INITIAL CORE DESCRIPTIONS

DEEP SEA DRILLING PROJECT

LEG 41

EASTERN NORTH ATLANTIC

Prepared for the
NATIONAL SCIENCE FOUNDATION
National Ocean Sediment Coring Program
Under Contract C-482
By the
UNIVERSITY OF CALIFORNIA
Scripps Institution of Oceanography
Prime Contractor for the Project

MGG 15055042

UNIVERSITY OF CALIFORNIA, SAN DIEGO

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

SCRIPPS INSTITUTION OF OCEANOGRAPHY

POST OFFICE BOX 1529
LA JOLLA, CALIFORNIA 92037

Dear Colleague:

This document has been printed and distributed by the Deep Sea Drilling Project for the purpose of sample selection by interested earth scientists, sample requests being honored one year after completion of the cruise on which the samples were collected. It is an interim and informal document consisting of site data and sedimentologic and paleontologic data as known six (6) months post-cruise. These data, while completely adequate for almost all sample selection needs, will be subject to possible slight change by the time of issue of the formal cruise report, the corresponding volume of the Initial Reports of the Deep Sea Drilling Project.

The information contained herein is preliminary and privileged, consequently this document is not to be cited or used as the basis of other publications. Data cited or used in a manuscript will be considered a breach of professional ethics.

Thank you for your interest in the Deep Sea Drilling Project.

Sincerely,

N. Terence Edgar
Chief Scientist
Deep Sea Drilling Project

NTE:eb

INITIAL CORE DESCRIPTION (ICD) DEEP SEA DRILLING PROJECT

LEG 41

February 17, 1975 — April 10, 1975

A Project Planned by and Carried Out With the Advice of the
JOINT OCEANOGRAPHIC INSTITUTIONS FOR DEEP EARTH SAMPLING (JOIDES)

MEMBER ORGANIZATIONS

Lamont-Doherty Geological Observatory, Columbia University
Rosenstiel School of Marine and Atmospheric Science, University of Miami
Scripps Institution of Oceanography, University of California
University of Washington
Woods Hole Oceanographic Institution
P. P. Shirshov Institute of Oceanology, Moscow, USSR
Bundesanstalt für Bodenforschung, Hannover, FRG

PARTICIPATING SCIENTISTS

Yves Lancelot, Eugen Seibold, Pavel Cepek,
Walter E. Dean, Vladislav Eremeev, James V. Gardner,
Lubomir F. Jansa, David Johnson, Valeri Krashneninnikov,
Uwe Pflaumann, J. Graham Rankin, Peter Trabant

INITIAL CORE DESCRIPTION - LEG 41

INTRODUCTION

GLOMAR CHALLENGER left Abidjan, Ivory Coast on February 17, 1975, and docked at Malaga, Spain on April 10, after having drilled five sites. The main objectives of this cruise were to obtain as complete as possible a record of the sedimentary history of the eastern North Atlantic and its margin in order to understand their evolution and compare that to the evolution of the western Atlantic and the South Atlantic.

During the planning phase for this leg, a deliberate choice was made to drill only a small number of holes, but carefully select them so that their results would yield a comprehensive picture of the different environments represented in the area. Restricting the number of holes appeared to be the best way to get deep penetration and to obtain a complete record of all the sediment facies present. In order to achieve these goals, eight primary sites, located in the deep basins, on different types of rises, and on the continental slope, were selected by the JOIDES Atlantic Advisory Panel. All the sites were selected in areas where abundant seismic reflection profiles are available thus insuring that each site could be located in a region truly representative of the general stratigraphy of the eastern North Atlantic. This also allows the drilling results to be utilized for basin-wide correlations. Much of the data obtained during Leg 41 should eventually be of more than regional interest; they bear on fundamental problems related to the

5

evolution of the Atlantic and more generally of a "rifted" ocean and its margins.

Of the five sites drilled during this Leg (Figure 1), two were deep basin sites (367 and 370), two were rise sites (366 and 368) and one was a continental slope site (369). The sites drilled in the basins are located on old oceanic crust, within the magnetic quiet zone, so that only the oldest part of the record was expected to provide a good stratigraphic control. The younger sediments should have been mainly deposited below the CCD.

The younger record was investigated by drilling on the rise sites. Sierra Leone Rise is a typical aseismic oceanic rise, covered with a blanket of pelagic sediments. Cape Verde Rise was also expected to be covered with pelagic sediments; however, the occurrence of well-stratified parallel reflectors on the seismic reflection profiles suggests that hemipelagic sedimentation under the influence of bottom currents could have played an important role in the building of the rise. In that respect, the site on Cape Verde Rise (363) could be considered as intermediate between a basin site and the site on the Sierra Leone Rise (366). The site on the continental slope (369), south of the Atlas region which was folded in the Tertiary, can also provide a good comparison with the sites drilled on the rises.

In addition to covering a wide range of water depths, the five Leg 41 sites also cover a wide range of latitudes, from about 5°N to about 33°N, providing control on both vertical and latitudinal environment gradients reflecting both the biogenic and terrigenous contribution to the sediments.

A brief description of the preliminary scientific results appeared in Geotimes, July 1975, v. 20, (p. 18-21).

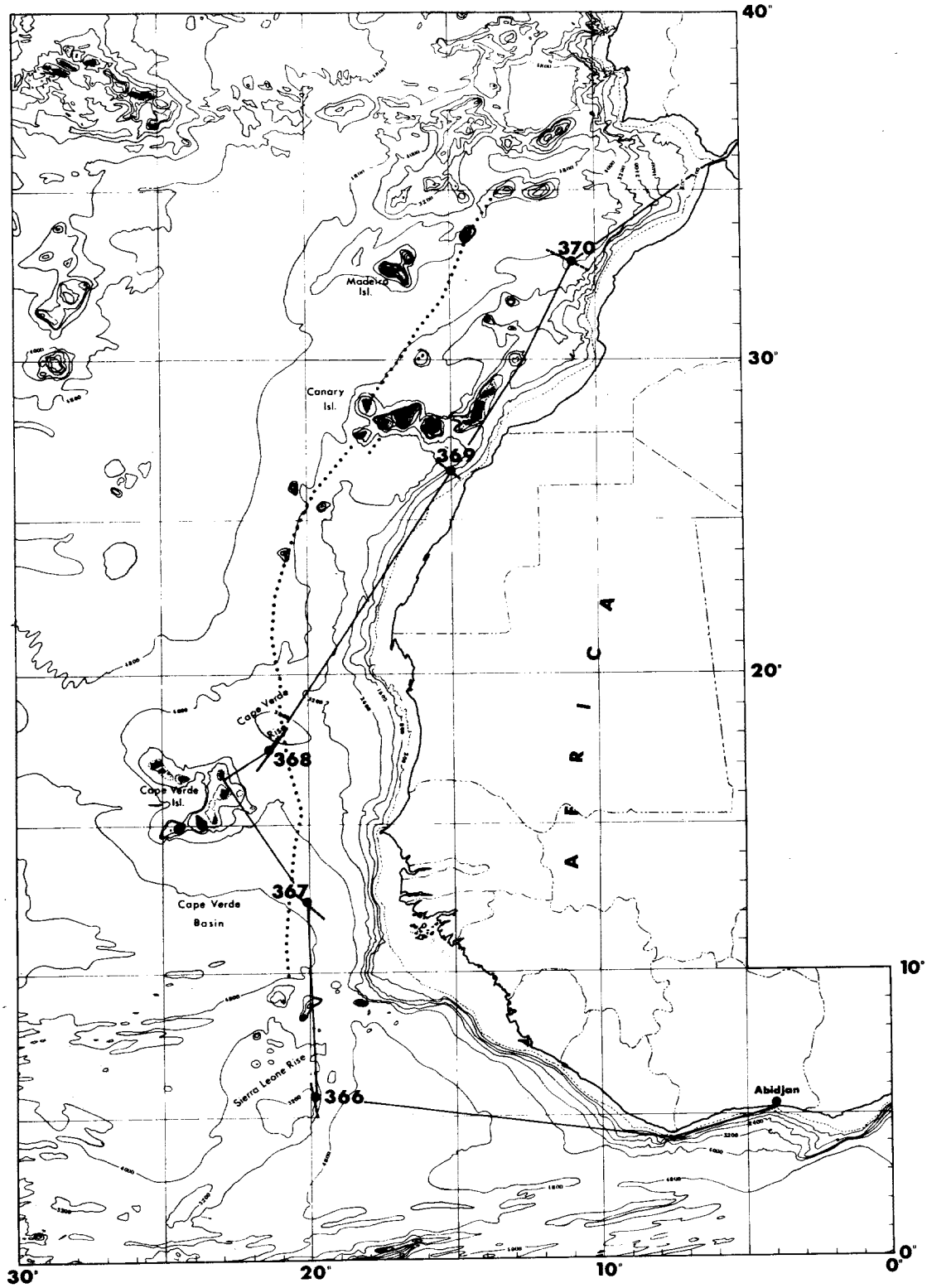


Figure 1. Leg 41 Drill Sites.

EXPLANATORY NOTES

The purpose of this volume is to present descriptions of all the cores recovered on DSDP Leg 41 to aid potential investigators in the selection of samples. The descriptions of lithology and biostratigraphy should be regarded as tentative because shore-based investigations were just beginning at the time this volume was published. The following material is intended as an aid in understanding the terminology, labeling, and the numbering conventions used on DSDP Leg 41 material.

Numbering and Depth Conventions

A site number refers to a single hole or group of holes drilled in essentially the same position using the same acoustic beacon. The first hole at a site is given the number of the site. Second or subsequent holes drilled after withdrawing from the first hole and redrilling were labeled "A", "B", etc. (e.g. Site 366A).

A core is taken by dropping a core barrel down the drill string and coring for 9.5 meters as measured by lowering of the drill string. The sediment is retained in a plastic liner 9.28 meters long inside the core barrel and in a 0.20 meter long core catcher assembly below the liner. The liner is not usually full when retrieved.

Upon recovery the liner is cut into sections of 1.5 meters, measured from the lowest point of sediment within the liner. In general the top of the core does not coincide with the top of a

section. The sections are labeled from 1 for the top (often incomplete) section to a figure as high as 6 for the bottom (complete) section, depending on the total length of core recovered. By convention, when partial recovery results, the recovered sediment is assumed to represent the top of the cored sequence. The core catcher represents sediment immediately below the lowest section.

An example of accepted convention for a sample number is "41-369-3-1 (10-20 cm)." This sample represents sediment from Leg 41, Site 369, Core 3, in Section 1 between 10 and 20 centimeters.

Handling of Cores

After a core section was cut, sealed, and labeled, it was brought into the core laboratory for processing. Sonic velocity measurements, using a Hamilton frame velocimeter, and physical property data were taken on selected samples. Samples were taken from suitable cores for inorganic and organic geochemical analysis. One of the split halves was designated a working half. Samples, including those for grain size, X-ray mineralogy, water content, carbon-carbonate, and samples for shipboard and shorebased studies of nannoplankton, foraminifera, radiolarians, diatoms, and silico-flagellates or other paleontological studies were taken.

The other half of the core section was designated an archive half. The color, texture, structure, and composition of the various lithologic units within a section were described on standard visual core description sheets (one per section) and any remarkable features

noted. Smear slides were made for each sediment of distinct lithology, microscopic examinations were made, and the descriptions were recorded. The archive half of the core section was then photographed. After the above process, both halves were stored in the ship's cold storage.

All samples now reside in cold storage at the DSDP East Coast Repository at Lamont-Doherty Geological Observatory, Palisades, New York and are avilable to investigators.

Sediment Analyses

Carbon-Carbonate

Organic carbon and calcium carbonate analyses were performed using a Leco 70-Second Analyzer following procedures outlined in Volumes 9 and 18 of the Initial Reports of the Deep Sea Drilling Project. Accuracy and precision of the results are as follows:

Total carbonate	±0.3% (absolute)
Organic carbon	±0.06% (absolute)
$CaCO_3$	±3% (absolute)

Analyses designated "$CaCO_3$ bomb" were made using a method of measuring the CO_2 pressure after acidification of the sample, described by Müller and Gastner (1971). The state the accuracy of this method is ±1% $CaCO_3$.

The size classification used here is that of Shepard (1954) with the sand, silt, and clay boundaries based on the Wentworth (1922) scale: sand from 2000 to 62.5 microns, silt 62.5 to 3.91 microns, and clay less than 3.91 microns.

Standard sieve and pipette methods were used to determine the grain size distribution. The sand-size fraction was removed by wet sieving using a 63-micron sieve, and the silt and clay fractions were analyzed by standard pipette analysis. Sampling depths and volumes were calculated using equations derived from the Stokes settling velocity equation (Krumbein and Pettijohn, 1938, 95-96).

Sediment Classification

The sediment classification used on Leg 41 is outlined below. The sediment was examined on a smear slide and placed in one of the categories.

CLASSIFICATION AND NOMENCLATURE RULES

I. Rules for class limits and sequential listing of constituents in a sediment name.

   A. Major constituents

      1. Sediment assumes names of those constituents present in major amounts (major defined as >25%). See example in rule 1A3.

      2. Where more than one major constituent is present, the one in greatest abundance is listed farthest to the right. The remaining major constituents are listed progressively farther to the left in order of decreasing abundance.

      3. When two or more major constituents are present, class limits are based on percentage intervals: 0-5, 5-25, 25-75, 75-100.

B. Minor constituents

Constituents present in the amounts of 5-25% are prefixed on the sediment name by the term -bearing.

Example: 50% nannofossils, 30% radiolarians, 20% zeolites would be called a zeolite-bearing rad nanno ooze.

Examples illustrating rules 1A and 1B and the resulting sediment names:

% Clay	% Nannos		
0- 5	75-95	=	Nanno ooze
10- 25	25-75	=	Clay-bearing nanno ooze
75- 95	5-25	=	Nanno-bearing clay
95-100	0- 5	=	Clay

II. Specific rules for calcareous and siliceous tests.

A. Nannofossil is applied only the calcareous tests of coccolithophorids, discoasters, etc.

B. The term calcareous or siliceous, depending on skeletal composition, is applied where no attempt is made to distinguish fossils as to major subgroup. Thus, if no estimate is made, a mixture of radiolarians, diatoms, and silicoflagellates would be called a siliceous ooze. Where this distinction is made, the appropriate fossil name is used.

C. Fossil tests are not qualified by a textural term unless very obviously redeposited.

D. Abbreviations, as nanno for nannofossil, rad for radiolarian, etc. may be used in sediment name.

E. The terms ooze, marl, and clay are used to designate >60%, 30 to 60%, and <30% carbonate, respectively (see Table 1).

F. The term chalk is used to represent a compacted, semi-lithified ooze.

G. Limestone is restricted to cemented calcareous rocks.

Table 1. Shales apply when sediment is fissile. Limestones must be cemented.

$CaCO_3$ Content Percent	INDURATION		
	Unconsolidated	Semilithified	Lithified
0-30	clay	clay	claystone
30-60	marl	marl	marlstone
>60	ooze	chalk	limestone

III. Clastic sediments

A. Clastic constituents, whether detrital, volcanic, biogenous or authigenic, are given a textural designation. When detrital[1] grains are the sole clastic constituents of a sediment, a simple textural term suffices for its name. The textural term can be preceded by a mineralogical term when this seems warranted. Such mineralogical terms are applied as per rules 1A and B.

B. Clastic volcanics

Redeposited pyroclastics also become a clastic component. They are recognized by the term volcanic and receive a

[1] Detrital = all clastic grains derived from the erosion of pre-existing rocks except for those of biogenous, authigenic, or volcanic origin.

textural term such as gravel, sand, silt, etc. It is particularly difficult at times to differentiate between volcanic sand (i.e., transported by tractive mechanisms) and crystal ash (i.e., direct outfall resulting from explosion of a volcano).

C. Clastic authigenic constituents

Where authigenic minerals are recognized as being a redeposited constituent, they are given a textural designation in additon to their mineral names.

IV. Volcanic and authigenic constituents

A. Volcanic constituents

Pyroclastics are given textural designations already established in the literature. Thus, volcanic breccia = >32 mm, volcanic lapilli = <32 mm to >4 mm, and volcanic ash = <4 mm. It is at times useful to further refine the textural designations by using such modifiers as coarse or fine. An ash wholly, or almost wholly, of glass shards is termed vitric ash.

B. Authigenic constituents

1. Authigenic minerals enter the sediment name in a fashion similar to that outlined under rules 1A and B. Normally, as with a fossil biocoenosis, the authigenic minerals are not given a textural designation and texture.

2. The terms ooze and chalk are applied to carbonate minerals of all types using the same rules that apply to biogenous constituents.

The lithologic symbols used in the core forms are shown in Figure 2.

Determinations of Shipboard Mineralogy and Lithology.

Smear Slides

Smear slides are the means of mineral identification on shipboard. Smear slide estimates of mineral abundances were based on the area of the smear slide covered by each component. Quantification was assigned using the following criteria:

Smear Slide descriptions

X-ray, grain size, and carbon-carbonate data

Many cores contain important minor lithologies as well as a basic lithology. The description of the basic lithology is so indicated in most cases; however, descriptive information for minor lithologies is included wherever possible.

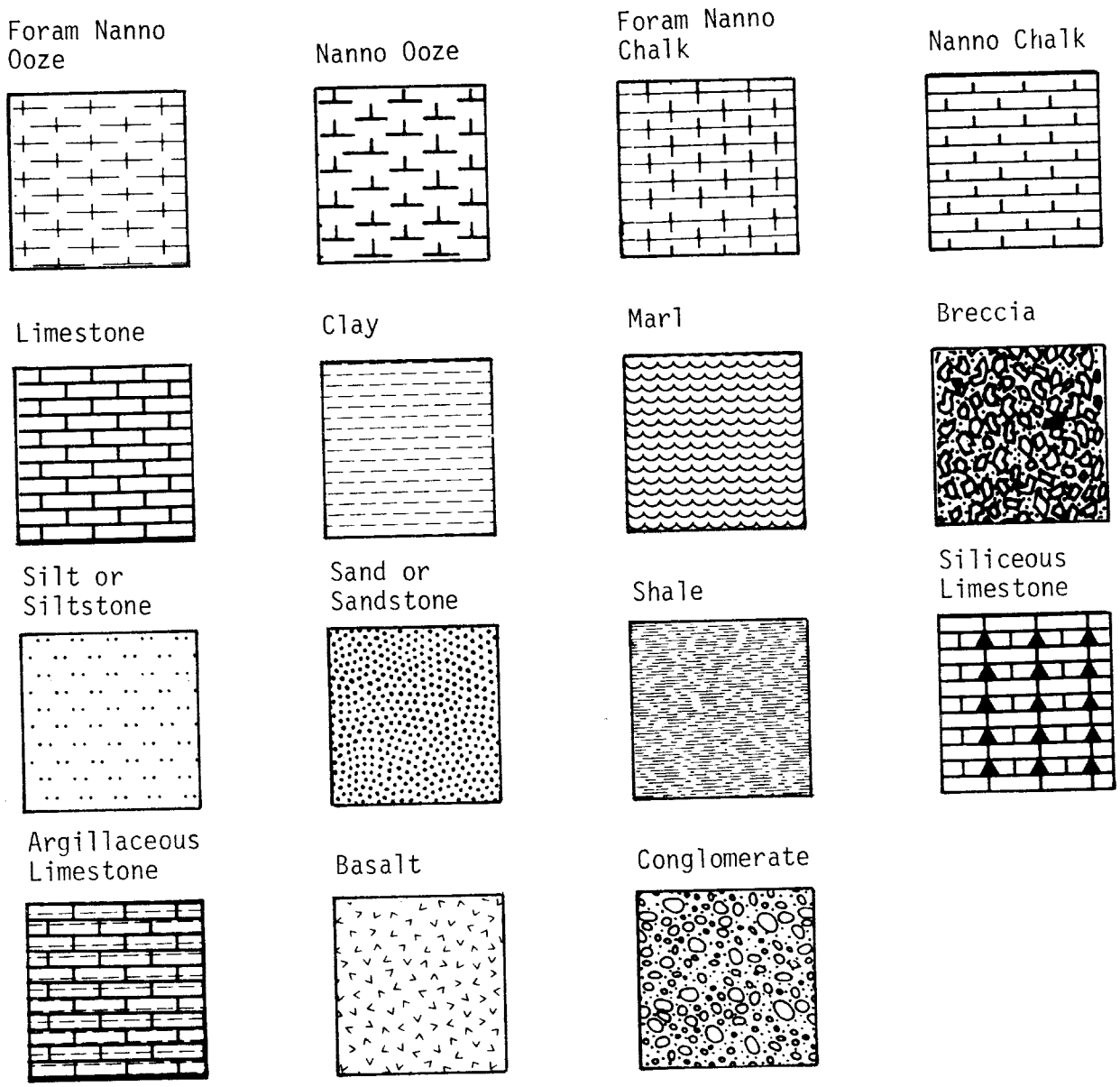
A sample core form appears in Figure 3. This sample core form contains all legend and explanatory notes for understanding of the core forms.

Biostratigraphy

The biostratigraphy used for Leg 41 material follows the references in Table 2.

Table 2. Biostratigraphy

	Cenozoic	Mesozoic
Nannofossils	Martini, 1971	Thierstein, 1971
Foraminifera	Bolli, 1966 Banner and Blow, 1965	van Hinte, 1972
Radiolaria	Riedel and Sanfilippo (in press)	Riedel and Sanfilippo, 1974



V = Volcanic Ash
F = Forams
R = Rads
D = Diatoms
N = Nannos

Z = Zeolitic
◺ = Turbidite
Fe = Ferruginous
△ = Porcellanite
▲ = Chert
⋀ = Gypsum or Barite

Figure 2. Lithologic Symbols

Site Hole Core Cored Interval:

AGE	NANNOS FORAMS RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
	NANNOFOSSIL ZONES FORAMINIFERA ZONES RADIOLARIA ZONES	D = diatom, F = foraminifera, N = nannofossil, R = radiolaria, S = Silicoflagellate	A = abundant, C = common, F = rare, T = trace, O = omitted	G = good, M = moderate, P = poor	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	The lithology symbols are only to indicate the sediment types present and do not indicate relative amounts of each type.	---- moderate disturbance, ~~~~ severe disturbance, bx = drilling breccia, VOID = no material recovered Blank = minor to no disturbance	*Smear Slide depth in centimeters within the section C = chemistry, TS = thin section	GENERAL CODE FOR LITHOLOGIC DESCRIPTIONS Description of major and minor (if any) lithologies, color, deformation, and characteristics. SMEAR SLIDE - section, depth in section Abundances are qualitative follow the general scheme: D = >75% A = 25-75% C = 5-25% R = 1- 5%

Explanatory notes in Chapter 1

Figure 3. Sample Core Form and Legends

Drilling Deformation

Four degrees of drilling deformation were recognized and are noted by symbols on the sample core form (Figure 3). Slightly deformed cores exhibit a slight bending of bedding contacts; extreme bending defines moderate deformation. In highly deformed cores, injected bedding may be completely disrupted to produce a "drilling breccia." Watery intervals generally have lost any bedding characteristics originally available. Great care and considerable judgment must be used in determining whether sediment structural features are original or are artifacts introduced by the drilling and coring techniques.

Downhole Contamination

Downhole contamination is a serious problem. Hard objects (manganese nodules, chert, lithic fragments, and pebbles) are often washed or dragged downhole. They are commonly lodged in the top of cores or incorporated into the middle of cores at levels far below their proper stratigraphic position. Displaced manganese nodules can usually be detected. However, displaced chert, lithic fragments, and pebbles are more difficult to recognize.

1- 5% Rare (R)

5-25% Common (C)

25-75% Abundant (A)

>75% Dominant (D)

Specific mineral identification and quantification was attempted for sands, but for silts, and clays, only the textural categories were used.

Core Forms

The basic lithologic data are contained on core summary forms in both symbolic (Figure 2) and descriptive form. As far as possible the data are presented in the following order:

Sediment name

Color name and Munsell or GSA number

The reader is advised that colors recorded in core barrel summaries were determined during shipboard examination immediately after splitting the core sections. Experience with carbonate sediments has shown that many of the colors will fade or disappear with time after opening and storage. Colors particularly susceptible to rapid fading are purple, light and medium tints of blue, light bluish gray, dark greenish black, light tints of green, and aple tints of orange. These colors change to white or yellowish white or pale tan.

Composition

Structure(s)

REFERENCES

Banner, F. T. and Blow, W. H., 1965. Progress in planktonic foraminiferal biostratigraphy of the Neogene: Nature, v. 208, no. 5016, p. 1164.

Bolli, H., 1966. Zonation of Cretaceous to Pliocene marine sediments based on planktonic foraminifera: Bull. Assoc. Venezolana Geol. Mineral Petrol., v. 9, no. 1, p. 3.

Krumbein, W. C. and Pettijohn, F. J., 1938. Manual of sedimentary petrography: New York, Appleton Century Co., Inc., p. 95-96.

Martini, E., 1971. Standard Tertiary and Quaternary calcareous nannoplankton zonation: In Proc. 2nd Planktonic Conf., Roma, p. 739-785.

Müller, G. and Gastner, M., 1971. The "karbonat-bombe", a simple device for the determination of the carbonate content in sediments, soils and other materials: N. Jb. Miner,. Mh., H. 10, p. 466-469.

Riedel, W. R. and Sanfilippo, A., 1974. Radiolaria from the Southern Indian Ocean, DSDP Leg 26: In Davis, T. A., Luyendyk, B. P., et al., Initial Reports of the Deep Sea Drilling Project, v. 26, Washington (U. S. Government Printing Office), p. 771-813.

_____, in press. Stratigraphy and evolution of tropical Cenozoic Radiolaria: In Proc. 3rd Planktonic Conf. Kiel, Germany.

Shepard, F. P., 1954. Nomenclature based on sand-silt-clay ratios: J. Sed. Petrol., v. 24, (3), p. 151-158.

Thierstein, H. R., 1971. Tentative Lower Cretaceous calcareous nannoplankton zonation: Eclog. Geol. Helv., v. 64.

Van Hinte, J. E., 1972. The Cretaceous time scale and planktonic foraminiferal zones: Koninkl. Nederl. Akad. vanwetenschappen, Series B, v. 75, no. 1, p. 8.

Wentworth, C. K., 1922. A scale of grade and class terms of clastic sediments: J. Geol., v. 30, p. 377.

sample-distribution policy

Distribution of Deep Sea Drilling samples will be undertaken in order to (1) provide supplementary data for inclusion in the appropriate Initial Report to support *Glomar Challenger* scientists in achieving the scientific objectives of their particular cruise, and (2) provide individual investigators with material to conduct detailed studies beyond the scope of the Initial Reports.

The National Science Foundation has established a Sample Distribution Panel to advise on distribution of core material. This panel is chosen in accordance with usual Foundation practices, in a manner that will assure advice in the various disciplines leading to a complete and adequate study of the core and related materials. Funding for the proposed research is handled separately by the investigator, not through the Deep Sea Drilling Project.

Distribution of samples for contributions to Initial Reports

Any investigator who wishes to contribute a paper to a given volume of the Initial Reports may write to the Curator, Deep Sea Drilling Project, Scripps Institution of Oceanography, University of California at San Diego, La Jolla, 92037, requesting samples from a forthcoming cruise. The request should include the nature of the study, and type, size, number of samples, particular sampling techniques or equipment that might be required, and an estimate of the time required to complete the study. The requests will be reviewed by shipboard scientists, and, if they are deemed suitable and pertinent to the objectives of the leg, and shipboard workload permits, the requested samples will be taken during the cruise (provided, of course, material suitable to the investigation is obtained during the drilling). In the case of multiple requests to perform the same investigation, selection of investigator will be made by the shipboard scientific party.

Proposals should be of a scope appropriate to complete the sampling and study in time for publication in the Initial Reports. Studies deemed acceptable will be referred to the Curator who will, with the consent of the NSF Sample Distribution Panel, authorize distribution of the samples. The Sample Distribution Panel and the Deep Sea Drilling Project will strive to ensure a reasonable degree of continuity in the investigations among the various cruises, that the studies are pertinent to goals of the cruise, and that they are consistent with the publication policy for the Initial Reports. Subject to these same provisions, the shipboard scientific party may elect to have special studies of selected core samples of its recently completed cruise made by other investigators.

Investigations not completed in time for inclusion in the Initial Report may not be published in other journals until publication of the Initial Report for which it was intended.

Distribution of samples for publication other than in Initial Reports

1. Researchers intending to request samples for studies beyond the scope of the Initial Reports should first obtain a sample request form from the Curator. Requests should specify the quantities and intervals of the core required, a statement of the proposed research, the possibility of returning residue to the Curator, the estimated time required to complete and publish the results, and the availability or need of funding and availability of equipment and space foreseen for the research.

In order to ensure that requests for highly desirable but limited samples can all be considered, approval of requests and distribution of samples will not be made prior to 12 months after date of completion of the cruise that collected the cores. Prior to publication of an Initial Report, requests for samples from a cruise can be based on the preliminary shipboard core logs. Copies of these logs will be kept on open file at Scripps and other designated institutions. The only exceptions will be for specific instances involving ephemeral properties.

Requests for samples from researchers in industrial laboratories will be handled in the same manner as those from academic organizations, and there will be the same obligation to publish results promptly. Requests from foreign scientists or organizations will also be considered.

2. The Curator has the responsibility for distributing samples, controlling quality of samples, and preserving core material. He also has the responsibility for maintaining a record of requests for samples that have been processed and filled indicating the investigator and subjects to be studied. This record will be available to investigators.

The distribution of samples will be made directly from the two repositories at Lamont-Doherty Geological Observatory and Scripps by the Curator or his designated representative.

3. (a) Samples up to 10 cc/m of core length can be automatically distributed by the Curator, Deep Sea Drilling Project or his authorized representative to any qualified investigator who requests them. The Curator will refrain from making automatic distribution of any parts of the cores which appear to be in particularly high demand, and any requests for these parts of the cores will be referred to the Sample Distribution Panel for review. Requests for samples from thin layers or important stratigraphic boundaries will generally require Panel review.

(b) All requests for samples in excess of 3(a) above will be referred to the Sample Distribution Panel.

(c) If, in the opinion of scientific investigators, certain properties they wish to study may deteriorate prior to the normal availability of the samples, such investigators may request that the normal waiting period not apply. All such requests must be approved by the Sample Distribution Panel.

4. Samples will not be provided prior to assurance that funding for sample studies either exists or is not needed. However, neither formal approval of sample requests nor distribution of samples will be made until the appropriate time (Item 1). If a sample request is dependent, either wholly or in part, on proposed funding, the Curator will provide to the organization to whom the funding proposal has been submitted any information on the availability (or potential availability) of samples that it may request.

5. Investigators receiving samples are responsible for:

i) promptly publishing significant results.

ii) acknowledging, in publications, that samples were supplied through the assistance of the National Science Foundation.

iii) submitting 4 copies of all reprints of published results to the Curator.

iv) notifying the Curator of any work done on the samples that is additional to that stated in the original request for samples.

v) returning, in good condition, the remainders of samples after termination of research, if requested by the Curator.

6. Cores will be made available at repositories for investigators to examine and specify exact samples in such instances as this may be necessary for the scientific purposes of the sampling, subject to the limitations of 3 (a), (b), (c), and 5, above, and with the specific permission of the Curator or his delegate.

7. Cores of igneous and metamorphic rocks will also remain at the repositories where they will be available for observation and description and where selected samples may be taken for thin-section preparation and other work.

8. The Deep Sea Drilling Project routinely processes by computer most of the quantitative data presented in the Initial Reports. Space limits in the Initial Reports preclude detailed presentation of all such data. However, copies of the computer readout are available for those who wish the data for further analysis or as an aid in selecting samples.

Magnetics, seismic-reflection and bathymetric data collected under way by the *Glomar Challenger* will also be available for distribution 12 months after completion of the cruise.

Requests for these data may be made to the Coordinating Staff Geologist of the Deep Sea Drilling Project, at Scripps.

A charge will be made to recover the expenses of responding to individual requests. Estimated charges can be furnished before the request is processed, if required.

9. This policy has the approval of the National Science Foundation and is designed to help ensure that the greatest possible scientific benefit is gained from the materials obtained, and that samples will be made widely available to interested geologists.

(Slightly condensed from the official sample distribution policy of the Deep Sea Drilling Project.)

DEEP SEA DRILLING PROJECT

LEG 41 SITE 366 (HOLE 366A)

SITE SUMMARY SHEET

PRINCIPAL RESULTS:

Sierra Leone Rise

The sedimentary section on Sierra Leone Rise was continuously cored down to 850.5 meters and a complete Cenozoic record of pelagic sedimentation was recovered. The hole bottomed in upper Maestrichtian sediments and was abandoned due to plugging of the drill bit. The section consists of nanno oozes and marls grading downward to chalks and marls and then to limestones and marlstones. Chert and porcellanite were found in middle to lower Eocene. No hiatus sediments was found and all the biostratigraphic zones were sampled. The co-occurrence of different microfossil groups in most of the section makes it an ideal references section for Cenozoic zonation in tropical-subtropical latitudes. Since the latest Cretaceous Sierra Leone Rise was always in a deep-water pelagic environment, and well above the CCD. The rate of sedimentation appears rather constant with the lower values corresponding to times when hiatuses are observed in the basins and some other rises in the Atlantic. The highest rates of accumulation correspond to nonhiatus times. Dissolution and/or dilution cycles, present in most of the lower section up to the middle Miocene, are probably related to climatic variations. A major reflector observed at 0.5 seconds on the seismic profile corresponds to the youngest occurrence of middle Eocene porcellanites and chert. Another reflector, at about 0.9 seconds, but not corresponding to basement, was not reached so the age and nature of the oldest sediments remain unknown.

Date occupied	1140Z 22 February 1975
Date departed	1614Z 1 March 1975
Time on site	7 days, 4 hours, 34 minutes
Position: Latitude	05°40.7'N
Longitude	19°51.1'W
Water depth (sea level)	2853 corrected meters
Water depth (rig floor)	2863 corrected meters
Penetration	850.5 meters

LEG 41 SITE 366 (HOLE 366A)
SITE SUMMARY SHEET, con't.

Number of holes	2
Number of cores	55 at 366; 39 at 366A
Total length of cored section	850.5 meters
Total core recovered	582 meters
Percentage core recovery	68%
<u>Oldest Sediment Cored</u>	
Depth subbottom	950.5 meters
Nature	Limestone
Age	Maestrichtian

Site 366 Hole Core 1 Cored Interval: 0.0-5.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PLEISTOCENE	Globorotalia truncatulinoides N22 Gephyrocapsa oceanica-Emiliania huxleyi, NN20-NN21 QUATERNARY (unzoned)			F N R	A A R	G G M	0					FORAM NANNO OOZE, mottled dark yellowish orange (10YR 6/6), dark yellowish brown (10YR 4/2), and dusky yellow brown (10YR 2/2), intense drilling disturbance, soft. Section 1 has common pelagic clay component, opal phytoliths, and fresh water diatoms, rare rads and diatoms. Section 5 has rare silicoflagellates.
							1	0.5 1.0			24 50,53	SS at 1-24 (minor lithology) Pelagic clay C Diatoms R Micronodules R Rads R Forams A Fish debris R Nannos A Opal phytoliths R
							2				65	SS at 2-65 (dominant lithology) Forams A Diatoms C Nannos A Rads R
												SS at 5-85 (dominant lithology) Forams A Rads R Nannos A Silicoflagellates VR Diatoms R-C Opal phytoliths R
							3					SS at CC (dominant lithology) Micronodules R Rads VR Forams A Silicoflagellates VR Nannos A Fish debris R Diatoms R Opal phytoliths R
							4		VOID			
							5		VOID VOID		85	10YR 5/4 10YR 4/2
							6		VOID VOID		24	
							Core Catcher				CC	

Site 366 Hole Core 2 Cored Interval: 5.0-14.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PLEISTOCENE	QUATERNARY Globorotalia truncatulinoides N22 Pseudoemiliania lacunosa NN19 QUATERNARY (unzoned)			F N R	A A F	G G G	0					FORAM NANNO OOZE, intense mottling, very pale orange (10YR 8/2), moderate yellowish brown (10YR 5/4), intense drilling disturbance; soft.
							1	0.5 1.0			70	SS at 1-70 (dominant lithology) Forams A Nannos A Rads R
												10YR 8/2
							2				128	SS at 2-128 (dominant lithology) Forams A Rads R Nannos A Silicoflagellates R Diatoms C Clay R 10YR 6/6 10YR 5/4
												SS at CC (dominant lithology) Forams C Rads R Nannos A Silicoflagellates R Diatoms R Opal phytoliths R
							3		VOID			
							4		VOID			10YR 5/4
							5					10YR 5/6 10YR 5/4 10YR 6/6
							6					
							Core Catcher				CC	

Site 366 Hole Core 3 Cored Interval: 119.0-128.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE-UPPER MIDDLE MIOCENE	Globorotalia acostaensis-Globigerina nepenthes Zones N16-N14 Discoaster hamatus-Discoaster quinqueramus NN9-NN11			F N R	C C –	P P –	0					FORAM-BEARING NANNO OOZE, dominant colors: grayish orange (10YR 7/4), very pale orange (10YR 8/2); slight drilling disturbance for most of core; intensely bioturbated throughout; stiff ooze.
							1	0.5 1.0			51	10YR 7/4 10YR 8/2 SS at 1-51, 2-80, 3-125, 4-90, CC (dominant lithology) Forams C Nannos D
							2				80	Carbonate Bomb: 1-25 to 26 cm = 72% 2-25 to 26 cm = 83% 4-84 to 85 cm = 59% 5-82 to 83 cm = 62%
							3				125	
							4				90	10YR 8/2 10YR 6/6 10YR 8/2
							5					10YR 7/4 10YR 8/2
							6					10YR 7/4
							Core Catcher				135 CC	10YR 8/2

Site 366 Hole Core 4 Cored Interval: 242.5-252.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER MIOCENE	Globigerinoides primordius N48 Triquetrorhabdulus carinatus-Discoaster druggi NN1-NN2 Lychnocanoma elongata						0					FORAM-BEARING NANNO OOZE, very pale orange (10YR 8/2) to white (N9), firm to stiff, slight drilling disturbance, except for first 55 cm which are intense. Main lithology is mottled with grayish orange (10YR 7/4) and light grayish green (5GY 8/1) colors throughout core. Section 3 shows presence of Radiolaria. Fresh water diatoms. Lithology becomes a CHALK within Section 2.
							1	0.5 1.0	VOID		22 50	
							2				90	SS at 1-22 (dominant lithology) Forams C Nannos D SS at 2-90 (dominant lithology) Forams A Rads R Nannos A Sponge spicules VR SS at 3-28 (dominant lithology) Forams A Diatoms R-C Nannos A Rads C SS at 3-87 (minor lithology) Forams A Diatoms R Nannos A Rads C SS at 3-120 (dominant lithology) Forams A Rads R Nannos A Sponge spicules VR Silicoflagellates VR
							3				28 87	Carbonate Bomb: 2-136 to 137 cm = 79%
		NANNOS		R	F	P						
		FORAMS			F	P						
					C	M	4				120	
							Core Catcher					

Site 366 Hole Core 5 Cored Interval: 366.0-375.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER OLIGOCENE	Globigerina sellii-Globigerina tapuriensis P19-P18 Sphenolithus predistentus NP23 Theocyrtis tuberosa			F N R	F F C	P P M	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	R VOID R R R R R R		90 140 140

LITHOLOGIC DESCRIPTION

RAD-BEARING FORAM NANNO CHALK, light greenish gray (5GY 8/1), mottled, little to slight drilling disturbance, stiff, burrowed zones 0-30, 108-125 and in Core 2. Biogenic calcite needles prominant in Section 3. FORAM NANNO CHALK, light bluish gray (5B 7/1), slight drilling disturbance, stiff, with Zoophycos tracks and burrowing, especially in Sections 5 and 6.

SS at 1-90 (dominant lithology)

Zeolites(?)	VR	Forams	A
Rads	C	Nannos	A

SS at 3-140 (dominant lithology)

Zeolites(?)	R	Nannos	A
Forams	A	Calcite needles	C

SS at 6-140 (dominant lithology)

Forams	R	Rads	R
Nannos	D		

Site 366 Hole Core 6 Cored Interval: 375.5-385.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER OLIGOCENE	Globigerina sellii-Globigerina tapuriensis P19-P18 Ericsonia subdisticha-Helicopontosphaera reticulata NP21-NP22 Theocyrtis tuberosa			F N R	R F C	P P M	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID VOID R R	bx	126 61 70 35 CC

LITHOLOGIC DESCRIPTION

NANNO CHALK, bluish white (5B 9/1) with mottles and bands of light bluish gray (5B 7/1), slight drilling disturbance, stiff, commonly burrowed and Zoophycos tracks. Mn laminations and liesegang banding common. Drilling breccia from 6-100 to 6-150 cm. Core Catcher is RAD-BEARING FORAM NANNO CHALK, bluish white (5B 9/1), stiff.

SS at 2-126 (dominant lithology)

Zeolites(?)	R	Sponge spicules	R
Forams	R	Nannos	D

SS at 4-70 (dominant lithology)

Forams	C	Rads	R
Nannos	A		

SS at 5-53 (minor lithology)

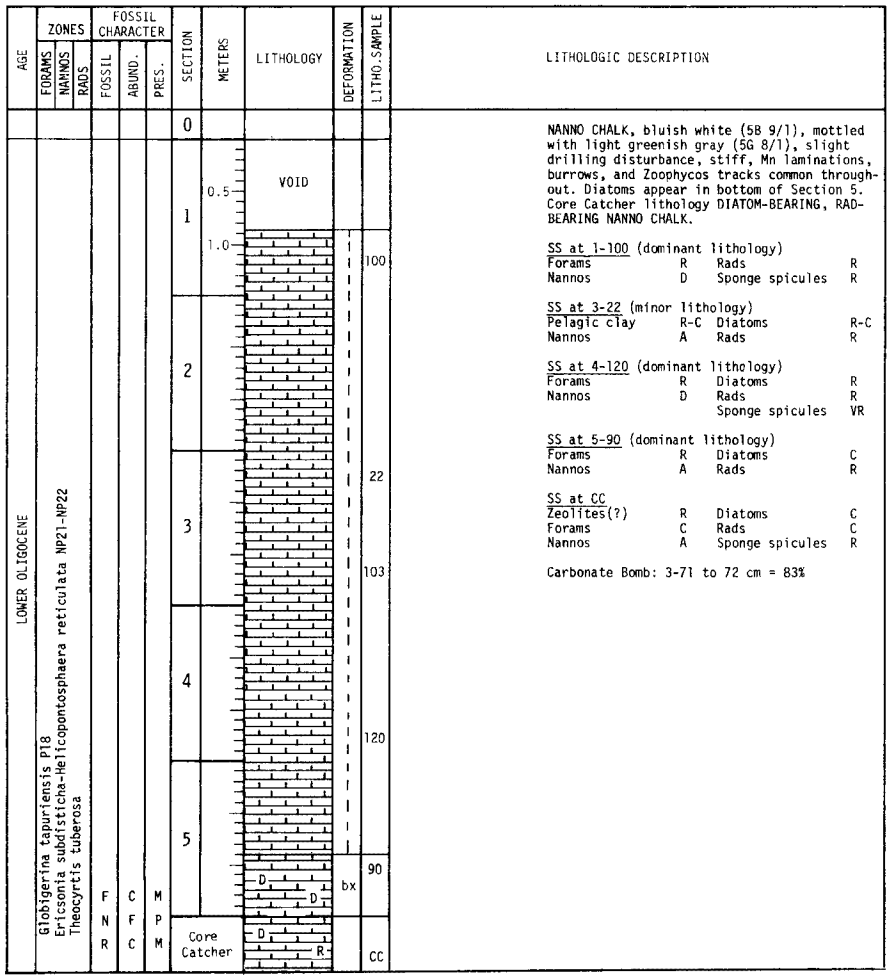
Nannos	A	Rads	R
Diatoms	R	Sponge spicules	R

SS at CC

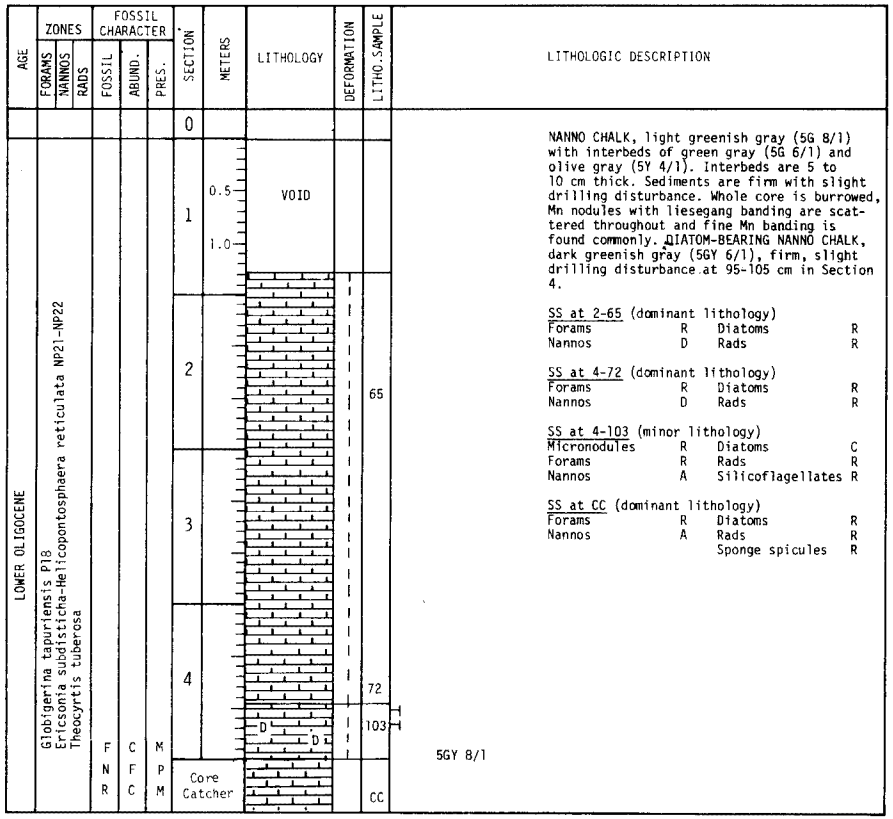
Forams	A	Rads	C
Nannos	A	Sponge spicules	R
		Silicoflagellates	R

Carbonate Bomb: 3-64 to 65 cm = 79%

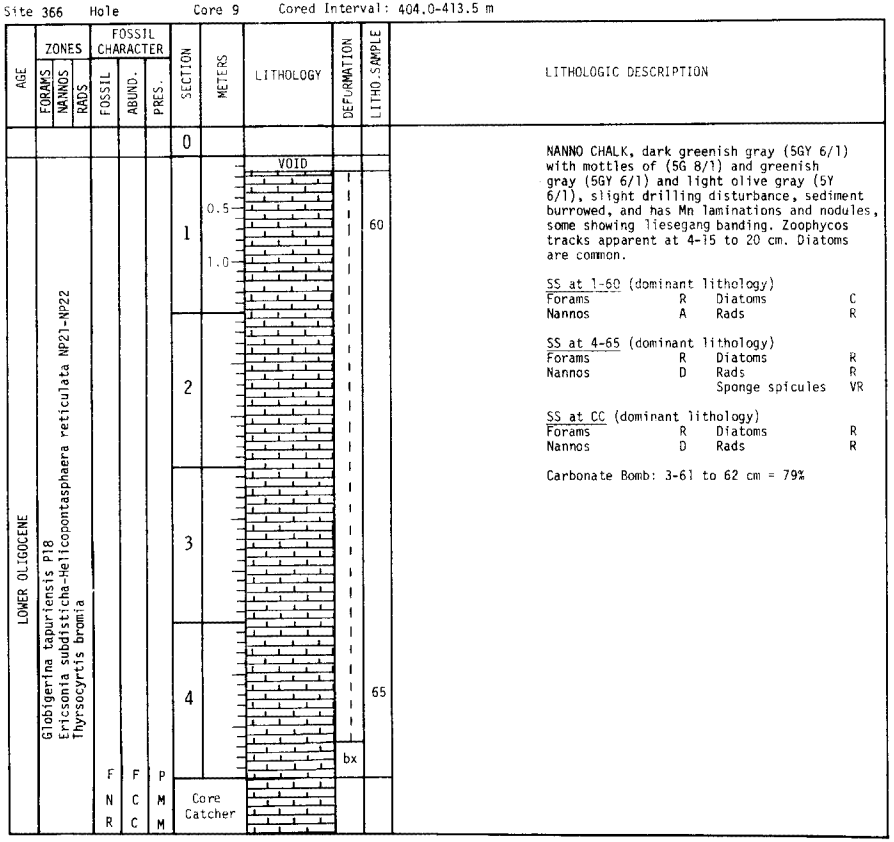
Site 366 Hole Core 7 Cored Interval: 385.0-394.5 m



Site 366 Hole Core 8 Cored Interval: 394.5-404.0 m



Site 366 Hole Core 9 Cored Interval: 404.0-413.5 m



NANNO CHALK, dark greenish gray (5GY 6/1) with mottles of (5G 8/1) and greenish gray (5GY 6/1) and light olive gray (5Y 6/1), slight drilling disturbance, sediment burrowed, and has Mn laminations and nodules, some showing liesegang banding. Zoophycos tracks apparent at 4-15 to 20 cm. Diatoms are common.

SS at 1-60 (dominant lithology)

Forams	R	Diatoms	C
Nannos	A	Rads	R

SS at 4-65 (dominant lithology)

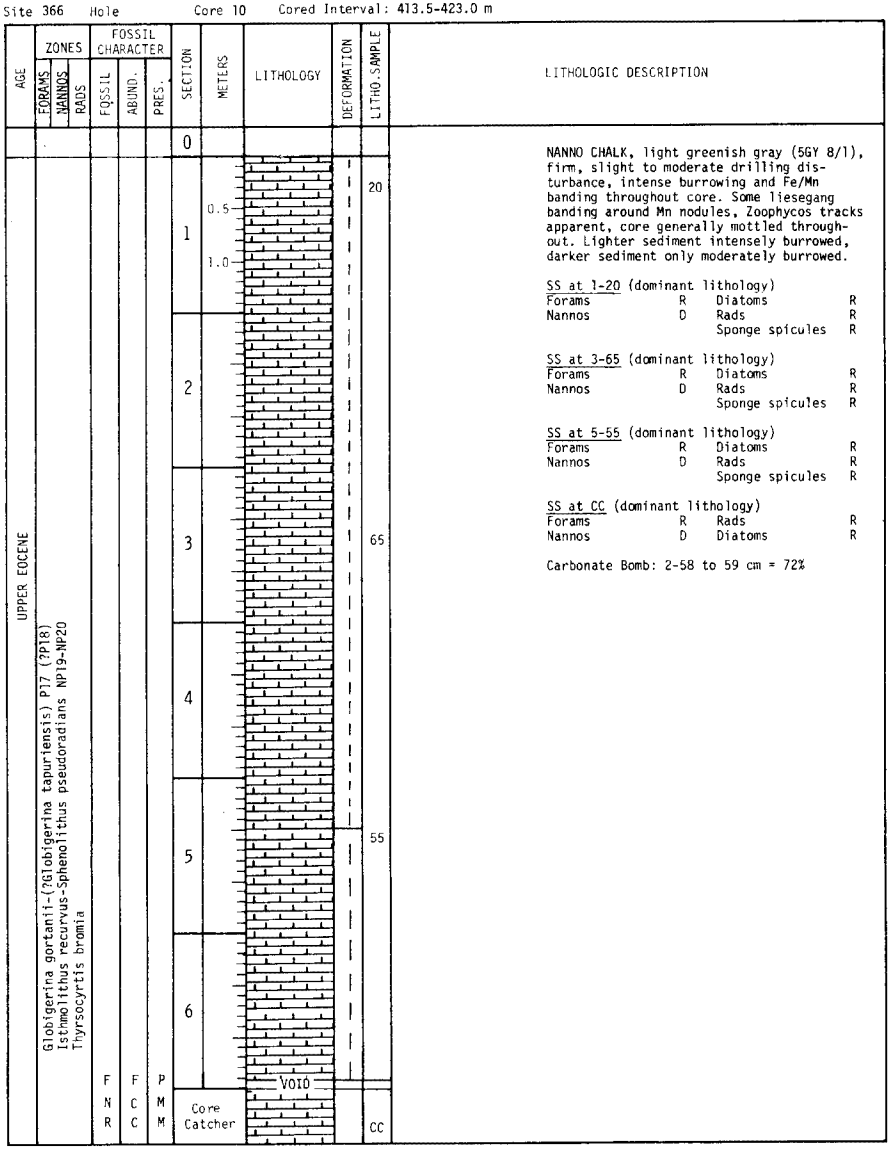
Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	VR

SS at CC (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R

Carbonate Bomb: 3-61 to 62 cm = 79%

Site 366 Hole Core 10 Cored Interval: 413.5-423.0 m



NANNO CHALK, light greenish gray (5GY 8/1), firm, slight to moderate drilling disturbance, intense burrowing and Fe/Mn banding throughout core. Some liesegang banding around Mn nodules, Zoophycos tracks apparent, core generally mottled throughout. Lighter sediment intensely burrowed, darker sediment only moderately burrowed.

SS at 1-20 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at 3-65 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at 5-55 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at CC (dominant lithology)

Forams	R	Rads	R
Nannos	D	Diatoms	R

Carbonate Bomb: 2-58 to 59 cm = 72%

Site 366 Hole Core 11 Cored Interval: 423.0-432.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER EOCENE	P16-P15 Globorotalia cocoaensis-Globigerinatheka semiinvoluta	*Thyrsocyrtis bromia		R	C	G	0				
					C	M	1	0.5, 1.0		bx	50
					R	P	Core Catcher				cc

LITHOLOGIC DESCRIPTION

NANNO CHALK, light greenish gray (5GY 8/1) with mottles and interbeds of 5G 8/1, firm, slight to moderate drilling disturbance in first 100 cm then drilling breccia for remaining 50 cm. Sediment is burrowed throughout with Fe/Mn nodules, some with liesegang banding.

SS at 1-50 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R

SS at CC (dominant lithology)

Forams	VR	Rads	R
Nannos	A	Silicoflagellates	VR
Diatoms	C		

Carbonate Bomb: 1-52 to 53 cm = 75%

* Isthmolithus recurvus-Sphenolithus pseudoradians NP19-NP20

Site 366 Hole Core 12 Cored Interval: 432.5-442.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER EOCENE	Isthmolithus recurvus-Sphenolithus pseudoradians NP19-NP20	Thyrsocyrtis bromia					0		VOID		
				F	R	P	1	0.5, 1.0			
							2				17
							3				70
							4				60
				N	F	P	Core Catcher				
				R	C	G					CC

LITHOLOGIC DESCRIPTION

NANNO CHALK, light greenish gray (5GY 8/1) with mottles of greenish gray (5GY 6/1). Drilling disturbance moderate to intense, firm. Sediment burrowed throughout and has common Fe/Mn bands and nodules, some showing liesegang banding. Zoophycos tracks apparent in Section 3. Faint greenish laminations occur, especially in Sections 3 and 4.

SS at 2-70 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at 4-60 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at CC

Forams	R	Diatoms	C
Nannos	A	Rads	C

Carbonate Bomb: 3-76 to 77 cm = 58%

Site 366 Hole Core 13 Cored Interval: 442.0-451.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER EOCENE	Isthmolithus recurvus-Sphenolithus pseudoradians NP19-NP20	Thyrsocyrtis bromia					0				
				R	C	G	1	0.5, 1.0	VOID		
							2				
							3				
					F	P					80
					F	P	Core Catcher				
											CC

LITHOLOGIC DESCRIPTION

NANNO CHALK, light greenish gray (5GY 8/1) with mottles of slightly darker color. Sediment is firm and has moderate drilling disturbance. Common faint green laminations.

SS at 3-80 (dominant lithology)

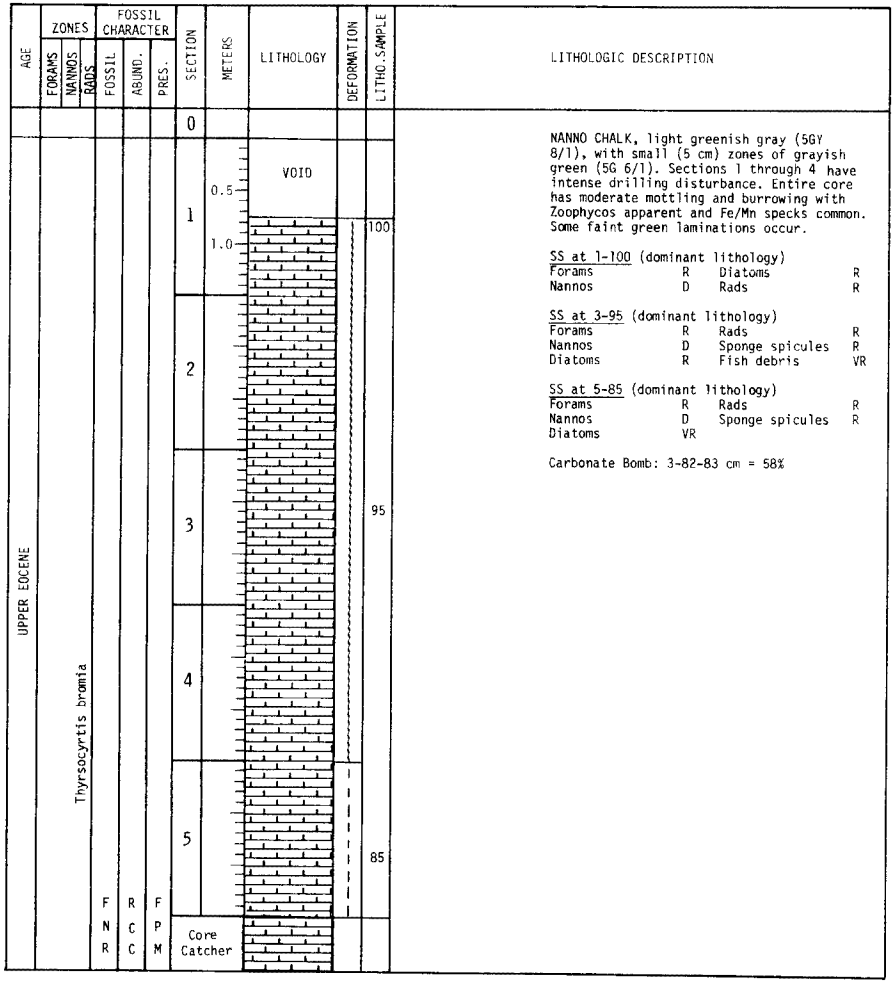
Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

SS at CC

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	VR

Carbonate Bomb: 2-82 to 83 cm = 54%

Site 366 Hole Core 14 Cored Interval: 451.5-461.0 m



LITHOLOGIC DESCRIPTION

NANNO CHALK, light greenish gray (5GY 8/1), with small (5 cm) zones of grayish green (5G 6/1). Sections 1 through 4 have intense drilling disturbance. Entire core has moderate mottling and burrowing with Zoophycos apparent and Fe/Mn specks common. Some faint green laminations occur.

SS at 1-100 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R

SS at 3-95 (dominant lithology)

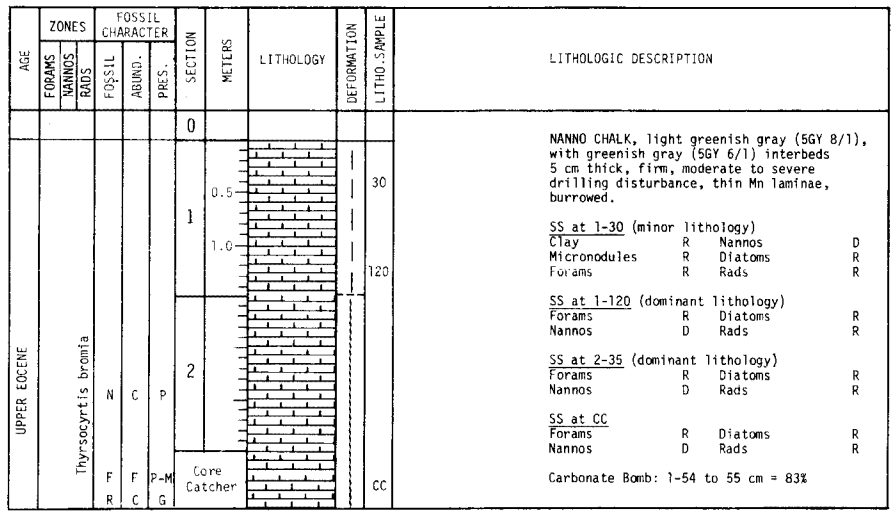
Forams	R	Rads	R
Nannos	D	Sponge spicules	R
Diatoms	R	Fish debris	VR

SS at 5-85 (dominant lithology)

Forams	R	Rads	R
Nannos	D	Sponge spicules	R
Diatoms	VR		

Carbonate Bomb: 3-82-83 cm = 58%

Site 366 Hole Core 15 Cored Interval: 461.0-470.5 m



LITHOLOGIC DESCRIPTION

NANNO CHALK, light greenish gray (5GY 8/1), with greenish gray (5GY 6/1) interbeds 5 cm thick, firm, moderate to severe drilling disturbance, thin Mn laminae, burrowed.

SS at 1-30 (minor lithology)

Clay	R	Nannos	D
Micronodules	R	Diatoms	R
Forams	R	Rads	R

SS at 1-120 (dominant lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R

SS at 2-35 (dominant lithology)

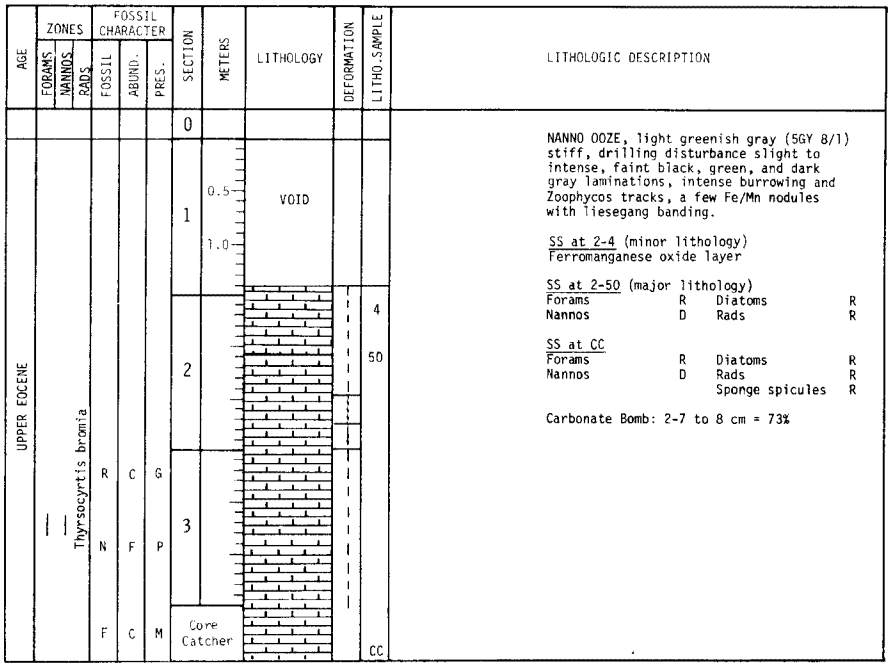
Forams	R	Diatoms	R
Nannos	D	Rads	R

SS at CC

Forams	R	Diatoms	R
Nannos	D	Rads	R

Carbonate Bomb: 1-54 to 55 cm = 83%

Site 366 Hole Core 16 Cored Interval: 470.5-480.0 m



LITHOLOGIC DESCRIPTION

NANNO OOZE, light greenish gray (5GY 8/1) stiff, drilling disturbance slight to intense, faint black, green, and dark gray laminations, intense burrowing and Zoophycos tracks, a few Fe/Mn nodules with liesegang banding.

SS at 2-4 (minor lithology)
Ferromanganese oxide layer

SS at 2-50 (major lithology)

Forams	R	Diatoms	R
Nannos	D	Rads	R

SS at CC

Forams	R	Diatoms	R
Nannos	D	Rads	R
		Sponge spicules	R

Carbonate Bomb: 2-7 to 8 cm = 73%

Site 366 Hole Core 17 Cored Interval: 480.0-489.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	P14 Truncorotaloides rohri			N	F	P	1	0.5, 1.0	VOID		28	INTERBEDDED NANNO CHALK AND PORCELLANITE IN CYCLES NANNO CHALK, light greenish gray (5GY 8/1), laminated, stiff, severe drilling disturbance, burrowed. PORCELLANITE, light gray (N7). SS at 1-28 (minor lithology) Forams R Nannos D Rads R
				F	C	P	Core Catcher					
				R	R	P					CC	SS at CC Forams R Nannos D

Site 366 Hole Core 18 Cored Interval: 498.5-499.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Truncorotaloides rohri P14 Chiphragmolithus alatus-1 Sphenolithus pseudoradians NP15-20			N	C	P	1	0.5, 1.0	VOID		38	INTERBEDDED PORCELLANITE AND NANNO CHALK IN CYCLES NANNO CHALK, light greenish gray (5GY 8/1), well-indurated but not cemented, disturbed by drilling, discontinuous laminae of greenish gray (5GY 6/1) nanno chalk. PORCELLANITE, light gray (N7), subconchoidal fracturing. SS at 1-38 (minor lithology) Recrystallized calcite A Nannos A
				F	C	P	Core Catcher					

Site 366 Hole Core 19 Cored Interval: 499.0-508.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Truncorotaloides rohri P14 Chiphragmolithus alatus-Discoaster tani nodifer NP15-NP16		*	N	F	P	1	0.5, 1.0	VOID		40 80	INTERBEDDED PORCELLANITE AND NANNO CHALK IN CYCLES (~25 cm) NANNO CHALK, light greenish gray (5GY 8/1), well-indurated but not cemented, severe drilling disturbance, laminated and burrowed. PORCELLANITE, light gray (N7) becoming cherty in center of burrows(?). Chert is light olive gray (5Y 6/1). SS at 1-40 (dominant ltihology) Recrystallized calcite A Nannos A SS at 1-80 (dominant lithology) Recrystallized calcite C Forams R Carbonate Bomb: 1-103 to 104 cm = 83%
				F	C	P	Core Catcher		△△△△△			
				R	F	P						

Explanatory notes in Chapter 1 * Podocyrtis chalara

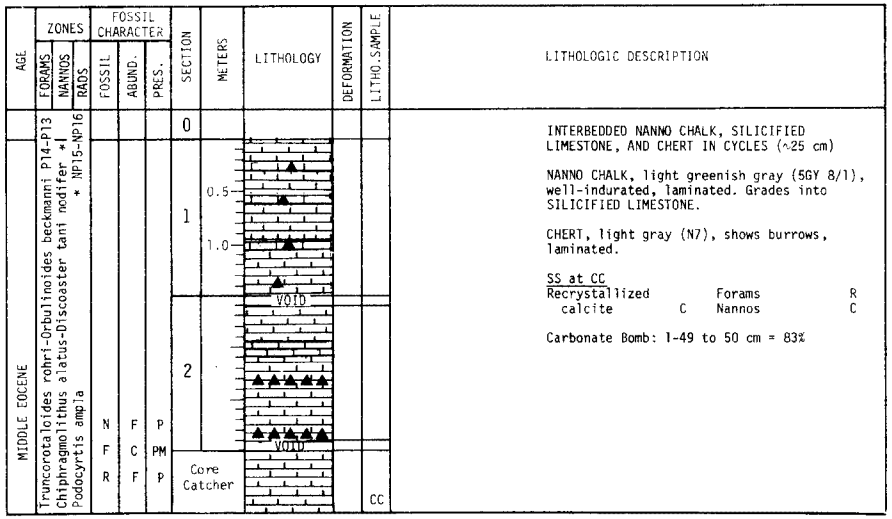
Site 366 Hole Core 20 Cored Interval: 508.5-518.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Truncorotaloides rohri P14 Chiphragmolithus alatus-Discoaster tani nodifer NP15-NP16 Podocyrtis mitra			N	F	P	1	0.5, 1.0	VOID			PORCELLANITE, CHERT, NANNO CHALK IN CYCLES (~25 cm) PORCELLANITE, light gray (N7) grading into CHERT nodules and stringers, very light gray (N8) to light gray (N7). NANNO CHALK is light greenish gray (5GY 8/1). This series of nanno chalk, porcellanite, chert occurs of about a 40 cm interval. SS at 2-60 (dominant lithology) Recrystallized calcite C Nannos C Carbonate Bomb: 2-131 to 132 cm = 79%
				F	C	P	2				60	
				R	F	P	Core Catcher					

Site 366 Hole Core 21 Cored Interval: 518.0-527.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Truncorotaloides rohri-Orbulinoides beckmanni P14-P13 Chiphragmolithus alatus-Discoaster tani nodifer NP15-NP16 Podocyrtis mitra			R	F	P	1	0.5, 1.0	VOID			PORCELLANITE, CHERT, NANNO CHALK IN CYCLES (~25 cm). PORCELLANITE, light gray (N7) grading into CHERT nodules and stringers, very light gray (N8) to light gray (N7). NANNO CHALK is light greenish gray (5GY 8/1). This series of nanno chalk, porcellanite, chert occurs of about a 40 cm interval. SS at 2-60 (dominant lithology) Recrystallized calcite C Nannos C Carbonate Bomb: 2-131 to 132 cm = 79%
							2					
				N	P	F	3					
				F	C	P	Core Catcher				CC	

Site 366 Hole Core 22 Cored Interval: 527.5-537.0 m



INTERBEDDED NANNO CHALK, SILICIFIED LIMESTONE, AND CHERT IN CYCLES (~25 cm)

NANNO CHALK, light greenish gray (5GY 8/1), well-indurated, laminated. Grades into SILICIFIED LIMESTONE.

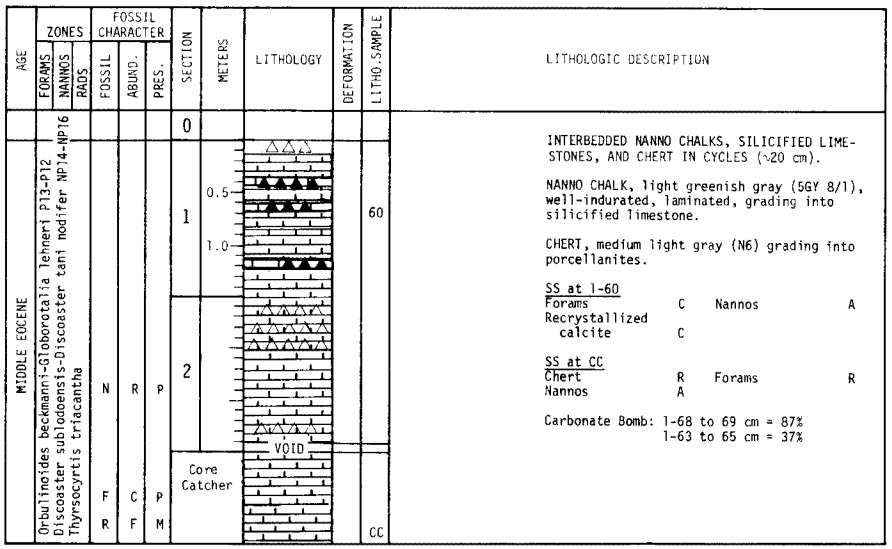
CHERT, light gray (N7), shows burrows, laminated.

SS at CC

Recrystallized calcite	C	Forams	R
		Nannos	C

Carbonate Bomb: 1-49 to 50 cm = 83%

Site 366 Hole Core 23 Cored Interval: 537.0-546.5 m



INTERBEDDED NANNO CHALKS, SILICIFIED LIMESTONES, AND CHERT IN CYCLES (~20 cm).

NANNO CHALK, light greenish gray (5GY 8/1), well-indurated, laminated, grading into silicified limestone.

CHERT, medium light gray (N6) grading into porcellanites.

SS at 1-60

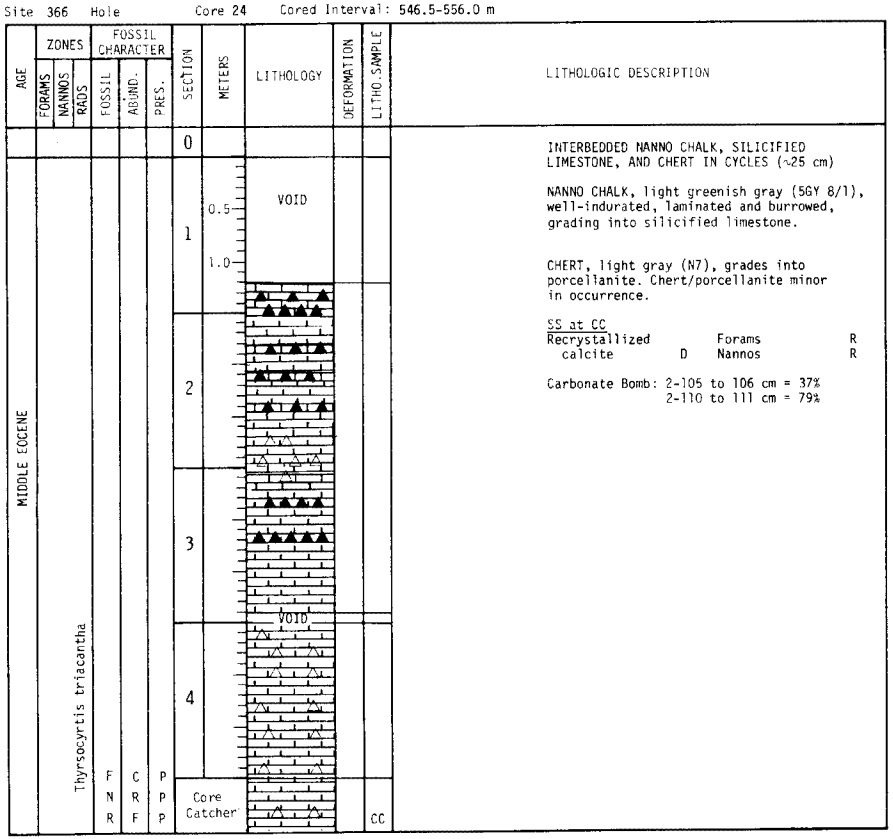
Forams	C	Nannos	A
Recrystallized calcite	C		

SS at CC

Chert	R	Forams	R
Nannos	A		

Carbonate Bomb: 1-68 to 69 cm = 87%
1-63 to 65 cm = 37%

Site 366 Hole Core 24 Cored Interval: 546.5-556.0 m



INTERBEDDED NANNO CHALK, SILICIFIED LIMESTONE, AND CHERT IN CYCLES (~25 cm)

NANNO CHALK, light greenish gray (5GY 8/1), well-indurated, laminated and burrowed, grading into silicified limestone.

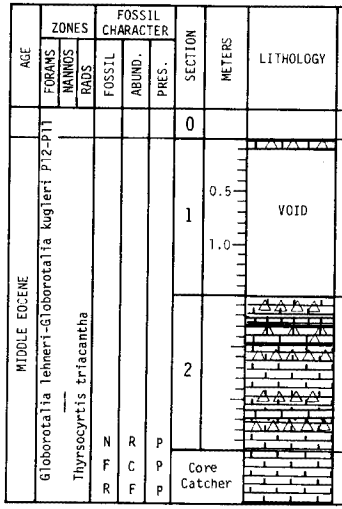
CHERT, light gray (N7), grades into porcellanite. Chert/porcellanite minor in occurrence.

SS at CC

Recrystallized calcite	D	Forams	R
		Nannos	R

Carbonate Bomb: 2-105 to 106 cm = 37%
2-110 to 111 cm = 79%

Site 366 Hole Core 25 Cored Interval: 556.0-565.5 m



LITHOLOGIC DESCRIPTION

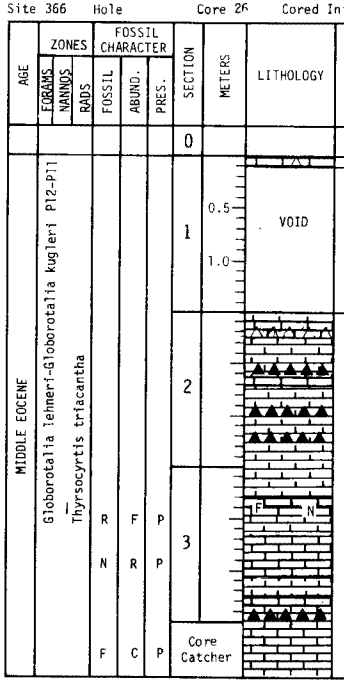
INTERBEDDED NANNO CHALK, SILICIFIED LIMESTONE, AND CHERT, IN CYCLES OF ABOUT 20 cm.

NANNO CHALK, light greenish gray (5GY 8/1), well-indurated, laminated, grading into SILICIFIED LIMESTONE.

CHERT, medium light gray (N6) grading into PORCELLANITE, light gray (N7).

Carbonate Bomb: 2-60 to 61 cm = 40%

Site 366 Hole Core 26 Cored Interval: 565.5-575.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CHALK, LIMESTONE AND PORCELLANITE/CHERT IN CYCLES (~20 cm)

CHALK, light bluish gray (5B 7/1) to light greenish gray (5GY 8/1), well-indurated, wavy Mn-high laminations, burrows, and a few liesegang bands.

LIMESTONE, light gray (N7) to very light gray (N8), laminated.

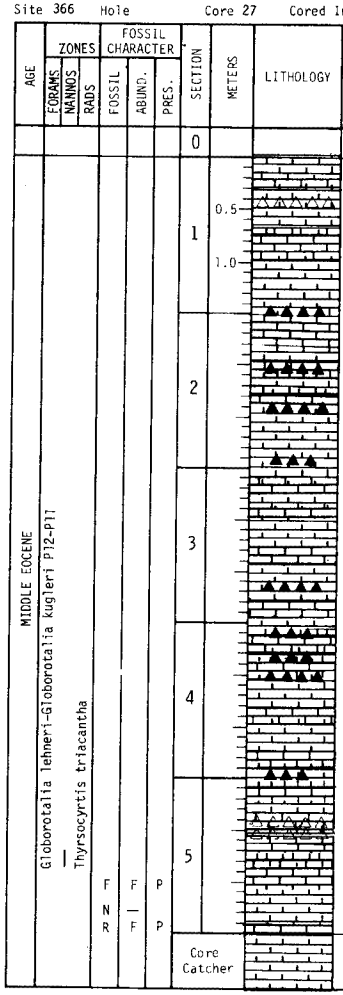
PORCELLANITE/CHERT, light bluish gray (5B 7/1), occurs as thin (~3 cm) beds above CHALK units, or as nodules in silicified limestone segments.

SS at 3-40 (dominant lithology)

Recrystallized calcite	C	Forams	C
		Nannos	A

Carbonate Bomb: 3-81 to 82 cm = 73%

Site 366 Hole Core 27 Cored Interval: 575.0-584.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED LIMESTONE, CHALK, AND MINOR CHERT IN CYCLES (~20 cm)

CHALK, light greenish gray (5GY 8/1) to greenish gray (5GY 6/1), well-indurated, laminated, burrowed, Fe/Mn specks, a few with liesegang banding, chalk becomes shaly in more argillaceous sections.

LIMESTONE, very light gray (N8) to light greenish gray (5G 8/1), burrowing, dark Fe/Mn laminations common, varying degrees of cementation.

CHERT, very light gray (N8) to light bluish gray (5B 7/1), occurs within or just above each limestone segment.

Complete cycles consist of:	4 cm	20 cm	CHERT
	8 cm		LIMESTONE
	8 cm		CHALK

SS at 1-80 (dominant lithology)

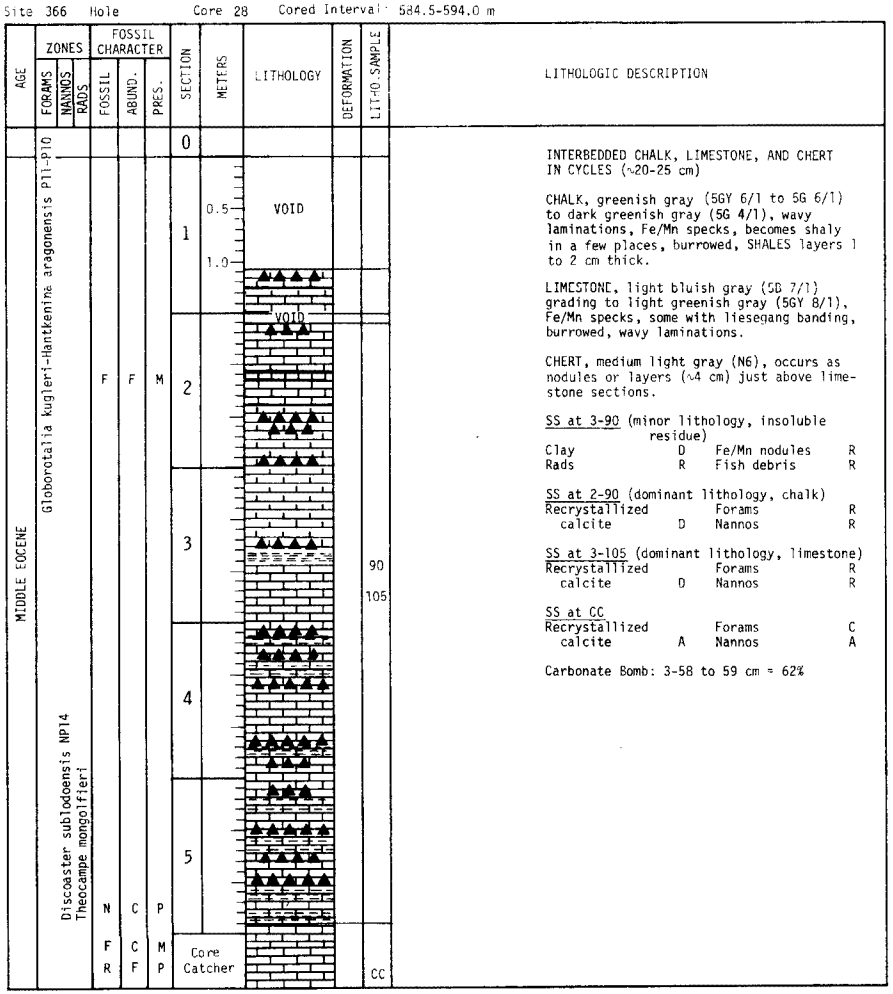
Recrystallized calcite	C	Forams	C
		Nannos	A

SS at 5-134 (minor lithology)

Fe/Mn nodules	R	Forams	R
Recrystallized calcite	C	Nannos	A

Carbonate Bomb: 2-79 to 80 cm = 62%

Site 366 Hole Core 28 Cored Interval: 584.5-594.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CHALK, LIMESTONE, AND CHERT IN CYCLES (~20-25 cm)

CHALK, greenish gray (5GY 6/1 to 5G 6/1) to dark greenish gray (5G 4/1), wavy laminations, Fe/Mn specks, becomes shaly in a few places, burrowed, SHALES layers 1 to 2 cm thick.

LIMESTONE, light bluish gray (5B 7/1) grading to light greenish gray (5GY 8/1), Fe/Mn specks, some with liesegang banding, burrowed, wavy laminations.

CHERT, medium light gray (N6), occurs as nodules or layers (~4 cm) just above limestone sections.

SS at 3-90 (minor lithology, insoluble residue)

Clay	D	Fe/Mn nodules	R
Rads	R	Fish debris	R

SS at 2-90 (dominant lithology, chalk)

Recrystallized calcite	D	Forams	R
		Nannos	R

SS at 3-105 (dominant lithology, limestone)

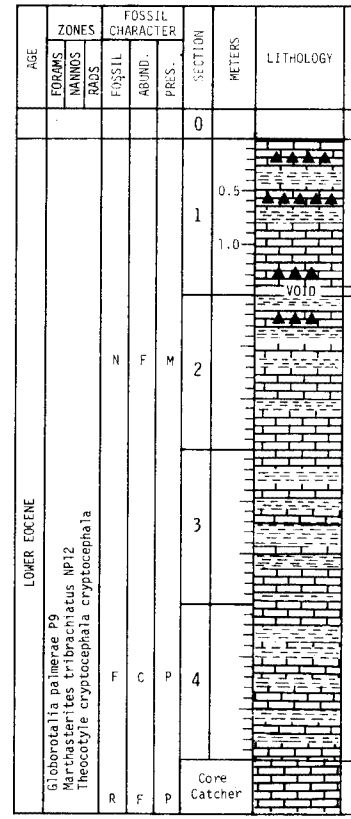
Recrystallized calcite	D	Forams	R
		Nannos	R

SS at CC

Recrystallized calcite	A	Forams	C
		Nannos	A

Carbonate Bomb: 3-58 to 59 cm = 62%

Site 366 Hole Core 29 Cored Interval: 594.0-603.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED ARGILLACEOUS LIMESTONE, AND SILICEOUS LIMESTONE WITH CHERT IN CYCLES (~50 cm)

ARGILLACEOUS LIMESTONE, very light gray (N8) to light greenish gray (5GY 8/1), faintly laminated, burrowed, Fe/Mn specks. Occasionally a small (~3 cm) interbed of SHALE occurs.

Grades into SILICEOUS LIMESTONE, light gray (N8), faintly laminated, burrowed, capped by chert nodules.

CHERT, medium light gray (N6), about 3 to 4 cm thick.

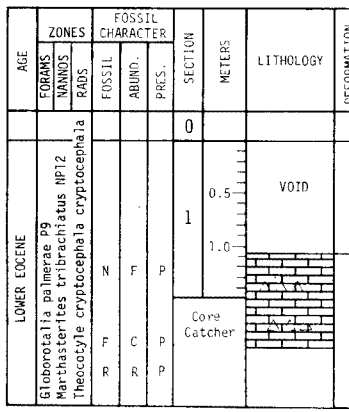
This core is a more argillaceous and more siliceous gradation of the previous core. The transition occurs over several cores.

SS at 2-63 (minor lithology)

Clay	A	Fe/Mn	R
Forams	R	Nannos	R
Recrystallized calcite	C	Fish debris	R

Carbonate Bomb: 2-37 to 38 cm = 67%

Site 366 Hole Core 30 Cored Interval: 603.5-613.0 m

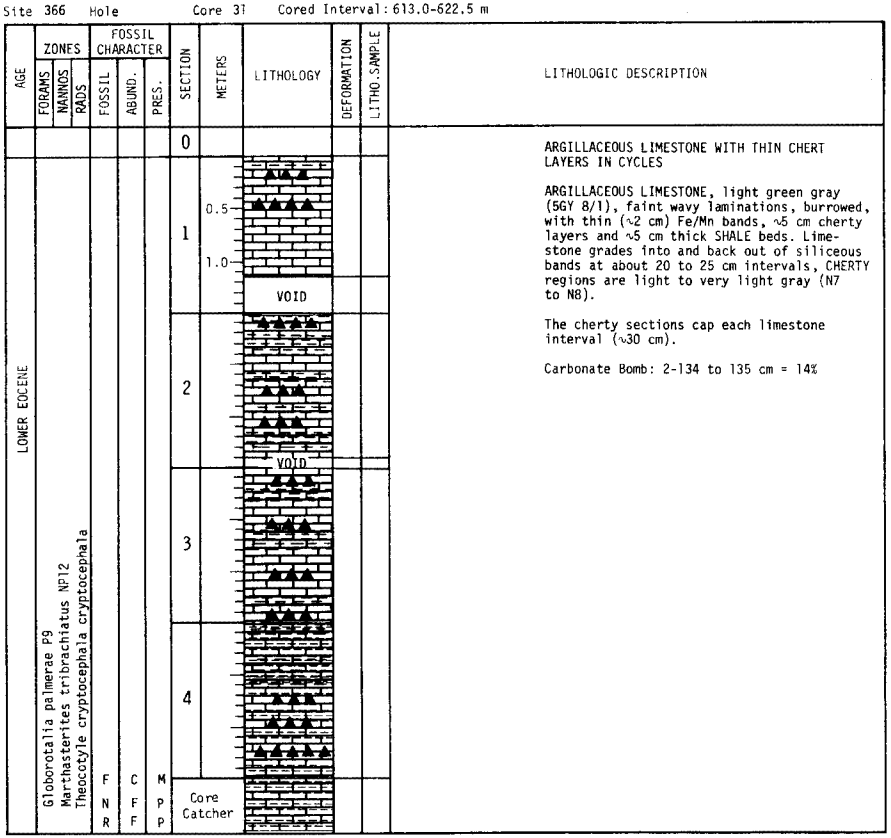


LITHOLOGIC DESCRIPTION

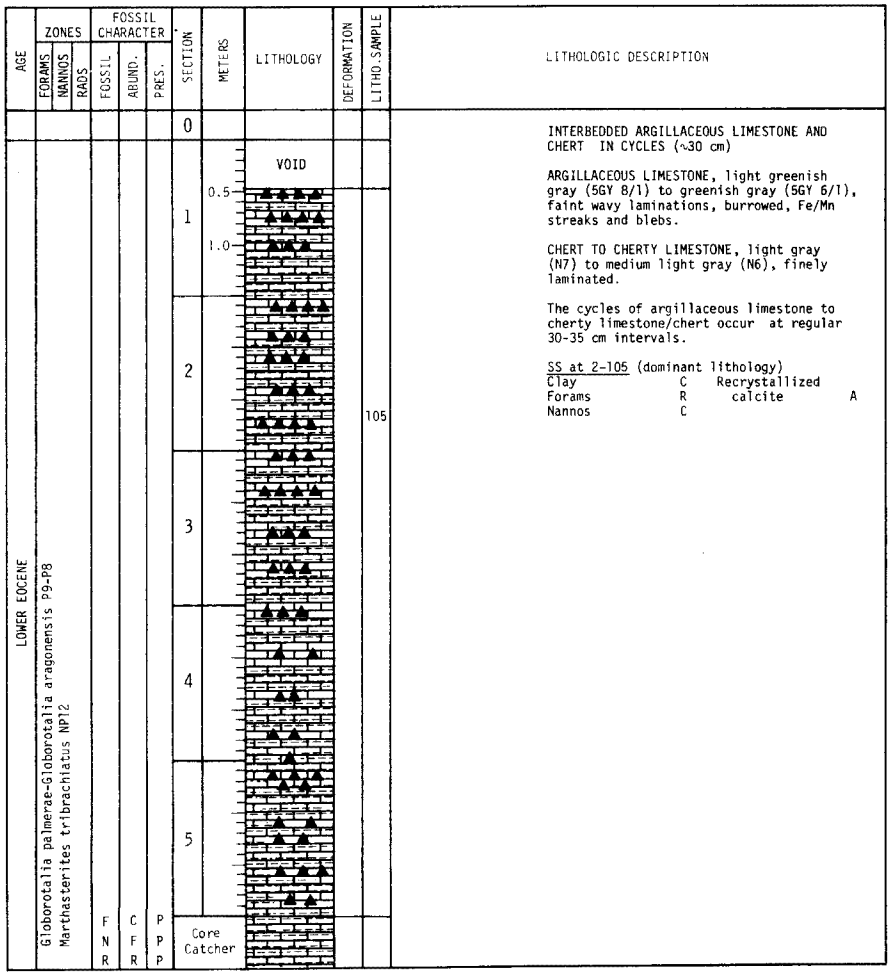
SILICEOUS LIMESTONE, light gray (N7) to very light gray (N8), some faint laminations, burrowed.

Carbonate Bomb: 1-111 to 112 cm = 29%

Site 366 Hole Core 31 Cored Interval: 613.0-622.5 m



Site 366 Hole Core 32 Cored Interval: 622.5-632.0 m



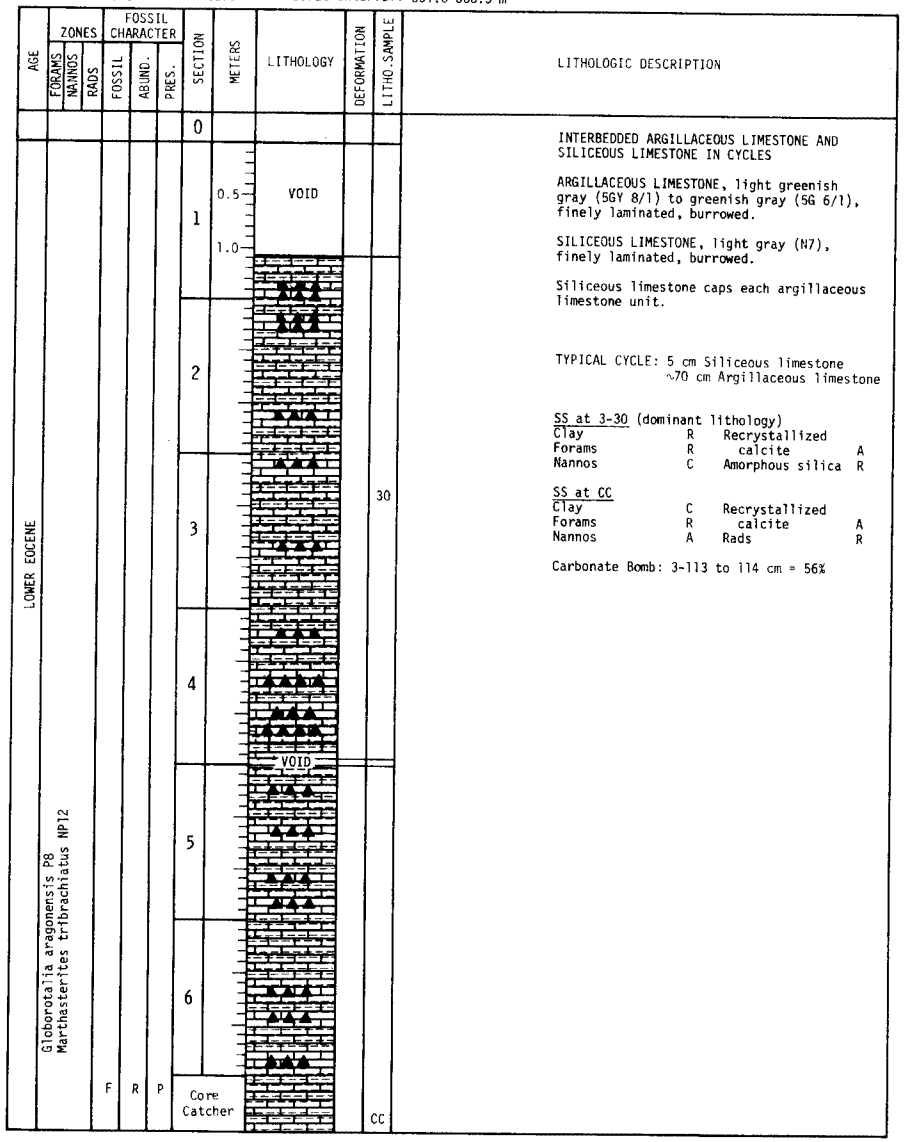
Site 366 Hole Core 33 Cored Interval: 632.0-641.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia aragonensis P8	Marthasterites tribrachiatus NP12		F	R	P	0					INTERBEDDED ARGILLACEOUS LIMESTONE AND CHERTY LIMESTONE IN CYCLES ARGILLACEOUS LIMESTONE, light greenish gray (5GY 8/1) to greenish gray (5G 6/1), faint wavy laminations, burrowed. CHERTY LIMESTONE, light gray (N7), caps the top of the argillaceous limestones (each zone 10 to 20 cm thick). Cycles of argillaceous then cherty limestone average 25 to 30 cm thick and consist of: 10 cm Cherty limestone 15 cm Argillaceous limestone
							1	0.5 1.0	VOID			
							2					
							3		VOID			
							4		VOID			
							5		VOID			
				R	—	—	Core Catcher					

Site 366 Hole Core 34 Cored Interval: 641.5-651.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia aragonensis P8	Marthasterites tribrachiatus NP12					0					ARGILLACEOUS LIMESTONE WITH THIN SILICEOUS LIMESTONE INTERBEDS IN CYCLES ARGILLACEOUS LIMESTONE, light gray (N7) to greenish gray (5G 6/1) to medium blue gray (5B 5/1), laminated, bioturbated. SILICEOUS LIMESTONE, light gray (N7), to light greenish gray (5GY 8/1), laminated and burrowed. Each cycle, 30 to 50 cm thick, consists of: 5 cm Siliceous limestone 25-45 cm Argillaceous limestone SS at 4-95 (dominant lithology) Clay C Recrystallized calcite A Fe/Mn nodules R Forams R Nannos C Carbonate Bomb: 5-133 to 134 cm = 55%
							1	0.5 1.0	VOID			
							2					
							3					
							4				95	
							5					
							Core Catcher				CC	

Site 366 Hole Core 35 Cored Interval: 651.0-660.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED ARGILLACEOUS LIMESTONE AND SILICEOUS LIMESTONE IN CYCLES

ARGILLACEOUS LIMESTONE, light greenish gray (5GY 8/1) to greenish gray (5G 6/1), finely laminated, burrowed.

SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed.

Siliceous limestone caps each argillaceous limestone unit.

TYPICAL CYCLE: 5 cm Siliceous limestone
~70 cm Argillaceous limestone

SS at 3-30 (dominant lithology)

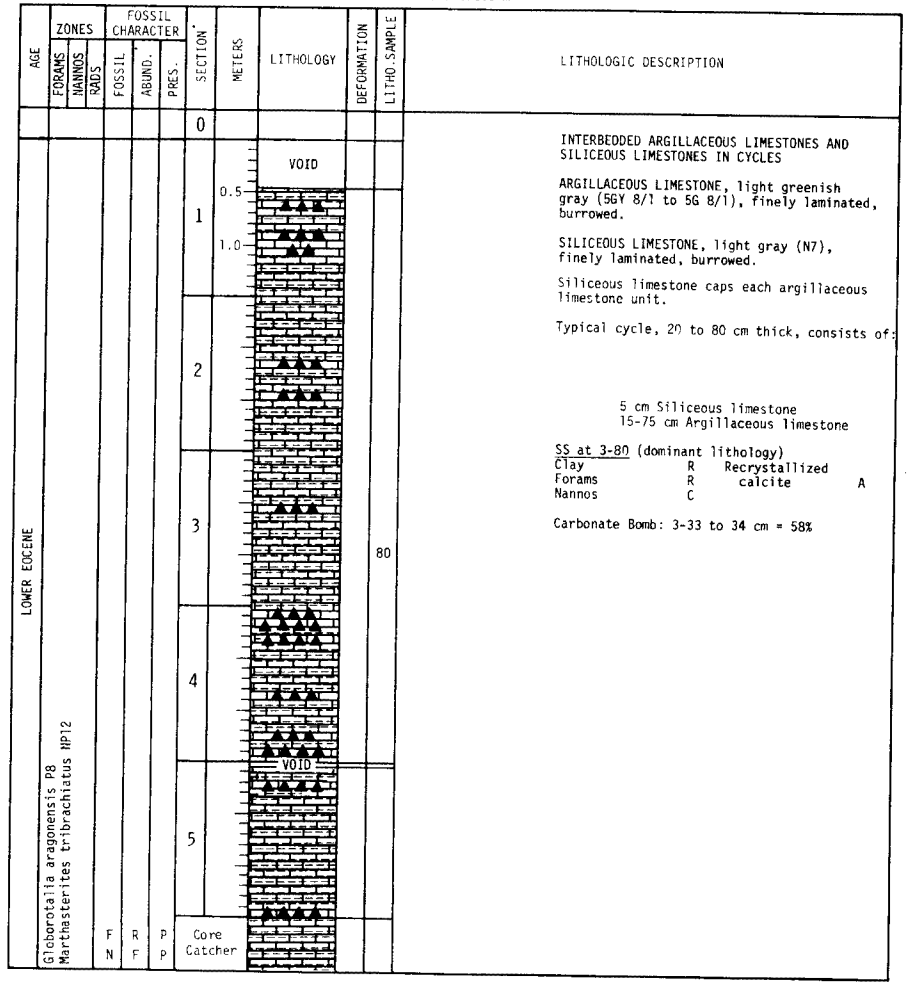
Clay	R	Recrystallized calcite	A
Forams	R	Amorphous silica	R
Nannos	C		

SS at CC

Clay	C	Recrystallized calcite	A
Forams	R	Rads	R
Nannos	A		

Carbonate Bomb: 3-113 to 114 cm = 56%

Site 366 Hole Core 36 Cored Interval: 660.5-670.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED ARGILLACEOUS LIMESTONES AND SILICEOUS LIMESTONES IN CYCLES

ARGILLACEOUS LIMESTONE, light greenish gray (5GY 8/1 to 5G 8/1), finely laminated, burrowed.

SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed.

Siliceous limestone caps each argillaceous limestone unit.

Typical cycle, 20 to 80 cm thick, consists of:

5 cm Siliceous limestone
15-75 cm Argillaceous limestone

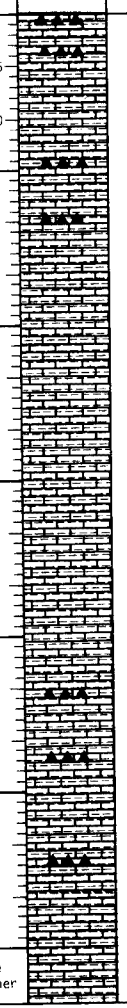
SS at 3-80 (dominant lithology)

Clay	R	Recrystallized calcite	A
Forams	R		
Nannos	C		

Carbonate Bomb: 3-33 to 34 cm = 58%

Site 366 Hole Core 37 Cored Interval: 670.0-679.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER EOCENE	Globorotalia aragonensis P8 Marthasterites tribrachiatus NP12			F	R	P	0				
							1	0.5, 1.0			
							2				
							3				60
				N	F	P	4				
							5				
							6				
							Core Catcher				



LITHOLOGIC DESCRIPTION

INTERBEDDED ARGILLACEOUS LIMESTONE AND SILICEOUS LIMESTONE IN CYCLES

ARGILLACEOUS LIMESTONE , light greenish gray (5GY 8/1) to dark greenish gray (5G 4/1), finely laminated, burrowed, a few shaly interbeds (~4 cm thick).

SILICEOUS LIMESTONE, light greenish gray (5GY 8/1) to light gray (N7), finely laminated, burrowed.

Siliceous limestone caps each argillaceous limestone unit.

TYPICAL CYCLE { 5 cm Siliceous limestone / 50-75 cm Argillaceous limestone

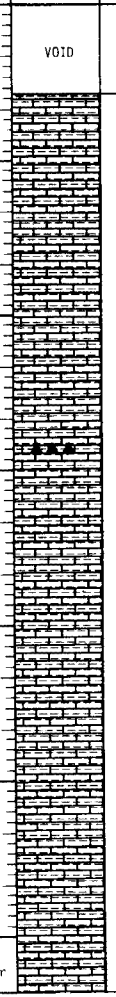
SS at 3-60 (dominant lithology)

Clay	C	Recrystallized calcite	A
Forams	R		
Nannos	C		

Carbonate Bomb: 3-25 to 26 cm = 37%

Site 366 Hole Core 38 Cored Interval: 679.5-689.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER EOCENE	Globorotalia aragonensis P8 Marthasterites tribrachiatus NP12						0				
							1	0.5, 1.0	VOID		
							2				
							3				100
				N	F	P	4				
				F	C	M	5				
				F	F	P	6				
							Core Catcher				



LITHOLOGIC DESCRIPTION

ARGILLACEOUS LIMESTONE, greenish gray (5G 6/1), finely laminated, burrowed. A few 2 to 4 cm thick shaly interbeds occur in Sections 3, 5 and 6 and a siliceous interbed occurs in Section 3 at 130 to 137 cm.

SS at 3-100 (dominant lithology)

Clay	R	Recrystallized calcite	A
Nannos	R		

Carbonate Bomb: 3-47 to 48 cm = 46%

Site 366 Hole Core 39 Cored Interval: 689.0-698.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia aragonensis P8 Marthasterites tribrachiatus NP12			F	C	M	0, 1, 2, 3, 4, 5, 6, Core Catcher	0.5, 1.0	VOID		100	ARGILLACEOUS LIMESTONE, light gray green (5G 8/1) to light greenish gray (5GY 8/1), finely laminated, burrowed. Thin shaly layers (~4 cm thick) occur in Section 1-140 cm, 2-15 cm, 5-55 cm. SS at 3-100 (dominant lithology) Clay C Forams R Nannos R Recrystallized calcite A Carbonate Bomb: 3-123 to 124 cm = 55%

Site 366 Hole Core 40 Cored Interval: 698.5-708.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia gormosa formosa P7 Marthasterites tribrachiatus NP12			F	C	M	0, 1, 2, 3, 4, 5, 6, Core Catcher	0.5, 1.0	VOID			ARGILLACEOUS LIMESTONE, light greenish gray (5GY 8/1 to 5G 8/1) to greenish gray (5G 6/1), finely laminated, burrowed. Shaly interbed at 5-117 cm. Carbonate Bomb: 3-77 to 78 cm = 47%

Site 366 Hole Core 41 Cored Interval: 708.0-717.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia formosa formosa-Globorotalia subbotinae P7-P6 Marthasterites tribrachiatus NP12			N	R	P	0					ARGILLACEOUS LIMESTONE, light grayish green (5GY 8/1), grading in Section 4 to light gray (N7), finely laminated, burrowed. Shaly interbeds occur at 2-52 cm, 3-90 cm. A winnowed deposit rich in forams occurs at 6-130 cm, very light gray (N8) (CALCARENITE).
							1	0.5 1.0	VOID			Carbonate Bomb: 3-76 to 77 cm = 56%
							2					
							3					
							4					
							5					
				F	F	P	6					
							Core Catcher					

Site 366 Hole Core 42 Cored Interval: 717.5-727.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia subbotinae P6	Discoaster multinadiatus- Marthasterites contortus NP9-10					0					ARGILLACEOUS LIMESTONE, greenish gray (N7) to light greenish gray (5GY 8/1), finely laminated, burrowed. Winnowed layers of CALCARENITE, occur at 3-100, 3-127, 4-118, 4-145, 5-60, 5-105, 5-130, 6-45, 6-90, 6-103, 6-110, 6-120, 6-140.
							1	0.5 1.0				SS at 3-90 (dominant lithology) Clay R; Recrystallized calcite A Forams R; Rads R Nannos C
							2					SS at 3-127 (minor lithology) Recrystallized calcite A; Forams C Nannos C SS at CC Recrystallized calcite A; Nannos R
							3				90 127	Carbonate Bomb: 3-123 to 124 cm = 71%
							4					
							5					
				F	C	M	6					
				N	R	P	Core Catcher				CC	

Site 366 Hole Core 43 Cored Interval: 727.0-736.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER PALEOCENE	Globorotalia velascoensis P5	Discoaster multiradiatus-Marthasterites contortus NP9-NP10		F	R	P	0				
							1	0.5, 1.0			
							2				
							3				126
							4				
							5				
							6				
				N	F	P	Core Catcher				

LITHOLOGIC DESCRIPTION

ARGILLACEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, with winnowed layers of CALCARENITE at 1-30, 1-70, 1-85, 1-120, 1-130, 2-12, 2-42, 2-83, 2-115, 2-142. Small (3 cm) thick shaly interval occur at 1-46, 1-98, 2-14. This argillaceous limestone grades to:

SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, with bluish black flakes scattered throughout. CALCARENITE layers occur at 4-10, 4-55, 4-80, 40-90, 5-15, 5-60, 5-110, 5-148. Dark greenish gray bands occur at 4-135, 5-2, 5-6, 6-70, 6-100 and 6-140. These are shaly at 5-2 especially.

Core has been severely fractured during drilling.

SS at 3-126 (dominant lithology)

Clay	R	Quartz(?)	C
Recrystallized calcite	A		

Carbonate Bomb: 3-128 to 129 cm = 72%

Site 366 Hole Core 44 Cored Interval: 736.5-746.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
UPPER PALEOCENE	Globorotalia velascoensis P5			F	R	P	1	0.5, 1.0			
							2				
							3				85, 120
							4				
							5				60
							6				
							Core Catcher				

LITHOLOGIC DESCRIPTION

SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, with stringers of winnowed layers, CALCARENITE , at 1-14, 1-60, 1-90, 1-123, 1-140, 2-18, 2-82, 2-111, 2-140, 3-88, 3-129, 4-11, 4-140, 5-96. Argillaceous bands occur at 3-10, 3-14, 3-39 and disseminated pyrite occurs in a zone from 3-50 to 3-55 and throughout Sections 4 and 5.

SS at 3-85 (minor lithology)

Clay	A	Recrystallized calcite	R
Fe/Mn	C		
Quartz(?)	R	Nannos	R
Fish debris	R		

SS at 3-120 (dominant lithology)

Clay	C	Recrystallized calcite	A
Quartz(?)	R		
Forams	R	Nannos	C

SS at 5-60 (dominant lithology)

Clay	C	Recrystallized calcite	C
Quartz(?)	R		
Nannos	C		

Carbonate Bomb: 3-74 to 75 cm = 4%

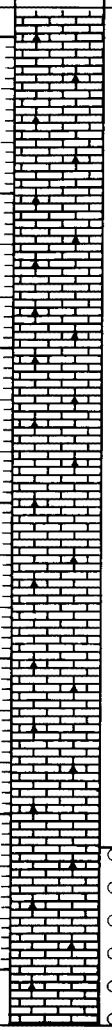
Site 366 Hole Core 45 Cored Interval: 746.0-755.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PALEOCENE	Globorotalia velascoensis P5 Discoaster multiradiatus NP9			F N	F F	P R	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID VOID		88	SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, with flecks of blue-black submetallic matter scattered throughout the core. Also, at Section 5 burrows within burrows(?) (see diagram below) are common. burrows within burrows? ~2 cm SS at 6-88 (minor lithology) Clay C Recrystallized calcite A Quartz(?) R Nannos R SS at 6-88 (dominant lithology) Clay C Recrystallized calcite C Calcite crystals R Forams R Nannos R Carbonate Bomb: 3-43 to 44 cm = 71.5%

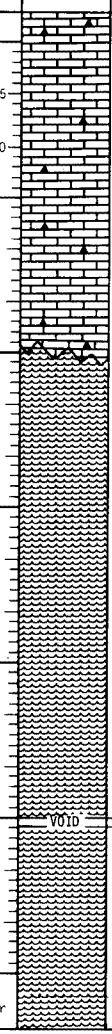
Site 366 Hole Core 46 Cored Interval: 755.5-765.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PALEOCENE	Globorotalia velascoensis P5 Discoaster multiradiatus NP9						0 1 2 3 Core Catcher	0.5 1.0	VOID		50	SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, flecks of blue-black submetallic matter scattered throughout core, burrows within burrows(?) occurs in Sections 2 and 3. burrows within burrows? ~2 cm SS at 3-50 (dominant lithology) Clay R Recrystallized calcite A Calcite crystals R Nannos C Carbonate Bomb: 3-64 to 65 cm = 65.5%

Site 366 Hole Core 47 Cored Interval: 765.0-774.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PALEOCENE	Globorotalia velascoensis P5 Discoaster multiradiatus NP9			F N	C F	M P	0, 1, 2, 3, 4, 5, 6, Core Catcher	0.5, 1.0			60	SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed. SS at 3-60 (dominant lithology) Clay C Recrystallized Calcite crystals R calcite A Forams R Nannos A Carbonate Bomb: 3-43 to 44 cm = 65%

Site 366 Hole Core 48 Cored Interval: 774.5-784.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PALEOCENE	Globorotalia pseudomenardii P4 Heliolithus riedelli NP8			F N	C C	M P	0, 1, 2, 3, 4, 5, 6, Core Catcher	0.5, 1.0			40	SILICEOUS LIMESTONE, light gray (N7), finely laminated, burrowed, intensely burrowed in Section 2. MARLSTONE, light olive gray (5Y 6/1) to yellowish gray (5Y 7/1), finely laminated, burrowed. Differs from the siliceous limestone only in not being cemented but well-indurated. SS at 3-40 (dominant lithology) Clay C Recrystallized Forams R calcite A Nannos C Carbonate Bomb: 3-44 to 45 cm = 58%

VOID

Site 366 Hole Core 49 Cored Interval: 784.0-793.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER PALEOCENE	Globorotalia pseudomenardii P4 Heliolithus riedeli NP8		F N	A C	M P		0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID		30	MARLSTONE, light olive gray (5Y 6/1) to yellowish gray (5Y 7/1), finely laminated, burrowed. Shaly interbeds (~4 cm thick) at 3-91 and 4-30. Burrowing, especially Zoophycos and chondrites well-developed in Sections 5 and 6. SS at 3-30 (dominant lithology) Clay C Recrystallized calcite A Calcite crystals R Nannos A Carbonate Bomb: 3-85 to 86 cm = 57.5%

Site 366 Hole Core 50 Cored Interval: 793.5-803.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER PALEOCENE	Globorotalia pusilla pusilla s.s. P3b Fasciculithus tympaniformis NP5		F N	C F	M P		0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID VOID		60	MARLSTONE, medium olive gray (5Y 5/1), finely laminated, burrowed. Becomes light olive gray (5Y 6/1) at 4-45. SS at 5-60 (dominant lithology) Clay C Recrystallized calcite A Calcite crystals R Forams R Nannos C Fish debris R Carbonate Bomb: 3-107 to 108 cm = 65.5% 5Y 5/1 5Y 6/1

Site 366 Hole Core 51 Cored Interval: 803.0-812.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PALEOCENE, DANIAN Acarinina uncinata P2 Chasmolithus danicus NP3		F N		C F	M P		0 1 2 3 4 5 6 Core Catcher	0.5 1.0			80	MARLSTONE, light olive gray (5Y 6/1), finely laminated, burrowed. SS at 3-80 (dominant lithology) Clay C Recrystallized calcite A Fish debris R Calcite crystals C Forams R Nannos R Carbonate Bomb: 2-77 to 78 cm = 72%

Site 366 Hole Core 52 Cored Interval: 812.5-822.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PALEOCENE, DANIAN s.s. Globorotalia trinidadensis P1 Cruciplacolithus tenuis NP2				F N	A R	M P	0 Core Catcher					MARLSTONE, light olive gray (5Y 6/1).

Site 366 Hole Core 53 Cored Interval: 822.0-831.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PALEOCENE, DANIAN Globrotalia trinidadensis P1 Cruciplacolithus tenuis NP2				F N	A R	M F	0 Core Catcher				CC	MARLSTONE, light olive gray (5Y 6/1). SS at CC Clay C Quartz R Fe/Mn micronodules R Fish debris R Recrystallized calcite A Calcite crystals C Forams C Site 366, Core 54, Cored Interval: 831.5-841.0 m: NO RECOVERY

Site 366 Hole Core 55 Cored Interval: 841.0-850.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
CRETACEOUS, MAESTRICHTIAN Globorotuncana contusa Lithraphidites quadratus				F N	A F	M P-M	0 Core Catcher				CC	ONLY SCRAPINGS OFF OF CORE CATCHER MARLSTONE, light olive gray (5Y 6/1). SS at CC Clay C Recrystallized calcite A Nannos C Fe/Mn micronodules R Calcite crystals R Fish debris R

Site 366 Hole A Core 1 Cored Interval: 0.0-6.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Globorotalia truncatulinoides N22 / Gephyrocapsa oceanica- Emiliania huxleyi NN20-NN21 / QUATERNARY (unzoned)			N F R	C A C	G G G	0				
							1	0.5, 1.0	F, N, F		70, 103
							2		N, F		
							3		N, F		
							4		N		60
							Core Catcher		VOID		

LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL, dark yellowish brown (10YR 4/2) to dusky yellow brown (10YR 2/2), soft, moderate to severe drilling disturbance, mottled. Thin, disturbed zones show more clay (1-100 to 110) or increased foram content (1-60 to 100; 1-110 to 120; 2-90 to 105). Drilling disturbance is too severe to be certain about these zones.

SS at 1-70 (dominant lithology)

Clay	A	Forams	C
Nannos	A	Rads	R
Diatoms	R	Opal phytoliths	R
Fish debris	R		

SS at 1-103 (minor lithology)

Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Opal phytolith	R	Fish debris	R

SS at 4-60 (dominant lithology)

Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Opal phytolith	R	Fish debris	R

All smear slides showed both marine and fresh water diatoms (Melasira granulata) and opal phytoliths.

Site 366 Hole A Core 2 Cored Interval: 6.0-15.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Globorotalia truncatulinoides N22 / Pseudoemiliania lacunosa NN19 / QUATERNARY (unzoned)			N F R	C A R	G G M	0				
							1	0.5, 1.0	F, N		
							2		F, N		
							3		F, N		
							4		F, N		50
							5		F, N		
							6		F, N		
									VOID		
							Core Catcher		F		

LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL, moderate yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4), very soft, intense drilling disturbance, some mottling but drill disturbance too severe to be certain if it is real.

SS at 4-50 (dominant lithology)

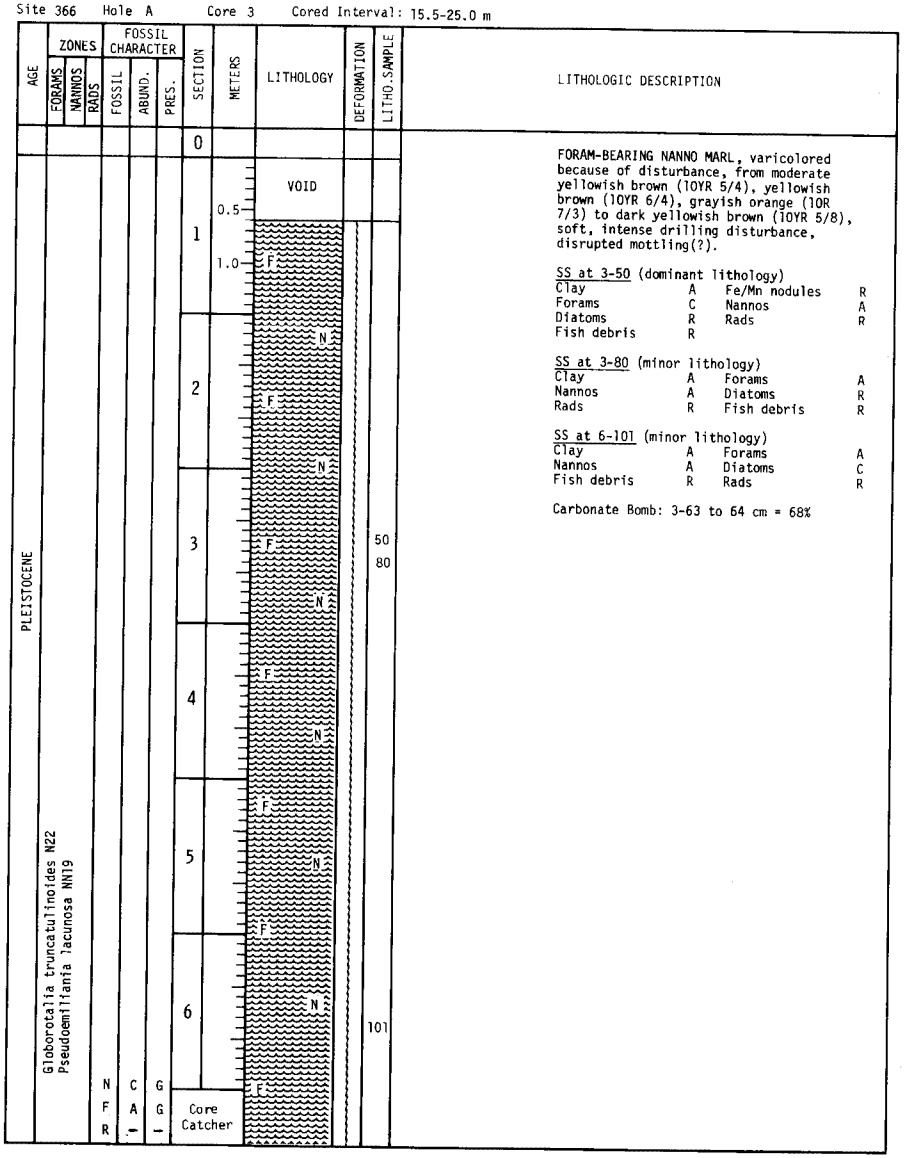
Clay	A	Fe/Mn nodules	R
Forams	C	Nannos	A
Rads	R	Silicoflagellates	R
Opal phytoliths	R	Fish remains	R

Both fresh water and marine diatoms occur.

Ceratoliths appear in smear slide.

Carbonate Bomb: 3-66 to 67 cm = 56%

Site 366 Hole A Core 3 Cored Interval: 15.5-25.0 m



LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL, varicolored because of disturbance, from moderate yellowish brown (10YR 5/4), yellowish brown (10YR 6/4), grayish orange (10R 7/3) to dark yellowish brown (10YR 5/8), soft, intense drilling disturbance, disrupted mottling(?).

SS at 3-50 (dominant lithology)

Clay	A	Fe/Mn nodules	R
Forams	C	Nannos	A
Diatoms	R	Rads	R
Fish debris	R		

SS at 3-80 (minor lithology)

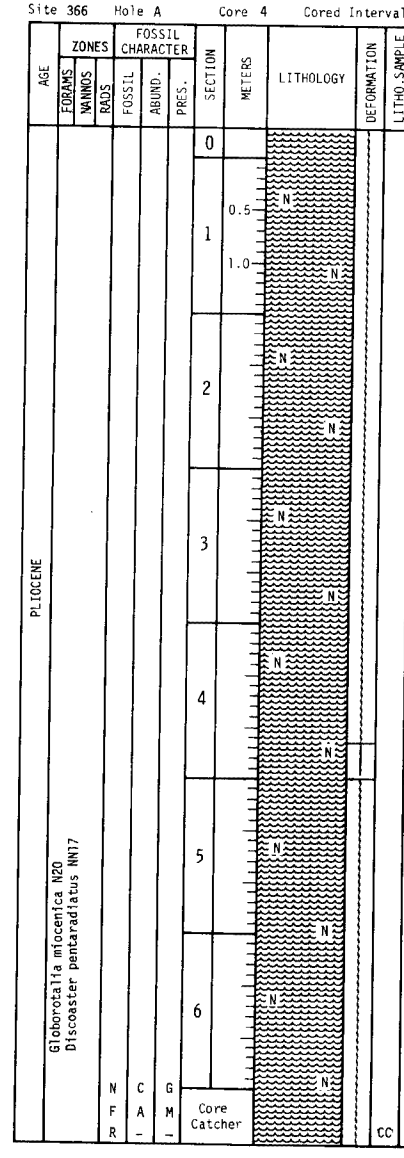
Clay	A	Forams	A
Nannos	A	Diatoms	R
Rads	R	Fish debris	R

SS at 6-101 (minor lithology)

Clay	A	Forams	A
Nannos	A	Diatoms	C
Fish debris	R	Rads	R

Carbonate Bomb: 3-63 to 64 cm = 68%

Site 366 Hole A Core 4 Cored Interval: 25.0-34.5 m



LITHOLOGIC DESCRIPTION

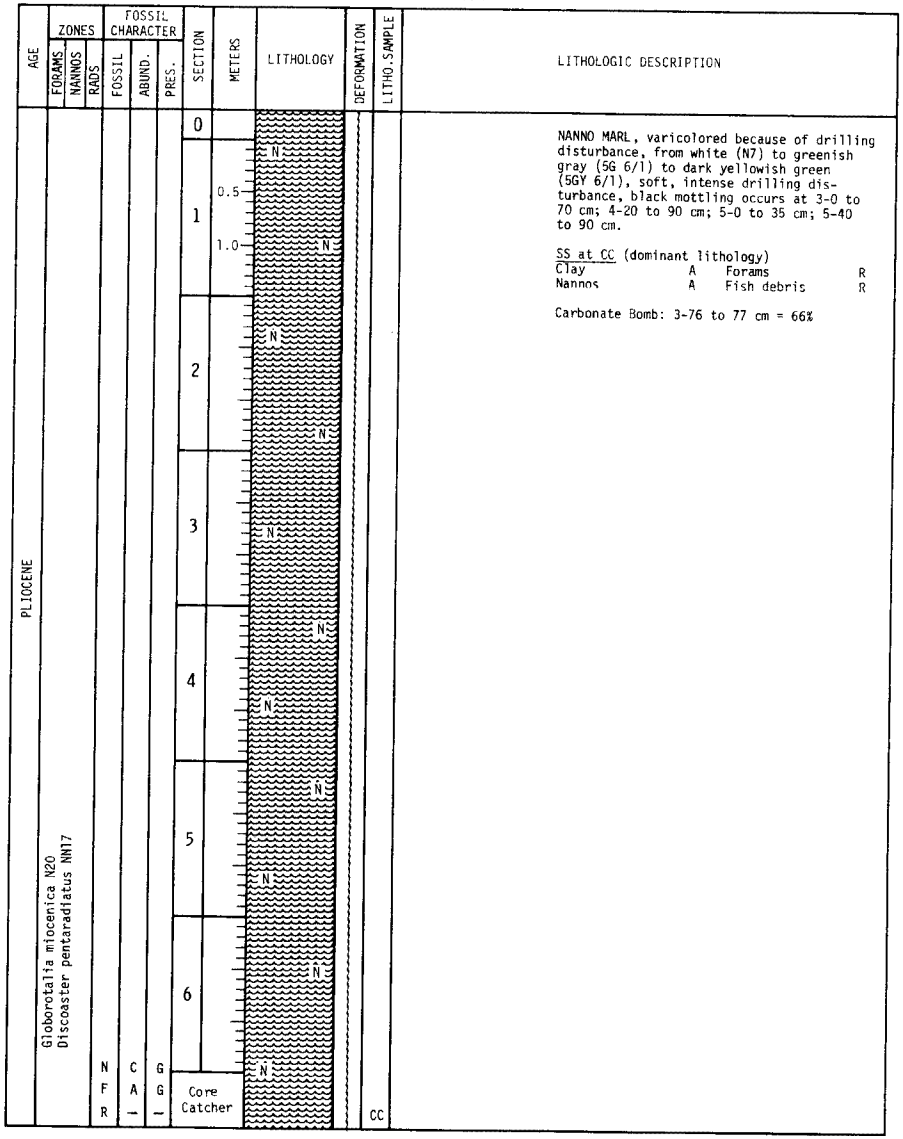
NANNO MARL, white (5Y 8/1), soft, intense drilling disturbance, thin (~10 cm) clayey bands occur at 1-40 to 55 cm; 1-145 to 150 cm; 2-0 to 30 cm; 3-15 to 45 cm; 4-110 to 150 cm; 5-0 to 50 cm; these clays are greenish gray (5GY 6/1) and show mottling. Black mottling occurs in 4-0 to 30 cm.

SS at CC (dominant lithology)

Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Fish debris	R		

Carbonate Bomb: 3-24 to 25 cm = 49%

Site 366 Hole A Core 5 Cored Interval: 34.5-44.0 m



LITHOLOGIC DESCRIPTION

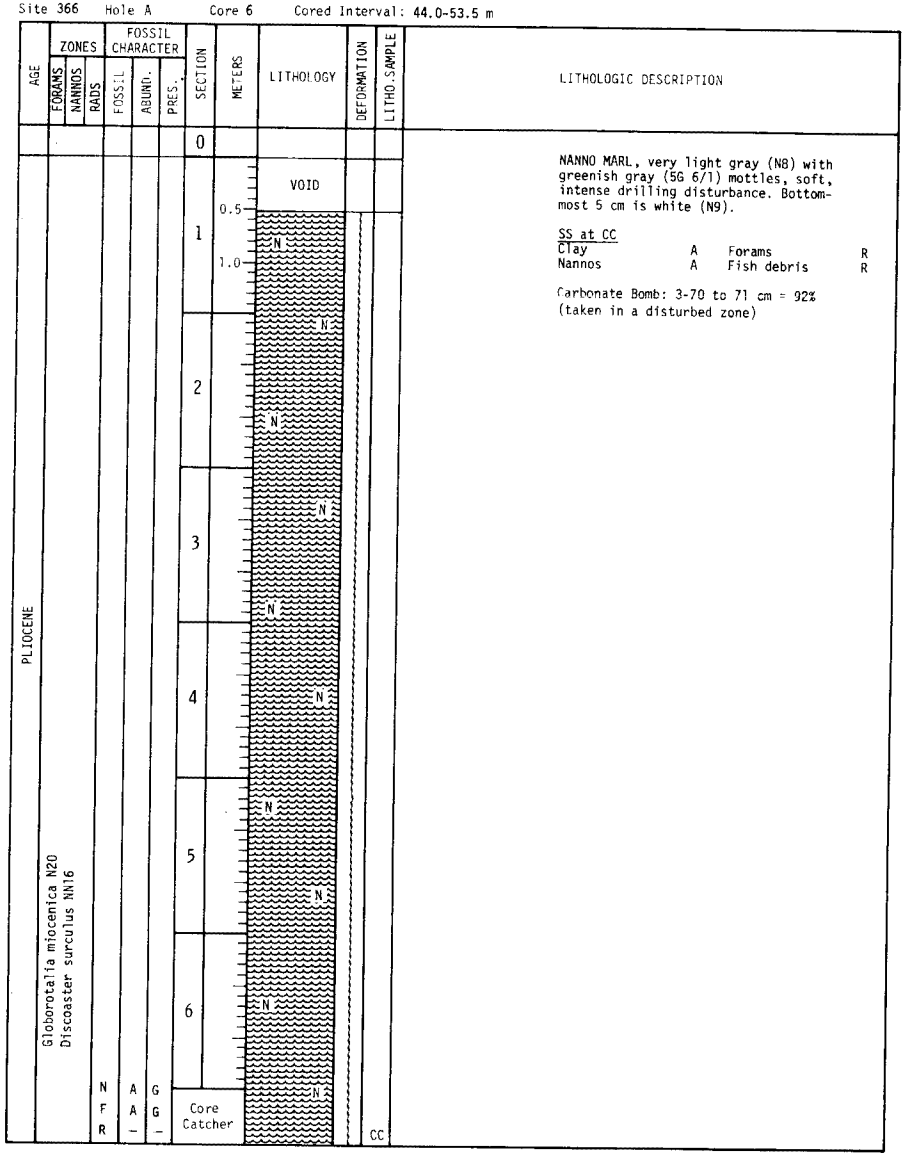
NANNO MARL, varicolored because of drilling disturbance, from white (N7) to greenish gray (5G 6/1) to dark yellowish green (5GY 6/1), soft, intense drilling disturbance, black mottling occurs at 3-0 to 70 cm; 4-20 to 90 cm; 5-0 to 35 cm; 5-40 to 90 cm.

SS at CC (dominant lithology)

Clay	A	Forams	R
Nannos	A	Fish debris	R

Carbonate Bomb: 3-76 to 77 cm = 66%

Site 366 Hole A Core 6 Cored Interval: 44.0-53.5 m



LITHOLOGIC DESCRIPTION

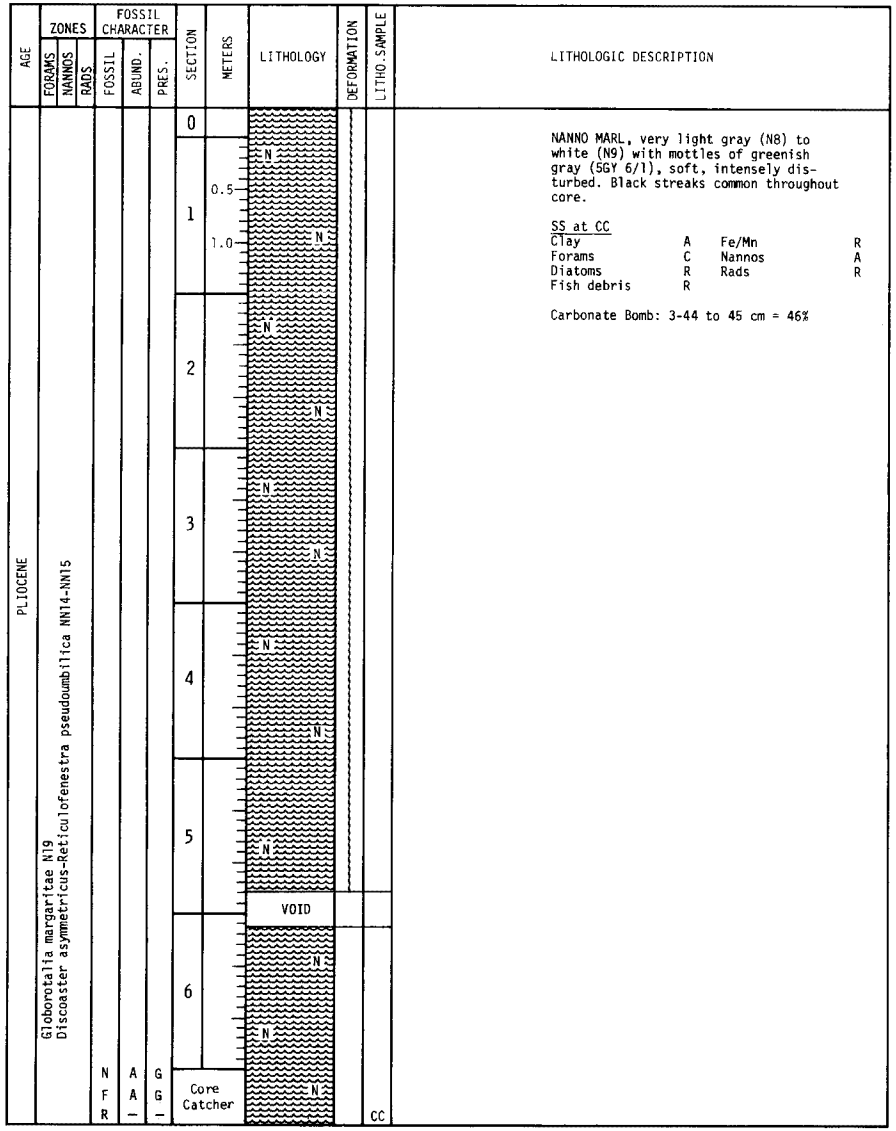
NANNO MARL, very light gray (N8) with greenish gray (5G 6/1) mottles, soft, intense drilling disturbance. Bottom-most 5 cm is white (N9).

SS at CC

Clay	A	Forams	R
Nannos	A	Fish debris	R

Carbonate Bomb: 3-70 to 71 cm = 92%
(taken in a disturbed zone)

Site 366 Hole A Core 7 Cored Interval: 53.5-63.0 m



LITHOLOGIC DESCRIPTION

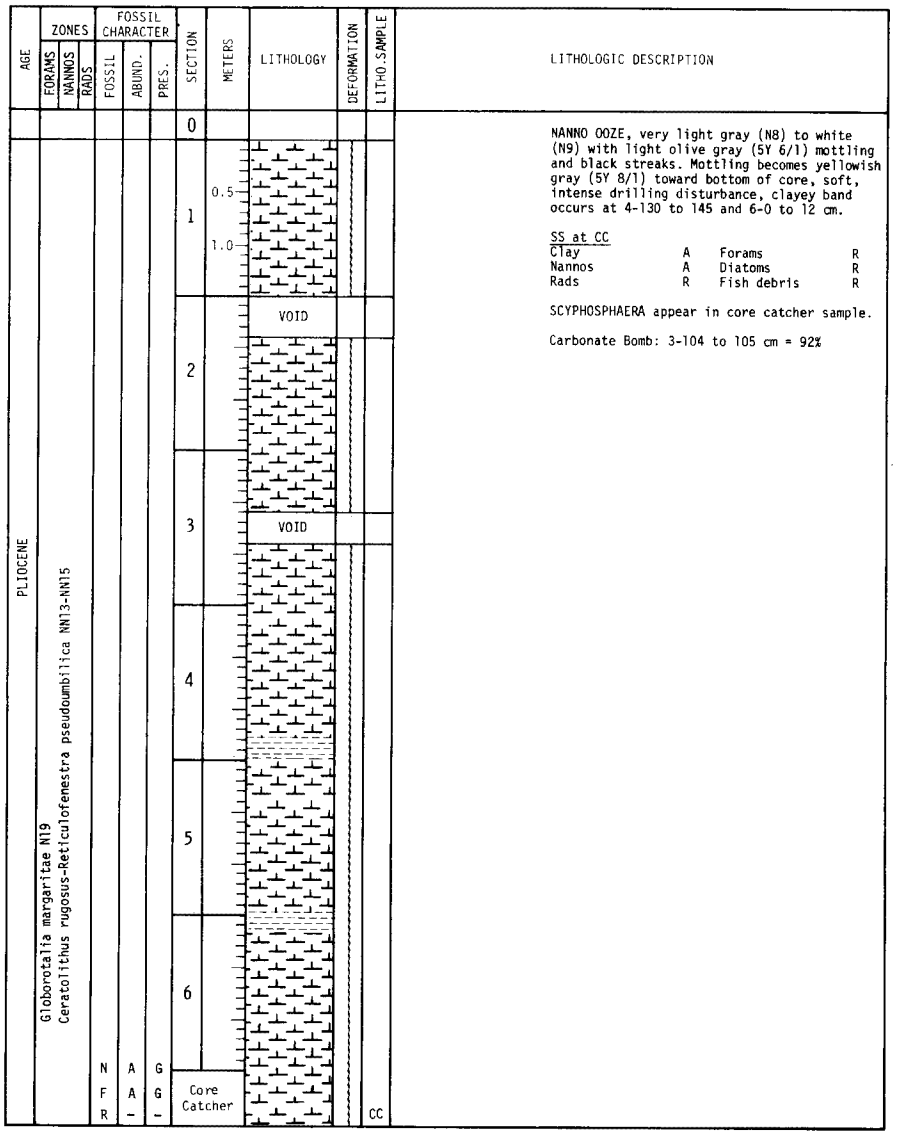
NANNO MARL, very light gray (N8) to white (N9) with mottles of greenish gray (5GY 6/1), soft, intensely disturbed. Black streaks common throughout core.

SS at CC

Clay	A	Fe/Mn	R
Forams	C	Nannos	A
Diatoms	R	Rads	R
Fish debris	R		

Carbonate Bomb: 3-44 to 45 cm = 46%

Site 366 Hole A Core 8 Cored Interval: 63.0-72.5 m



LITHOLOGIC DESCRIPTION

NANNO OOZE, very light gray (N8) to white (N9) with light olive gray (5Y 6/1) mottling and black streaks. Mottling becomes yellowish gray (5Y 8/1) toward bottom of core, soft, intense drilling disturbance, clayey band occurs at 4-130 to 145 and 6-0 to 12 cm.

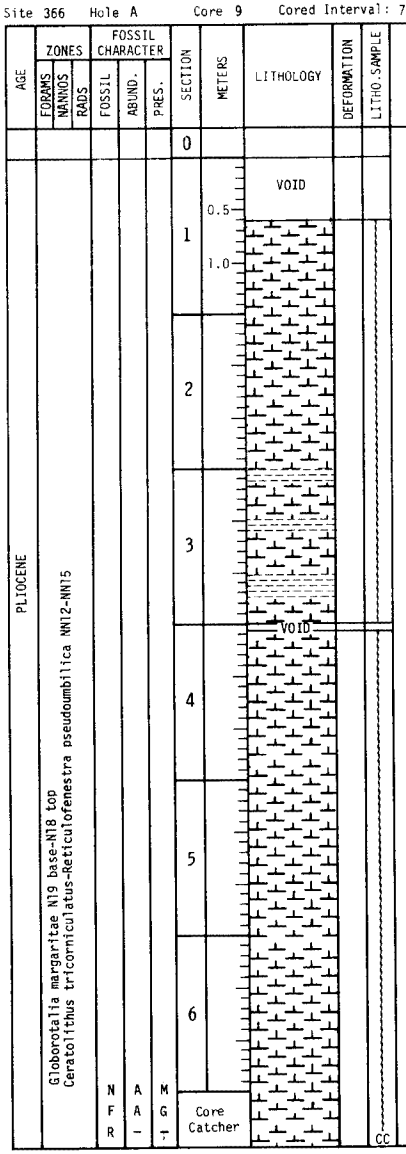
SS at CC

Clay	A	Forams	R
Nannos	A	Diatoms	R
Rads	R	Fish debris	R

SCYPHOSPHAERA appear in core catcher sample.

Carbonate Bomb: 3-104 to 105 cm = 92%

Site 366 Hole A Core 9 Cored Interval: 72.5-82.0 m



LITHOLOGIC DESCRIPTION

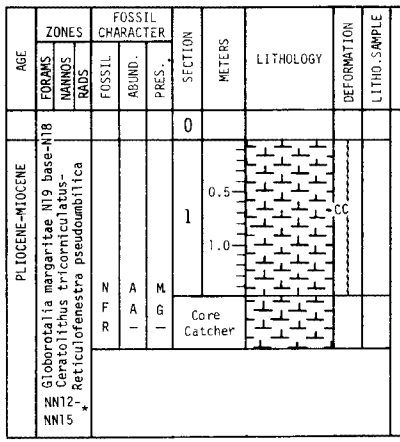
NANNO OOZE, white (N9) to yellowish gray (5Y 8/1) mottled together, soft, intense drilling disturbance. Clayey bands occur at 3-0 to 10 cm; 3-50 to 55 cm; 3-100 to 120 cm.

SS at CC

Clay	A	Forams	R
Nannos	A	Fish debris	R

Carbonate Bomb: 3-77 to 78 cm = 86%

Site 366 Hole A Core 10 Cored Interval: 82.0-91.5 m



LITHOLOGIC DESCRIPTION

NANNO OOZE, white (N9) and light olive gray (5Y 6/1) mottled, soft, intense drilling disturbance.

SS at CC

Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Diatoms	R	Fish debris	R

Carbonate Bomb: 1-54 to 55 cm = 84%

Site 366 Hole A Core 11 Cored Interval: 91.5-101.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
PLICOENE-MIOCENE	Globorotalia margaritae N19 base-N18 Ceratolithus tricorniculatus-Reticulofenestra pseudoumbilica NN12-NN15			N F R	A A T	G G —	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID VOID		CC	NANNO OOZE, yellowish gray (5Y 8/1) with white (N9) mottles. Soupy, intense drilling disturbance, Section 4 has black streaks throughout. Color gradually changes to very pale brown (10YR 7/3) with white (N9) mottles by Section 4. SS at CC Clay A Fe/Mn R Forams R Nannos A Carbonate Bomb: 3-54 to 55 cm = 83%

Site 366 Hole A Core 12 Cored Interval: 101.0-110.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	Globorotalia plesiotumida N17 Discoaster quinqueramus NN11			N F R	A A —	M G —	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID VOID		100 122 CC	NANNO OOZE, white (N9) with mottles of yellowish gray (5Y 8/1), soupy in upper section, soft in lower 4 sections, intense drilling disturbance. Black streaks throughout Sections 2, 3 and 6. SS at 6-100 (dominant lithology) Clay A Forams R Nannos A Rads R Fish debris R SS at 6-122 (dominant lithology) Clay A Nannos A Fe/Mn R Rads R Forams R Fish debris R SS at CC Clay A Forams R Nannos A Fish debris R Carbonate Bomb: 3-110 to 111 cm = 72%

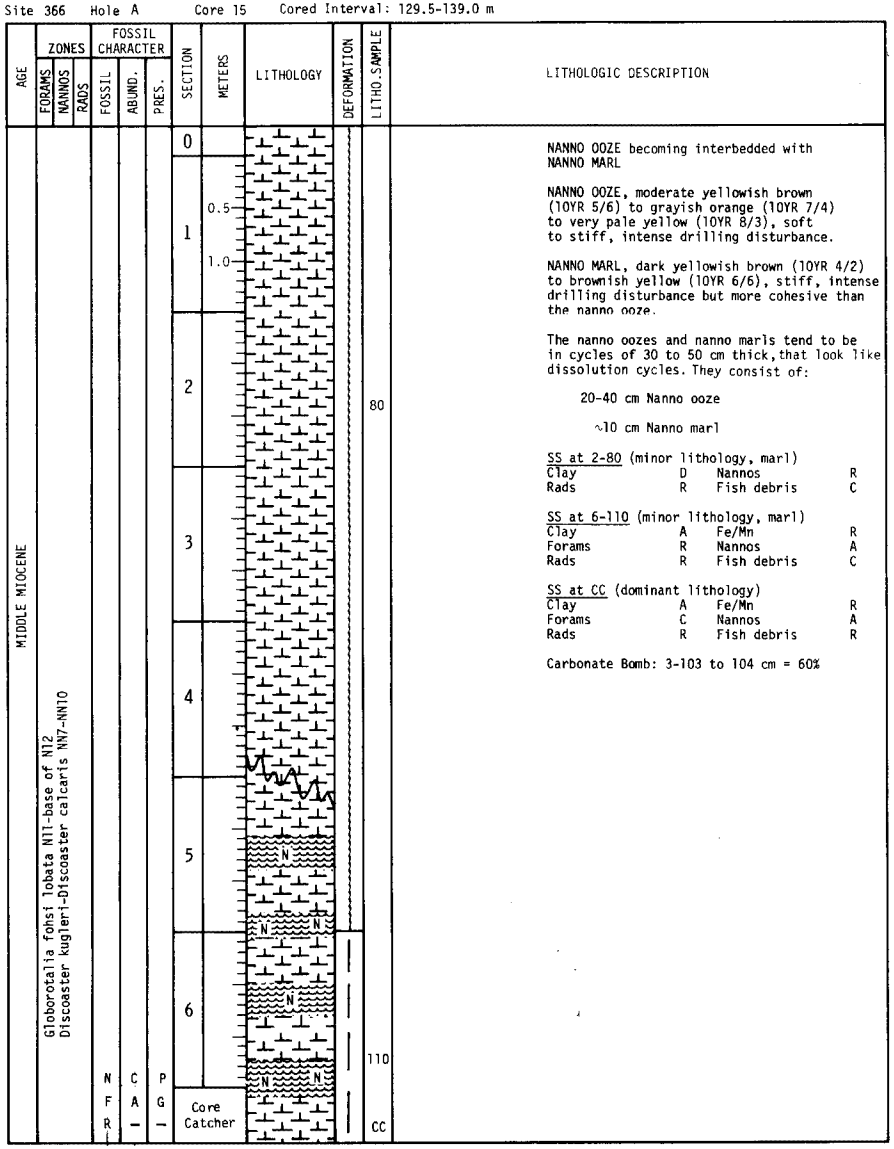
Site 366 Hole A Core 13 Cored Interval: 110.5-120.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	Globorotalia plesiotumida N17 Discoaster quinqueramus NN11			N F R	C A —	P-M GM —	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	F VOID VOID		CC	FORAM BEARING NANNO OOZE, pale orange (10YR 8/3) with mottling of moderate yellowish brown (10YR 6/4) and very pale yellow brown (10YR 7/4), soft to soupy, intense drilling disturbance, clayey bands at 4-95 to 104. SS at CC Clay A Nannos A Forams C Fish debris R

Site 366 Hole A Core 14 Cored Interval: 120.0-129.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE	Globorotalia acostaensis N16 Discoaster quinqueramus NN11			N F R	C A —	P GM —	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	F VOID VOID		CC	FORAM BEARING NANNO OOZE, very pale orange (10YR 8/2) becoming mottled after Section 2 with yellow brown (10YR 5/6) and light yellow brown (10YR 6/4) and white (10YR 8/2), soft, intense drilling disturbance. SS at CC Clay A Forams C Nannos A Diatoms R Rads R Fish debris R Carbonate Bomb: 3-91 to 92 cm = 68%

Site 366 Hole A Core 15 Cored Interval: 129.5-139.0 m



LITHOLOGIC DESCRIPTION

NANNO OOZE becoming interbedded with NANNO MARL

NANNO OOZE, moderate yellowish brown (10YR 5/6) to grayish orange (10YR 7/4) to very pale yellow (10YR 8/3), soft to stiff, intense drilling disturbance.

NANNO MARL, dark yellowish brown (10YR 4/2) to brownish yellow (10YR 6/6), stiff, intense drilling disturbance but more cohesive than the nanno ooze.

The nanno oozes and nanno marls tend to be in cycles of 30 to 50 cm thick, that look like dissolution cycles. They consist of:

20-40 cm Nanno ooze

~10 cm Nanno marl

SS at 2-80 (minor lithology, marl)

Clay	D	Nannos	R
Rads	R	Fish debris	C

SS at 6-110 (minor lithology, marl)

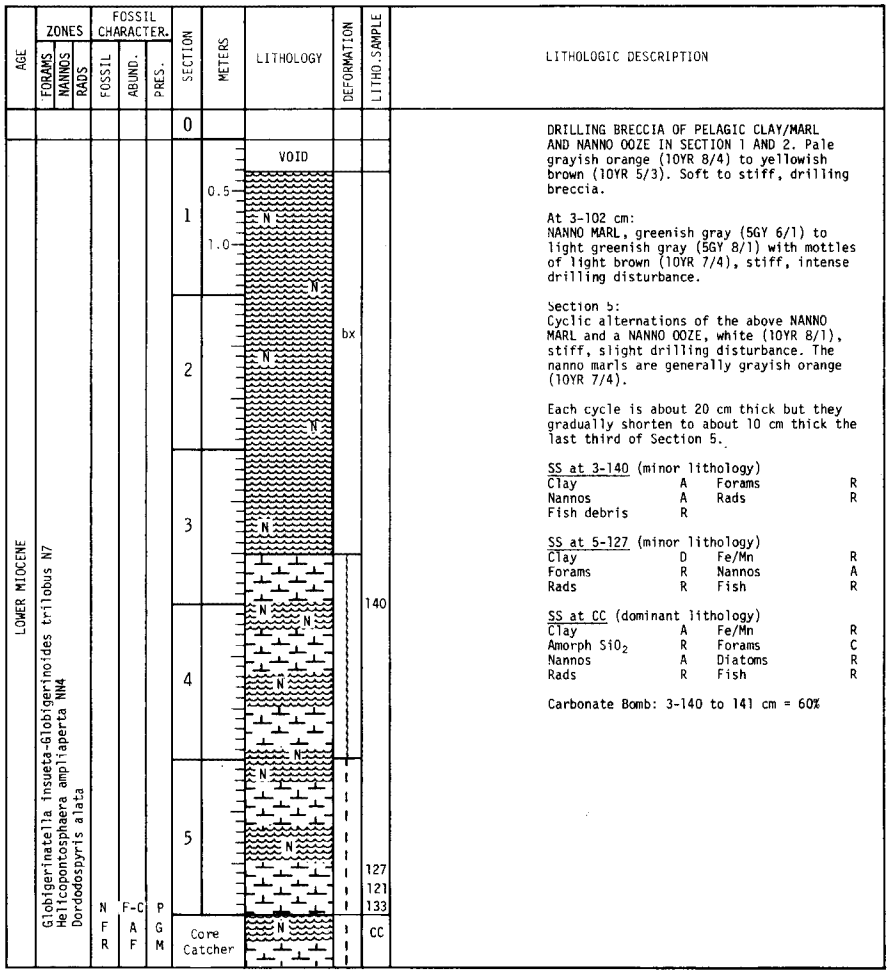
Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Rads	R	Fish debris	C

SS at CC (dominant lithology)

Clay	A	Fe/Mn	R
Forams	C	Nannos	A
Rads	R	Fish debris	R

Carbonate Bomb: 3-103 to 104 cm = 60%

Site 366 Hole A Core 16 Cored Interval: 139.0-148.5 m



LITHOLOGIC DESCRIPTION

DRILLING BRECCIA OF PELAGIC CLAY/MARL AND NANNO OOZE IN SECTION 1 AND 2. Pale grayish orange (10YR 8/4) to yellowish brown (10YR 5/3). Soft to stiff, drilling breccia.

At 3-102 cm:
NANNO MARL, greenish gray (5GY 6/1) to light greenish gray (5GY 8/1) with mottles of light brown (10YR 7/4), stiff, intense drilling disturbance.

Section 5:
Cyclic alternations of the above NANNO MARL and a NANNO OOZE, white (10YR 8/1), stiff, slight drilling disturbance. The nanno marls are generally grayish orange (10YR 7/4).

Each cycle is about 20 cm thick but they gradually shorten to about 10 cm thick the last third of Section 5.

SS at 3-140 (minor lithology)

Clay	A	Forams	R
Nannos	A	Rads	R
Fish debris	R		

SS at 5-127 (minor lithology)

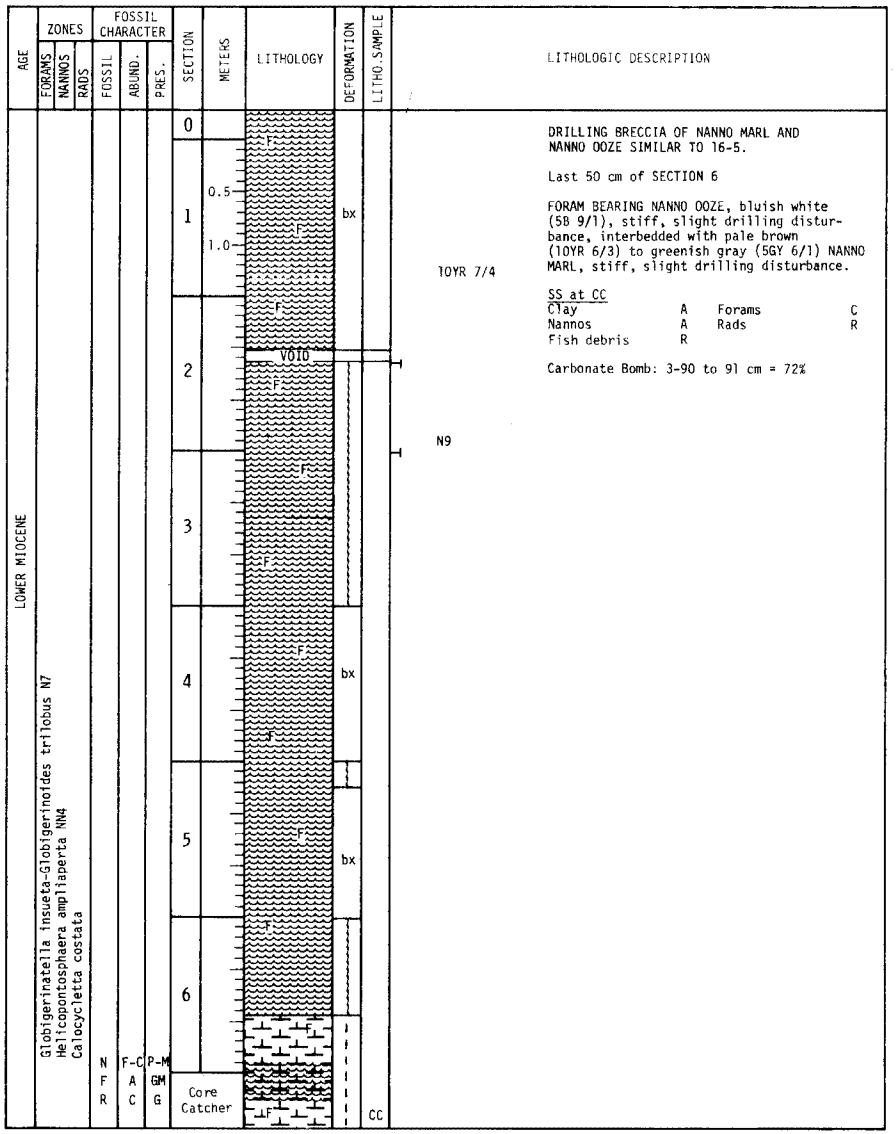
Clay	D	Fe/Mn	R
Forams	R	Nannos	A
Rads	R	Fish	R

SS at CC (dominant lithology)

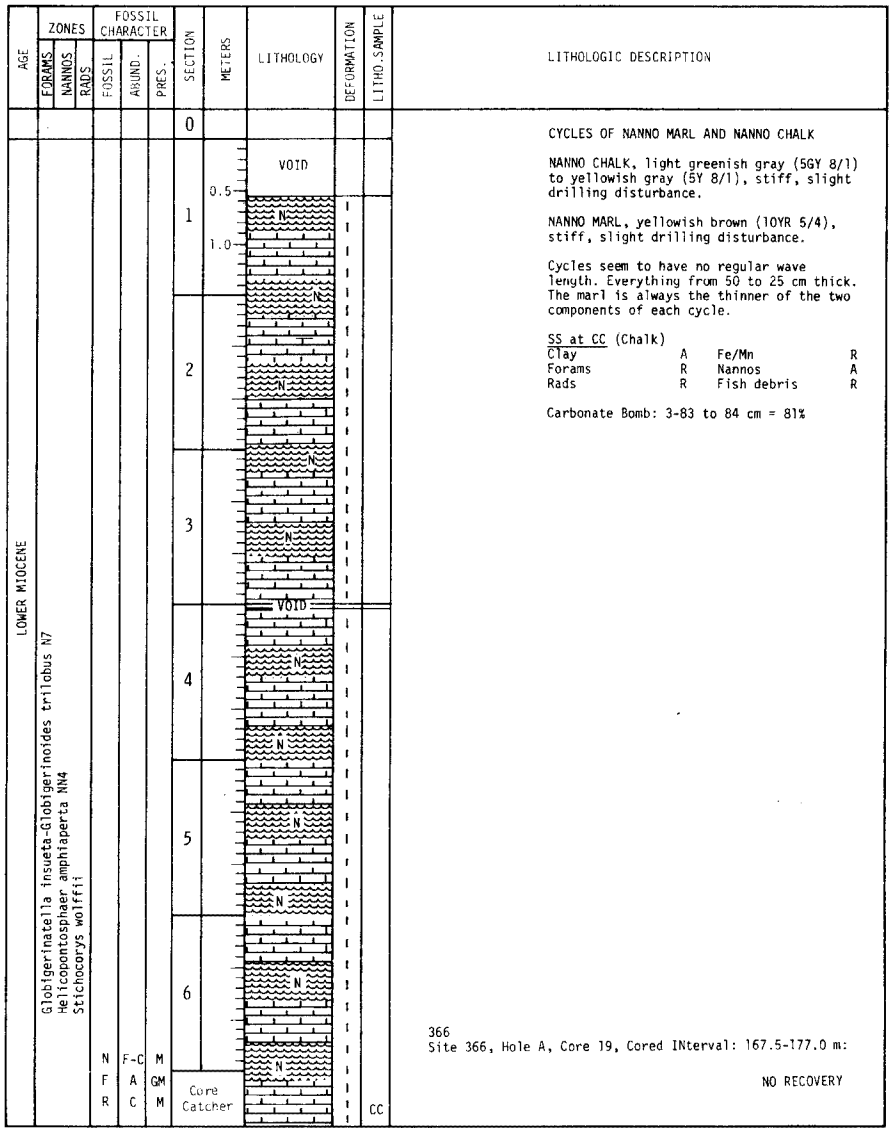
Clay	A	Fe/Mn	R
Amorph SiO_2	R	Forams	C
Nannos	A	Diatoms	R
Rads	R	Fish	R

Carbonate Bomb: 3-140 to 141 cm = 60%

Site 366 Hole A Core 17 Cored Interval: 148.5-158.0 m



Site 366 Hole A Core 18 Cored Interval: 158.0-167.5 m



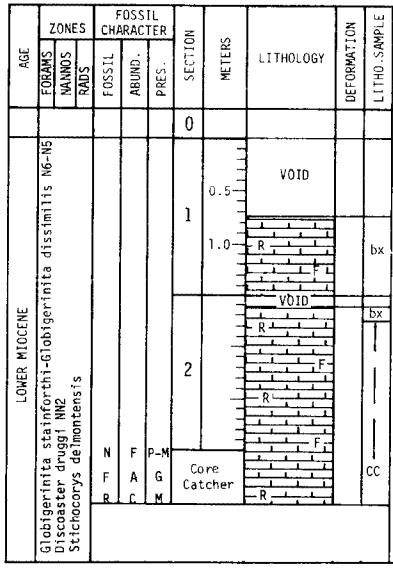
Site 366 Hole A Core 20 Cored Interval: 177.0-186.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER MIOCENE	Globigerinita stainforthi-Globigerinita dissimilis N6-N5 Discoaster druggi-Sphenolithus belemnos NN2-NN3 Stichocorys wolffii			N F R	F A F	P-M G M	0 1 2 3 Core Catcher	0.5 1.0	VOID VOID		CC	FORAM NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight drilling disturbance. Mottled with yellowish gray (5Y 8/1). SS at CC Clay A Fe/Mn R Forams A Nannos A Rads R Sponge spicules R Carbonate Bomb: 3-104-105 cm = 77%

Site 366 Hole A Core 21 Cored Interval: 186.5-196.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWER MIOCENE	Globigerinita stainforthi-Globigerinita dissimilis N6-N5 Discoaster druggi-Sphenolithus belemnos NN2-NN3 Stichocorys delmontensis			N F R	F-C A C	P-M G M	0 1 2 3 4 5 6 Core Catcher	0.5 1.0		bx	CC	FORAM NANNO CHALK, light greenish gray (5GY 8/1), soupy to severe drilling disturbance, stiff, burrowing apparent in some sections. Some green (5G 6/1) bands in Section 6. SS at CC Clay A Forams A Nannos A Diatoms R Rads R Sponge spicules R Carbonate Bomb: 3-74 to 75 cm = 79%

Site 366 Hole A Core 22 Cored Interval: 196.0-205.5 m



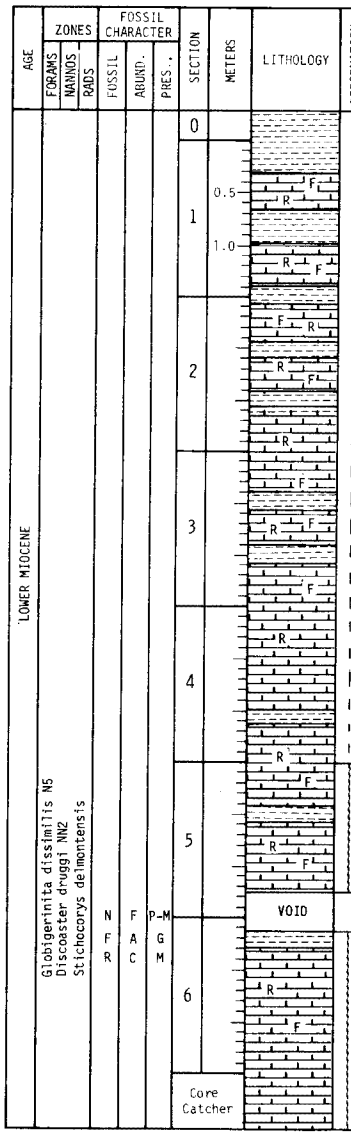
LITHOLOGIC DESCRIPTION

RAD-FORAM-BEARING NANNO CHALK, light greenish gray (5GY 8/1), stiff, soupy to moderate drilling disturbance, several dark green (5G 6/1) bands and laminae occur, mottles and faint burrows common.

SS at CC

Clay	A	Forams	C
Nannos	A	Diatoms	R
Rads	C		

Site 366 Hole A Core 23 Cored Interval: 205.5-215.0 m



LITHOLOGIC DESCRIPTION

CYCLES OF INTERBEDDED PELAGIC CLAY AND RAD-FORAM-BEARING NANNO CHALK

PELAGIC CLAY, dark greenish gray (5G 4/1), burrowed (excellent chondrites), stiff, slight drilling disturbance.

SS at 1-12 (pelagic clay)

Clay	A	Fe/Mn	R
Nannos	R	Diatoms	R
Rads	R		

SS at 2-59 (minor lithology)

Clay	A	Nannos	R
Diatoms	C	Rads	R
Sponge spicules	R	Fish debris	R

RAD-FORAM-BEARING NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight drilling disturbance. Burrows abundant and filled with lighter material.

These cycles appear to be dissolution cycles.

Carbonate Bomb: 1-26 to 27 cm = 7%
1-45 to 46 cm = 71%
3-72 to 73 cm = 80%
3-98 to 99 cm = 22%

Site 366 Hole A Core 24 Cored Interval: 215.0-224.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER MIOCENE	Globigerinita dissimilis Discoaster druggi NN2 Cyrtocapsa tetrapera			N F R	C A C	P-M G M	0 1 2 Core Catcher	0.5 1.0	VOID R F R F R F		CC

LITHOLOGIC DESCRIPTION

CYCLES OF INTERBEDDED PELAGIC CLAY AND RAD-FORAM-BEARING NANNO CHALK

PELAGIC CLAY, dark greenish gray (5G 4/1), burrowed (chondrites), stiff, severe drilling disturbance.

RAD-FORAM-BEARING NANNO CHALK, light greenish gray (5GY 8/1), stiff, severe drilling disturbance, burrowed.

Cycles appear to be dissolution cycles.

SS at CC (dominant lithology)

Clay	A	Forams	C
Nannos	A	Diatoms	R
Rads	C		

Carbonate Bomb: 2-95 to 96 cm = 80%

Site 366 Hole A Core 25 Cored Interval: 224.5-234.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER MIOCENE	Globigerinita dissimilis N5 Discoaster druggi NN2 Cyrtocapsa tetrapera			N F R	F-C A F	M G M	0 1 Core Catcher	0.5 1.0	F D F D D F		CC

LITHOLOGIC DESCRIPTION

FORAM-DIATOM-BEARING CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, severe drilling disturbance, some darker green burrowed segments. Ethmodiscus rex common.

SS at CC

Clay	A	Forams	C
Nannos	A	Diatoms	C
Rads	R	Silicoflagellates	R

Site 366 Hole A Core 26 Cored Interval: 234.0-243.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER MIOCENE	Globigerinita dissimilis N5 Discoaster druggi NN2 Lychnocanoma elongata			N F R	C A R	M G M	0 1 2 3 4 5 Core Catcher	0.5 1.0	VOID		65 CC

LITHOLOGIC DESCRIPTION

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight to severe drilling disturbance, burrowed. Thin (10 cm) interbeds of slightly darker green occur at 2-70 to 80 cm; 3-47 to 54 cm; 3-85 to 100 cm; scattered throughout Section 4 and at 5-20 to 30 cm.

These slightly darker green layers appear to have less carbonate and may be part of the previous dissolution cycle sequence.

SS at 4-65 (dominant lithology)

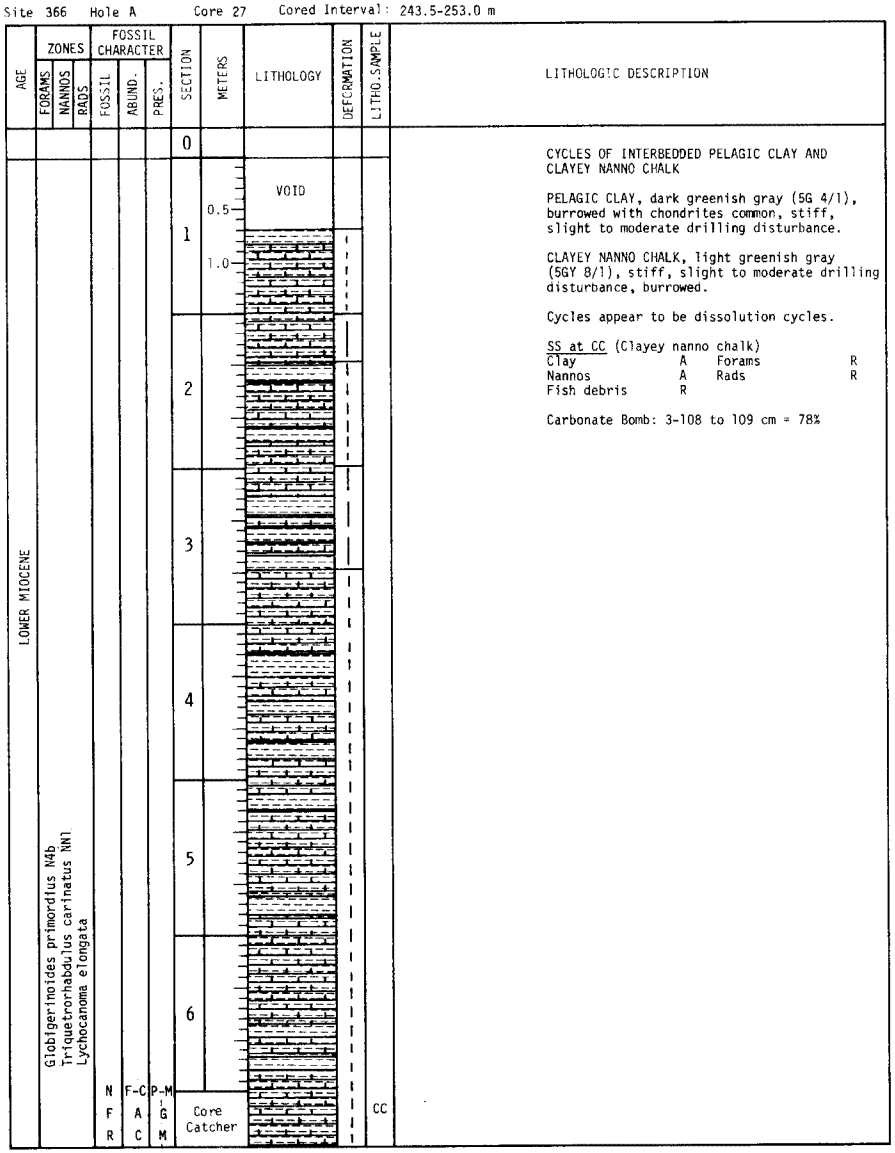
Clay	A	Fe/Mn	C
Forams	R	Nannos	A
Rads	R		

SS at CC

Clay	A	Forams	R
$CaCO_3$ needles	C	Nannos	A
Rads	C		

Carbonate Bomb: 3-113 to 114 cm = 80%

Site 366 Hole A Core 27 Cored Interval: 243.5-253.0 m



LITHOLOGIC DESCRIPTION

CYCLES OF INTERBEDDED PELAGIC CLAY AND CLAYEY NANNO CHALK

PELAGIC CLAY, dark greenish gray (5G 4/1), burrowed with chondrites common, stiff, slight to moderate drilling disturbance.

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight to moderate drilling disturbance, burrowed.

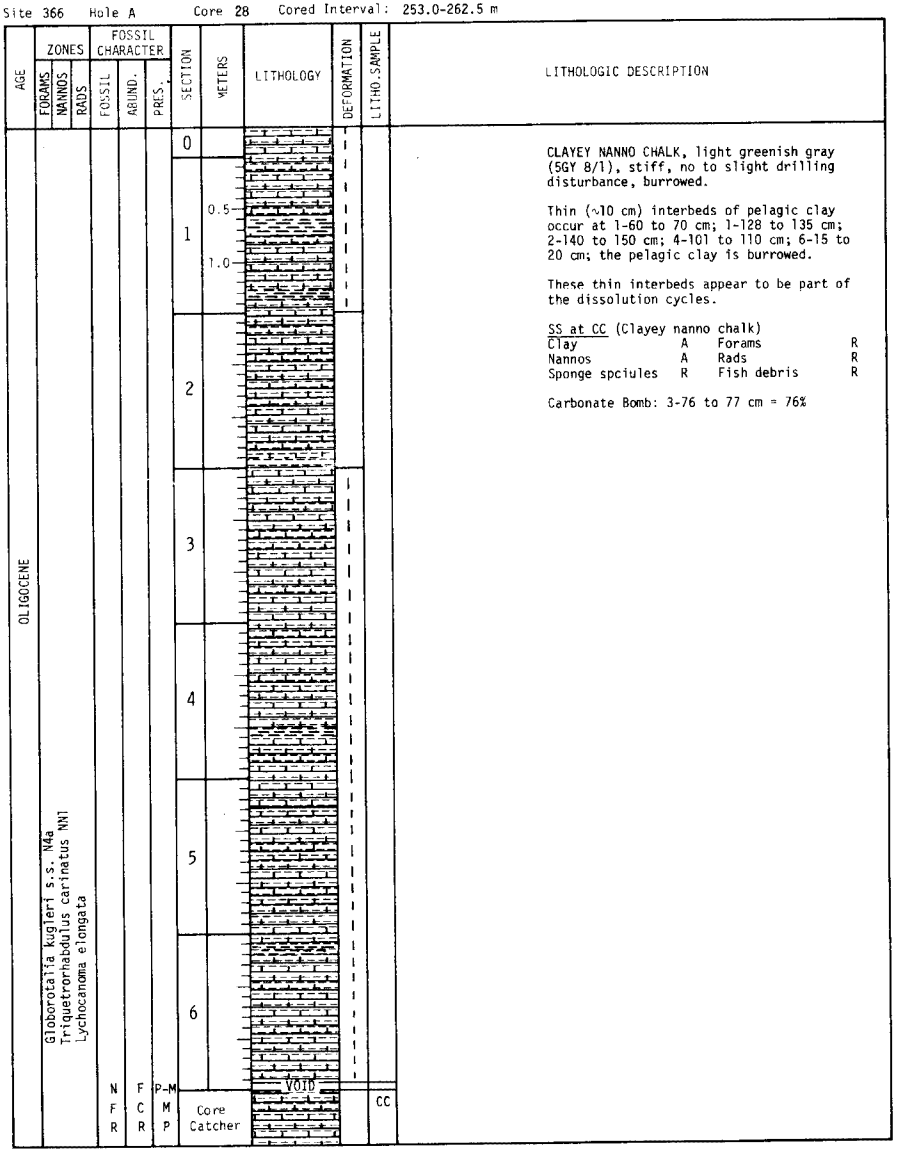
Cycles appear to be dissolution cycles.

SS at CC (Clayey nanno chalk)

Clay	A	Forams	R
Nannos	A	Rads	R
Fish debris	R		

Carbonate Bomb: 3-108 to 109 cm = 78%

Site 366 Hole A Core 28 Cored Interval: 253.0-262.5 m



LITHOLOGIC DESCRIPTION

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, no to slight drilling disturbance, burrowed.

Thin (~10 cm) interbeds of pelagic clay occur at 1-60 to 70 cm; 1-128 to 135 cm; 2-140 to 150 cm; 4-101 to 110 cm; 6-15 to 20 cm; the pelagic clay is burrowed.

These thin interbeds appear to be part of the dissolution cycles.

SS at CC (Clayey nanno chalk)

Clay	A	Forams	R
Nannos	A	Rads	R
Sponge spciules	R	Fish debris	R

Carbonate Bomb: 3-76 to 77 cm = 76%

Site 366 Hole A Core 29 Cored Interval: 262.5-272.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
OLIGOCENE	Globorotalia kugleri (base)-Globigerinia ciperoensis N4a (base)-P22 Triquetrorhabdulus carinatus-Sphenolithus ciperoensis NN1-NP25			N F R	C A –	P-M M –	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID		CC	INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY, light greenish gray (5GY 8/1), stiff, slight drilling disturbance, burrowed. Thin interbeds of pelagic clay occur at 1-95 to 110 cm; 1-135 to 142 cm; 3-72 to 82 cm; 3-121 to 135 cm; 4-23 to 34 cm; 4-106 to 116 cm; 5-0 to 10 cm. PELAGIC CLAY, dark greenish gray (5G 4/1), burrowed, stiff, slight drilling disturbance. Appear to be dissolution cycles. SS at CC (dominant lithology) Clay A Forams R Nannos A Rads R The alternations appear to be dissolution cycles. Carbonate Bomb: 3-72 to 73 cm = 79%

Site 366 Hole A Core 30 Cored Interval: 272.0-281.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
OLIGOCENE	Globigerina ciperoensis P22 Sphenolithus ciperoensis NP25 Dorcadospyris ateuchus			N F R	F A F	P-M G M	0 1 2 3 4 5 6 Core Catcher	0.5 1.0			CC	INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight drilling disturbance, burrowed. Mn specks and liesegang bands common. Black specks occasional. PELAGIC CLAY, dark greenish gray (5G 4/1), stiff, slight drilling disturbance, burrowed, some sequences laminated. SS at CC (dominant lithology) Clay A Forams C Nannos A Rads R Fish debris R These alternations appear to be dissolution cycles. Carbonate Bomb: 3-54 to 55 cm = 73%

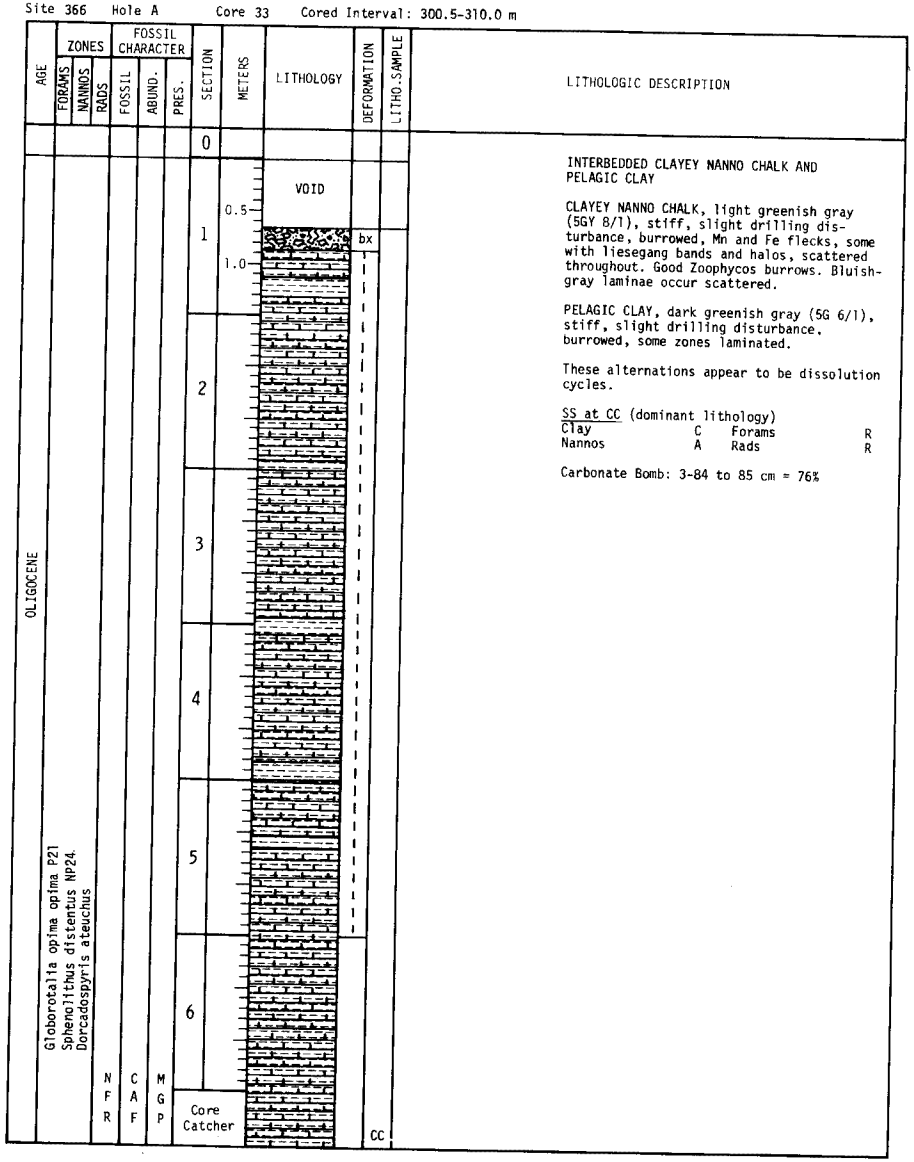
Site 366 Hole A Core 31 Cored Interval: 281.5-291.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight drilling disturbance, burrowed, Mn spots with liesegang halos scattered throughout. PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, slight drilling disturbance, burrowed, sometimes laminated. These appear to be dissolution cycles. SS at CC (dominant lithology) Clay A Forams R Nannos A Rads R Carbonate Bomb: 3-84 to 85 cm = 81%
OLIGOCENE	Globigerina ciperoensis P22 Sphenolithus ciperoensis NP25 Dorcadospyris ateuchus						1	0.5 1.0	VOID	bx		
							2					
							3					
							4					
							5					
				N F R	F-C A C	P-M GM M	Core Catcher				CC	

Site 366 Hole A Core 32 Cored Interval: 291.0-300.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					Only small sample CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff. SS at CC Clay A Fe/Mn R Forams R Nannos A Diatoms R Rads R Fish debris R
OLIGOCENE	Globigerina ciperoensis P22 Sphenolithus ciperoensis Dorcadospyris ateuchus			N R F	C F A	M P GM	Core Catcher			CC		

Site 366 Hole A Core 33 Cored Interval: 300.5-310.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight drilling disturbance, burrowed, Mn and Fe flecks, some with liesegang bands and halos, scattered throughout. Good Zoophycos burrows. Bluish-gray laminae occur scattered.

PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, slight drilling disturbance, burrowed, some zones laminated.

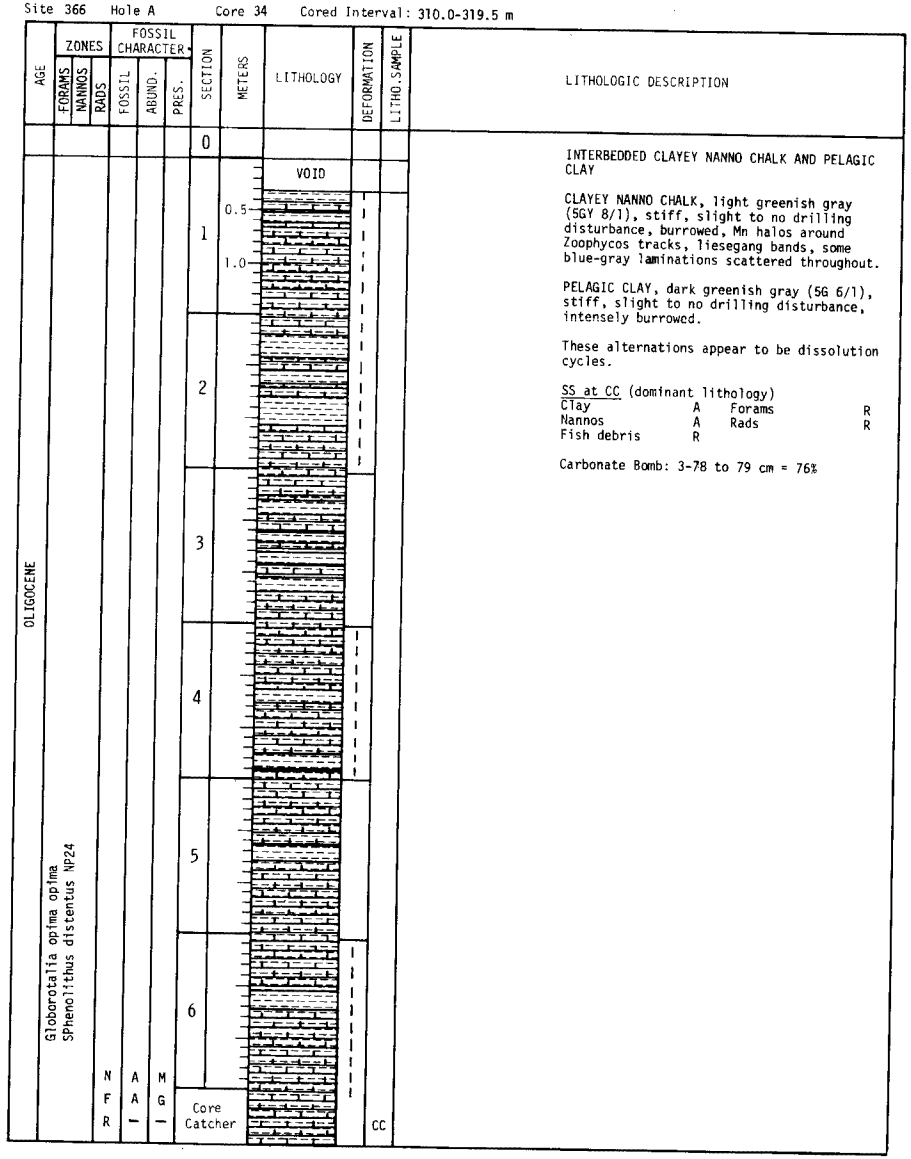
These alternations appear to be dissolution cycles.

SS at CC (dominant lithology)

Clay	C	Forams	R
Nannos	A	Rads	R

Carbonate Bomb: 3-84 to 85 cm = 76%

Site 366 Hole A Core 34 Cored Interval: 310.0-319.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight to no drilling disturbance, burrowed, Mn halos around Zoophycos tracks, liesegang bands, some blue-gray laminations scattered throughout.

PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, slight to no drilling disturbance, intensely burrowed.

These alternations appear to be dissolution cycles.

SS at CC (dominant lithology)

Clay	A	Forams	R
Nannos	A	Rads	R
Fish debris	R		

Carbonate Bomb: 3-78 to 79 cm = 76%

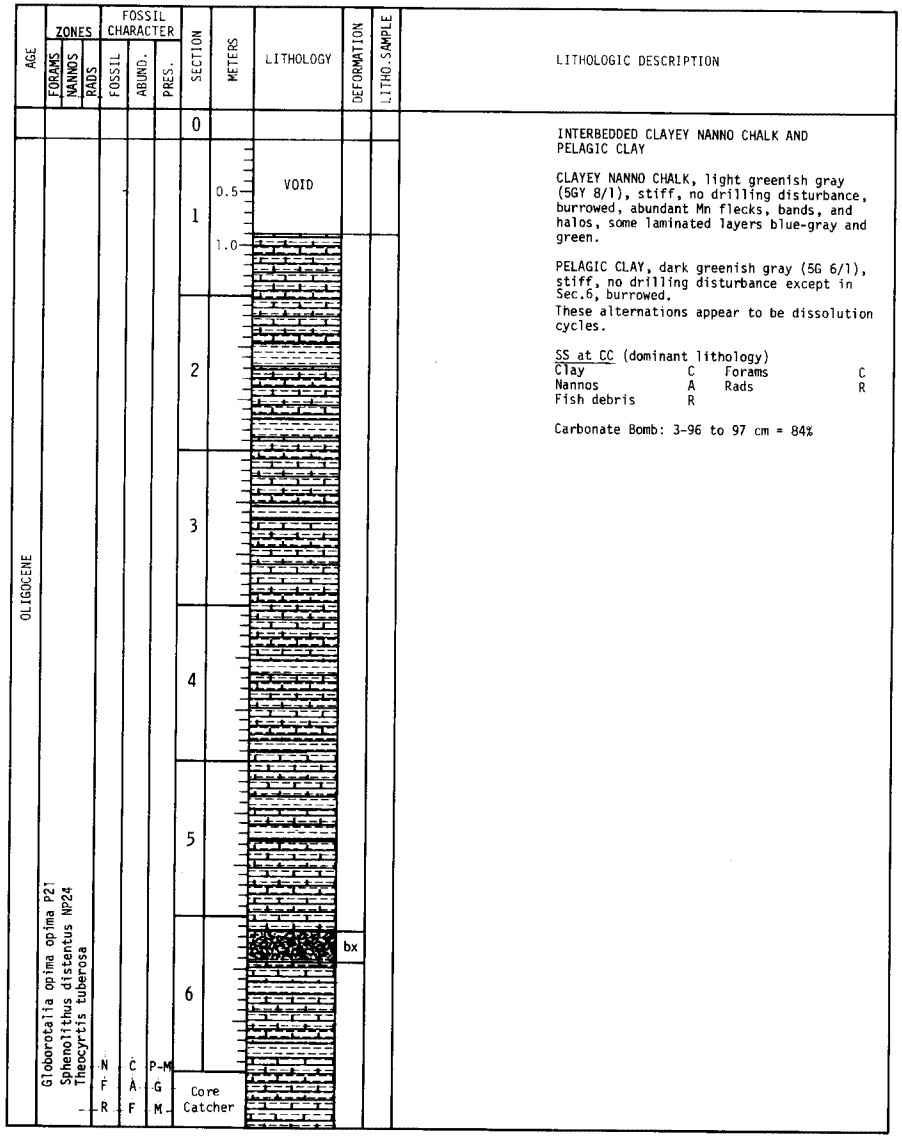
Site 366 Hole A Core 35 Cored Interval: 319.5-329.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
OLIGOCENE	Globorotalia opima opima P21 Sphenolithus distentus NP24			N F R	A A —	M-G G —	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	VOID	bx	CC	INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, slight to no drilling disturbance, burrowed, Mn flecks and liesegang bands scattered throughout, laminated zones present throughout. PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, slight to no drilling disturbance, burrowed. These alternations appear to be dissolution cycles. SS at CC (dominant lithology) Clay C Forams R Nannos A Fish debris R Carbonate Bomb: 3-73 to 74 cm = 80%

Site 366 Hole A Core 36 Cored Interval: 329.0-338.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
OLIGOCENE	Globorotalia opima opima P21 Sphenolithus distentus NP24 Dorcadospyris ateuchus			N F R	C A R	M G P	0 1 2 3 4 5 Core Catcher	0.5 1.0	VOID	bx	CC	INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, no drilling disturbance, burrowed, Mn bands, laminae, halos abundant, some layers laminated. PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, no drilling disturbance, burrowed. Sometimes the contact between pelagic clay below clayey nanno ooze is gradational but the other contact is always sharp. These alternations appear to be dissolution cycles. SS at CC (dominant lithology) Clay C Forams R Nannos A Rads R Carbonate Bomb: 3-53 to 54 cm = 69%

Site 366 Hole A Core 37 Cored Interval: 338.5-348.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, no drilling disturbance, burrowed, abundant Mn flecks, bands, and halos, some laminated layers blue-gray and green.

PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, no drilling disturbance except in Sec.6, burrowed.

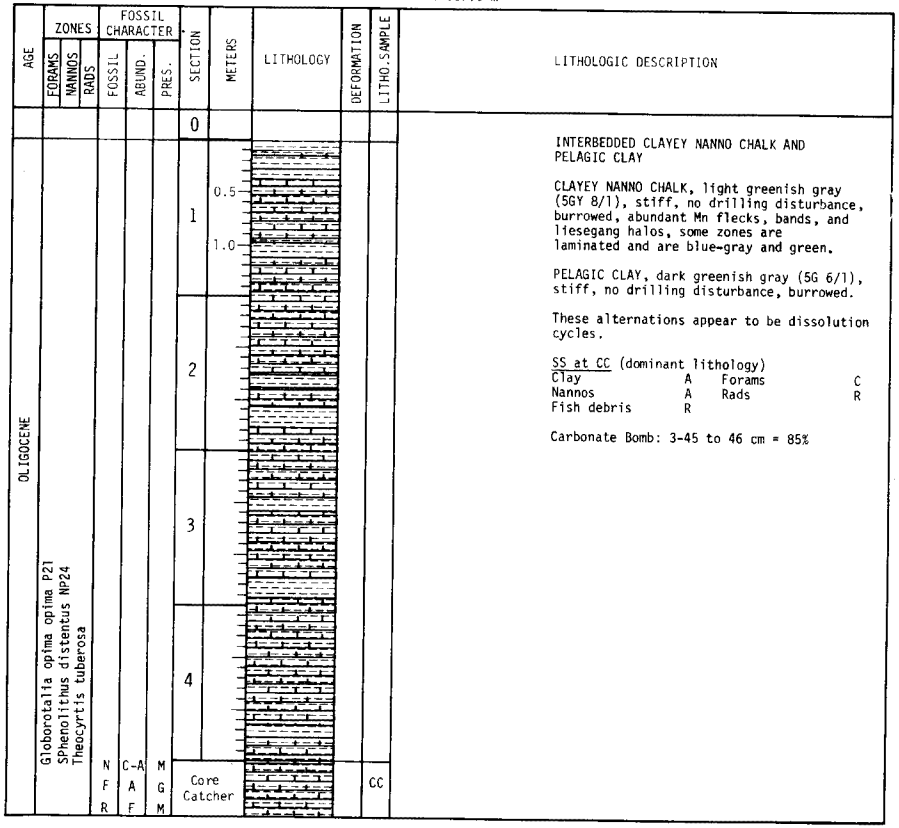
These alternations appear to be dissolution cycles.

SS at CC (dominant lithology)

Clay	C	Forams	C
Nannos	A	Rads	R
Fish debris	R		

Carbonate Bomb: 3-96 to 97 cm = 84%

Site 366 Hole A Core 38 Cored Interval: 348.0-357.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY

CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, no drilling disturbance, burrowed, abundant Mn flecks, bands, and liesegang halos, some zones are laminated and are blue-gray and green.

PELAGIC CLAY, dark greenish gray (5G 6/1), stiff, no drilling disturbance, burrowed.

These alternations appear to be dissolution cycles.

SS at CC (dominant lithology)

Clay	A	Forams	C
Nannos	A	Rads	R
Fish debris	R		

Carbonate Bomb: 3-45 to 46 cm = 85%

Site 366 Hole A Core 39 Cored Interval: 357.5-367.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
OLIGOCENE	Globigerina ampliapertura-Globigerina tapuriensis P20-P18	Sphenolithus predistentus NP23	Theocyrtis tuberosa	N F R	C C F	P-M M M	0					
							1	0.5 1.0		bx		INTERBEDDED CLAYEY NANNO CHALK AND PELAGIC CLAY CLAYEY NANNO CHALK, light greenish gray (5GY 8/1), stiff, no drilling disturbance, burrowed, abundant Mn flecks, laminations, liesegang halos, common blue-gray and green laminae. PELAGIC CLAY, dark yellowish gray (5G 6/1), stiff, no drilling disturbance, burrowed and sometimes laminated. These alternations appear to be dissolution cycles. SS at CC (dominant lithology) Clay A Fe/Mn R Forams R Nannos A Rads R Fish depris R Carbonate Bomb: 3-91 to 92 cm = 86%
							2					
							3					
							4					
							Core Catcher				CC	

DEEP SEA DRILLING PROJECT

LEG 41 SITE 367

SITE SUMMARY SHEET

PRINCIPAL RESULTS:

Cape Verde Basin

An 1153-meter section was drilled in the Cape Verde Basin, southeast of the Cape Verde Islands, in the magnetic quiet zone. The hole bottomed in basalt overlain by ?middle to upper Jurassic sediments. It is not entirely clear if the basalt is a sill or if it represents the top of layer 2. Regional correlations and preliminary examination of the rocks, however, support an interpretation suggesting that the basalt represents basement. The Mesozoic part of the section is strikingly similar to the one sampled by Leg 11 in the North American Basin (especially Site 105). This similarity can be observed even in the minute details of sedimentary structures. The differences, minor in importance, are: 1) slightly larger amounts of chert, 2) absence of large scale redeposition features at the Cape Verde Basin site, and 3) the presence of some variegated claystone at the base of the black shale sequence. The entire sedimentary section consists of deep-water deposits. The section was divided into the following units from top to bottom: 1) Pleistocene to Miocene marls and silty clays with occasional sand layers in the Pliocene and other indications of redeposition of originally shallow-water sediment; 2) late Eocene radiolarian clay and middle to early Eocene zeolitic clay and chert; 3) ?Paleocene to Late Cretaceous multicolored silty clay in which the benthonic foraminifera faunas are similar to the Alpine flysch assemblages of the same age; 4) Cenomanian to late Aptian black shales rich in organic matter (organic carbon up to 6.7%) and methane, with abundant pyrite, and rare crystals of partly pyritized barite; 5) Early Aptian to Barremian variegated claystone; 6) Neocomian to Tithonian light gray limestones interbedded with dark gray marls and shales, and rich in aptychi with some ammonites (resembling the sequence outcropping in Maio, Cape Verde Islands); 7) late to ?middle Jurassic reddish brown argillaceous limestones, marls, and claystones with aptychi; and 8) basalt.

Horizon A correlates with middle Eocene cherts. Horizon β possibly correlates with some sideritic beds within the black shale section. The uppermost part of the rather diffuse reflector C correlates with the top of the limestones but no clear correlation can be established between the seismic data and the basalt.

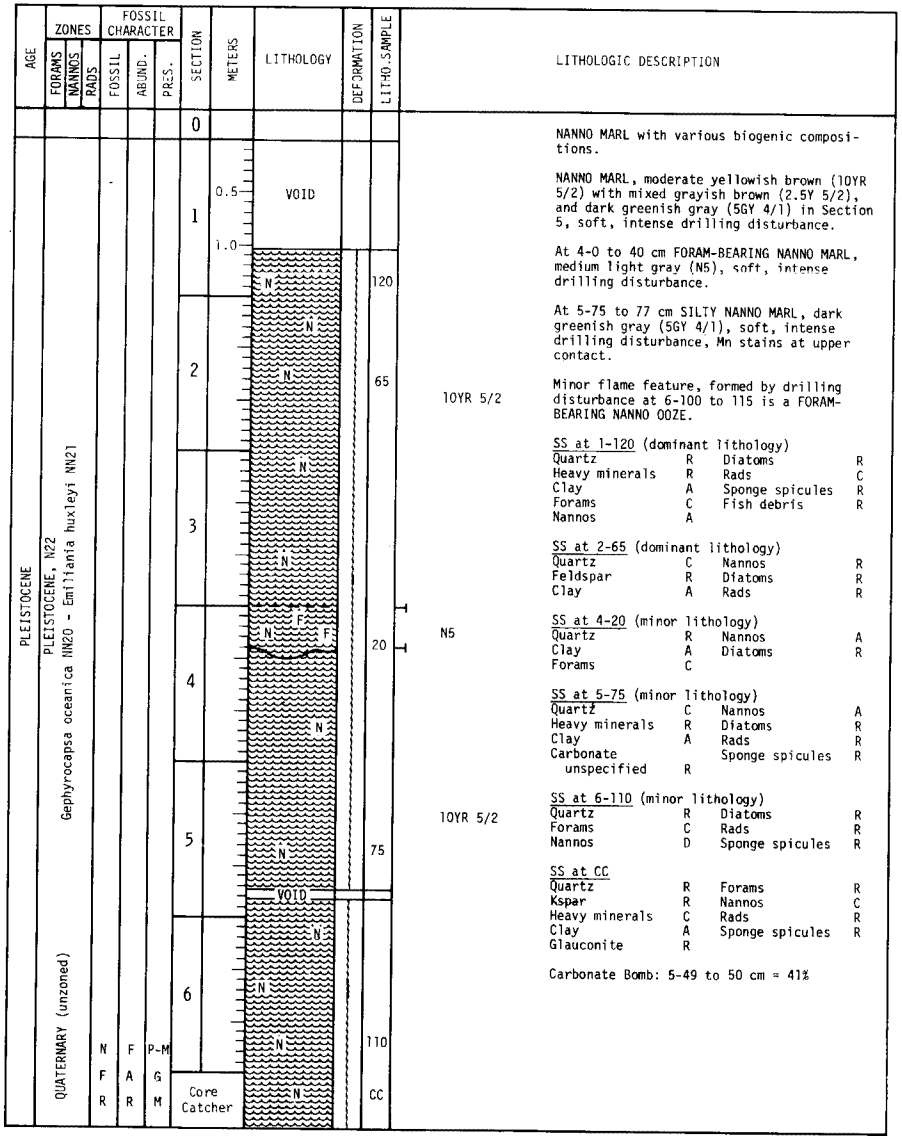
Date occupied	1840Z 3 March 1975
Date departed	0238Z 10 March 1975

65

LEG 41 SITE 367
SITE SUMMARY SHEET, con't.

Time on site	6 days, 7 hours, 58 minutes
Position: Latitude	12°29.2'N
Longitude	20°02.8'W
Water depth (sea level)	4748 corrected meters
Water depth (rig floor)	4758 corrected meters
Penetration	1153 meters
Number of holes	1
Number of cores	40
Total length of cored section	347.0 meters
Total core recovered	174.3 meters
Percentage core recovery	50
<u>Oldest Sediment Cored</u>	
Depth subbottom	1146 meters
Nature	Red argillaceous limestone
Age	Kimmeridgian to Oxfordian
Measured velocity	∿3.5 km/sec
<u>Basement</u>	
Depth subbottom	1146 meters
Nature	Basalt
Velocity range	4.3 km/sec

Site 367 Hole Core 1 Cored Interval: 0.0-8.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL with various biogenic compositions.

NANNO MARL, moderate yellowish brown (10YR 5/2) with mixed grayish brown (2.5Y 5/2), and dark greenish gray (5GY 4/1) in Section 5, soft, intense drilling disturbance.

At 4-0 to 40 cm FORAM-BEARING NANNO MARL, medium light gray (N5), soft, intense drilling disturbance.

At 5-75 to 77 cm SILTY NANNO MARL, dark greenish gray (5GY 4/1), soft, intense drilling disturbance, Mn stains at upper contact.

Minor flame feature, formed by drilling disturbance at 6-100 to 115 is a FORAM-BEARING NANNO OOZE.

10YR 5/2

N5

10YR 5/2

SS at 1-120 (dominant lithology)

Quartz	R	Diatoms	R
Heavy minerals	R	Rads	C
Clay	A	Sponge spicules	R
Forams	C	Fish debris	R
Nannos	A		

SS at 2-65 (dominant lithology)

Quartz	C	Nannos	R
Feldspar	R	Diatoms	R
Clay	A	Rads	R

SS at 4-20 (minor lithology)

Quartz	R	Nannos	A
Clay	A	Diatoms	R
Forams	C		

SS at 5-75 (minor lithology)

Quartz	C	Nannos	A
Heavy minerals	R	Diatoms	R
Clay	A	Rads	R
Carbonate unspecified	R	Sponge spicules	R

SS at 6-110 (minor lithology)

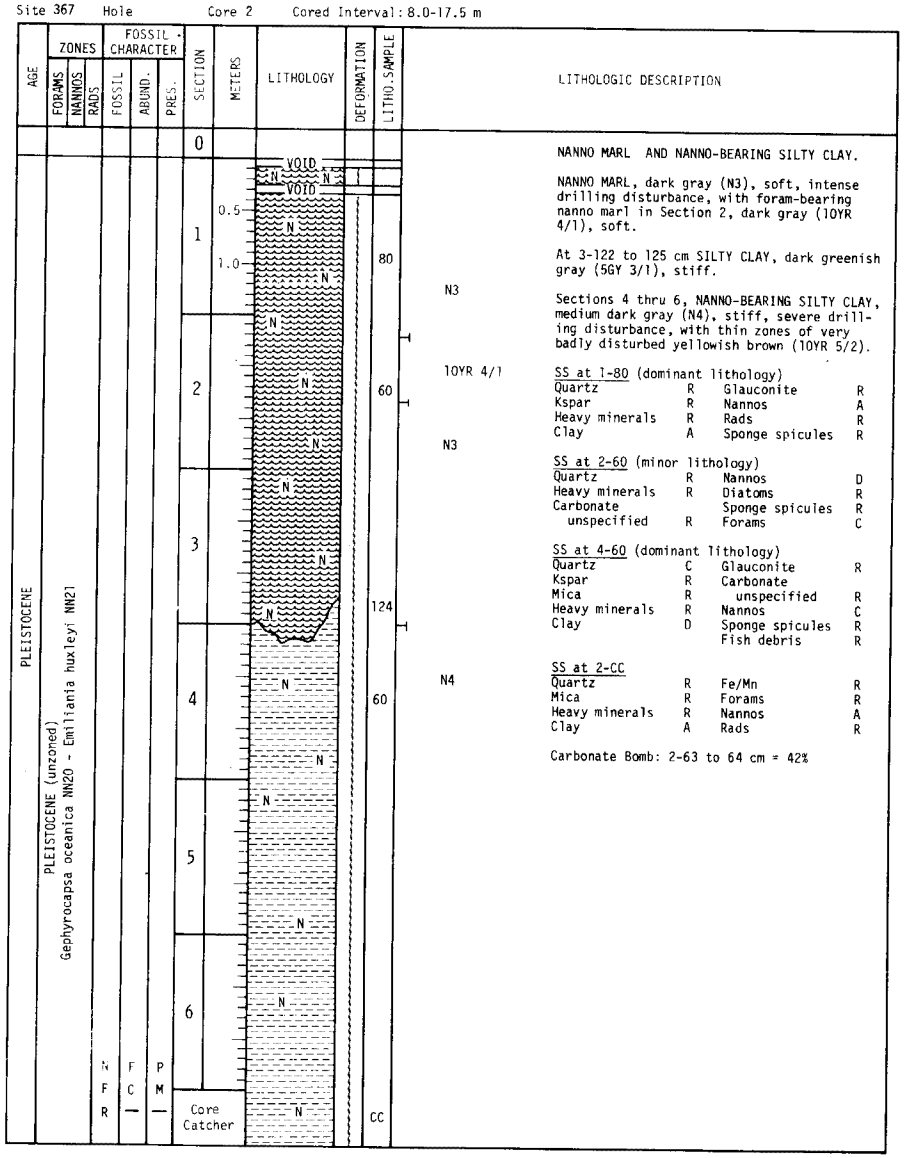
Quartz	R	Diatoms	R
Forams	C	Rads	R
Nannos	D	Sponge spicules	R

SS at CC

Quartz	R	Forams	R
Kspar	R	Nannos	C
Heavy minerals	C	Rads	R
Clay	A	Sponge spicules	R
Glauconite	R		

Carbonate Bomb: 5-49 to 50 cm = 41%

Site 367 Hole Core 2 Cored Interval: 8.0-17.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL AND NANNO-BEARING SILTY CLAY.

NANNO MARL, dark gray (N3), soft, intense drilling disturbance, with foram-bearing nanno marl in Section 2, dark gray (10YR 4/1), soft.

At 3-122 to 125 cm SILTY CLAY, dark greenish gray (5GY 3/1), stiff.

Sections 4 thru 6, NANNO-BEARING SILTY CLAY, medium dark gray (N4), stiff, severe drilling disturbance, with thin zones of very badly disturbed yellowish brown (10YR 5/2).

N3

10YR 4/1

N3

N4

SS at 1-80 (dominant lithology)

Quartz	R	Glauconite	R
Kspar	R	Nannos	A
Heavy minerals	R	Rads	R
Clay	A	Sponge spicules	R

SS at 2-60 (minor lithology)

Quartz	R	Nannos	D
Heavy minerals	R	Diatoms	R
Carbonate unspecified	R	Sponge spicules	R
		Forams	C

SS at 4-60 (dominant lithology)

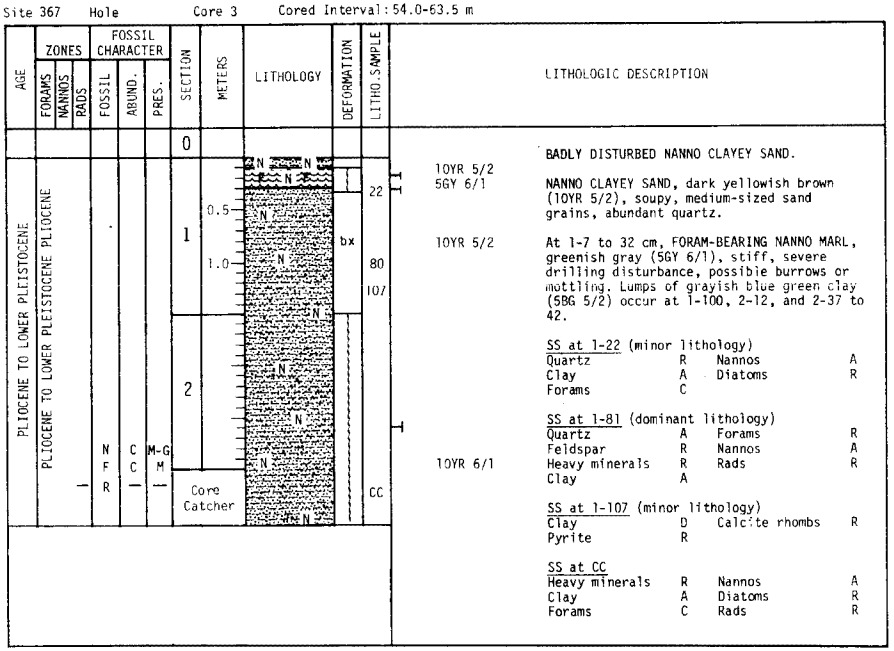
Quartz	C	Glauconite	R
Kspar	R	Carbonate unspecified	R
Mica	R	Nannos	C
Heavy minerals	R	Sponge spicules	R
Clay	D	Fish debris	R

SS at 2-CC

Quartz	R	Fe/Mn	R
Mica	R	Forams	R
Heavy minerals	R	Nannos	A
Clay	A	Rads	R

Carbonate Bomb: 2-63 to 64 cm = 42%

Site 367 Hole Core 3 Cored Interval: 54.0-63.5 m



LITHOLOGIC DESCRIPTION

BADLY DISTURBED NANNO CLAYEY SAND.

NANNO CLAYEY SAND, dark yellowish brown (10YR 5/2), soupy, medium-sized sand grains, abundant quartz.

At 1-7 to 32 cm, FORAM-BEARING NANNO MARL, greenish gray (5GY 6/1), stiff, severe drilling disturbance, possible burrows or mottling. Lumps of grayish blue green clay (5BG 5/2) occur at 1-100, 2-12, and 2-37 to 42.

SS at 1-22 (minor lithology)

Quartz	R	Nannos	A
Clay	A	Diatoms	R
Forams	C		

SS at 1-81 (dominant lithology)

Quartz	A	Forams	R
Feldspar	R	Nannos	A
Heavy minerals	R	Rads	R
Clay	A		

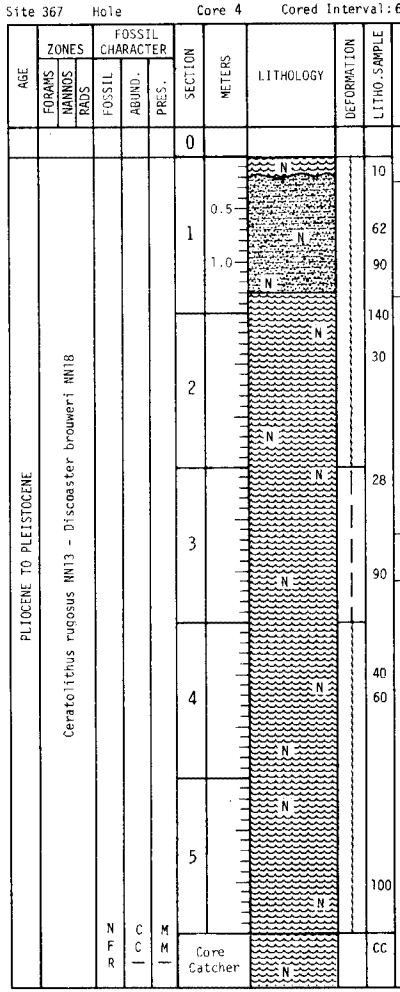
SS at 1-107 (minor lithology)

Clay	D	Calcite rhombs	R
Pyrite	R		

SS at CC

Heavy minerals	R	Nannos	A
Clay	A	Diatoms	R
Forams	C	Rads	R

Site 367 Hole Core 4 Cored Interval: 63.5-73.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO MARL AND CLAYEY SAND.

NANNO MARL, silt and foram-bearing in some samples, dark yellow brown (10YR 4/1) in upper part grading to light brownish gray (2.5Y 6/2) in Section 2, stiff, severe to moderate drilling disturbance, interbeds of FORAM-BEARING NANNO CLAYEY SAND, medium-grain size.

Mn stains and flecks concentrated from 2-58 to 65 and 2-86 to 95 cm.

Gradational color boundary at 3-70 between overlying and underlying nanno marls.

SS at 1-10 (minor lithology)

Quartz	R	Nannos	A
Clay	A	Diatoms	R

SS at 1-62 (minor lithology)

Quartz	A	Nannos	A
Clay	A	Diatoms	R
Forams	C	Fish debris	R

SS at 2-30 (dominant lithology)

Quartz	R	Nannos	A
Heavy minerals	R	Diatoms	R
Clay	A	Rads	R
Forams	C		

SS at 3-28 (dominant lithology)

Quartz	R	Nannos	A
Heavy minerals	R	Diatoms	R
Clay	A	Rads	R
Forams	A		

SS at 3-90 (minor lithology)

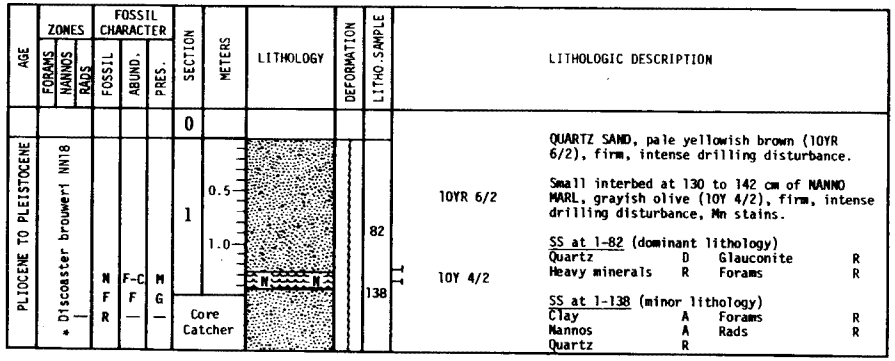
Quartz	R	Nannos	A
Heavy minerals	R	Fish debris	R
Clay	A		

SS at 4-40 (dominant lithology)

Quartz	R	Forams	R
Heavy minerals	R	Nannos	A
Clay	A	Diatoms	R
Calcite rhombs	R	Rads	R

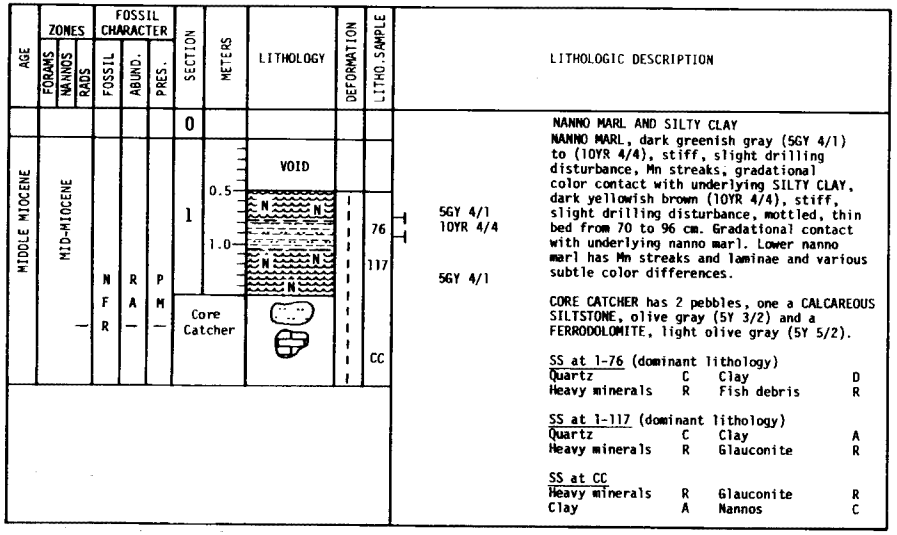
Carbonate Bomb: 2-56 to 57 cm = 69%

Site 367 Hole Core 5 Cored Interval: 150.5-160.0 m

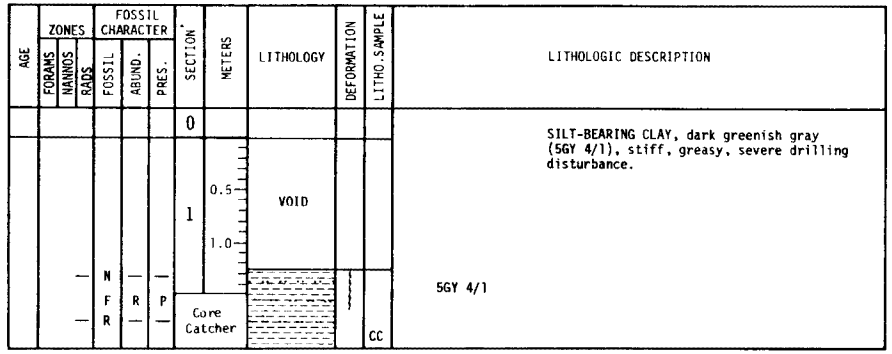


* Ceratolithus rugosus NN13

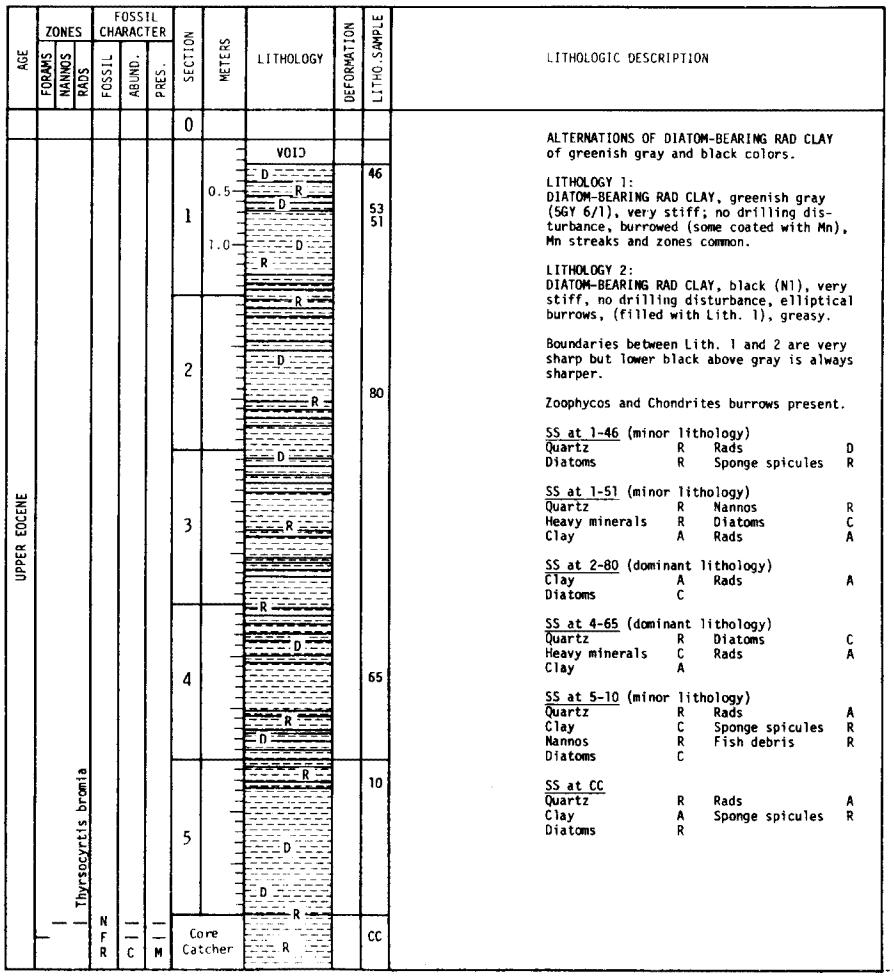
Site 367 Hole Core 6 Cored Interval: 236.0 245.5 m



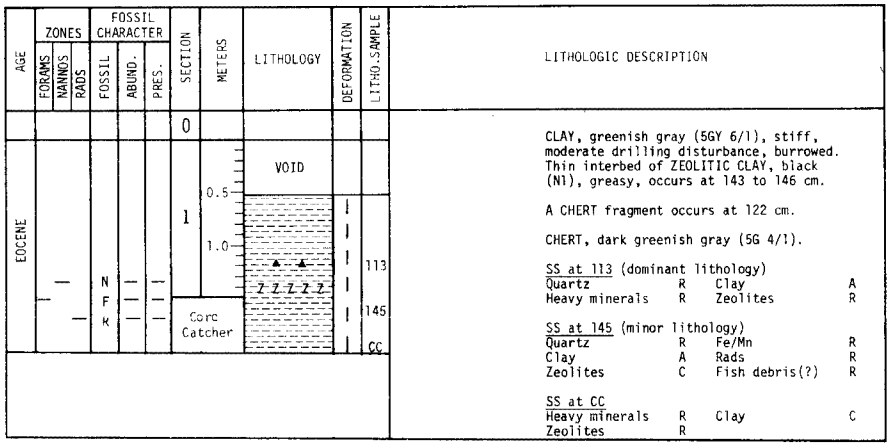
Site 367 Hole Core 7 Cored Interval: 245.5-255.0 m



Site 367 Hole Core 8 Cored Interval: 302.5-312.0 m



Site 367 Hole Core 9 Cored Interval: 331.0-340.5 m



LITHOLOGIC DESCRIPTION

CLAY, greenish gray (5GY 6/1), stiff, moderate drilling disturbance, burrowed. Thin interbed of ZEOLITIC CLAY, black (N1), greasy, occurs at 143 to 146 cm.

A CHERT fragment occurs at 122 cm.

CHERT, dark greenish gray (5G 4/1).

SS at 113 (dominant lithology)

Quartz	R	Clay	A
Heavy minerals	R	Zeolites	R

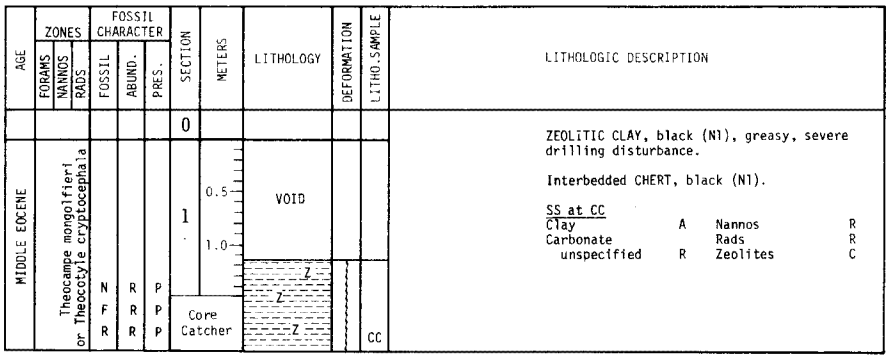
SS at 145 (minor lithology)

Quartz	R	Fe/Mn	R
Clay	A	Rads	R
Zeolites	C	Fish debris(?)	R

SS at CC

Heavy minerals	R	Clay	C
Zeolites	R		

Site 367 Hole Core 10 Cored Interval: 340.5-350.0 m



LITHOLOGIC DESCRIPTION

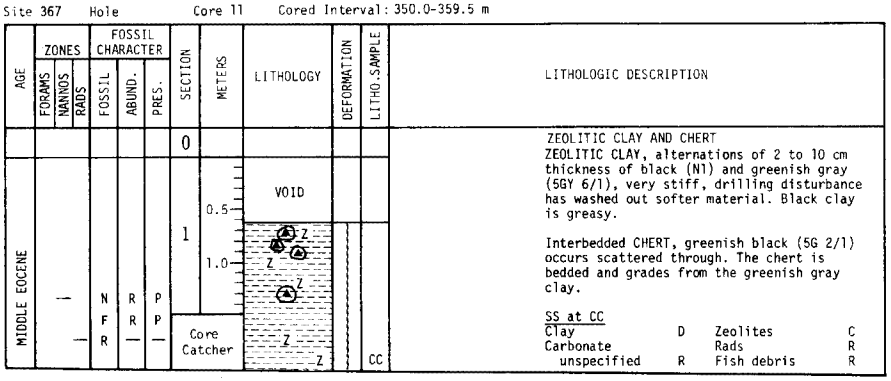
ZEOLITIC CLAY, black (N1), greasy, severe drilling disturbance.

Interbedded CHERT, black (N1).

SS at CC

Clay	A	Nannos	R
Carbonate unspecified	R	Rads	R
		Zeolites	C

Site 367 Hole Core 11 Cored Interval: 350.0-359.5 m



LITHOLOGIC DESCRIPTION

ZEOLITIC CLAY AND CHERT

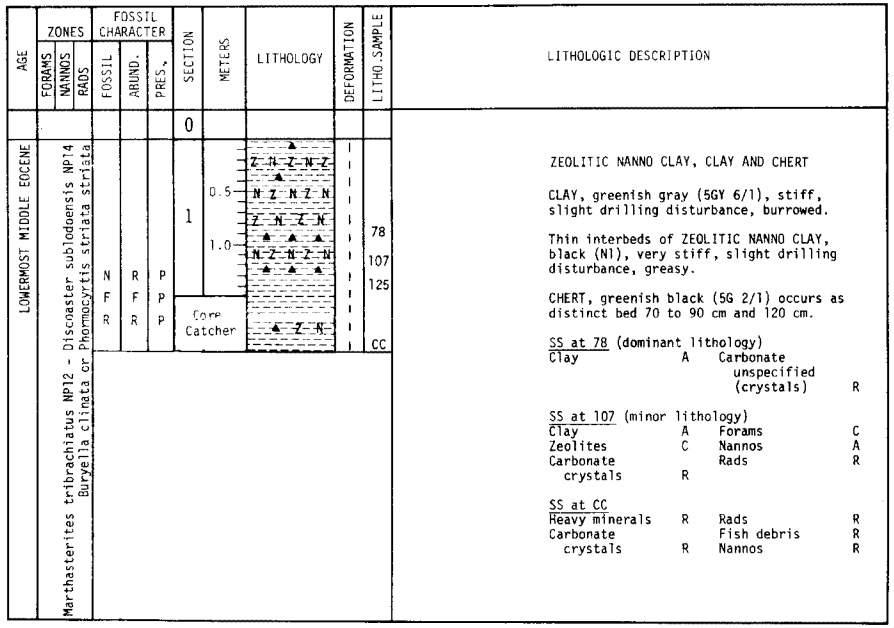
ZEOLITIC CLAY, alternations of 2 to 10 cm thickness of black (N1) and greenish gray (5GY 6/1), very stiff, drilling disturbance has washed out softer material. Black clay is greasy.

Interbedded CHERT, greenish black (5G 2/1) occurs scattered through. The chert is bedded and grades from the greenish gray clay.

SS at CC

Clay	D	Zeolites	C
Carbonate unspecified	R	Rads	R
		Fish debris	R

Site 367 Hole Core 12 Cored Interval: 359.5-369.0 m



LITHOLOGIC DESCRIPTION

ZEOLITIC NANNO CLAY, CLAY AND CHERT

CLAY, greenish gray (5GY 6/1), stiff, slight drilling disturbance, burrowed.

Thin interbeds of ZEOLITIC NANNO CLAY, black (N1), very stiff, slight drilling disturbance, greasy.

CHERT, greenish black (5G 2/1) occurs as distinct bed 70 to 90 cm and 120 cm.

SS at 78 (dominant lithology)

Clay	A	Carbonate unspecified (crystals)	R

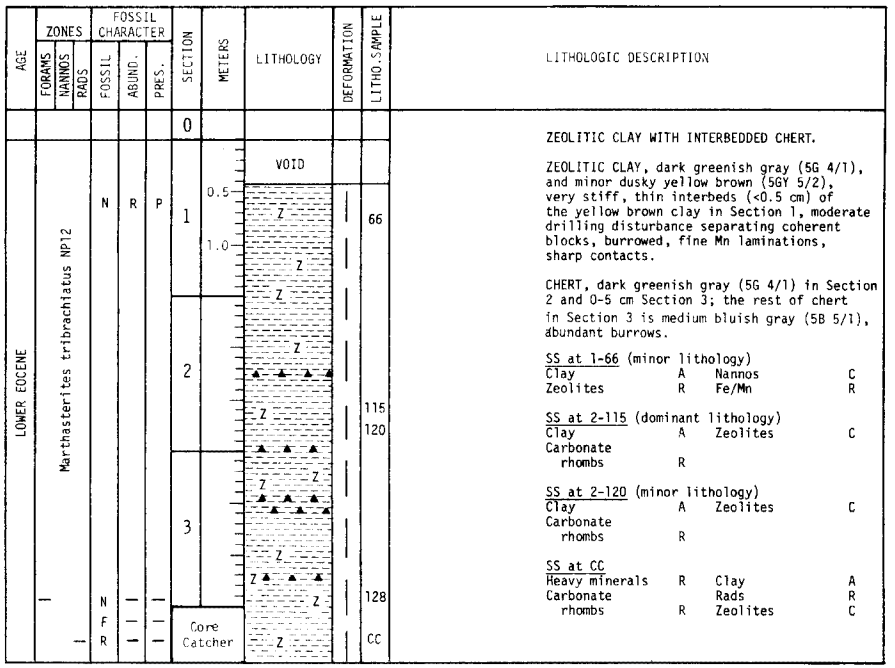
SS at 107 (minor lithology)

Clay	A	Forams	C
Zeolites	C	Nannos	A
Carbonate crystals	R	Rads	R

SS at CC

Heavy minerals	R	Rads	R
Carbonate crystals	R	Fish debris	R
		Nannos	R

Site 367 Hole Core 13 Cored Interval: 369.0-378.5 m



LITHOLOGIC DESCRIPTION

ZEOLITIC CLAY WITH INTERBEDDED CHERT.

ZEOLITIC CLAY, dark greenish gray (5G 4/1), and minor dusky yellow brown (5GY 5/2), very stiff, thin interbeds (<0.5 cm) of the yellow brown clay in Section 1, moderate drilling disturbance separating coherent blocks, burrowed, fine Mn laminations, sharp contacts.

CHERT, dark greenish gray (5G 4/1) in Section 2 and 0-5 cm Section 3; the rest of chert in Section 3 is medium bluish gray (5B 5/1), abundant burrows.

SS at 1-66 (minor lithology)

Clay	A	Nannos	C
Zeolites	R	Fe/Mn	R

SS at 2-115 (dominant lithology)

Clay	A	Zeolites	C
Carbonate rhombs	R		

SS at 2-120 (minor lithology)

Clay	A	Zeolites	C
Carbonate rhombs	R		

SS at CC

Heavy minerals	R	Clay	A
Carbonate rhombs	R	Rads	R
		Zeolites	C

Site 367 Hole Core 14 Cored Interval: 378.5-388.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
							0				
UPPER PALEOCENE TO LOWER EOCENE			Bekoma bidartensis				1	0.5 1.0	VOID		
							2				125 72 83 96
							3				
							4				40
				N F R	— — F	— — P	Core Catcher				CC

LITHOLOGIC DESCRIPTION

ZEOLITIC CLAY WITH INTERBEDDED ZEOLITIC CLAYEY SAND, CHERT AND PORCELLANITE.

ZEOLITIC CLAY, dark grayish green (5G 4/1), grayish olive (10Y 4/2), light greenish gray (5G 8/1), and brownish gray (5YR 4/1) - all interbedded at 5 to 10 cm thicknesses and with gradational color contacts, very stiff to subfissile, burrowed, finely laminated, pyrite present in layers.

ZEOLITIC CLAYEY SAND, dark grayish green (5G 4/1), fine to medium-grained, occurs as thin (2 to 10 cm) lenses.

CHERT AND PORCELLANITE , dark greenish gray (5G 4/1), to grayish olive green (5GY 3/2), burrowed, sharp basal contact and gradational upper contact with clay.

SS at 1-125 (dominant lithology)

Heavy minerals	R	Zeolites	R
Clay	D	Rads	R

SS at 2-83 (dominant lithology)

Clay	A	Zeolites	A

SS at 2-96 (minor lithology)

Quartz	A	Zeolites	A
Clay	C	Fish debris	R
Glauconite	R		

SS at 4-40 (minor lithology)

Quartz	C	Zeolites	R
Clay	D		

SS at CC (minor lithology)

Quartz	D	Carbonate rhombs	R

SS at CC

Quartz	R	Fe/Mn	R
Heavy minerals	R	Nannos	R
Clay	D	Fish debris	R
Zeolites	R		

Carbonate Bomb: 3-122 to 123 = 0%

Site 367 Hole Core 15 Cored Interval: 473.5-483.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	
							0					
UPPER CRETACEOUS TO PALEOCENE							1	0.5 1.0	VOID			
											135	5BG 5/2 10R 3/4
							2					5BG 5/2 10R 3/4
												5BG 5/2 10R 3/4
							3				80	5BG 5/2 10R 3/4
							4				20	5BG 5/2 10R 3/4 5BG 5/2 10R 3/4 5BG 5/2
							5					10R 3/4 5BG 5/2 10R 3/4 5BG 5/2
				N F R	R	P	Core Catcher				CC	

LITHOLOGIC DESCRIPTION

SILTY CLAY AND SAND

SILTY CLAY, alternating interbeds of grayish blue green (5BG 5/2) and dark reddish brown (10R 3/4), firm to subfissile, broken by drilling, sharp contacts between the two colors, burrowed and faint laminations. Thin (0.5 cm) CLAYEY SAND beds scattered throughout.

Mn streaks and pyrite crystals occur in Section 4.

PORCELLANITE, greenish gray (5G 6/1) occurs at 4-40. It is mottled and has Mn streaks and pyrite crystals within it.

SS at 1-135 (minor lithology)

Quartz	A	Heavy minerals	R

SS at 3-80 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	D		

SS at 4-20 (dominant lithology)

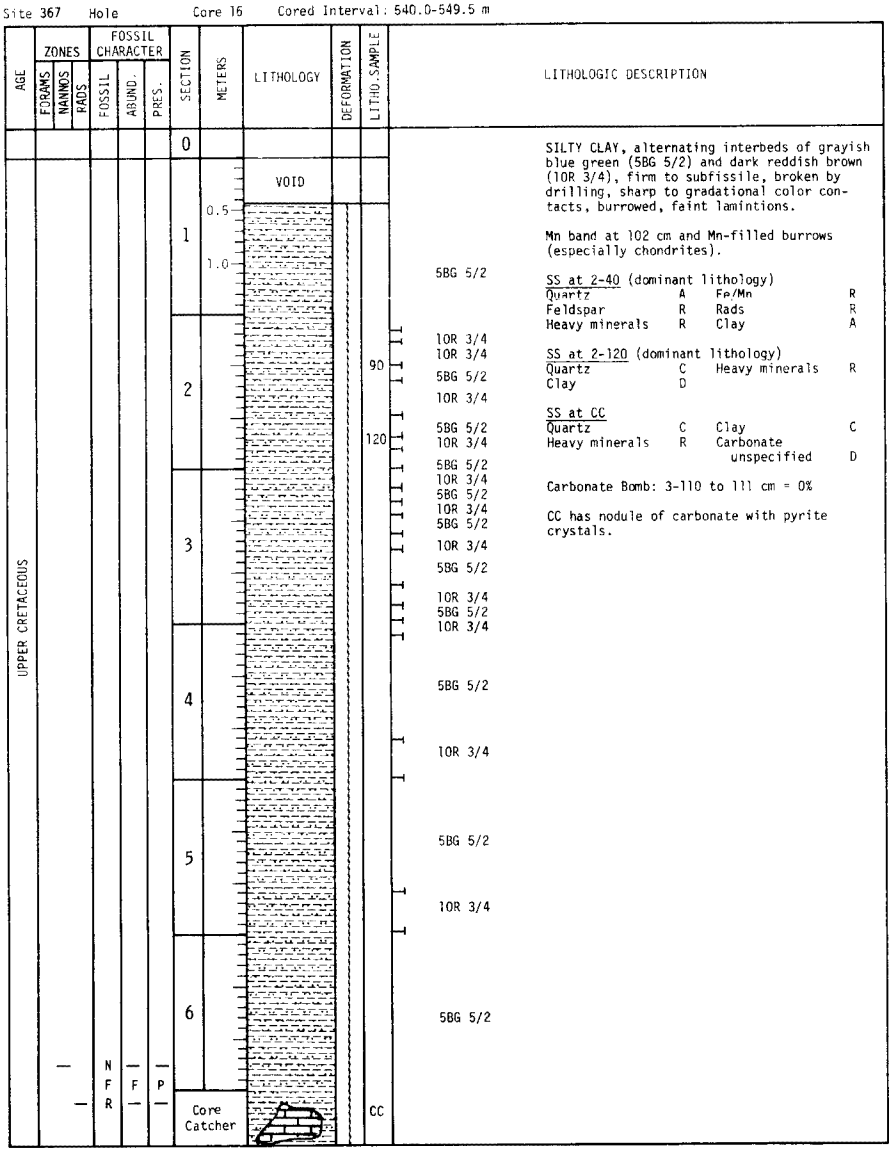
Quartz	C	Mica	R
Heavy minerals	R	Clay	D
Zeolites	R	Fe/Mn	R
Fish debris	R		

SS at CC

Quartz	C	Fe/Mn	R
Feldspar	R	Fish debris	R
Heavy minerals	R	Clay	A

Carbonate Bomb: 3-63 to 64 cm = 0.5%

Site 367 Hole Core 16 Cored Interval: 540.0-549.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, alternating interbeds of grayish blue green (5BG 5/2) and dark reddish brown (10R 3/4), firm to subfissile, broken by drilling, sharp to gradational color contacts, burrowed, faint lamintions.

Mn band at 102 cm and Mn-filled burrows (especially chondrites).

SS at 2-40 (dominant lithology)

Quartz	A	Fe/Mn	R
Feldspar	R	Rads	R
Heavy minerals	R	Clay	A

SS at 2-120 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	D		

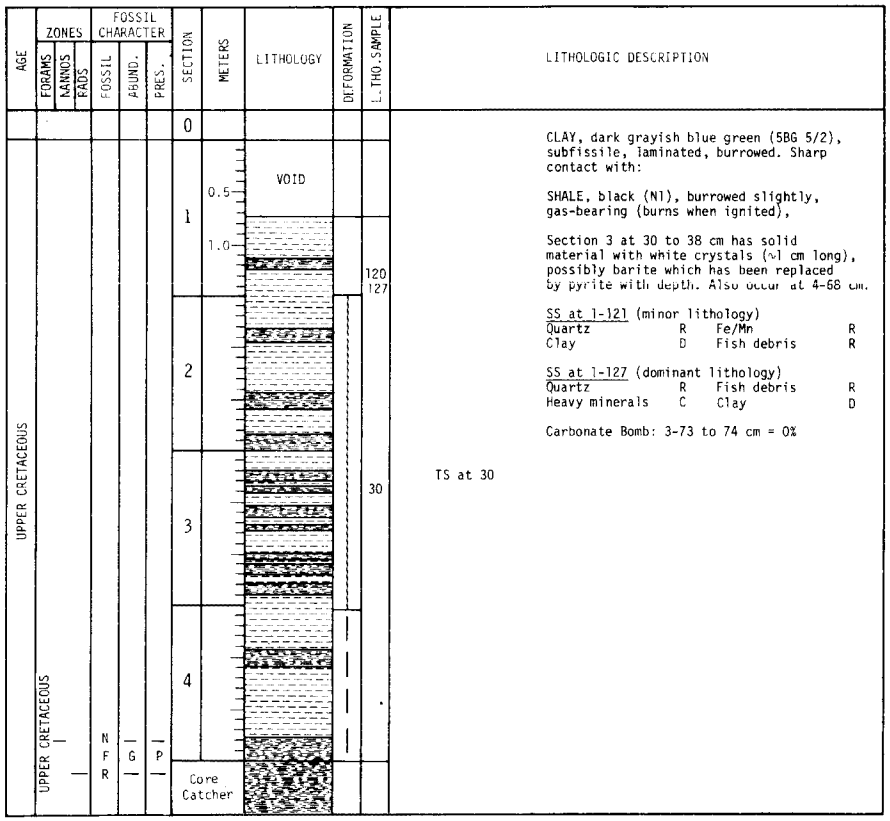
SS at CC

Quartz	C	Clay	C
Heavy minerals	R	Carbonate unspecified	D

Carbonate Bomb: 3-110 to 111 cm = 0%

CC has nodule of carbonate with pyrite crystals.

Site 367 Hole Core 17 Cored Interval: 616.0-625.5 m



LITHOLOGIC DESCRIPTION

CLAY, dark grayish blue green (5BG 5/2), subfissile, laminated, burrowed. Sharp contact with:

SHALE, black (N1), burrowed slightly, gas-bearing (burns when ignited),

Section 3 at 30 to 38 cm has solid material with white crystals (~1 cm long), possibly barite which has been replaced by pyrite with depth. Also occur at 4-68 cm.

SS at 1-121 (minor lithology)

Quartz	R	Fe/Mn	R
Clay	D	Fish debris	R

SS at 1-127 (dominant lithology)

Quartz	R	Fish debris	R
Heavy minerals	C	Clay	D

Carbonate Bomb: 3-73 to 74 cm = 0%

TS at 30

Site 367 Hole Core 18 Cored Interval: 636.0-644.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
UPPER CRETACEOUS	—		—	N	—	—	1	0.5, 1.0	VOID		80
							2				138
							3				
				N	R	P	4				112
				R	—	—	5				98
				N F	— R	— P	Core Catcher				

LITHOLOGIC DESCRIPTION

SHALE, black (N1), fissile, hard, gas-bearing, faint burrowing but rare, plant debris and fish skeletal material commonly found on fissile bedding planes. Small light colored specks scattered but rare.

Section 3-92 to 94 cm has pyrite laminations (~1 mm thick).

Thin silts scattered throughout Section 5.

SS at 1-80 (dominant lithology)

Clay	A	Zeolites	C
Fe/Mn	C		

SS at 2-138 (minor lithology, white speck)

Clay	A	Carbonate crystals	A
Zeolites	C		

SS at 4-112 (dominant lithology)

Quartz	R	Fe/Mn	C
Clay	D	Forams	R
Zeolites	R	Nannos	R

SS at 5-98 (dominant lithology)

Quartz	R	Zeolites	R
Heavy minerals	R	Fe/Mn	R
Clay	D	Nannos	R

Carbonate Bomb: 3-94 to 95 cm = 0%

Site 367 Hole Core 19 Cored Interval: 644.5-654.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
CENOMANIAN							1	0.5, 1.0	VOID, bx		
							2				65
				N	F	P-M	3				58
				F	A	P	4				53
				F	A	P					
				N F R	R-F R —	P P —	Core Catcher				

LITHOLOGIC DESCRIPTION

SHALE, black (N1), fissile, hard, gas-bearing, disseminated pyrite and thin (~1 mm) pyrite laminae throughout. Whitish flecks scattered. Burrows (?) occur. A few dark grayish green (5G 4/2) laminae begin to appear in Section 2.

In Sections 3 and 4 thin (~2 mm) light-colored carbonate TURBIDITES occur with organic debris concentrated at the base. These occur at: 3-59, 3-77, 3-83, 4-40 and 4-110.

SS at 2-65 (dominant lithology)

Quartz	R	Zeolites	C
Heavy minerals	R	Fish debris	R

SS at 3-58 (minor lithology)

Quartz	C	Nannos	R
Clay	A	Rads	R
Forams	A	Fish debris	R

SS at 4-53

Heavy minerals	R	Zeolites	R
Clay	D	Nannos	R

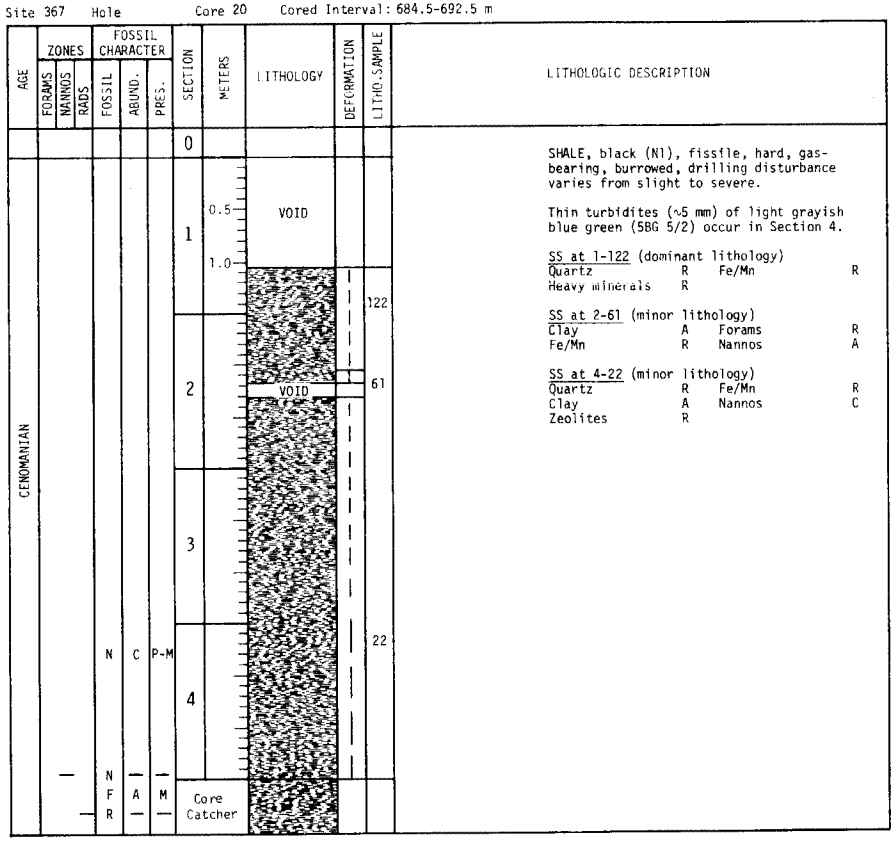
SS at CC

Quartz	R	Fe/Mn	R
Clay	A	Carbonate crystals	A

SS at CC

Clay	A	Carbonate crystals	A

Site 367 Hole Core 20 Cored Interval: 684.5-692.5 m



LITHOLOGIC DESCRIPTION

SHALE, black (N1), fissile, hard, gas-bearing, burrowed, drilling disturbance varies from slight to severe.

Thin turbidites (~5 mm) of light grayish blue green (5BG 5/2) occur in Section 4.

SS at 1-122 (dominant lithology)

Quartz	R	Fe/Mn	R
Heavy minerals	R		

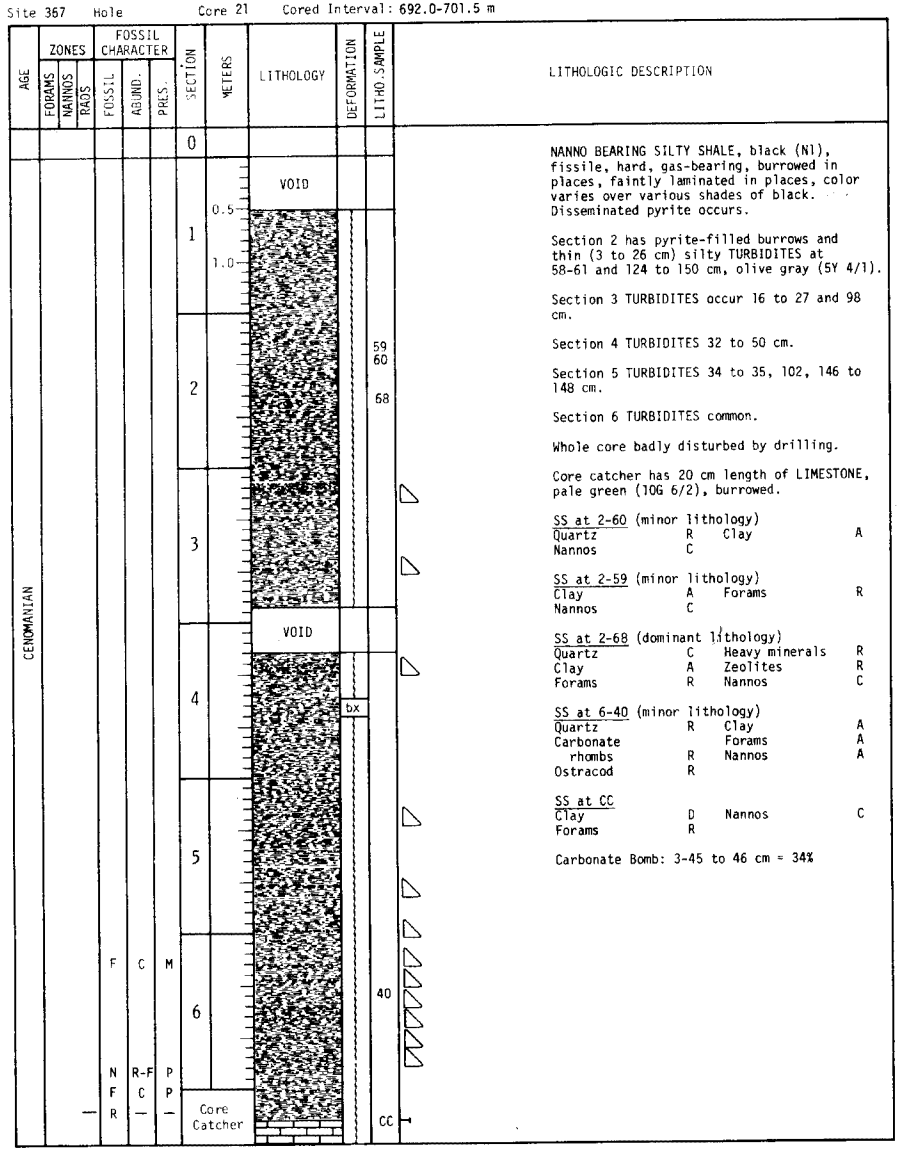
SS at 2-61 (minor lithology)

Clay	A	Forams	R
Fe/Mn	R	Nannos	A

SS at 4-22 (minor lithology)

Quartz	R	Fe/Mn	R
Clay	A	Nannos	C
Zeolites	R		

Site 367 Hole Core 21 Cored Interval: 692.0-701.5 m



LITHOLOGIC DESCRIPTION

NANNO BEARING SILTY SHALE, black (N1), fissile, hard, gas-bearing, burrowed in places, faintly laminated in places, color varies over various shades of black. Disseminated pyrite occurs.

Section 2 has pyrite-filled burrows and thin (3 to 26 cm) silty TURBIDITES at 58-61 and 124 to 150 cm, olive gray (5Y 4/1).

Section 3 TURBIDITES occur 16 to 27 and 98 cm.

Section 4 TURBIDITES 32 to 50 cm.

Section 5 TURBIDITES 34 to 35, 102, 146 to 148 cm.

Section 6 TURBIDITES common.

Whole core badly disturbed by drilling.

Core catcher has 20 cm length of LIMESTONE, pale green (10G 6/2), burrowed.

SS at 2-60 (minor lithology)

Quartz	R	Clay	A
Nannos	C		

SS at 2-59 (minor lithology)

Clay	A	Forams	R
Nannos	C		

SS at 2-68 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Zeolites	R
Forams	R	Nannos	C

SS at 6-40 (minor lithology)

Quartz	R	Clay	A
Carbonate rhombs	R	Forams	A
		Nannos	A
Ostracod	R		

SS at CC

Clay	D	Nannos	C
Forams	R		

Carbonate Bomb: 3-45 to 46 cm = 34%

Site 367 Hole Core 22 Cored Interval: 720.5-730.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
ALBIAN	Parhabdolithus angustus - Prediscosphaera cretacea			N F R	F-C F —	P M —	0				
							1	0.5, 1.0	VOID		
							2		N N		37, 97
							3		N N N		51
							4				
							5				78
							6				
							Core Catcher				

LITHOLOGIC DESCRIPTION

ALTERNATIONS OF SHALE, CLAY, AND SILT TURBIDITES.

NANNO-BEARING CLAY, dark gray black (N3) to dark greenish black (5G 2/1) to dark greenish gray (5G 4/1), hard, burrowed, faint laminations, severe drilling disturbance (broken).

SHALE, black (N1), fissile, gas-bearing, burrowed, severe drilling disturbance.

Clays are interbedded with thin quartz silt turbidites (1 cm to 12 cm thick) scattered throughout the core.

SS at 2-37 (dominant lithology)

Quartz	R	Clay	D
Forams	R	Nannos	R
Rads	R	Fe/Mn nodules	C

SS at 2-97 (dominant lithology)

Heavy minerals	R	Clay	A
Carbonate crystals	R	Forams	R
		Nannos	C
Rads	R	Pyrite	C
Fe/Mn nodules	C		

SS at 2-138 (minor lithology)

Quartz	D	Nannos	R
Feldspar	R	Fish debris	R
Heavy minerals	R		

SS at 3-51 (minor lithology)

Dolomite	D	Nannos	R

SS at 5-78 (minor lithology)

Quartz	R	Nannos	C
Clay	A	Pyrite	C

Site 367 Hole Core 23 Cored Interval: 777.5-787.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER CRETACEOUS	Parhabdolithus angustus - Prediscosphaera cretacea			N F R	R — —	P — —	0				
							1	0.5, 1.0			10
							2				75, 90
							Core Catcher				

LITHOLOGIC DESCRIPTION

INTERBEDDED SHALE AND CLAY.

SHALE, black (N1), fissile, broken by drilling.

CLAY, black (N1), destroyed by drilling.

SIDERITE-STONE, occurs at 2-16 to 26 and 2-85 to 92 cm.

SS at 1-10 (minor lithology)

Quartz	C	Clay	D
Heavy minerals	C	Nannos	R

SS at 2-75 (minor lithology)

Quartz	A	Glauconite	R
Heavy minerals	R	Fish debris	R
Clay	A		

SS at 2-90 (minor lithology)

Carbonate crystals (siderite)	A	Clay	C
		Fe/Mn	R

Carbonate Bomb: 2-70 to 71 cm = 0%

Site 367 Hole Core 24 Cored Interval: 834.5-844.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
BARREMIAN TO LOWER APTIAN	LOWER APTIAN/BARREMIAN Upper part of Lithraphidites - Chiastozygus litterarius			N F R	C A R	P-M G P	0				
							1	0.5, 1.0	VOID		
							2				30, 122
							3				
							Core Catcher				CC

10R 3/4

5G 4/1 to N3

10R 3/4

LITHOLOGIC DESCRIPTION

CLAYSTONE, dark reddish brown (10R 3/4) interbedded with dark greenish gray (5G 4/1) to dark gray (N3), burrowed with green color within red color only, homogeneous.

SS at 2-30 (dominant lithology, red)

Quartz	R	Clay	D
Zeolites	R		

SS at 2-122 (dominant lithology, green)

Quartz	R	Heavy minerals	R
Clay	D	Fish debris	R

SS at CC

Quartz	R	Clay	C
Fe/Mn	R	Nannos	D

Carbonate Bomb: 2-125 to 125 = 0%
3-47 to 48 = 0%

Site 367 Hole Core 25 Cored Interval: 891.5-901.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
NEOCOMIAN	Lithraphidites bollii - Chiastozygus litterarius			R	—	—	0				
				R	F	P	1	0.5, 1.0			39
				R	R	P	2				70
				R	F	P	3				
				N	C-A	G	4				
				F	R	P	Core Catcher				CC
				R	F	P					

LITHOLOGIC DESCRIPTION

N7
5Y 4/1
N7

NANNO-BEARING LIMESTONE, light gray (N7) to medium gray (N5), and olive gray (5Y 4/1), hard, light gray facies is bioturbated, darker facies are not, both are laminated, and contain some gas.

Microfractures and inclined laminae occur, and some scour features at contacts.

Contacts are sharp going upwards from light gray to olive gray but gradual going from olive gray to light gray.

N5 and 5Y 4/1

Pyrite nodules occur at 2-130 and 3-78 cm.

SS at 3-70 (dominant lithology)
Nannos C

SS at 1-123 (dominant lithology)
Quartz R Clay C
Carbonate crystals A Nannos A

SS at 3-39 (minor lithology)
Clay A Fe/Mn R
Nannos A

SS at CC
Fe/Mn R Carbonate crystals D

N7
5Y 4/1

Carbonate Bomb: 3-91 to 92 cm = 94%

N7
5Y 4/1

N7

5Y 4/1

Site 367 Hole Core 26 Cored Interval: 910.5-920.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
BARREMIAN TO LOWER APTIAN	Upper part of Lithraphidites bollii - Chiastozygus litterarius						0		VOID		
							1	0.5, 1.0			60
							2				40
							3				
							4				
				N	C	P-M					
				F	R	P	Core Catcher				CC
				R	F	P					

LITHOLOGIC DESCRIPTION

ALTERNATIONS OF LIGHT GRAY LIMESTONE AND OLIVE BLACK MARLSTONE.

5Y 2/1
N7
5Y 2/1

NANNO-BEARING LIMESTONE, light gray (N7), burrowed, Mn streaks and burrow fillings.

NANNO MARLSTONE, olive black (5Y 2/1), laminated, aptychi visible, gas-bearing, pyrite lenses.

N7

Color contacts show actual position of the facies.

5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1
N7
5Y 2/1

Contacts between the two facies are sharp to gradational.

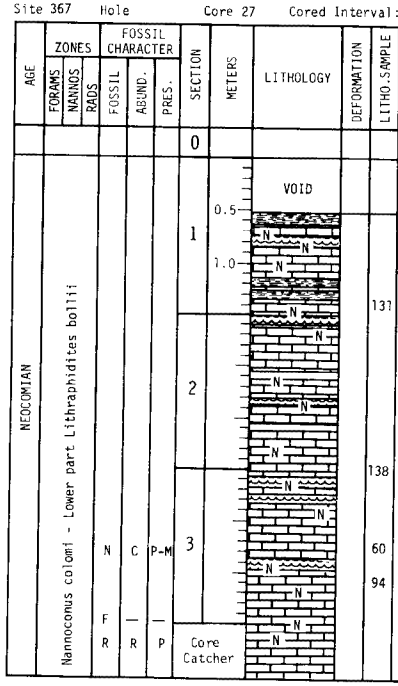
Thin COAL lense at 4-31 cm.

SS at 1-60 (dominant lithology)
Carbonate crystals A Nannos C

SS at 2-40 (minor lithology)
Quartz R Clay A
Nannos A

SS at CC
Clay A Fe/Mn R
Nannos A

Site 367 Hole Core 27 Cored Interval: 939.0-948.5 m



LITHOLOGIC DESCRIPTION

ALTERNATIONS OF LIGHT GRAY LIMESTONE AND OLIVE BLACK TO OLIVE GRAY SHALE AND MARLSTONE.

SHALE, olive black (5Y 2/1), fissile, gas-bearing, disseminated pyrite, a few aptychi found.

NANNO LIMESTONE, light gray (N7), burrowed, wavy laminations, some parallel (~1 mm), Mn streaks common.

NANNO MARLSTONE, varicolored olive gray (5Y 4/1), finely laminated, gas-bearing, aptychi-bearing.

All contacts are fairly sharp although some show diffusion(?) of colors into the surrounding limestone.

SS at 1-131 (minor lithology)

Quartz	R	Glauconite	R
Heavy minerals	R	Nannos	A
Clay	A	Fe/Mn	R

SS at 3-94 (minor lithology)

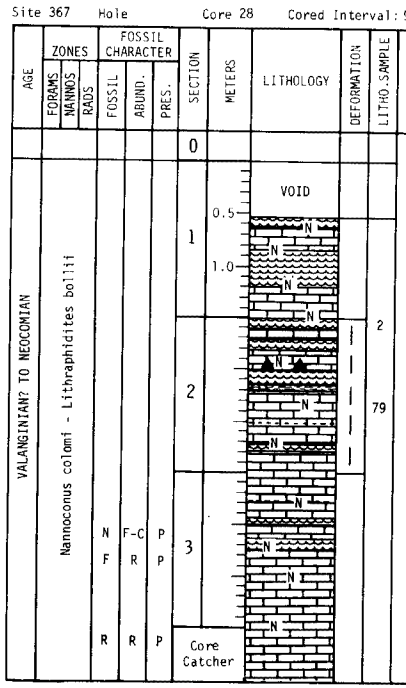
Clay	A	Fe/Mn	C
Pyrite	C	Nannos	A

SS at 3-60 (dominant lithology)

Calcite crystals	A	Forams	R
		Nannos	A

Carbonate Bomb: 3-84 to 85 cm = 92%

Site 367 Hole Core 28 Cored Interval: 967.5-977.0 m



LITHOLOGIC DESCRIPTION

ALTERNATIONS OF LIGHT GRAY LIMESTONE AND OLIVE BLACK TO OLIVE GRAY SHALE AND MARLSTONE.

NANNO MARLSTONE, varicolored olive gray (5Y 4/1), finely laminated, aptychi-bearing.

NANNO-BEARING LIMESTONE, light gray (N7), burrowed, some faintly wavy laminations, Mn streaks throughout, small chert nodule at Section 2-48 cm.

SHALE, olive black (5Y 2/1), fissile, aptychi-bearing.

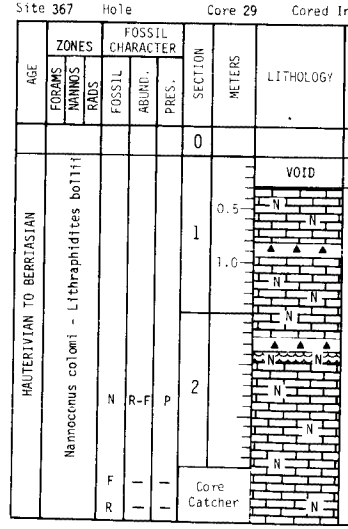
SS at 2-2 (minor lithology)

Pyrite	R	Clay	A
Fe/Mn	R	Calcite rhombs	R
Nannos	A	Fish debris	R

SS at 2-79 (dominant lithology)

Carbonate unspecified	D	Nannos	C

Site 367 Hole Core 29 Cored Interval: 996.0-1005.5 m



LITHOLOGIC DESCRIPTION

NANNO-BEARING LIMESTONE, light gray (N7), burrowed, Mn streaks common, has faint wavy laminations in places, occasional CHERT nodules, medium gray (N5).

Thin bed of NANNO MARLSTONE, varicolored olive gray (5Y 4/1), finely laminated. Occurs at 2-38 to 43 cm.

SS at 1-55 (minor lithology)

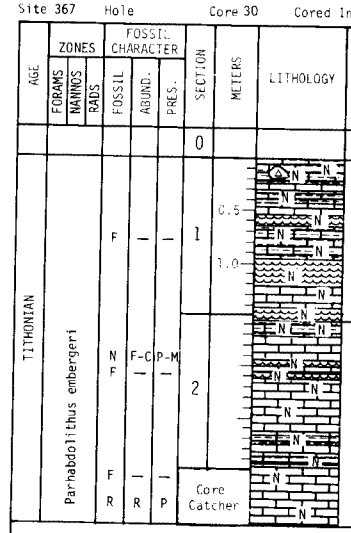
Quartz	C	Nannos	C
Calcite	A		

SS at 1-70 (dominant lithology)

Quartz	R	Calcite	A
Nannos	C		

Carbonate Bomb: 2-40 to 41 cm = 97%
2-106 to 107 cm = 96%

Site 367 Hole Core 30 Cored Interval: 1024.5-1034.0 m



LITHOLOGIC DESCRIPTION

ALTERNATIONS OF LIGHT GRAY LIMESTONE AND PALE TO DARK BROWN AGILLACEOUS LIMESTONE AND MARLSTONE.

NANNO-BEARING ARGILLACEOUS LIMESTONE, pale yellowish brown (10YR 6/2), finely laminated, porcellanite nodule at 1-16 cm.

NANNO MARLSTONE, varicolored dark yellowish brown (10YR 4/2), finely laminated, gas-bearing, sulfide minerals scattered throughout.

NANNO-BEARING LIMESTONE, light gray (N7), bioturbated, pyrite streaks and disseminated with sulfides.

SS at 1-10 (minor lithology)

Quartz	R	Albite	R
Carbonate unspecified	A	Clay	A
		Nannos	C

SS at 1-30 (dominant lithology)

Carbonate unspecified	D	Nannos	C

SS at 1-36 (minor lithology)

Heavy minerals	R	Clay	A
Pyrite	R	Fe/Mn	R
Forams	R	Nannos	A

SS at 1-101 (minor lithology)

Clay	A	Fe/Mn	R
Pyrite	R	Nannos	A

SS at 2-133 (minor lithology)

Quartz	R	Carbonate unspecified	D
Nannos	C		

SS at CC

Carbonate unspecified	D	Albite	R
		Nannos	C

Carbonate Bomb: 2-141 to 142 cm = 92%

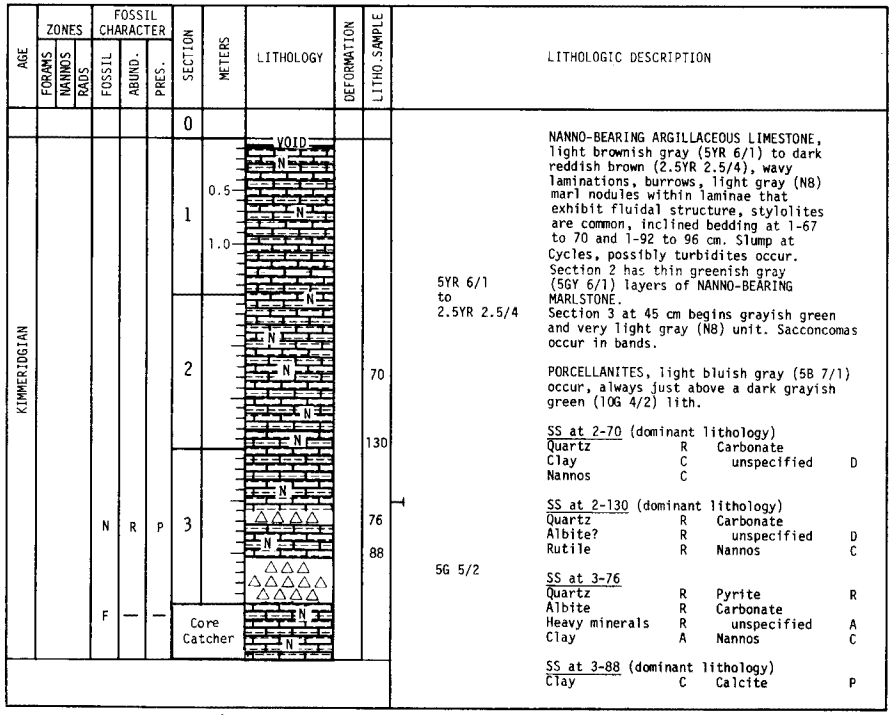
Site 367 Hole Core 31 Cored Interval: 1053.0-1062.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							0					ALTERNATIONS OF LIGHT GRAY LIMESTONE AND DARK GRAY MARLSTONE.
TITHONIAN	Parhabdolithus embergeri			R	F	P	1	0.5	VOID		28	NANNO-BEARING LIMESTONE, light gray (N7) to greenish gray (5GY 6/1), bioturbated or laminated but not both, pyrite-bearing and Mn(?) streaks, stylolites occur at 119 to 127 cm. PORCELLANITE zones, medium light gray (N6) and dark greenish gray (5GY 4/1).
				N	F-C	P-M		1.0			70	NANNO MARLSTONE, dark greenish gray (5GY 4/1) varicolored, finely laminated, sulfide minerals scattered, aptychi-bearing.
				R	R	P	2				TS 30-33	SS at 1-28 (dominant lithology) Clay A Fe/Mn R Pyrite R Nannos A SS at 1-70 (dominant lithology) Carbonate unspecified D Nannos C
											TS 119-122	SS at CC Clay A Fe/Mn R Pyrite R Nannos A
				F	—	—	Core Catcher				CC	

Site 367 Hole Core 32 Cored Interval: 1081.5-1091.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							0					NANNO-BEARING LIMESTONE, light gray (N7) to greenish gray (5GY 6/1), bioturbated, faintly laminated, sulfide minerals scattered throughout. Thin (2 to 5 cm) zones of NANNO MARLSTONE, dark greenish gray (5GY 4/1), shaley in Section 3 at 90 and 125 cm. Stylolites rare.
KIMMERIDGIAN							1	0.5 1.0	VOID			Thin stringers or nodules of PORCELLANITE, medium light gray (N6) occur.
							2				43 47	At Section 5-60 cm abrupt color change. (Contact possibly destroyed by drilling.) NANNO-BEARING ARGILLACEOUS LIMESTONE, light brownish gray (5YR 6/1) to dark reddish brown (2.5YR 2.5/4), wavy laminations, stylolites, a 5 cm thick turbidite occurs at 5-85 to 90 cm.
							3				24 29	SS at 2-43 (minor lithology) Clay A Pyrite R Nannos A SS at 2-47 (dominant lithology) Carbonate unspecified D Nannos C SS at 3-24 (minor lithology) Quartz R Carbonate unspecified A Rutile R Nannos C Clay A
							4					SS at 5-97 (minor lithology) Quartz R Chlorite R Carbonate unspecified A Rutile R Nannos C
				R	R	P	5				97	N7 and 5GY 6/1 5YR 6/1 to 2.5YR 2.5/4
							6					
				F N	R R-F	P P	Core Catcher				CC	

Site 367 Hole Core 33 Cored Interval: 1105.5-1111.0 m



NANNO-BEARING ARGILLACEOUS LIMESTONE, light brownish gray (5YR 6/1) to dark reddish brown (2.5YR 2.5/4), wavy laminations, burrows, light gray (N8) marl nodules within laminae that exhibit fluidal structure, stylolites are common, inclined bedding at 1-67 to 70 and 1-92 to 96 cm. Slump at Cycles, possibly turbidites occur. Section 2 has thin greenish gray (5GY 6/1) layers of NANNO-BEARING MARLSTONE. Section 3 at 45 cm begins grayish green and very light gray (N8) unit. Sacconcomas occur in bands.

PORCELLANITES, light bluish gray (5B 7/1) occur, always just above a dark grayish green (10G 4/2) lith.

SS at 2-70 (dominant lithology)

Quartz	R	Carbonate	
Clay	C	unspecified	D
Nannos	C		

SS at 2-130 (dominant lithology)

Quartz	R	Carbonate	
Albite?	R	unspecified	D
Rutile	R	Nannos	C

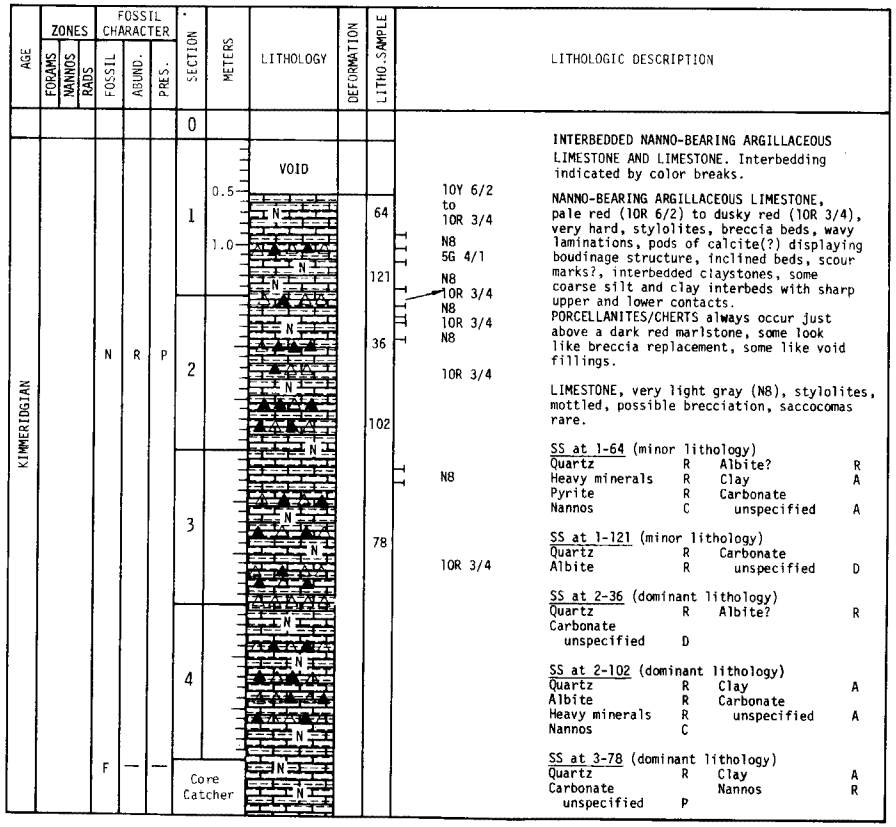
SS at 3-76

Quartz	R	Pyrite	R
Albite	R	Carbonate	
Heavy minerals	R	unspecified	A
Clay	A	Nannos	C

SS at 3-88 (dominant lithology)

Clay	C	Calcite	P

Site 367 Hole Core 34 Cored Interval: 1111.0-1119.5 m



INTERBEDDED NANNO-BEARING ARGILLACEOUS LIMESTONE AND LIMESTONE. Interbedding indicated by color breaks.

NANNO-BEARING ARGILLACEOUS LIMESTONE, pale red (10R 6/2) to dusky red (10R 3/4), very hard, stylolites, breccia beds, wavy laminations, pods of calcite(?) displaying boudinage structure, inclined beds, scour marks?, interbedded claystones, some coarse silt and clay interbeds with sharp upper and lower contacts. PORCELLANITES/CHERTS always occur just above a dark red marlstone, some look like breccia replacement, some like void fillings.

LIMESTONE, very light gray (N8), stylolites, mottled, possible brecciation, saccocomas rare.

SS at 1-64 (minor lithology)

Quartz	R	Albite?	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate	
Nannos	C	unspecified	A

SS at 1-121 (minor lithology)

Quartz	R	Carbonate	
Albite	R	unspecified	D

SS at 2-36 (dominant lithology)

Quartz	R	Albite?	R
Carbonate unspecified	D		

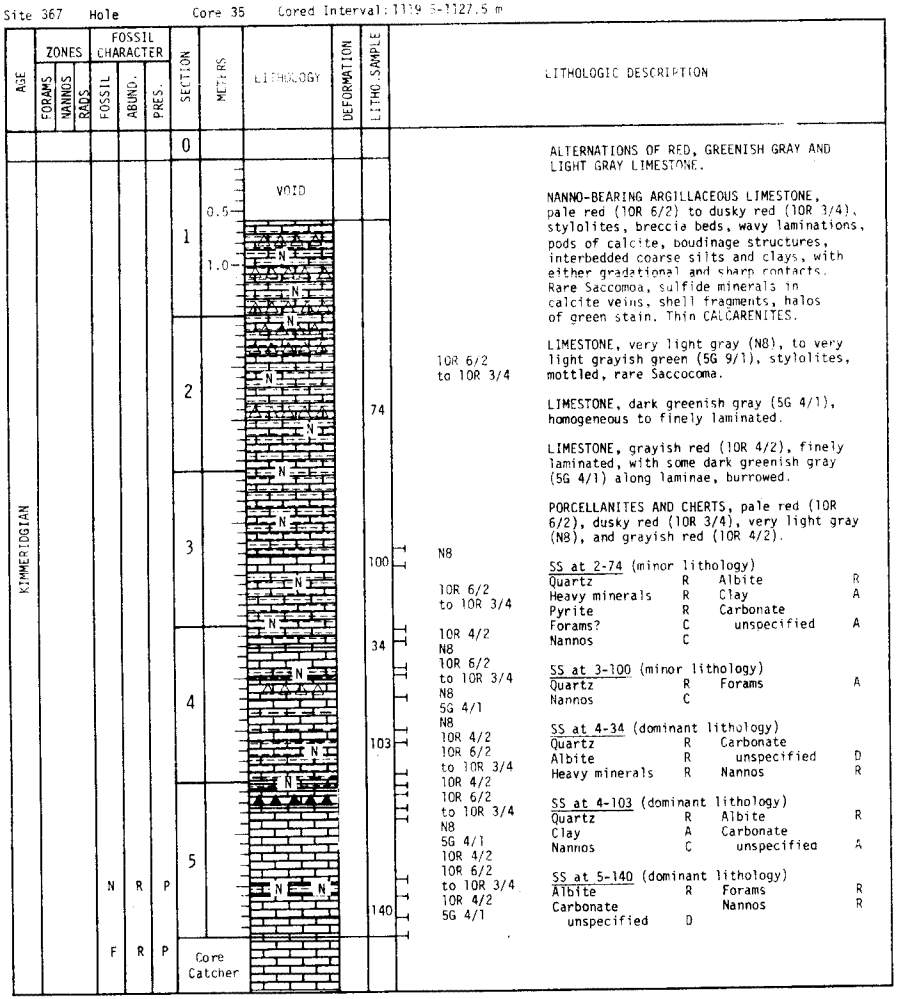
SS at 2-102 (dominant lithology)

Quartz	R	Clay	A
Albite	R	Carbonate	
Heavy minerals	R	unspecified	A
Nannos	C		

SS at 3-78 (dominant lithology)

Quartz	R	Clay	A
Carbonate unspecified	P	Nannos	R

Site 367 Hole Core 35 Cored Interval: 1119.5-1127.5 m



LITHOLOGIC DESCRIPTION

ALTERNATIONS OF RED, GREENISH GRAY AND LIGHT GRAY LIMESTONE.

NANNO-BEARING ARGILLACEOUS LIMESTONE, pale red (10R 6/2) to dusky red (10R 3/4), stylolites, breccia beds, wavy laminations, pods of calcite, boudinage structures, interbedded coarse silts and clays, with either gradational and sharp contacts. Rare Saccomoa, sulfide minerals in calcite veins, shell fragments, halos of green stain. Thin CALCARENITES.

10R 6/2 to 10R 3/4

LIMESTONE, very light gray (N8), to very light grayish green (5G 9/1), stylolites, mottled, rare Saccocoma.

LIMESTONE, dark greenish gray (5G 4/1), homogeneous to finely laminated.

LIMESTONE, grayish red (10R 4/2), finely laminated, with some dark greenish gray (5G 4/1) along laminae, burrowed.

PORCELLANITES AND CHERTS, pale red (10R 6/2), dusky red (10R 3/4), very light gray (N8), and grayish red (10R 4/2).

N8

10R 6/2 to 10R 3/4

10R 4/2
N8
10R 6/2 to 10R 3/4
N8
5G 4/1
N8
10R 4/2
10R 6/2 to 10R 3/4
10R 4/2
10R 6/2 to 10R 3/4
N8
5G 4/1
10R 4/2
10R 6/2 to 10R 3/4
10R 4/2
5G 4/1

SS at 2-74 (minor lithology)

Quartz	R	Albite	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate unspecified	A
Forams?	C		
Nannos	C		

SS at 3-100 (minor lithology)

Quartz	R	Forams	A
Nannos	C		

SS at 4-34 (dominant lithology)

Quartz	R	Carbonate unspecified	D
Albite	R		
Heavy minerals	R	Nannos	R

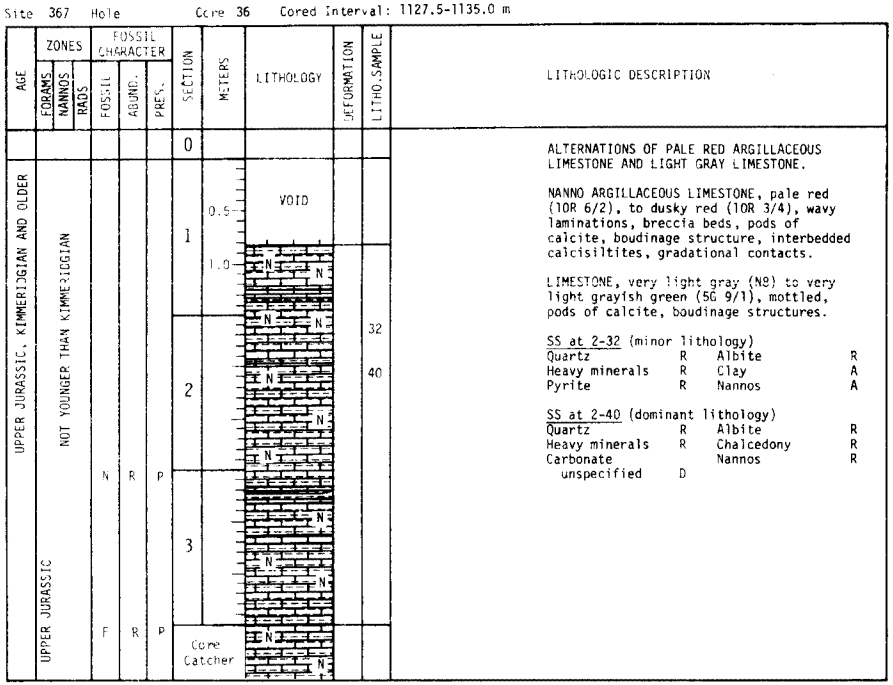
SS at 4-103 (dominant lithology)

Quartz	R	Albite	R
Clay	A	Carbonate unspecified	A
Nannos	C		

SS at 5-140 (dominant lithology)

Albite	R	Forams	R
Carbonate unspecified	D	Nannos	R

Site 367 Hole Core 36 Cored Interval: 1127.5-1135.0 m



LITHOLOGIC DESCRIPTION

ALTERNATIONS OF PALE RED ARGILLACEOUS LIMESTONE AND LIGHT GRAY LIMESTONE.

NANNO ARGILLACEOUS LIMESTONE, pale red (10R 6/2), to dusky red (10R 3/4), wavy laminations, breccia beds, pods of calcite, boudinage structure, interbedded calcisiltites, gradational contacts.

LIMESTONE, very light gray (N8) to very light grayish green (5G 9/1), mottled, pods of calcite, boudinage structures.

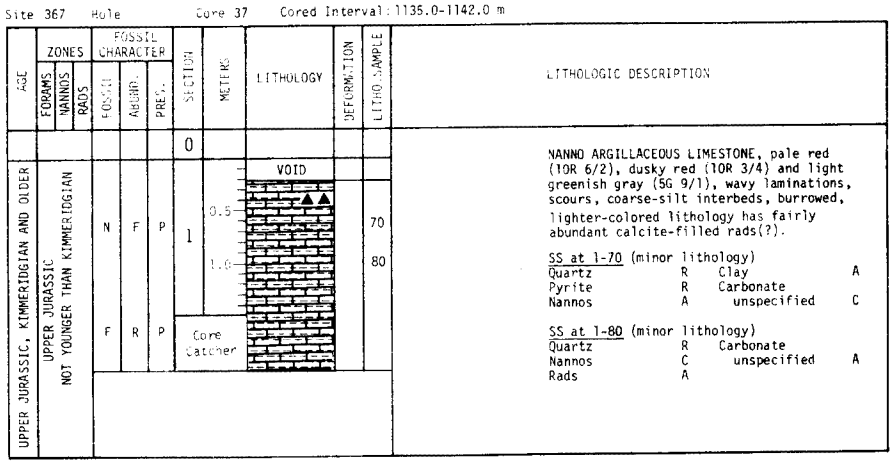
SS at 2-32 (minor lithology)

Quartz	R	Albite	R
Heavy minerals	R	Clay	A
Pyrite	R	Nannos	A

SS at 2-40 (dominant lithology)

Quartz	R	Albite	R
Heavy minerals	R	Chalcedony	R
Carbonate unspecified	D	Nannos	R

Site 367 Hole Core 37 Cored Interval: 1135.0-1142.0 m



LITHOLOGIC DESCRIPTION

NANNO ARGILLACEOUS LIMESTONE, pale red (10R 6/2), dusky red (10R 3/4) and light greenish gray (5G 9/1), wavy laminations, scours, coarse-silt interbeds, burrowed, lighter-colored lithology has fairly abundant calcite-filled rads(?).

SS at 1-70 (minor lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	C
Nannos	A		

SS at 1-80 (minor lithology)

Quartz	R	Carbonate unspecified	A
Nannos	C		
Rads	A		

Site 367 Hole Core 38 Cored Interval: 1142.0-1148.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER JURASSIC	NOT YOUNGER THAN KIMMERIDGIAN			N	R-F	P	0					NANNO-BEARING ARGILLACEOUS LIMESTONE, light brownish gray (5YR 6/1) and greenish gray (5G 6/1), microcrystalline, burrowed.
							1	0.5 1.0	VOID		138	BASALT, black (N1), calcite veined, chlorite and pyrite often line inside of amvadules but also glass-filled vesicles. Basalt is aphanitic and vesicular. At 3-54 cm zeolite(?) filled vesicles abruptly appear. By 3-70 the basalt begins to show laths although it is still almost indistinct. By 3-107, numerous glass-filled vesicles appear. Some calcite veins surrounded by dark red mineral (3-55 to 65) clasts of soft argillaceous limestone within the basalt, even in Section 3.
							2				35	
							3					
							Core Catcher					

SS at 1-138 (dominant lithology)

Clay	C	Pyrite	R
Carbonate unspecified	A	Nannos	C

SS at 2-35 (dominant lithology)

Chlorite	R	Clay	A
Carbonate unspecified	A	Nannos	R

Possible flow units: 2-27 to 3-33 cm
3-53 to 3-105 cm
3-105 to 3-150 cm

Site 367 Hole Core 39 Cored Interval: 1148.0-1151.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					BASALT, breccia clasts of unaltered, thick chlorite zones, calcite veins, amygdules filled with clear crystals and/or white, soft material, common, pyrite disseminated throughout, chert clast at 118 cm.
							1	0.5 1.0	VOID			
							Core Catcher					

Site 367 Hole Core 40 Cored Interval: 1151.0-1153.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					BASALT, black (N1), calcite veined and chlorite, chert clast at 40 cm, disseminated pyrite throughout, amygduloidal with green mineral and pyrite and glass fillings. Grain size larger than in Core 40.
							1	0.5 1.0				
							Core Catcher					

81

DEEP SEA DRILLING PROJECT

LEG 41 SITE 368

SITE SUMMARY SHEET

PRINCIPAL RESULTS:

Cape Verde Rise

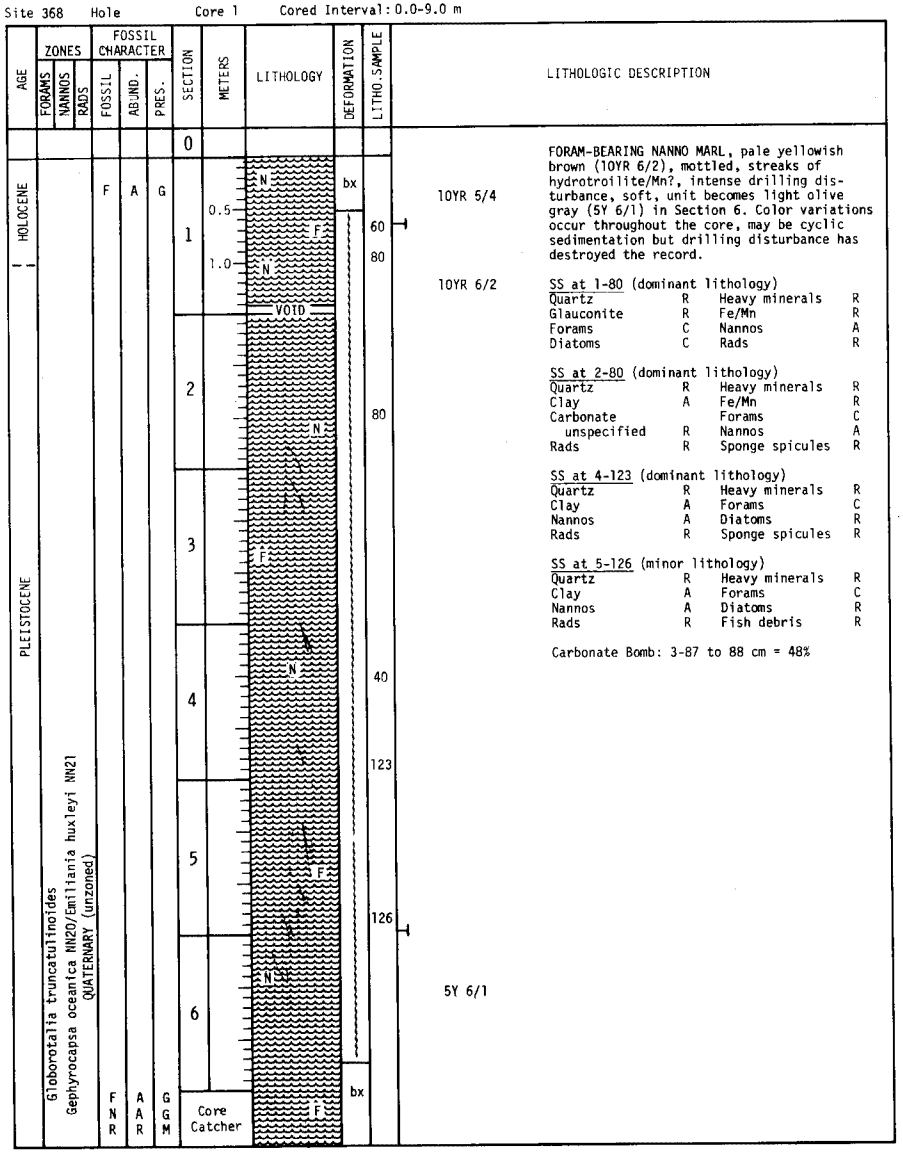
A sedimentary section of Cape Verde Rise was sampled down to 984.5 meters, the level of a sharp deep reflector. The sediments are predominantly terrigenous and almost barren of microfossils, except in the upper part and near the base of the section. The deep reflector was found to correspond with diabase sills interstratified within black shales near the top of that sedimentary unit. The sediment section consists of the following units (from top to bottom): 1) Quaternary to middle Miocene nannofossil oozes and marls with volcanic ash layers in the upper Miocene; 2) early Miocene to ?early Eocene green clays and claystones with chert and porcellanite; 3) ?Paleocene to ?late Cretaceous red and green shales; 4) ?late Cretaceous green claystone and shales; and 5) ?Turonian to Albian black shales with diabase sills. Three observations strongly suggest that the Cape Verde Rise resulted from a broad uplift of about 1000 to 1500 meters that could have taken place in the late Paleogene to early Neogene: 1) the occurrence of basic sills, probably related to Miocene volcanic activity on Cape Verde Islands; 2) abundant turbidite deposition in the Paleogene and late Cretaceous; and 3) the occurrence of carbonates restricted to the upper part of the section.

Date occupied	0651 hrs March 13, 1975
Date departed	1928 hrs March 20, 1975
Time on site	7 days, 2 hours, 37 minutes
Position: Latitude	17°30.4'N
Longitude	21°21.2'W
Water depth (sea level)	3366 corrected meters
Water depth (rig floor)	4758 corrected meters
Penetration	984.5 meters
Number of holes	1
Number of cores	63

LEG 41 SITE 368
SITE SUMMARY SHEET, con't.

Total length of cored section	582.5 meters
Total core recovered	327.7 meters
Percentage core recovery	56%
<u>Oldest Sediment Cored</u>	
Depth subbottom	984.5 meters
Nature	Black shale
Age	Albian
Measured Velocity	3.06 km/sec

Site 368 Hole Core 1 Cored Interval: 0.0-9.0 m



LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL, pale yellowish brown (10YR 6/2), mottled, streaks of hydrotroilite/Mn?, intense drilling disturbance, soft, unit becomes light olive gray (5Y 6/1) in Section 6. Color variations occur throughout the core, may be cyclic sedimentation but drilling disturbance has destroyed the record.

SS at 1-80 (dominant lithology)

Quartz	R	Heavy minerals	R
Glauconite	R	Fe/Mn	R
Forams	C	Nannos	A
Diatoms	C	Rads	R

SS at 2-80 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Fe/Mn	R
Carbonate unspecified	R	Forams	C
		Nannos	A
Rads	R	Sponge spicules	R

SS at 4-123 (dominant lithology)

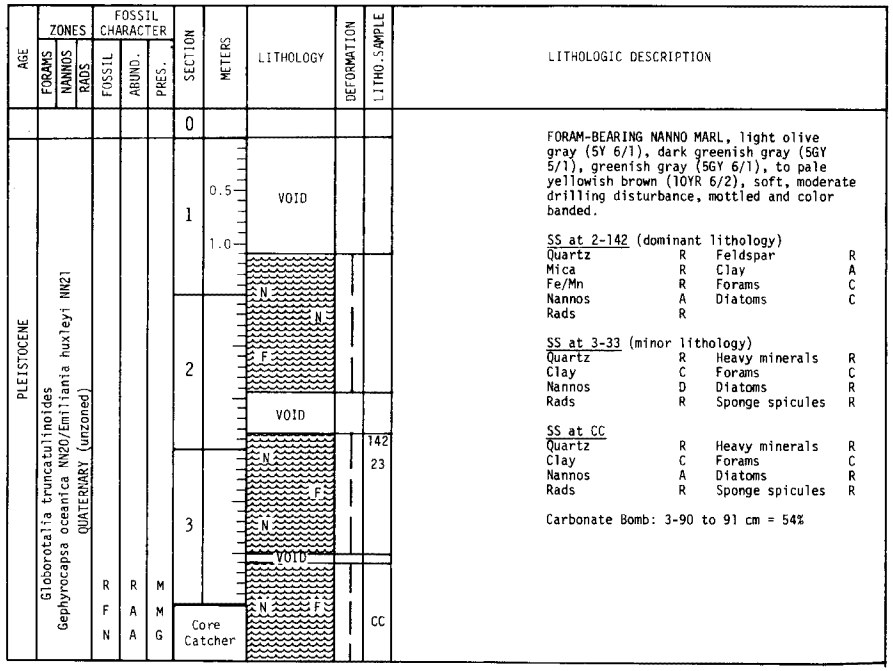
Quartz	R	Heavy minerals	R
Clay	A	Forams	C
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R

SS at 5-126 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Forams	C
Nannos	A	Diatoms	R
Rads	R	Fish debris	R

Carbonate Bomb: 3-87 to 88 cm = 48%

Site 368 Hole Core 2 Cored Interval: 9.0-18.5 m



LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL, light olive gray (5Y 6/1), dark greenish gray (5GY 5/1), greenish gray (5GY 6/1), to pale yellowish brown (10YR 6/2), soft, moderate drilling disturbance, mottled and color banded.

SS at 2-142 (dominant lithology)

Quartz	R	Feldspar	R
Mica	R	Clay	A
Fe/Mn	R	Forams	C
Nannos	A	Diatoms	C
Rads	R		

SS at 3-33 (minor lithology)

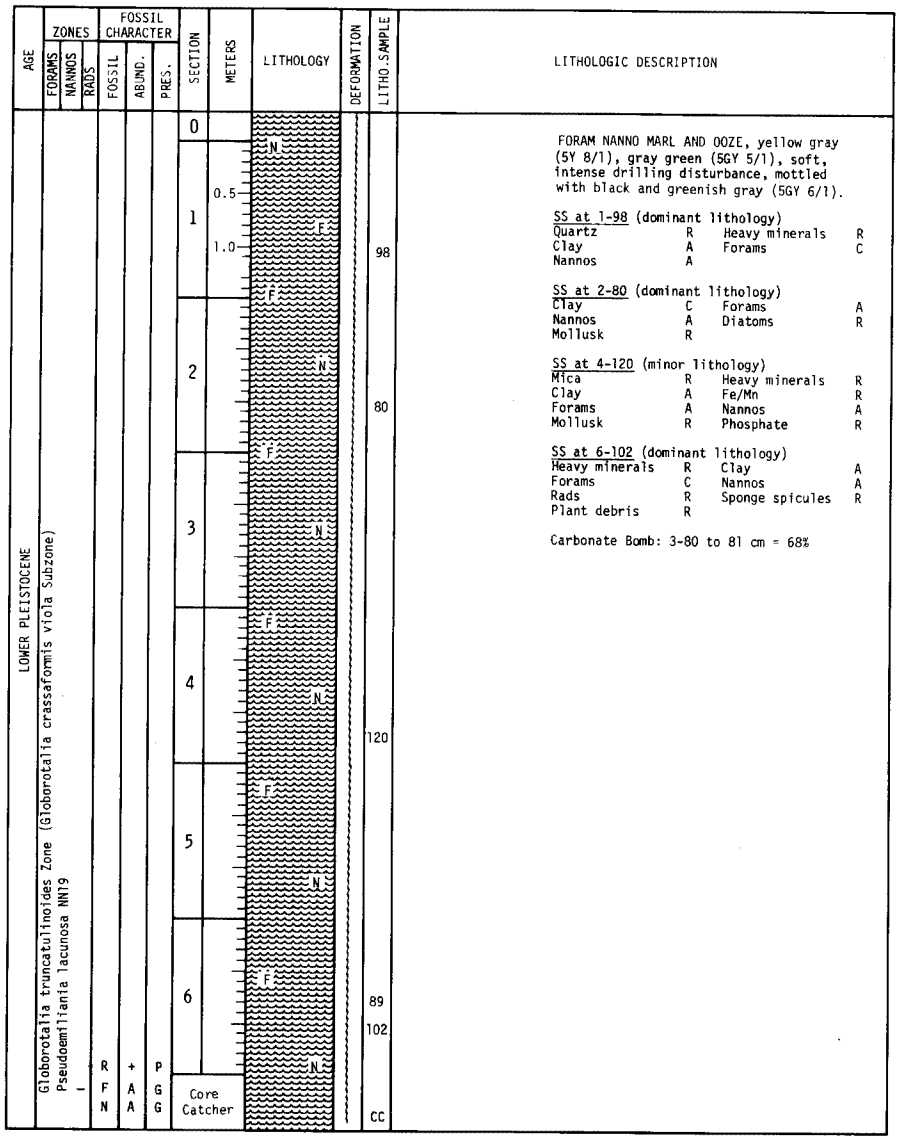
Quartz	R	Heavy minerals	R
Clay	C	Forams	C
Nannos	D	Diatoms	R
Rads	R	Sponge spicules	R

SS at CC

Quartz	R	Heavy minerals	R
Clay	C	Forams	C
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R

Carbonate Bomb: 3-90 to 91 cm = 54%

Site 368 Hole Core 3 Cored Interval: 47.0-56.5 m



LITHOLOGIC DESCRIPTION

FORAM NANNO MARL AND OOZE, yellow gray (5Y 8/1), gray green (5GY 5/1), soft, intense drilling disturbance, mottled with black and greenish gray (5GY 6/1).

SS at 1-98 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Forams	C
Nannos	A		

SS at 2-80 (dominant lithology)

Clay	C	Forams	A
Nannos	A	Diatoms	R
Mollusk	R		

SS at 4-120 (minor lithology)

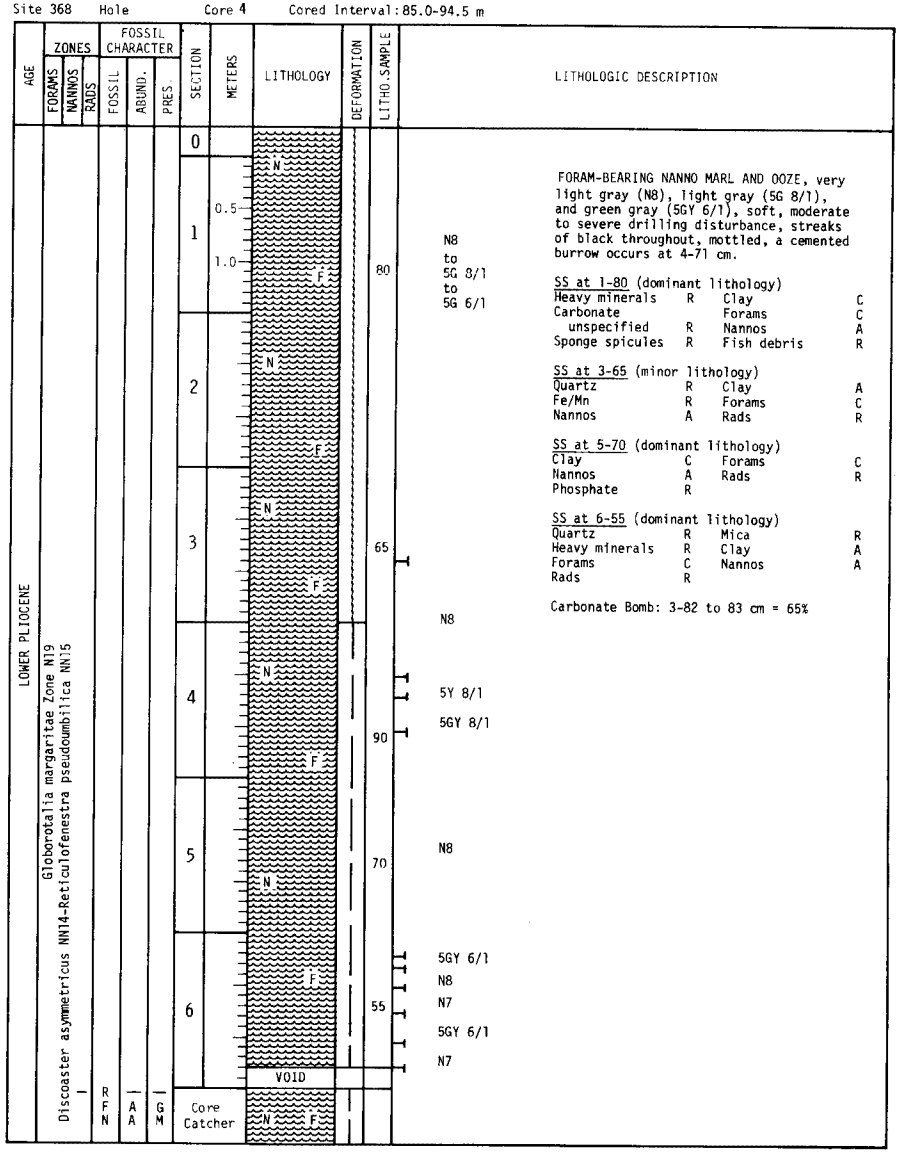
Mica	R	Heavy minerals	R
Clay	A	Fe/Mn	R
Forams	A	Nannos	A
Mollusk	R	Phosphate	R

SS at 6-102 (dominant lithology)

Heavy minerals	R	Clay	A
Forams	C	Nannos	A
Rads	R	Sponge spicules	R
Plant debris	R		

Carbonate Bomb: 3-80 to 81 cm = 68%

Site 368 Hole Core 4 Cored Interval: 85.0-94.5 m



LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO MARL AND OOZE, very light gray (N8), light gray (5G 8/1), and green gray (5GY 6/1), soft, moderate to severe drilling disturbance, streaks of black throughout, mottled, a cemented burrow occurs at 4-71 cm.

SS at 1-80 (dominant lithology)

Heavy minerals	R	Clay	C
Carbonate unspecified	R	Forams	C
		Nannos	A
Sponge spicules	R	Fish debris	R

SS at 3-65 (minor lithology)

Quartz	R	Clay	A
Fe/Mn	R	Forams	C
Nannos	A	Rads	R

SS at 5-70 (dominant lithology)

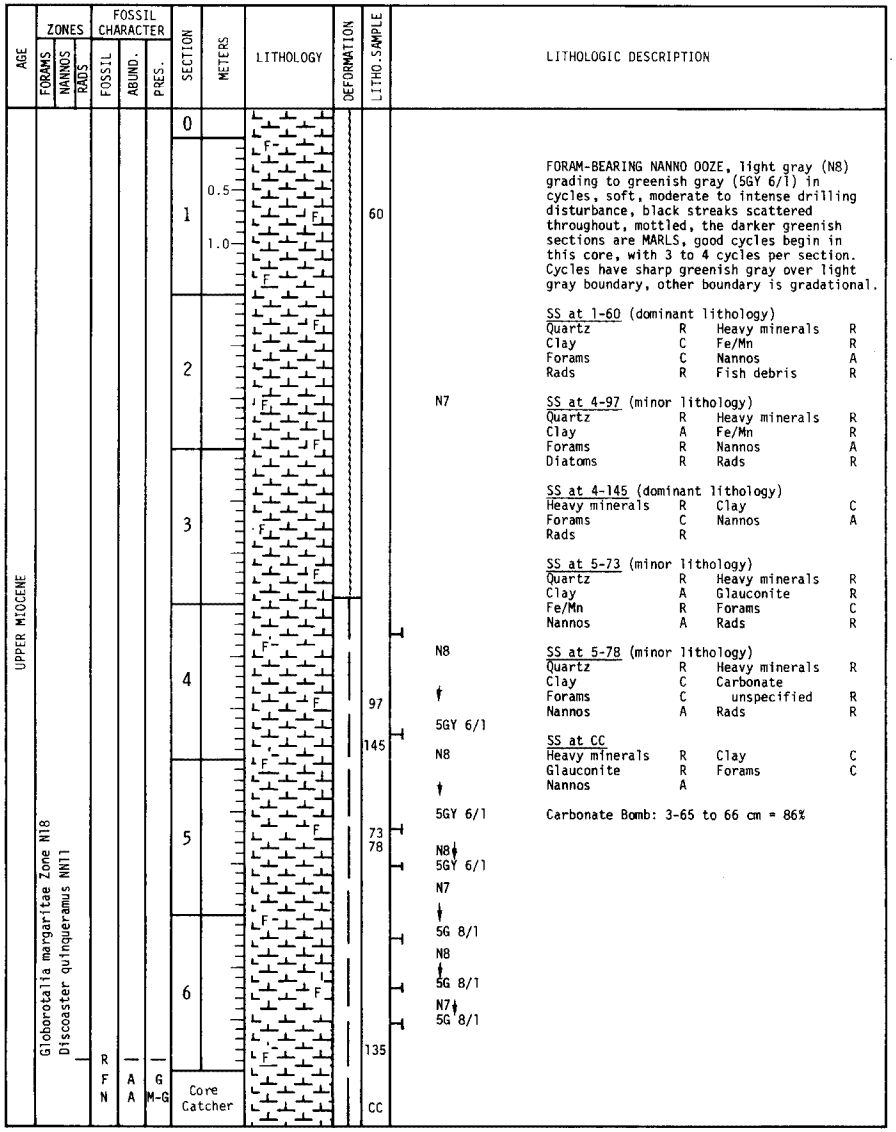
Clay	C	Forams	C
Nannos	A	Rads	R
Phosphate	R		

SS at 6-55 (dominant lithology)

Quartz	R	Mica	R
Heavy minerals	R	Clay	A
Forams	C	Nannos	A
Rads	R		

Carbonate Bomb: 3-82 to 83 cm = 65%

Site 368 Hole Core 5 Cored Interval: 123.0-132.5 m



LITHOLOGIC DESCRIPTION

FORAM-BEARING NANNO OOZE, light gray (N8) grading to greenish gray (5GY 6/1) in cycles, soft, moderate to intense drilling disturbance, black streaks scattered throughout, mottled, the darker greenish sections are MARLS, good cycles begin in this core, with 3 to 4 cycles per section. Cycles have sharp greenish gray over light gray boundary, other boundary is gradational.

SS at 1-60 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	C	Fe/Mn	R
Forams	C	Nannos	A
Rads	R	Fish debris	R

SS at 4-97 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Fe/Mn	R
Forams	R	Nannos	A
Diatoms	R	Rads	R

SS at 4-145 (dominant lithology)

Heavy minerals	R	Clay	C
Forams	C	Nannos	A
Rads	R		

SS at 5-73 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Fe/Mn	R	Forams	C
Nannos	A	Rads	R

SS at 5-78 (minor lithology)

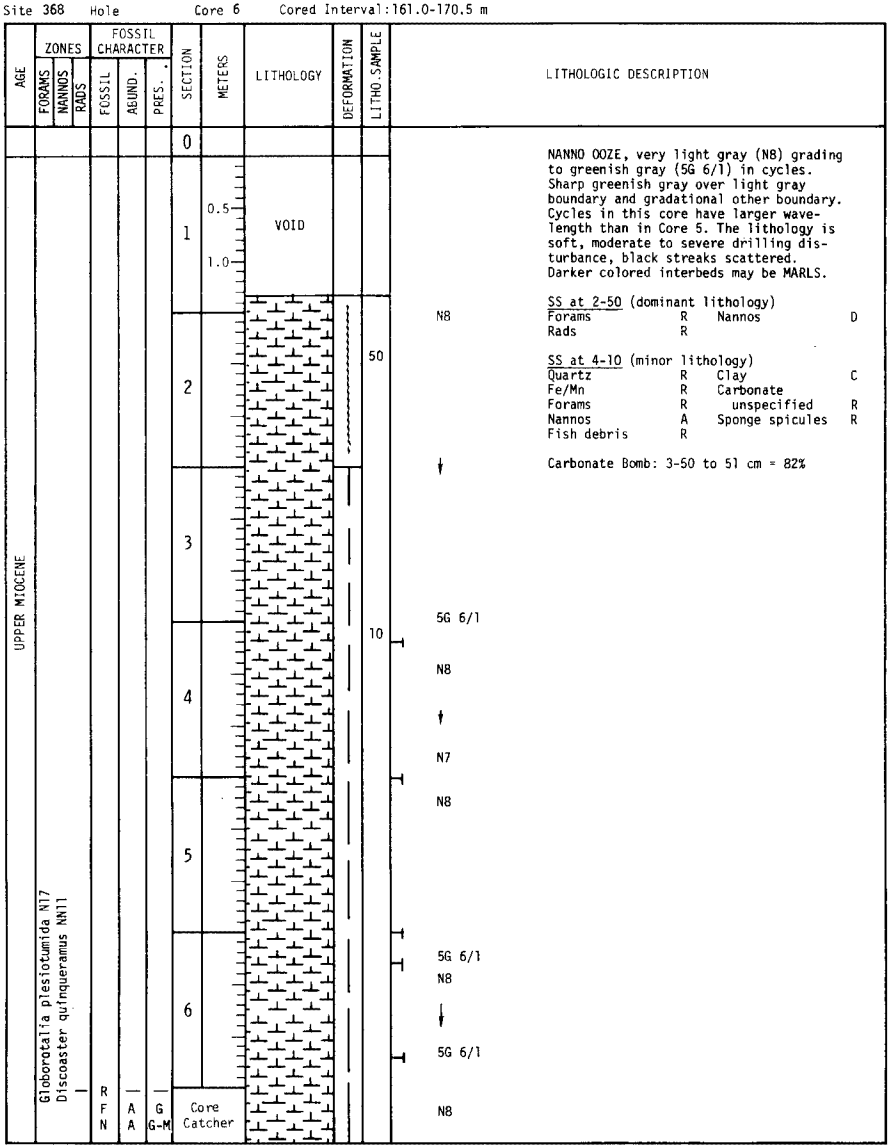
Quartz	R	Heavy minerals	R
Clay	C	Carbonate unspecified	R
Forams	C		
Nannos	A	Rads	R

SS at CC

Heavy minerals	R	Clay	C
Glauconite	R	Forams	C
Nannos	A		

Carbonate Bomb: 3-65 to 66 cm = 86%

Site 368 Hole Core 6 Cored Interval: 161.0-170.5 m



LITHOLOGIC DESCRIPTION

NANNO OOZE, very light gray (N8) grading to greenish gray (5G 6/1) in cycles. Sharp greenish gray over light gray boundary and gradational other boundary. Cycles in this core have larger wave-length than in Core 5. The lithology is soft, moderate to severe drilling disturbance, black streaks scattered. Darker colored interbeds may be MARLS.

SS at 2-50 (dominant lithology)

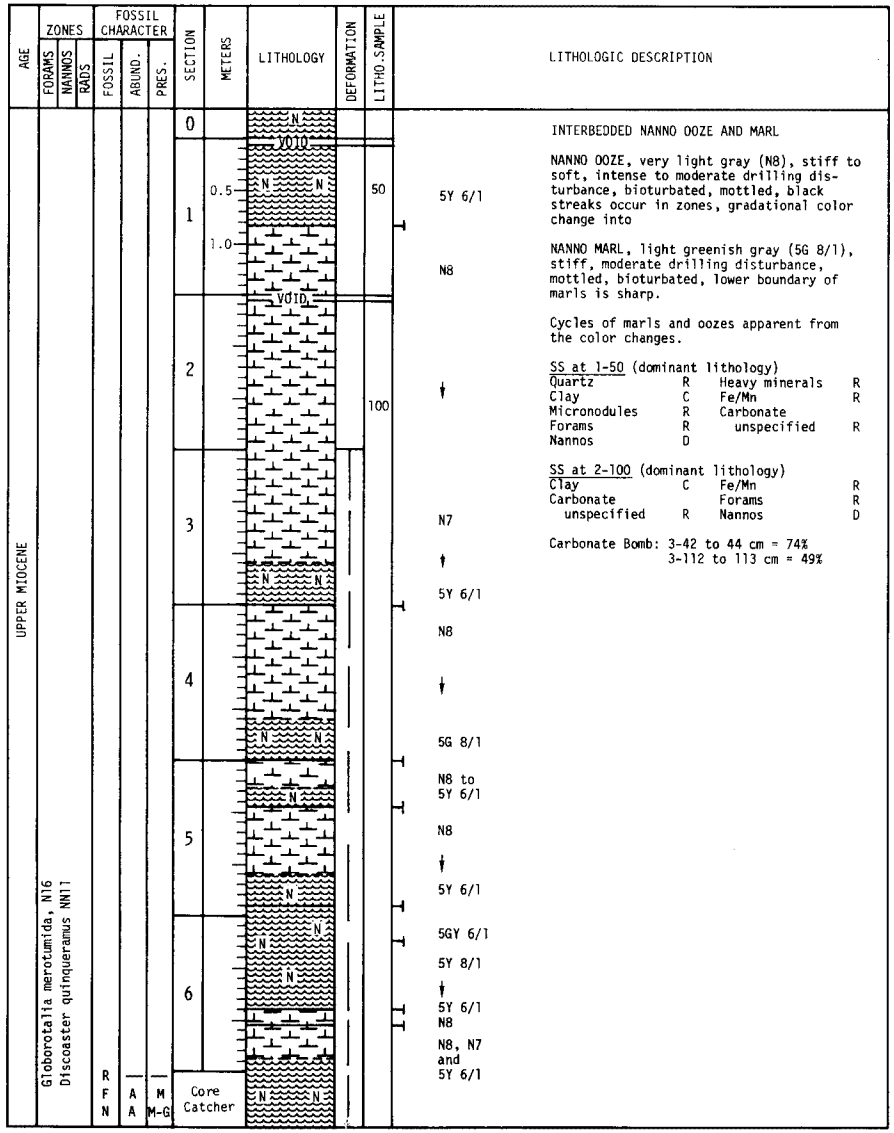
Forams	R	Nannos	D
Rads	R		

SS at 4-10 (minor lithology)

Quartz	R	Clay	C
Fe/Mn	R	Carbonate unspecified	R
Forams	R		
Nannos	A	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-50 to 51 cm = 82%

Site 368 Hole Core 7 Cored Interval: 170.5-180.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO OOZE AND MARL

NANNO OOZE, very light gray (N8), stiff to soft, intense to moderate drilling disturbance, bioturbated, mottled, black streaks occur in zones, gradational color change into

NANNO MARL, light greenish gray (5G 8/1), stiff, moderate drilling disturbance, mottled, bioturbated, lower boundary of marls is sharp.

Cycles of marls and oozes apparent from the color changes.

SS at 1-50 (dominant lithology)

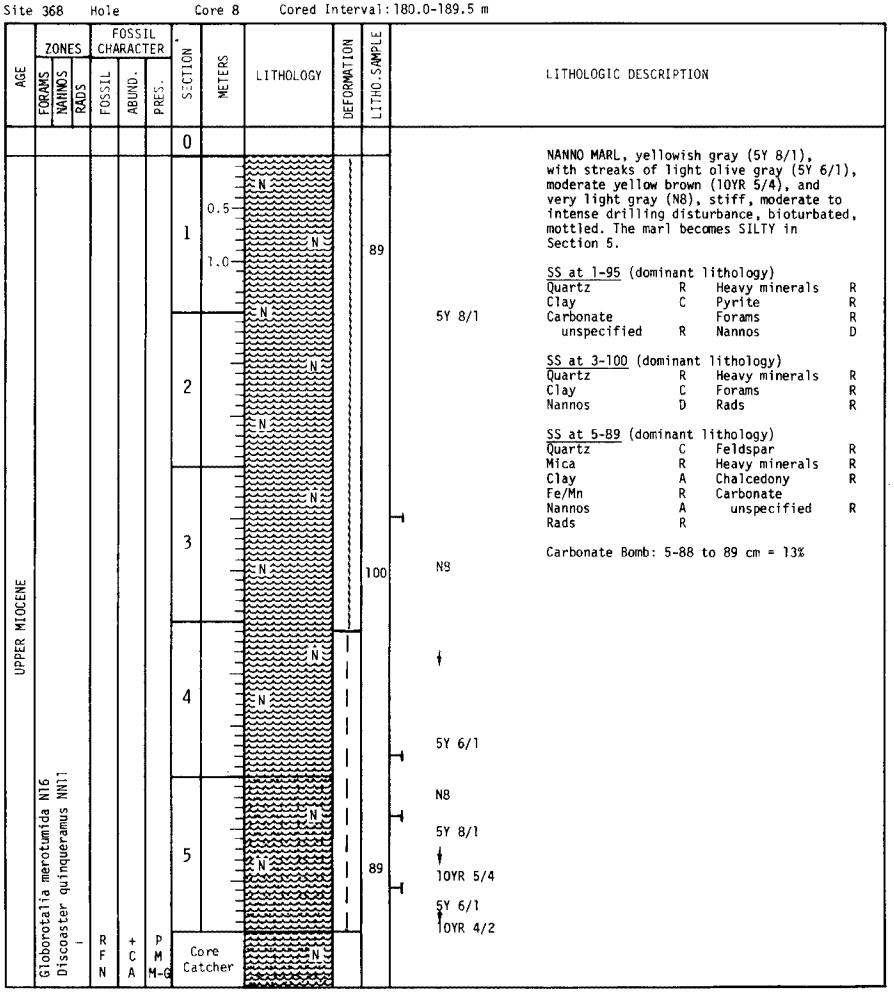
Quartz	R	Heavy minerals	R
Clay	C	Fe/Mn	R
Micronodules	R	Carbonate unspecified	R
Forams	R		
Nannos	D		

SS at 2-100 (dominant lithology)

Clay	C	Fe/Mn	R
Carbonate unspecified	R	Forams	R
		Nannos	D

Carbonate Bomb: 3-42 to 44 cm = 74%
3-112 to 113 cm = 49%

Site 368 Hole Core 8 Cored Interval: 180.0-189.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, yellowish gray (5Y 8/1), with streaks of light olive gray (5Y 6/1), moderate yellow brown (10YR 5/4), and very light gray (N8), stiff, moderate to intense drilling disturbance, bioturbated, mottled. The marl becomes SILTY in Section 5.

SS at 1-95 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	C	Pyrite	R
Carbonate unspecified	R	Forams	R
		Nannos	D

SS at 3-100 (dominant lithology)

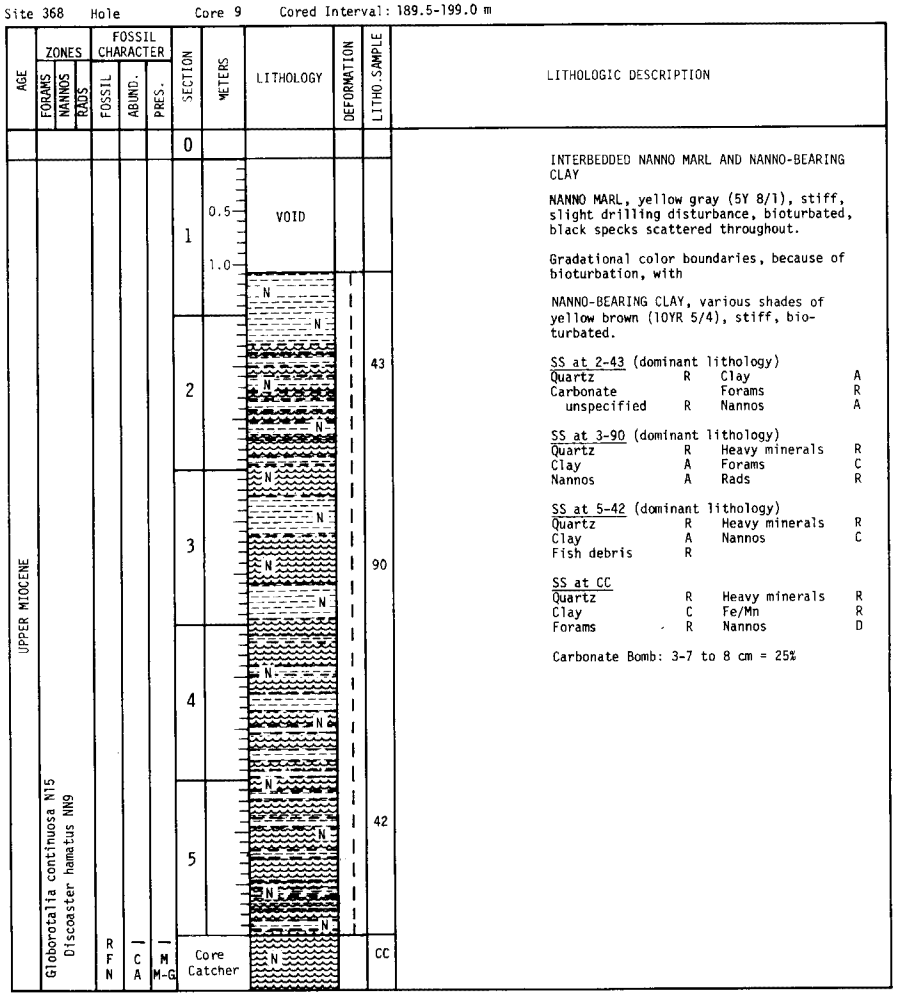
Quartz	R	Heavy minerals	R
Clay	C	Forams	R
Nannos	D	Rads	R

SS at 5-89 (dominant lithology)

Quartz	C	Feldspar	R
Mica	R	Heavy minerals	R
Clay	A	Chalcedony	R
Fe/Mn	R	Carbonate unspecified	R
Nannos	A		
Rads	R		

Carbonate Bomb: 5-88 to 89 cm = 13%

Site 368 Hole Core 9 Cored Interval: 189.5-199.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO MARL AND NANNO-BEARING CLAY

NANNO MARL, yellow gray (5Y 8/1), stiff, slight drilling disturbance, bioturbated, black specks scattered throughout.

Gradational color boundaries, because of bioturbation, with

NANNO-BEARING CLAY, various shades of yellow brown (10YR 5/4), stiff, bioturbated.

SS at 2-43 (dominant lithology)

Quartz	R	Clay	A
Carbonate unspecified	R	Forams	R
		Nannos	A

SS at 3-90 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Forams	C
Nannos	A	Rads	R

SS at 5-42 (dominant lithology)

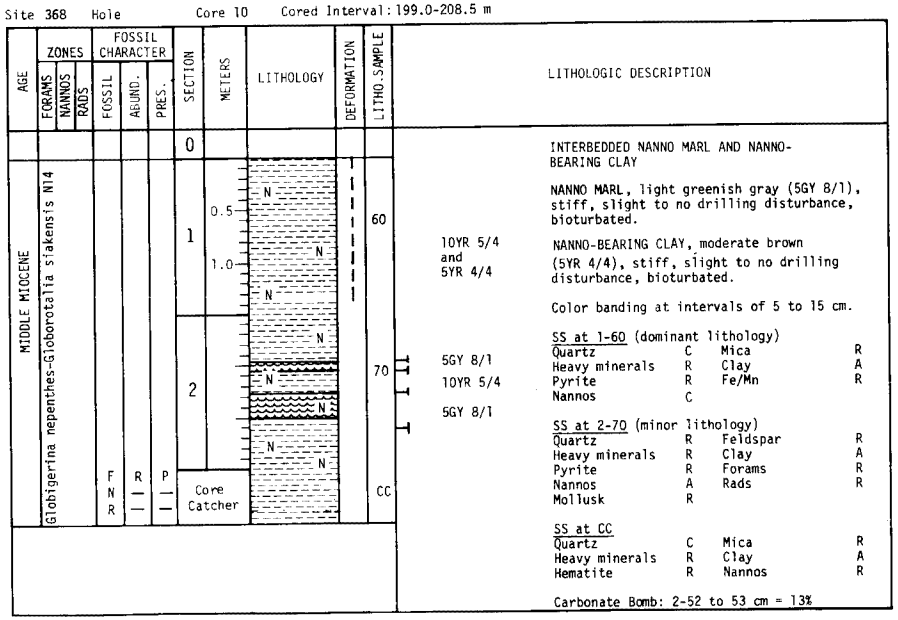
Quartz	R	Heavy minerals	R
Clay	A	Nannos	C
Fish debris	R		

SS at CC

Quartz	R	Heavy minerals	R
Clay	C	Fe/Mn	R
Forams	R	Nannos	D

Carbonate Bomb: 3-7 to 8 cm = 25%

Site 368 Hole Core 10 Cored Interval: 199.0-208.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO MARL AND NANNO-BEARING CLAY

NANNO MARL, light greenish gray (5GY 8/1), stiff, slight to no drilling disturbance, bioturbated.

NANNO-BEARING CLAY, moderate brown (5YR 4/4), stiff, slight to no drilling disturbance, bioturbated.

Color banding at intervals of 5 to 15 cm.

SS at 1-60 (dominant lithology)

Quartz	C	Mica	R
Heavy minerals	R	Clay	A
Pyrite	R	Fe/Mn	R
Nannos	C		

SS at 2-70 (minor lithology)

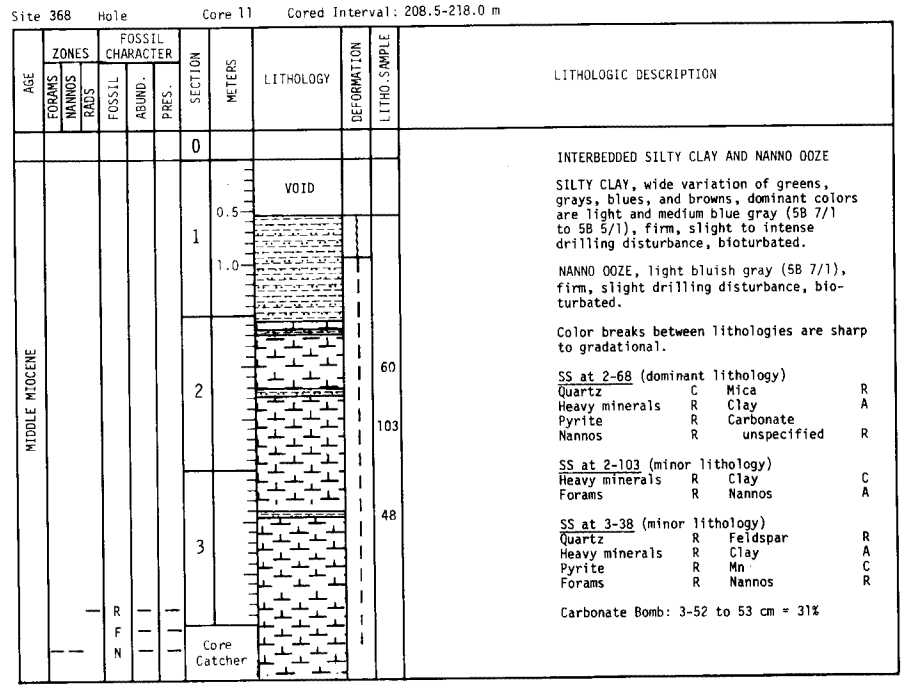
Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Pyrite	R	Forams	R
Nannos	A	Rads	R
Mollusk	R		

SS at CC

Quartz	C	Mica	R
Heavy minerals	R	Clay	A
Hematite	R	Nannos	R

Carbonate Bomb: 2-52 to 53 cm = 13%

Site 368 Hole Core 11 Cored Interval: 208.5-218.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED SILTY CLAY AND NANNO OOZE

SILTY CLAY, wide variation of greens, grays, blues, and browns, dominant colors are light and medium blue gray (5B 7/1 to 5B 5/1), firm, slight to intense drilling disturbance, bioturbated.

NANNO OOZE, light bluish gray (5B 7/1), firm, slight drilling disturbance, bioturbated.

Color breaks between lithologies are sharp to gradational.

SS at 2-68 (dominant lithology)

Quartz	C	Mica	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Nannos	R		

SS at 2-103 (minor lithology)

Heavy minerals	R	Clay	C
Forams	R	Nannos	A

SS at 3-38 (minor lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Pyrite	R	Mn	C
Forams	R	Nannos	R

Carbonate Bomb: 3-52 to 53 cm = 31%

Site 368 Hole Core 12 Cored Interval: 218.0-227.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE		Sphenolithus heteromorphus NN5		F N R	R F-C	P P	0					CLAY, grayish blue green (5BG 5/2), firm, intense drilling disturbance.
							1	0.5, 1.0	VOID			
							Core Catcher					

Site 368 Hole Core 13 Cored Interval: 227.5-237.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE	Globorotalia peripheroacuta N10	Sphenolithus heteromorphus NN5 Calocycletta costata		R F N	R C C	M M M	0					NANNO-BEARING SILTY CLAY, pale blue green (5BG 7/2) to grayish blue green (5BG 5/2), firm, becoming very firm by Section 3, slight to intense drilling disturbance, interbedded VOLCANIC ASH bed at 4-126 to 130. Color cycles apparent in Section 4 at about 40 cm intervals, bioturbated.
							1	0.5, 1.0	VOID		100	5BG 5/2
							2					5B 5/1
							3				100	
							4				129	5G 4/1; 5BG 5/2; 5B 7/1; 5Y 4/1
							Core Catcher					

SS 1-100 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Nannos	C		

SS at 3-100 (dominant lithology)

Quartz	R	Clay	A
Pyrite	R	Forams	R
Nannos	A	Rads	R
Sponge spicules	R		

SS at 4-129 (minor lithology)

Volcanic glass	A	Nannos	C
Rads	C	Sponge spicules	R

Carbonate Bomb: 4-74 to 75 cm = 13%

Site 368 Hole Core 14 Cored Interval: 237.0-246.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE		Sphenolithus heteromorphus NN5 Calocycletta costata		R F N	C R C	G P P-M	0					NANNO MARL WITH VOLCANIC ASH BEDS
							1	0.5, 1.0	VOID			NANNO MARL, pale blue green (5BG 7/2) to greenish gray (5G 6/1), firm, slight to intense drilling disturbance, bioturbated color cycles start to develop in Section 3.
							2				40, 100	VOLCANIC ASH, olive gray (5Y 4/1), firm, occurs at 2-35 to 50 and 3-60 to 62.
							3				61	5BG 5/2; 5G 6/1; 5G 4/1; 5G 6/1; 5G 4/1; 5BG 7/2; 5BG 5/2; 5BG 7/2
							Core Catcher					

SS at 2-40 (minor lithology)

Clay	C	Volcanic glass	A
Forams	R	Nannos	R
Rads	R		

SS at 2-100 (dominant lithology)

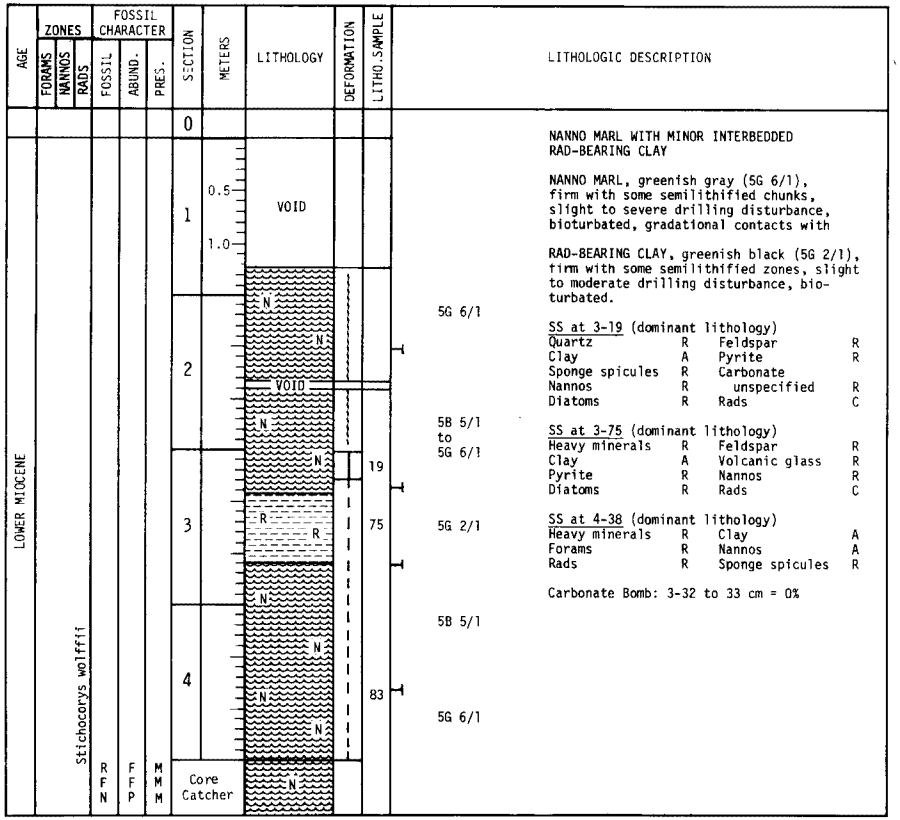
Heavy minerals	R	Clay	A
Volcanic glass	R	Pyrite	R
Forams	R	Nannos	A
Rads	R	Sponge spicules	R

SS at 3-61 (minor lithology)

Volcanic glass	D	Pyrite	R
Nannos	C	Rads	R

Carbonate Bomb: 3-62 to 63 cm = 23%

Site 368 Hole Core 15 Cored Interval: 246.5-256.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL WITH MINOR INTERBEDDED RAD-BEARING CLAY

NANNO MARL, greenish gray (5G 6/1), firm with some semilithified chunks, slight to severe drilling disturbance, bioturbated, gradational contacts with

RAD-BEARING CLAY, greenish black (5G 2/1), firm with some semilithified zones, slight to moderate drilling disturbance, bioturbated.

SS at 3-19 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Pyrite	R
Sponge spicules	R	Carbonate unspecified	R
Diatoms	R	Rads	C

SS at 3-75 (dominant lithology)

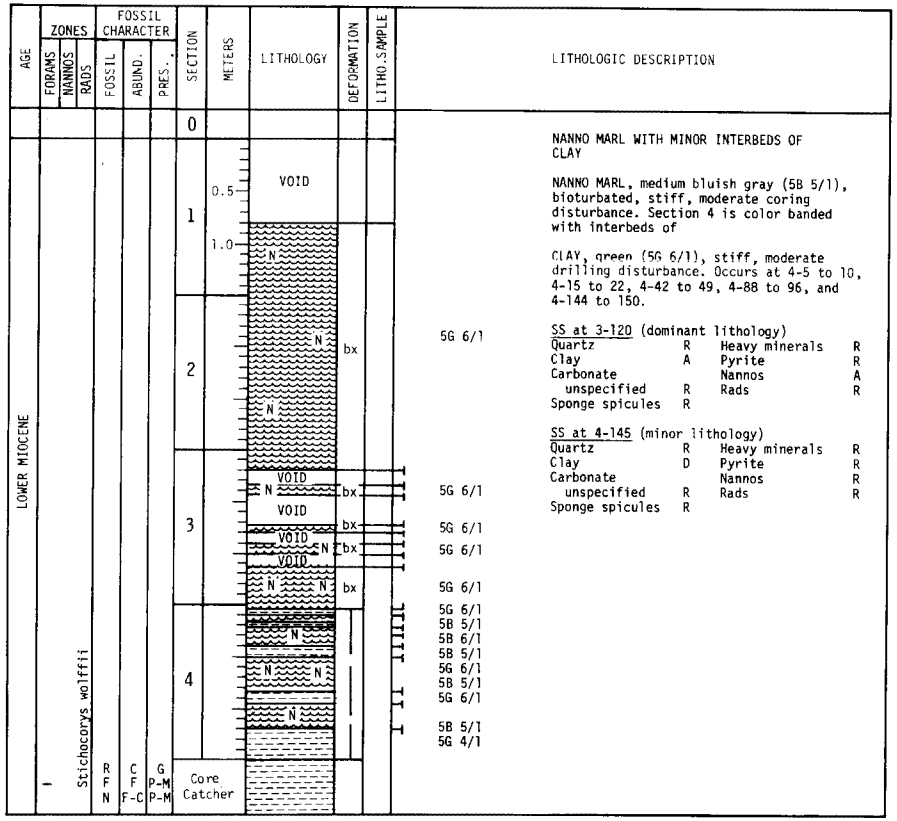
Heavy minerals	R	Feldspar	R
Clay	A	Volcanic glass	R
Pyrite	R	Nannos	R
Diatoms	R	Rads	C

SS at 4-38 (dominant lithology)

Heavy minerals	R	Clay	A
Forams	R	Nannos	A
Rads	R	Sponge spicules	R

Carbonate Bomb: 3-32 to 33 cm = 0%

Site 368 Hole Core 16 Cored Interval: 256.0-265.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL WITH MINOR INTERBEDS OF CLAY

NANNO MARL, medium bluish gray (5B 5/1), bioturbated, stiff, moderate coring disturbance. Section 4 is color banded with interbeds of

CLAY, green (5G 6/1), stiff, moderate drilling disturbance. Occurs at 4-5 to 10, 4-15 to 22, 4-42 to 49, 4-88 to 96, and 4-144 to 150.

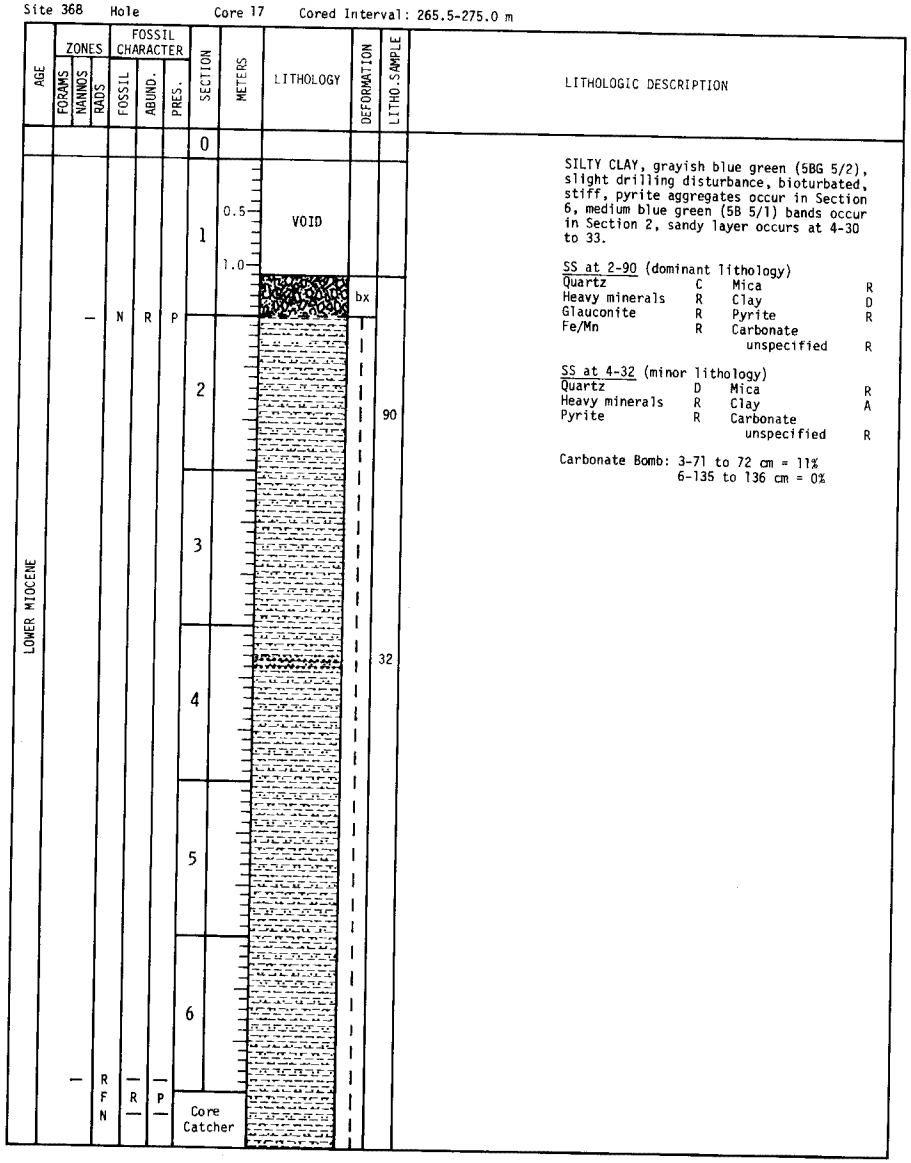
SS at 3-120 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Nannos	A
Sponge spicules	R	Rads	R

SS at 4-145 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Nannos	R
Sponge spicules	R	Rads	R

Site 368 Hole Core 17 Cored Interval: 265.5-275.0 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, grayish blue green (5BG 5/2), slight drilling disturbance, bioturbated, stiff, pyrite aggregates occur in Section 6, medium blue green (5B 5/1) bands occur in Section 2, sandy layer occurs at 4-30 to 33.

SS at 2-90 (dominant lithology)

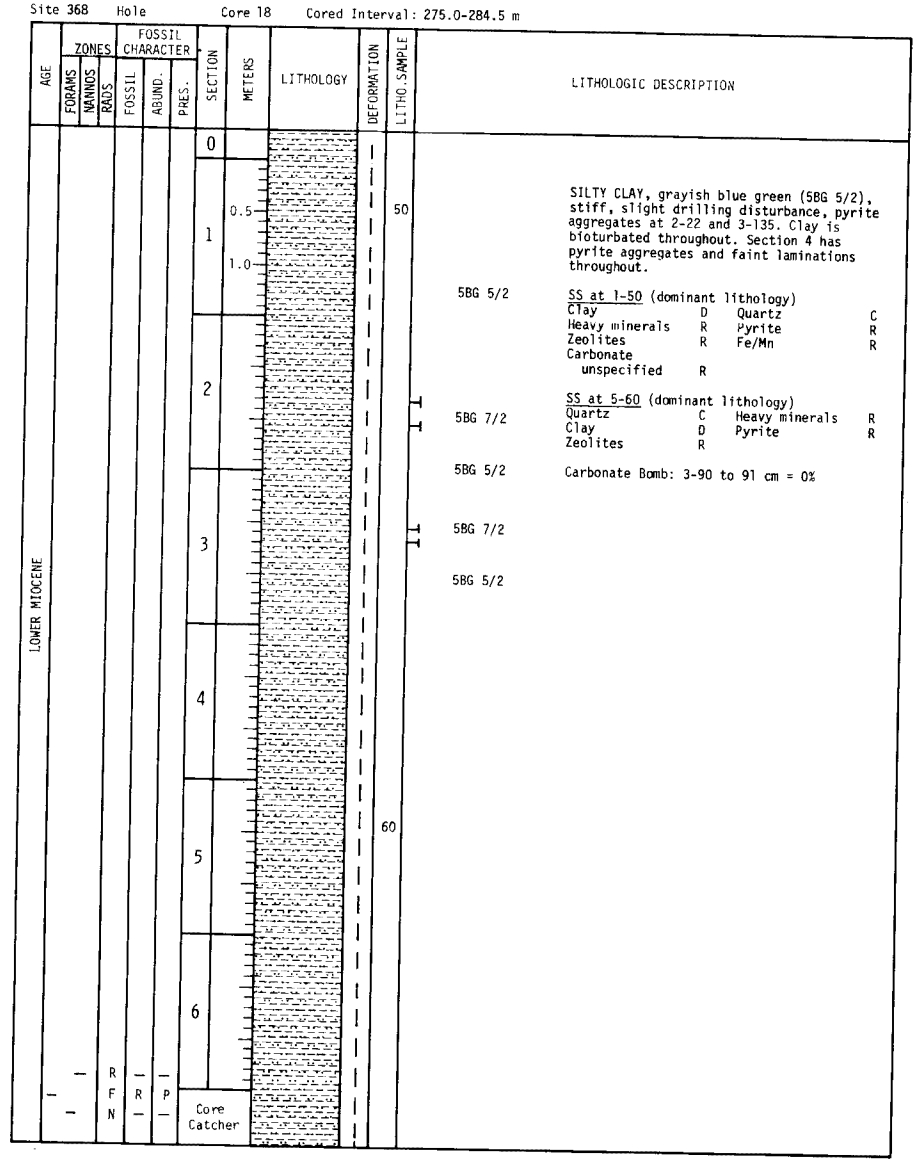
Quartz	C	Mica	R
Heavy minerals	R	Clay	D
Glauconite	R	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R

SS at 4-32 (minor lithology)

Quartz	D	Mica	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate unspecified	R

Carbonate Bomb: 3-71 to 72 cm = 11%
6-135 to 136 cm = 0%

Site 368 Hole Core 18 Cored Interval: 275.0-284.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, grayish blue green (5BG 5/2), stiff, slight drilling disturbance, pyrite aggregates at 2-22 and 3-135. Clay is bioturbated throughout. Section 4 has pyrite aggregates and faint laminations throughout.

SS at 1-50 (dominant lithology)

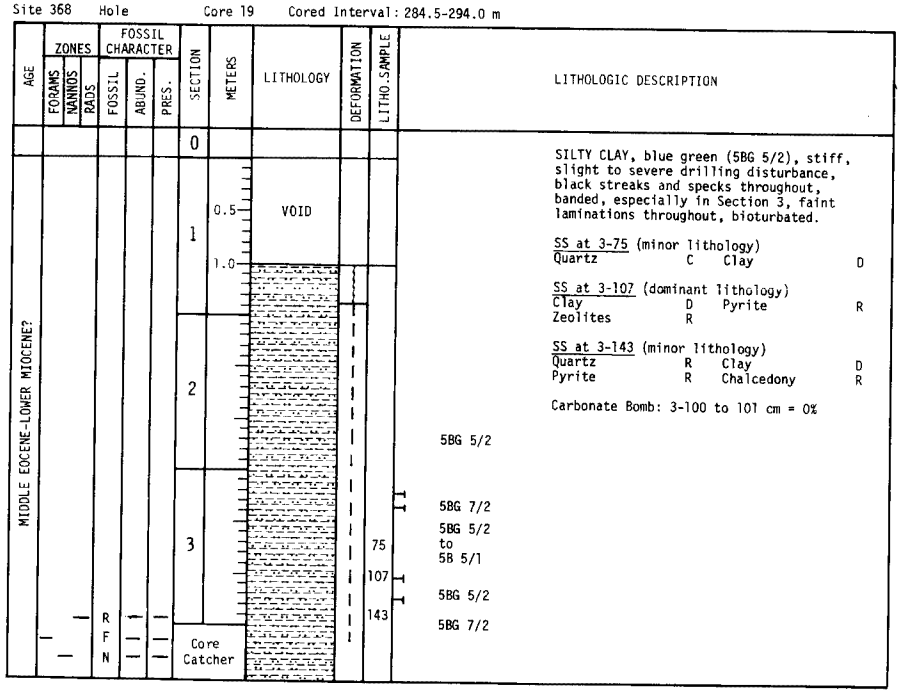
Clay	D	Quartz	C
Heavy minerals	R	Pyrite	R
Zeolites	R	Fe/Mn	R
Carbonate unspecified	R		

SS at 5-60 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	D	Pyrite	R
Zeolites	R		

Carbonate Bomb: 3-90 to 91 cm = 0%

Site 368 Hole Core 19 Cored Interval: 284.5-294.0 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, blue green (5BG 5/2), stiff, slight to severe drilling disturbance, black streaks and specks throughout, banded, especially in Section 3, faint laminations throughout, bioturbated.

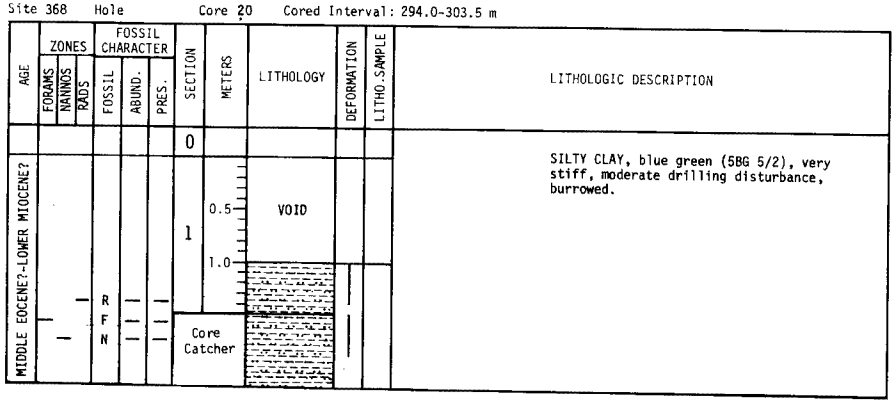
SS at 3-75 (minor lithology)
Quartz C Clay D

SS at 3-107 (dominant lithology)
Clay D Pyrite R
Zeolites R

SS at 3-143 (minor lithology)
Quartz R Clay D
Pyrite R Chalcedony R

Carbonate Bomb: 3-100 to 101 cm = 0%

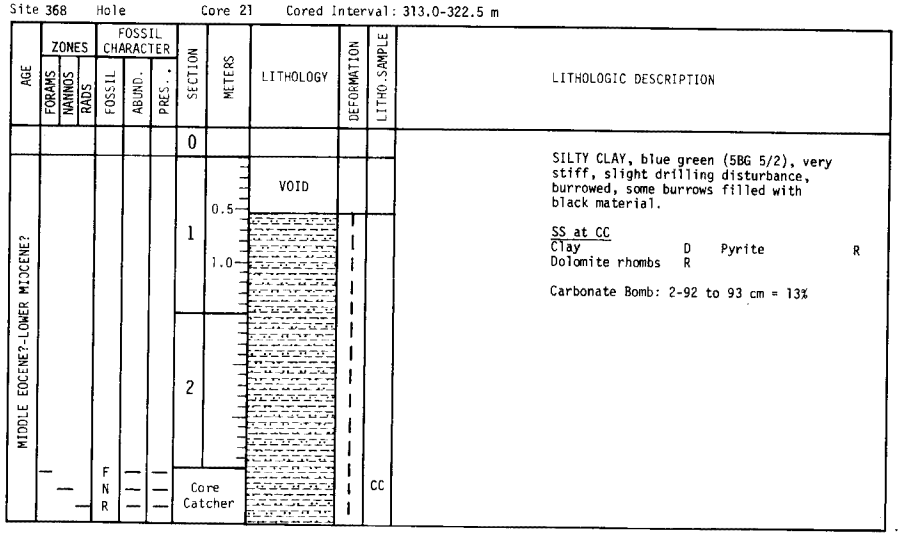
Site 368 Hole Core 20 Cored Interval: 294.0-303.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, blue green (5BG 5/2), very stiff, moderate drilling disturbance, burrowed.

Site 368 Hole Core 21 Cored Interval: 313.0-322.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAY, blue green (5BG 5/2), very stiff, slight drilling disturbance, burrowed, some burrows filled with black material.

SS at CC
Clay D Pyrite R
Dolomite rhombs R

Carbonate Bomb: 2-92 to 93 cm = 13%

Site 368 Hole Core 22 Cored Interval: 322.5-332.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE-LOWER MIOCENE							0					EACH SECTION OF THIS CORE EXPANDED BEYOND THE 150 cm CUT. SOME EXPANDED AS MUCH AS 10 cm.
							1	0.5 1.0			17 46 71 5B 5/1	CLAYSTONE, medium bluish gray (5B 5/1) grading with depth to thinly interbedded green gray (5G 6/1 and 5GY 4/1), hard, bioturbated with good zoophycos and chondrites, liesegang bands of Mn(?) around burrows, unit faintly laminated, fracturing caused by core expansion.
							2				30 83 5GY 4/1	In Sections 1 and 2 the medium blue gray color predominates. Beginning with Section 3 the gray (5GY 4/1) color predominates with thin (∿5 cm) interbeds of 5G 6/1. Contacts between colors are sharp.
											143 5B 5/1 5GY 4/1	SS at 1-17 (minor lithology) Quartz R, Heavy minerals R Clay D, Volcanic glass R Dolomite rhombs R
							3				5GY 4/1 with 5G 6/1	SS at 1-46 (minor lithology) Quartz R, Clay D Pyrite R, Fe/Mn R Dolomite R, Fish debris R SS at 1-71 (minor lithology) Quartz D, Feldspar R Heavy minerals R, Clay C Carbonate unspecified R
							4					SS at 2-30 (dominant lithology) Quartz R, Clay D Volcanic glass R, Pyrite R Carbonate unspecified R, Fish debris R SS at 2-83 (dominant lithology) Quartz D, Feldspar R Mica R, Heavy minerals R Clay C, Volcanic glass R Carbonate unspecified R, Fish debris R
							5					SS at 2-143 (dominant lithology) Quartz R, Clay D Volcanic glass R, Pyrite R Fe/Mn R, Carbonate unspecified R Nannos R Fish debris R
							6					Carbonate Bomb: 3-74 to 75 cm = 9% 5-135 to 136 cm = 9%
	—	—	—	F N R	— — —	— — —	Core Catcher					

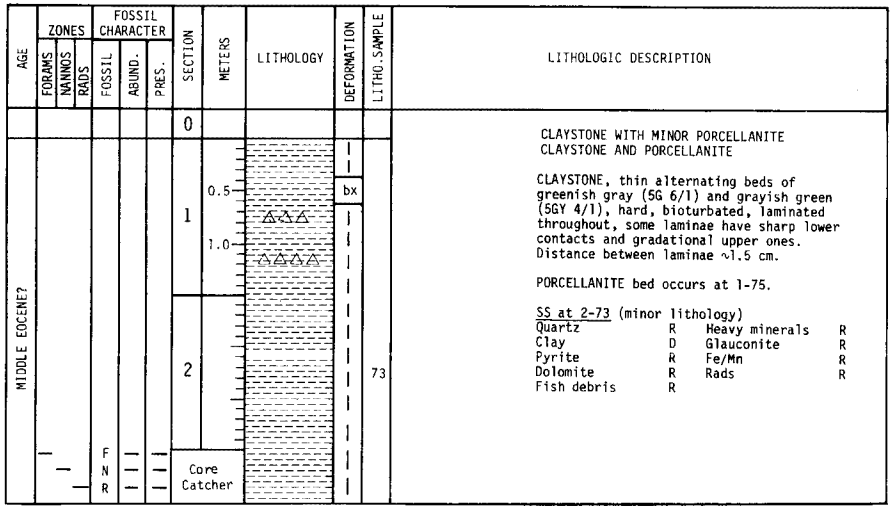
Site 368 Hole Core 23 Cored Interval: 351.0-360.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE?							0					CLAYSTONE WITH MINOR PORCELLANITE CLAYSTONE, greenish gray (5G 6/1), hard, slight drilling disturbance, bioturbated, Fe/Mn halos and bands, some thin (∿5 cm) interbedded PORCELLANITE, greenish gray (5GY 4/1), dull.
							1	0.5 1.0	VOID			
							2		△△△ △△△△		50 80	SS at 2-50 (minor lithology) Quartz R, Clay D Rads R, Chalcedony R SS at 2-80 (dominant lithology) Detrital R, Clay D Volcanic glass R, Fe/Mn R Dolomite R
	—	—	—	F N R	— — —	— — —	Core Catcher					

Site 368 Hole Core 24 Cored Interval: 360.5-370.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE?							0					CLAYSTONE, greenish gray (5G 6/1) alternating with thin interbeds of 5GY 4/1, hard, bioturbated, Fe/Mn halos and bands.
							1	0.5 1.0	VOID			
										bx		
	—	—	—	F N R	— — —	— — —	Core Catcher					

Site 368 Hole Core 25 Cored Interval: 370.0-375.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH MINOR PORCELLANITE
CLAYSTONE AND PORCELLANITE

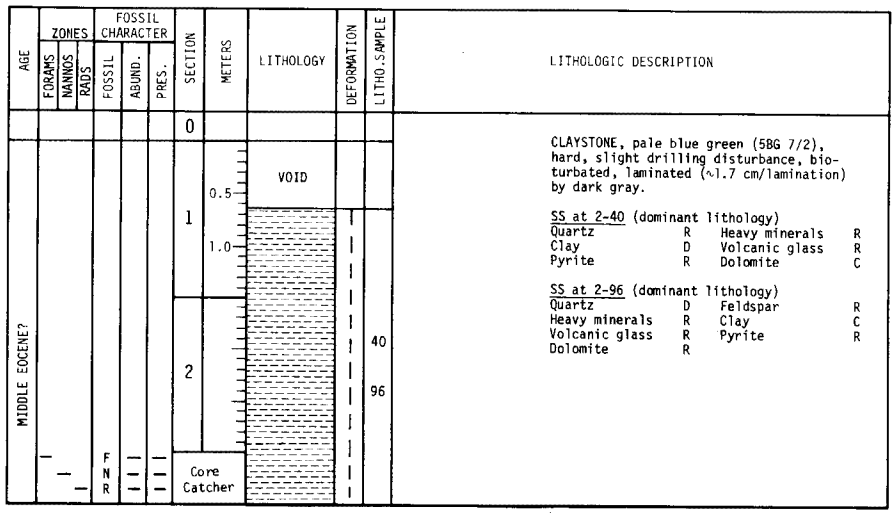
CLAYSTONE, thin alternating beds of greenish gray (5G 6/1) and grayish green (5GY 4/1), hard, bioturbated, laminated throughout, some laminae have sharp lower contacts and gradational upper ones. Distance between laminae ~1.5 cm.

PORCELLANITE bed occurs at 1-75.

SS at 2-73 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D	Glauconite	R
Pyrite	R	Fe/Mn	R
Dolomite	R	Rads	R
Fish debris	R		

Site 368 Hole Core 26 Cored Interval: 375.5-385.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE, pale blue green (5BG 7/2), hard, slight drilling disturbance, bioturbated, laminated (~1.7 cm/lamination) by dark gray.

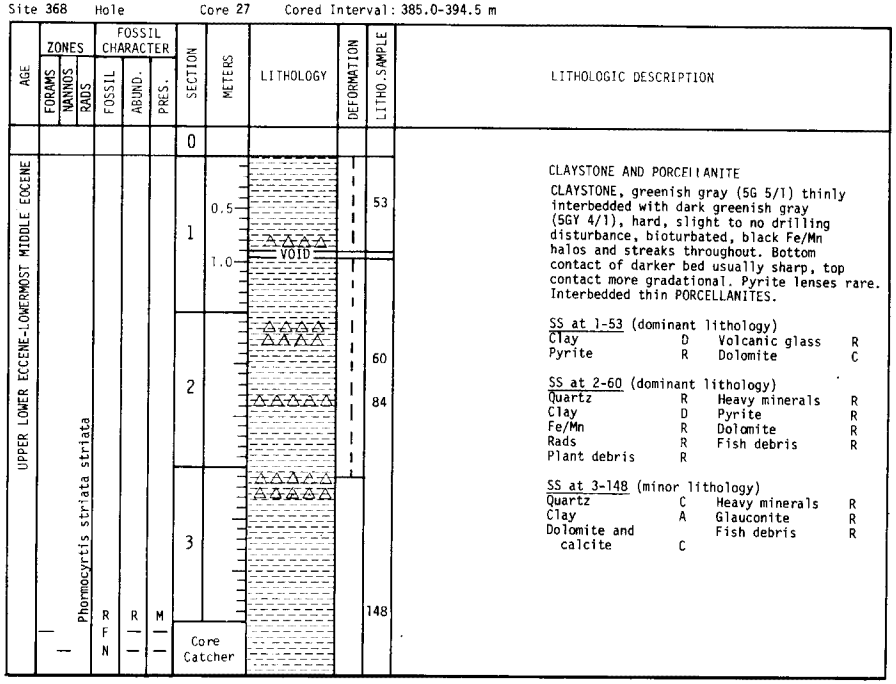
SS at 2-40 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Volcanic glass	R
Pyrite	R	Dolomite	C

SS at 2-96 (dominant lithology)

Quartz	D	Feldspar	R
Heavy minerals	R	Clay	C
Volcanic glass	R	Pyrite	R
Dolomite	R		

Site 368 Hole Core 27 Cored Interval: 385.0-394.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE

CLAYSTONE, greenish gray (5G 5/1) thinly interbedded with dark greenish gray (5GY 4/1), hard, slight to no drilling disturbance, bioturbated, black Fe/Mn halos and streaks throughout. Bottom contact of darker bed usually sharp, top contact more gradational. Pyrite lenses rare. Interbedded thin PORCELLANITES.

SS at 1-53 (dominant lithology)

Clay	D	Volcanic glass	R
Pyrite	R	Dolomite	C

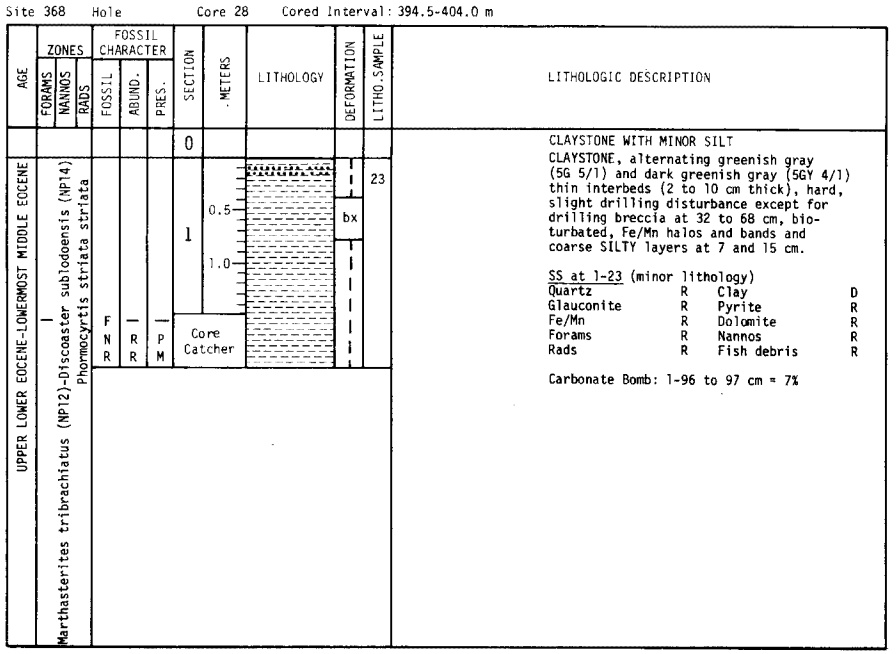
SS at 2-60 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Fe/Mn	R	Dolomite	R
Rads	R	Fish debris	R
Plant debris	R		

SS at 3-148 (minor lithology)

Quartz	C	Heavy minerals	R
Clay	A	Glauconite	R
Dolomite and calcite	C	Fish debris	R

Site 368 Hole Core 28 Cored Interval: 394.5-404.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH MINOR SILT

CLAYSTONE, alternating greenish gray (5G 5/1) and dark greenish gray (5GY 4/1) thin interbeds (2 to 10 cm thick), hard, slight drilling disturbance except for drilling breccia at 32 to 68 cm, bioturbated, Fe/Mn halos and bands and coarse SILTY layers at 7 and 15 cm.

SS at 1-23 (minor lithology)

Quartz	R	Clay	D
Glauconite	R	Pyrite	R
Fe/Mn	R	Dolomite	R
Forams	R	Nannos	R
Rads	R	Fish debris	R

Carbonate Bomb: 1-96 to 97 cm = 7%

Site 368 Hole Core 29 Cored Interval: 408.0-417.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER LOWER EOCENE-LOWERMOST MIDDLE EOCENE	Phormocyrtis striata striata			F N R	— — R	— — P	0					
							1	0.5 1.0	VOID		91	5GY 4/1 5G 5/1 5GY 4/1
							Core Catcher					

CLAYSTONE, greenish gray (5G 5/1), hard, slight drilling disturbance, bioturbated, interbeds of dark greenish gray (5GY 4/1) colors at 52 to 60 and 139 to 141 cm.

SS at 1-91 (dominant lithology)

Clay	D	Pyrite	R
Dolomite	R		

Carbonate Bomb: 1-84 to 85 cm = 3%

Site 368 Hole Core 30 Cored Interval: 417.5-427.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LOWERMOST MIDDLE EOCENE-UPPER LOWER EOCENE	Phormocyrtis striata striata						0					
							1	0.5 1.0	VOID			5G 5/1 5GY 4/1 5G 5/1 5GY 4/1
							2					5G 5/1 5GY 4/1 and 5G 5/1
				F N R	— — R	— — P	Core Catcher					

CLAYSTONE AND PORCELLANITE

CLAYSTONE, alternating greenish gray (5G 5/1) and dark greenish gray (5GY 4/1), interbeds, hard, slight drilling disturbance, bioturbated, Fe/Mn halos and bands.

PORCELLANITES occur at bottom of some darker (5GY 4/1) claystone beds. A large (5 cm) pyrite rosette occurs at 1-65.

Site 368 Hole Core 31 Cored Interval: 427.0-436.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS?-LOWER EOCENE?							0					
							1	0.5 1.0	VOID			
							2					
							3		VOID		53 95 123	
							4					
				R F N	— — —	— — —	Core Catcher					

CLAYSTONE WITH MINOR PORCELLANITE AND SILT

CLAYSTONE, greenish gray (5G 5/1) dominant but various shades in color bands, between 5G 6/1 and 5G 4/1, hard, slight drilling disturbance, bioturbated.

SILT laminae and burrow-fillings common. Several zones in Section 2 with floating sand grains within the claystone. Bands of pyrite occur scattered throughout.

PORCELLANITE occurs in center of olive gray (5Y 4/1), claystone zone at 3-65 cm.

SS at 3-53 (minor lithology)

Quartz	A	Heavy minerals	R
Clay	A	Fish debris	R

SS at 3-95 (dominant lithology)

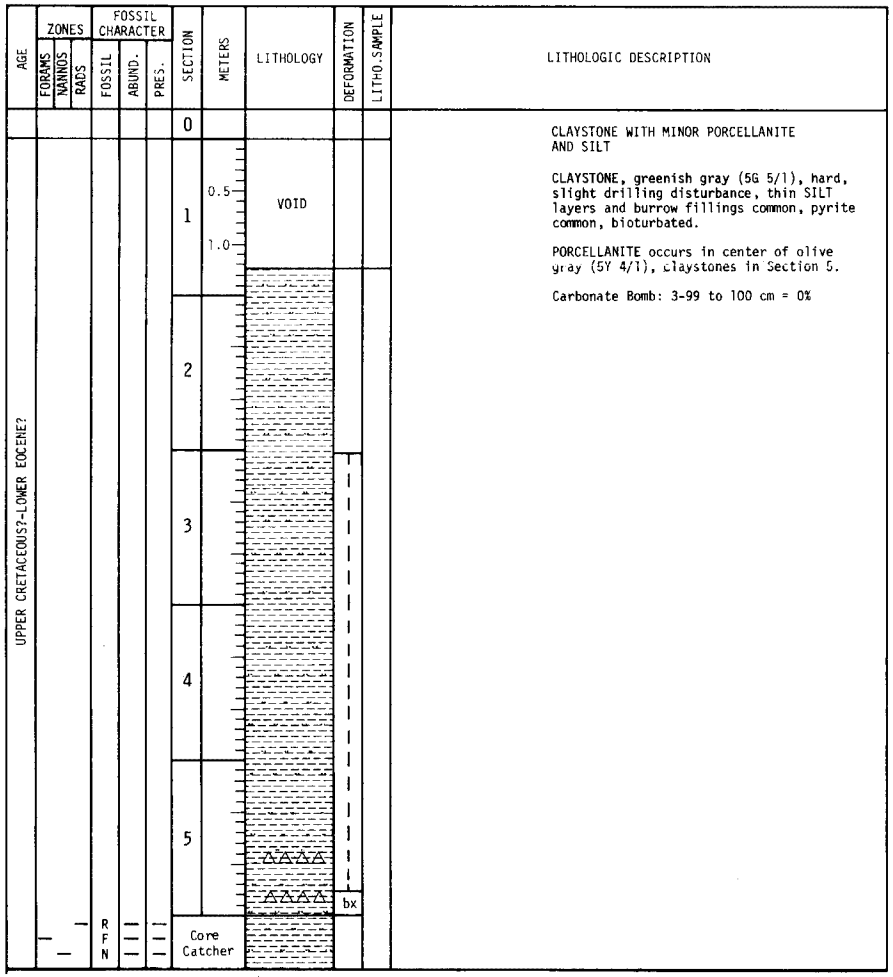
Quartz	R	Clay	D
Pyrite	R	Dolomite	R

SS at 3-123 (dominant lithology)

Quartz	R	Clay	D
Heavy minerals	R		

Carbonate Bomb: 3-121 to 122 cm = 0%

Site 368 Hole Core 32 Cored Interval: 436.5-446.0 m



LITHOLOGIC DESCRIPTION

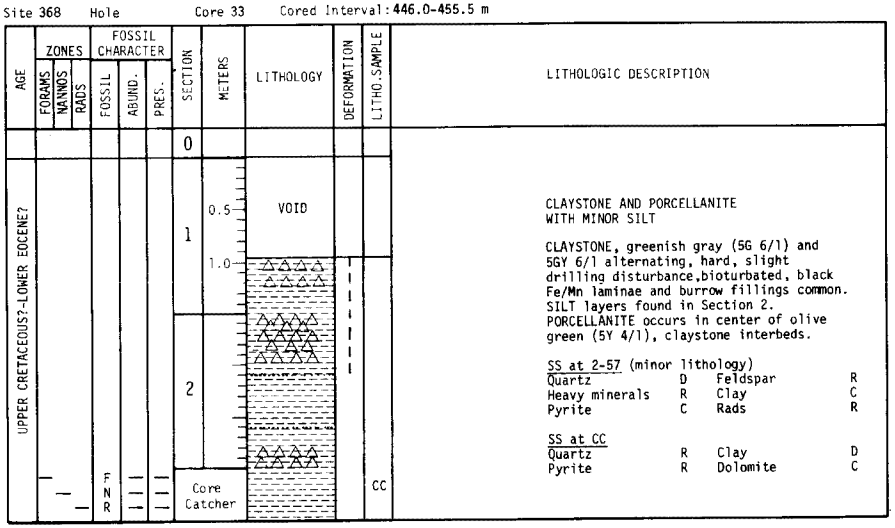
CLAYSTONE WITH MINOR PORCELLANITE AND SILT

CLAYSTONE, greenish gray (5G 5/1), hard, slight drilling disturbance, thin SILT layers and burrow fillings common, pyrite common, bioturbated.

PORCELLANITE occurs in center of olive gray (5Y 4/1), claystones in Section 5.

Carbonate Bomb: 3-99 to 100 cm = 0%

Site 368 Hole Core 33 Cored Interval: 446.0-455.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, greenish gray (5G 6/1) and 5GY 6/1 alternating, hard, slight drilling disturbance, bioturbated, black Fe/Mn laminae and burrow fillings common. SILT layers found in Section 2. PORCELLANITE occurs in center of olive green (5Y 4/1), claystone interbeds.

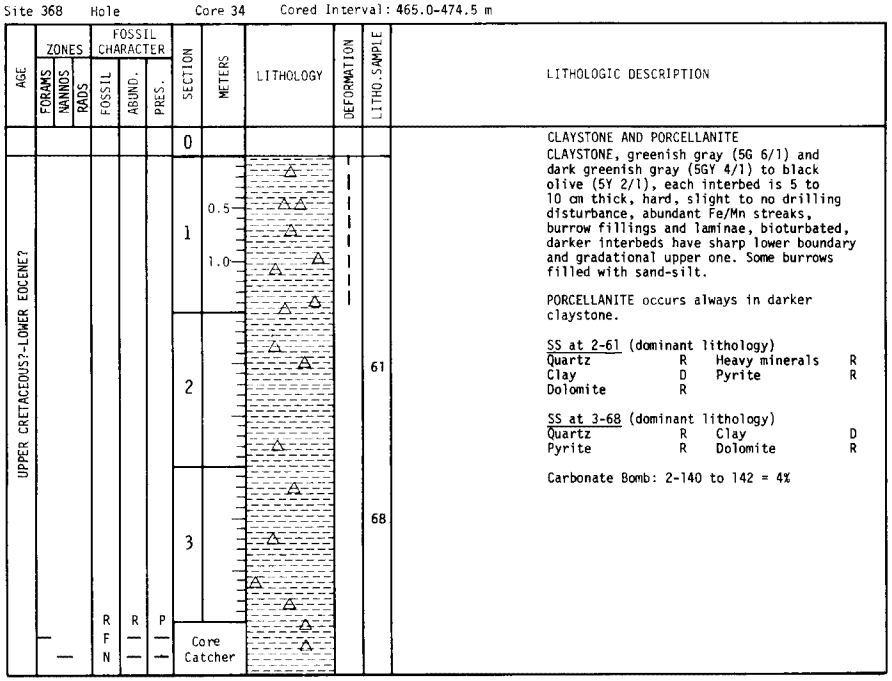
SS at 2-57 (minor lithology)

Quartz	D	Feldspar	R
Heavy minerals	R	Clay	C
Pyrite	C	Rads	R

SS at CC

Quartz	R	Clay	D
Pyrite	R	Dolomite	C

Site 368 Hole Core 34 Cored Interval: 465.0-474.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE

CLAYSTONE, greenish gray (5G 6/1) and dark greenish gray (5GY 4/1) to black olive (5Y 2/1), each interbed is 5 to 10 cm thick, hard, slight to no drilling disturbance, abundant Fe/Mn streaks, burrow fillings and laminae, bioturbated, darker interbeds have sharp lower boundary and gradational upper one. Some burrows filled with sand-silt.

PORCELLANITE occurs always in darker claystone.

SS at 2-61 (dominant lithology)

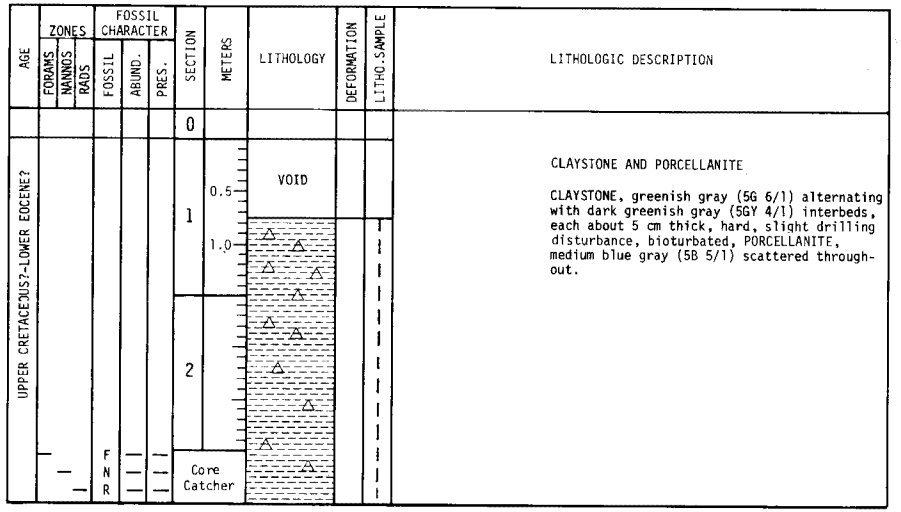
Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Dolomite	R		

SS at 3-68 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Dolomite	R

Carbonate Bomb: 2-140 to 142 = 4%

Site 368 Hole Core 35 Cored Interval: 484.0-493.5 m

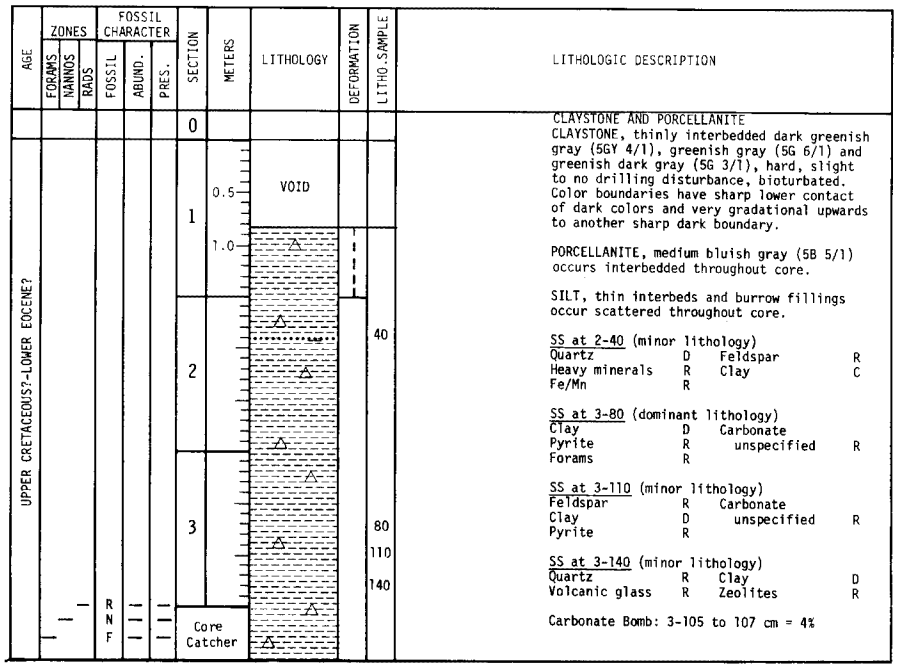


LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE

CLAYSTONE, greenish gray (5G 6/1) alternating with dark greenish gray (5GY 4/1) interbeds, each about 5 cm thick, hard, slight drilling disturbance, bioturbated, PORCELLANITE, medium blue gray (5B 5/1) scattered throughout.

Site 368 Hole Core 36 Cored Interval: 512.5-522.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE

CLAYSTONE, thinly interbedded dark greenish gray (5GY 4/1), greenish gray (5G 6/1) and greenish dark gray (5G 3/1), hard, slight to no drilling disturbance, bioturbated. Color boundaries have sharp lower contact of dark colors and very gradational upwards to another sharp dark boundary.

PORCELLANITE, medium bluish gray (5B 5/1) occurs interbedded throughout core.

SILT, thin interbeds and burrow fillings occur scattered throughout core.

SS at 2-40 (minor lithology)

Quartz	D	Feldspar	R
Heavy minerals	R	Clay	C
Fe/Mn	R		

SS at 3-80 (dominant lithology)

Clay	D	Carbonate	
Pyrite	R	unspecified	R
Forams	R		

SS at 3-110 (minor lithology)

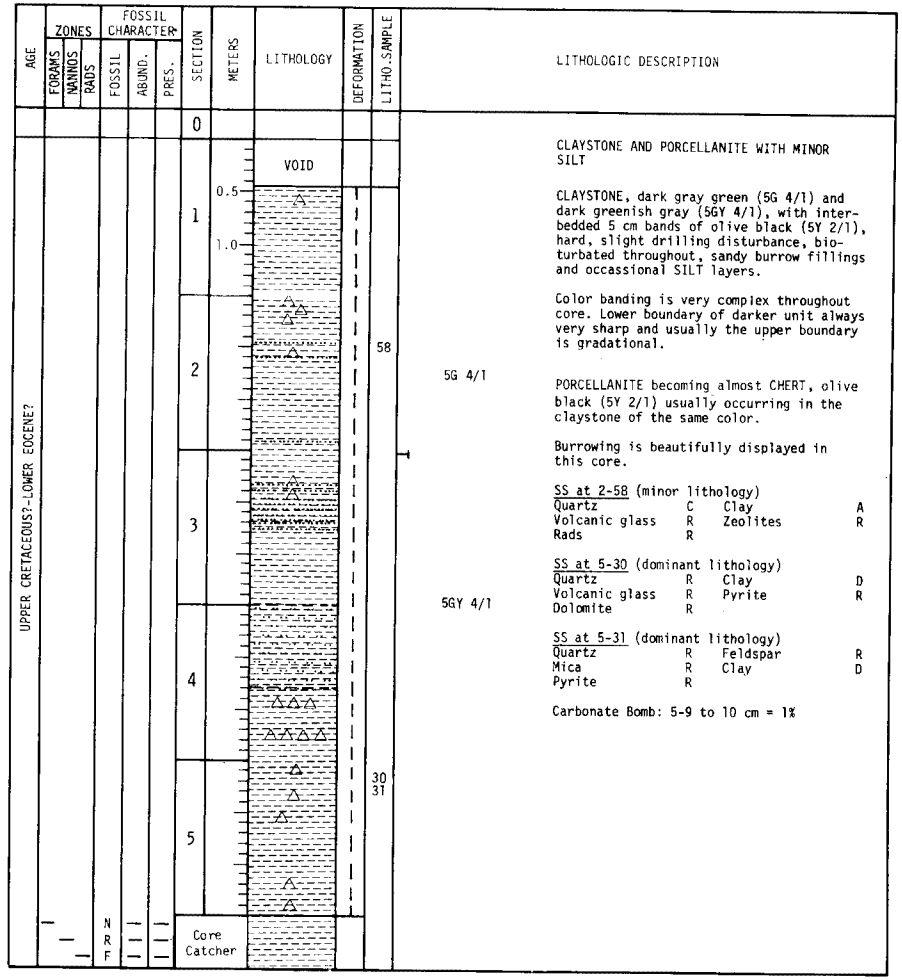
Feldspar	R	Carbonate	
Clay	D	unspecified	R
Pyrite	R		

SS at 3-140 (minor lithology)

Quartz	R	Clay	D
Volcanic glass	R	Zeolites	R

Carbonate Bomb: 3-105 to 107 cm = 4%

Site 368 Hole Core 37 Cored Interval: 531.5-541.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, dark gray green (5G 4/1) and dark greenish gray (5GY 4/1), with interbedded 5 cm bands of olive black (5Y 2/1), hard, slight drilling disturbance, bioturbated throughout, sandy burrow fillings and occassional SILT layers.

Color banding is very complex throughout core. Lower boundary of darker unit always very sharp and usually the upper boundary is gradational.

PORCELLANITE becoming almost CHERT, olive black (5Y 2/1) usually occurring in the claystone of the same color.

Burrowing is beautifully displayed in this core.

SS at 2-58 (minor lithology)

Quartz	C	Clay	A
Volcanic glass	R	Zeolites	R
Rads	R		

SS at 5-30 (dominant lithology)

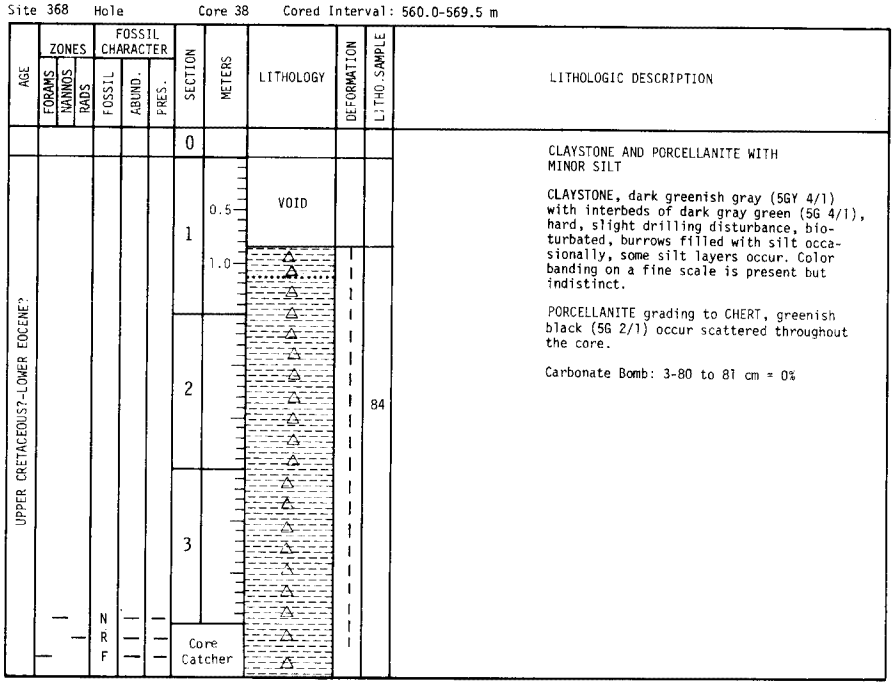
Quartz	R	Clay	D
Volcanic glass	R	Pyrite	R
Dolomite	R		

SS at 5-31 (dominant lithology)

Quartz	R	Feldspar	R
Mica	R	Clay	D
Pyrite	R		

Carbonate Bomb: 5-9 to 10 cm = 1%

Site 368 Hole Core 38 Cored Interval: 560.0-569.5 m



LITHOLOGIC DESCRIPTION

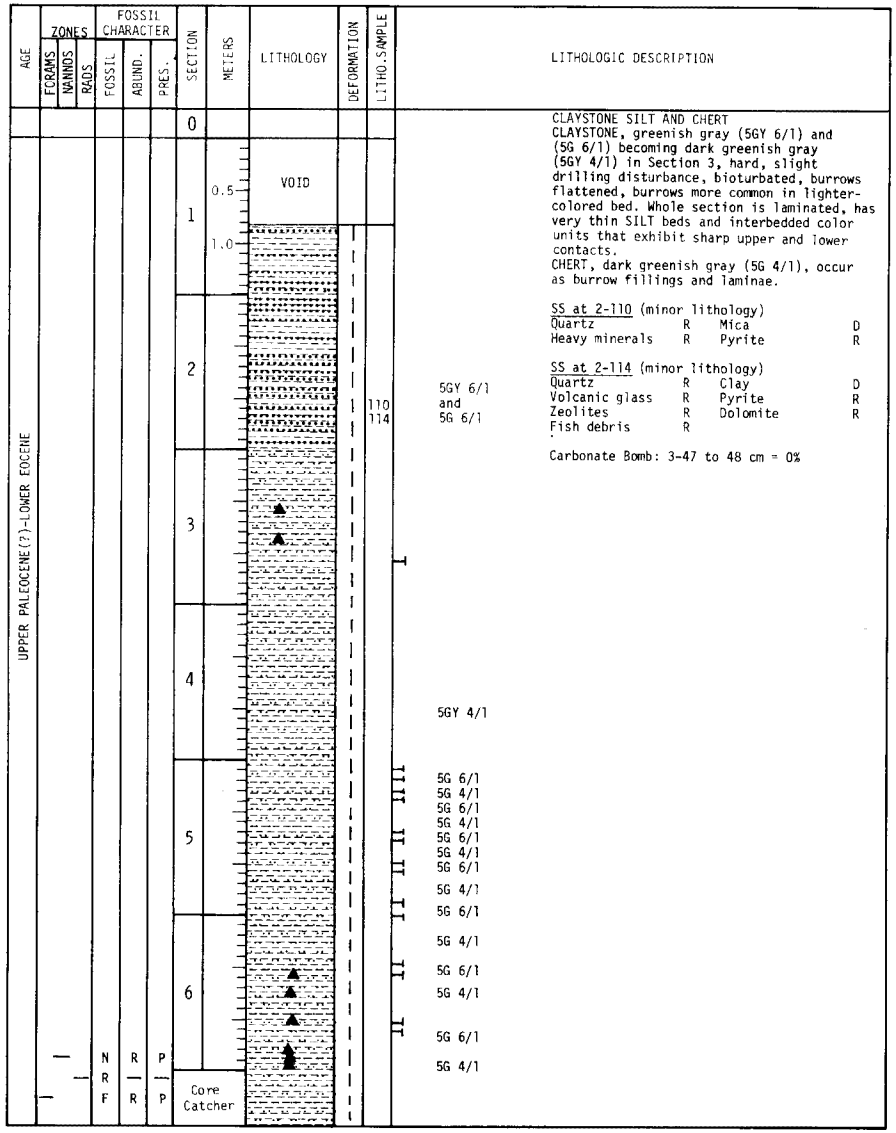
CLAYSTONE AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, dark greenish gray (5GY 4/1) with interbeds of dark gray green (5G 4/1), hard, slight drilling disturbance, bioturbated, burrows filled with silt occasionally, some silt layers occur. Color banding on a fine scale is present but indistinct.

PORCELLANITE grading to CHERT, greenish black (5G 2/1) occur scattered throughout the core.

Carbonate Bomb: 3-80 to 81 cm = 0%

Site 368 Hole Core 39 Cored Interval: 569.5-579.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE SILT AND CHERT

CLAYSTONE, greenish gray (5GY 6/1) and (5G 6/1) becoming dark greenish gray (5GY 4/1) in Section 3, hard, slight drilling disturbance, bioturbated, burrows flattened, burrows more common in lighter-colored bed. Whole section is laminated, has very thin SILT beds and interbedded color units that exhibit sharp upper and lower contacts.

CHERT, dark greenish gray (5G 4/1), occur as burrow fillings and laminae.

SS at 2-110 (minor lithology)

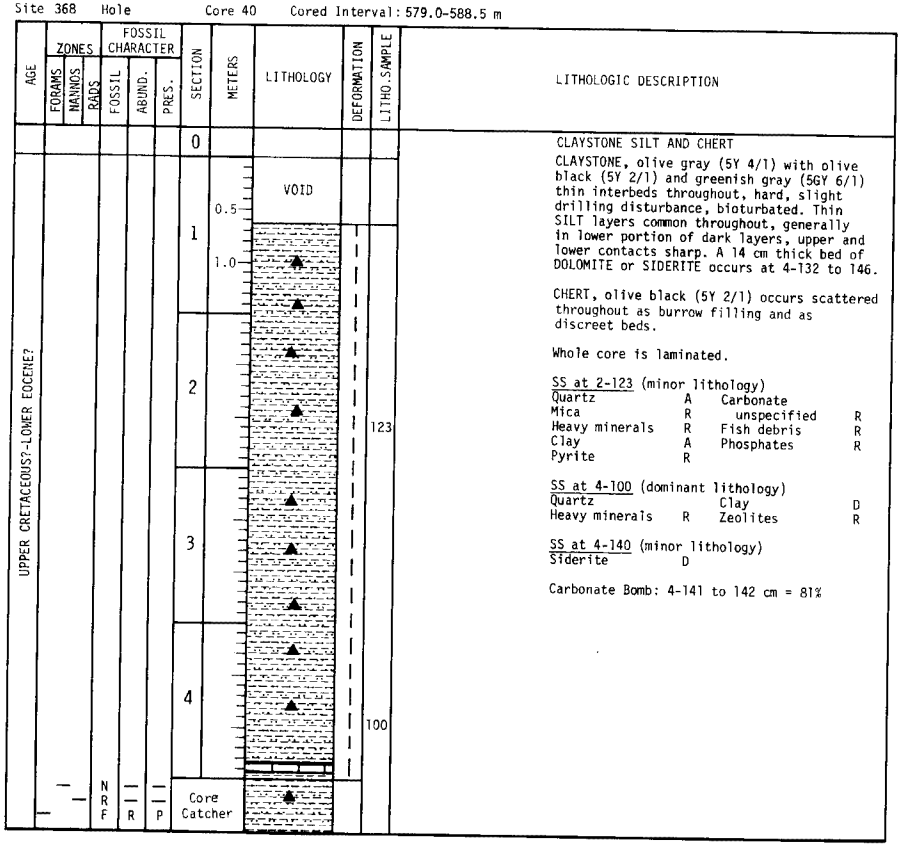
Quartz	R	Mica	D
Heavy minerals	R	Pyrite	R

SS at 2-114 (minor lithology)

Quartz	R	Clay	D
Volcanic glass	R	Pyrite	R
Zeolites	R	Dolomite	R
Fish debris	R		

Carbonate Bomb: 3-47 to 48 cm = 0%

Site 368 Hole Core 40 Cored Interval: 579.0-588.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE SILT AND CHERT

CLAYSTONE, olive gray (5Y 4/1) with olive black (5Y 2/1) and greenish gray (5GY 6/1) thin interbeds throughout, hard, slight drilling disturbance, bioturbated. Thin SILT layers common throughout, generally in lower portion of dark layers, upper and lower contacts sharp. A 14 cm thick bed of DOLOMITE or SIDERITE occurs at 4-132 to 146.

CHERT, olive black (5Y 2/1) occurs scattered throughout as burrow filling and as discreet beds.

Whole core is laminated.

SS at 2-123 (minor lithology)

Quartz	A	Carbonate unspecified	R
Mica	R		
Heavy minerals	R	Fish debris	R
Clay	A	Phosphates	R
Pyrite	R		

SS at 4-100 (dominant lithology)

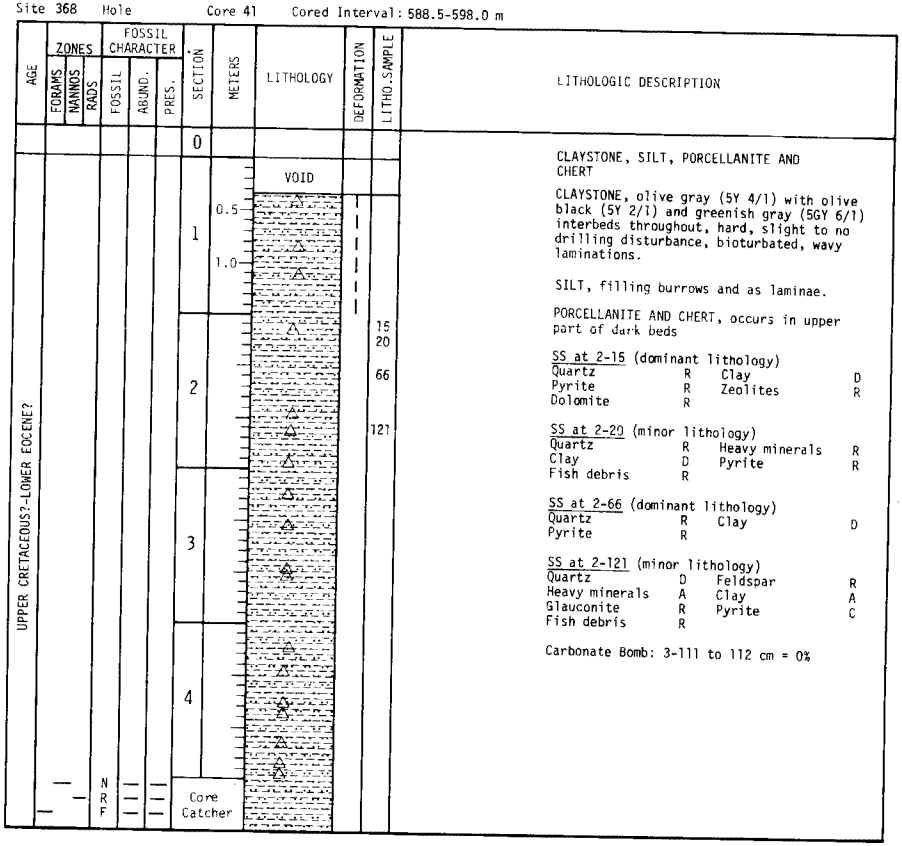
Quartz		Clay	D
Heavy minerals	R	Zeolites	R

SS at 4-140 (minor lithology)

Siderite D

Carbonate Bomb: 4-141 to 142 cm = 81%

Site 368 Hole Core 41 Cored Interval: 588.5-598.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE, SILT, PORCELLANITE AND CHERT

CLAYSTONE, olive gray (5Y 4/1) with olive black (5Y 2/1) and greenish gray (5GY 6/1) interbeds throughout, hard, slight to no drilling disturbance, bioturbated, wavy laminations.

SILT, filling burrows and as laminae.

PORCELLANITE AND CHERT, occurs in upper part of dark beds

SS at 2-15 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Zeolites	R
Dolomite	R		

SS at 2-20 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Fish debris	R		

SS at 2-66 (dominant lithology)

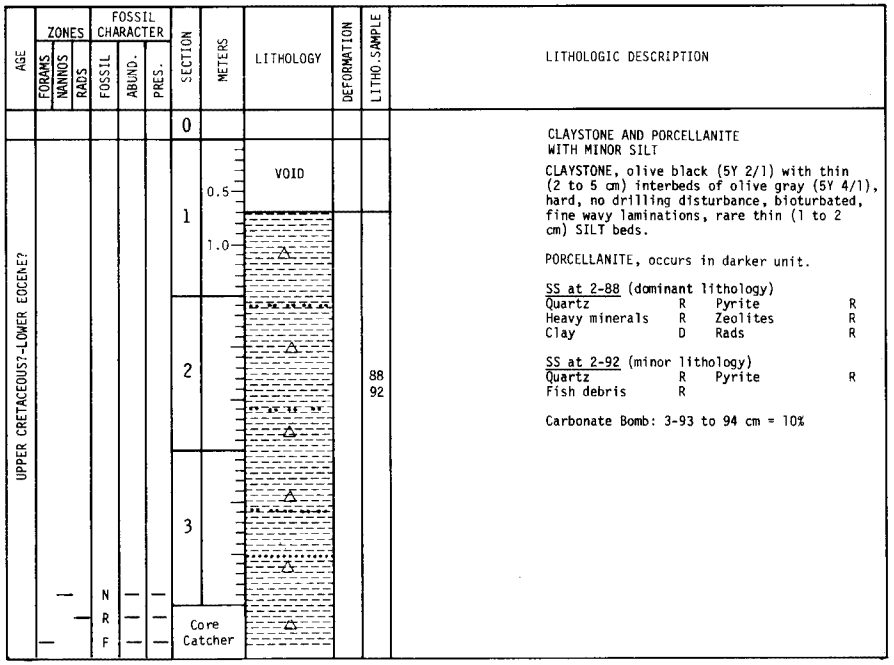
Quartz	R	Clay	D
Pyrite	R		

SS at 2-121 (minor lithology)

Quartz	D	Feldspar	R
Heavy minerals	A	Clay	A
Glauconite	R	Pyrite	C
Fish debris	R		

Carbonate Bomb: 3-111 to 112 cm = 0%

Site 368 Hole Core 42 Cored Interval: 598.0-607.5 m



CLAYSTONE AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, olive black (5Y 2/1) with thin (2 to 5 cm) interbeds of olive gray (5Y 4/1), hard, no drilling disturbance, bioturbated, fine wavy laminations, rare thin (1 to 2 cm) SILT beds.

PORCELLANITE, occurs in darker unit.

SS at 2-88 (dominant lithology)

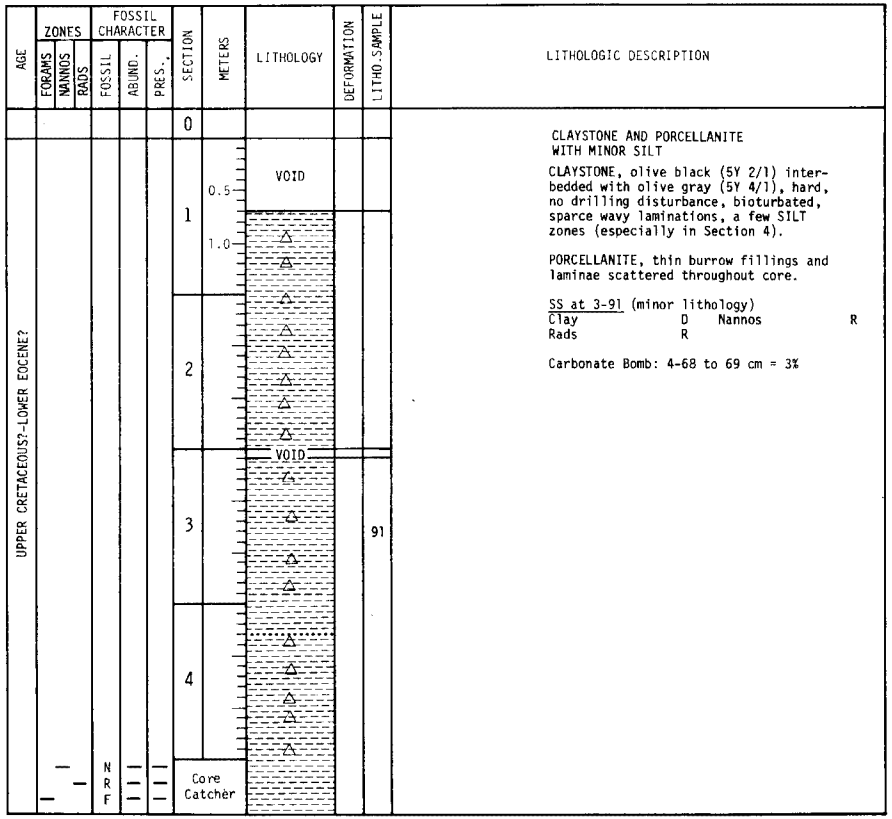
Quartz	R	Pyrite	R
Heavy minerals	R	Zeolites	R
Clay	D	Rads	R

SS at 2-92 (minor lithology)

Quartz	R	Pyrite	R
Fish debris	R		

Carbonate Bomb: 3-93 to 94 cm = 10%

Site 368 Hole Core 43 Cored Interval: 607.5-617.0 m



CLAYSTONE AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, olive black (5Y 2/1) interbedded with olive gray (5Y 4/1), hard, no drilling disturbance, bioturbated, sparce wavy laminations, a few SILT zones (especially in Section 4).

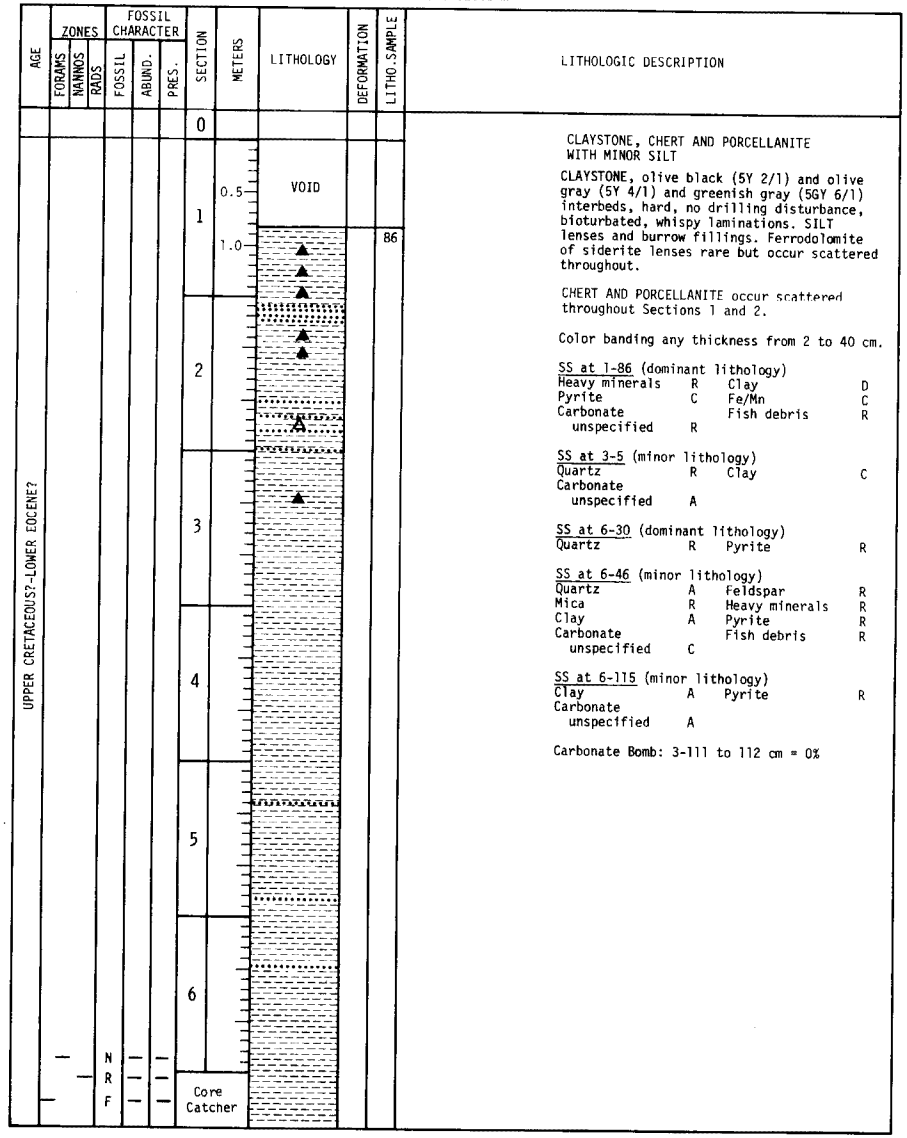
PORCELLANITE, thin burrow fillings and laminae scattered throughout core.

SS at 3-91 (minor lithology)

Clay	D	Nannos	R
Rads	R		

Carbonate Bomb: 4-68 to 69 cm = 3%

Site 368 Hole Core 44 Cored Interval: 617.0-626.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE, CHERT AND PORCELLANITE WITH MINOR SILT

CLAYSTONE, olive black (5Y 2/1) and olive gray (5Y 4/1) and greenish gray (5GY 6/1) interbeds, hard, no drilling disturbance, bioturbated, whispy laminations. SILT lenses and burrow fillings. Ferrodolomite of siderite lenses rare but occur scattered throughout.

CHERT AND PORCELLANITE occur scattered throughout Sections 1 and 2.

Color banding any thickness from 2 to 40 cm.

SS at 1-86 (dominant lithology)

Heavy minerals	R	Clay	D
Pyrite	C	Fe/Mn	C
Carbonate unspecified	R	Fish debris	R

SS at 3-5 (minor lithology)

Quartz	R	Clay	C
Carbonate unspecified	A		

SS at 6-30 (dominant lithology)

Quartz	R	Pyrite	R

SS at 6-46 (minor lithology)

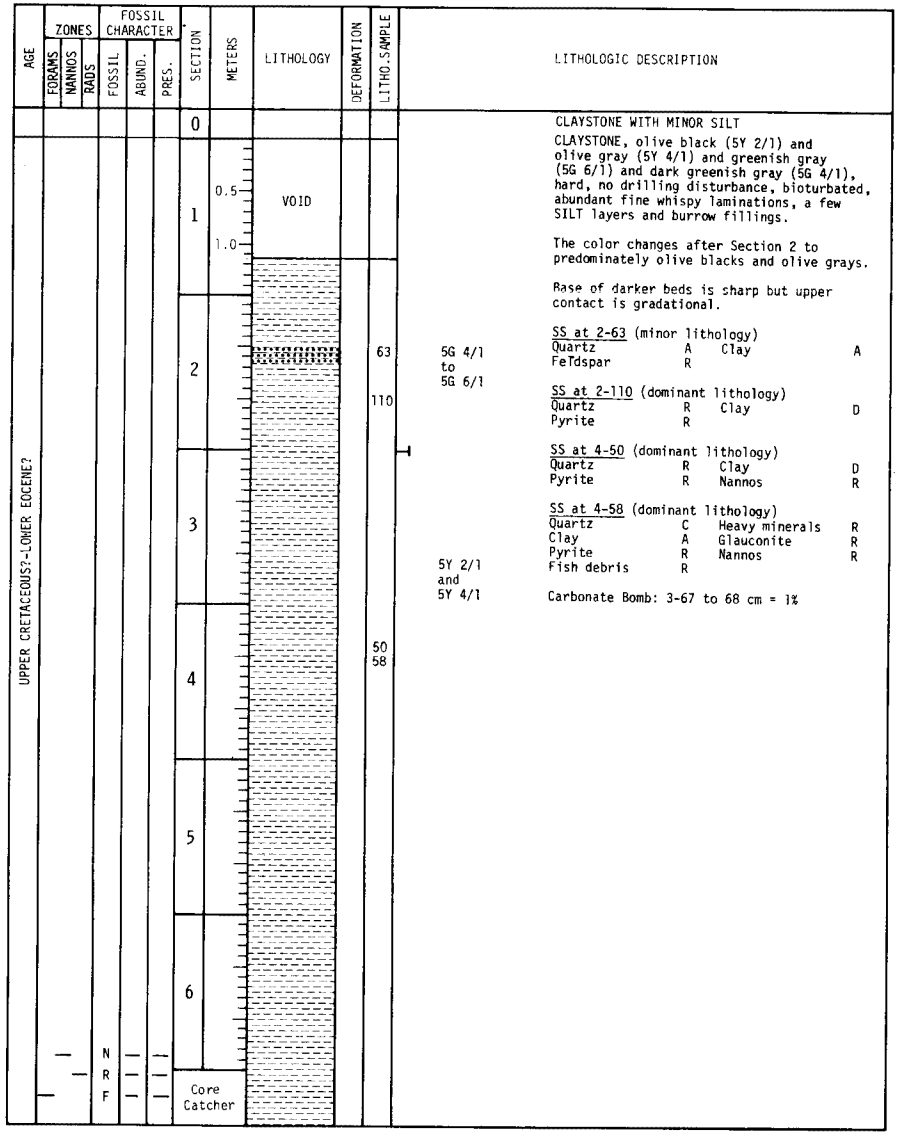
Quartz	A	Feldspar	R
Mica	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	C	Fish debris	R

SS at 6-115 (minor lithology)

Clay	A	Pyrite	R
Carbonate unspecified	A		

Carbonate Bomb: 3-111 to 112 cm = 0%

Site 368 Hole Core 45 Cored Interval: 626.5-636.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH MINOR SILT

CLAYSTONE, olive black (5Y 2/1) and olive gray (5Y 4/1) and greenish gray (5G 6/1) and dark greenish gray (5G 4/1), hard, no drilling disturbance, bioturbated, abundant fine whispy laminations, a few SILT layers and burrow fillings.

The color changes after Section 2 to predominately olive blacks and olive grays.

Base of darker beds is sharp but upper contact is gradational.

SS at 2-63 (minor lithology)

Quartz	A	Clay	A
FeTdspar	R		

SS at 2-110 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R		

SS at 4-50 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Nannos	R

SS at 4-58 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Nannos	R
Fish debris	R		

Carbonate Bomb: 3-67 to 68 cm = 1%

Site 368 Hole Core 46 Cored Interval: 636.0-645.5 m

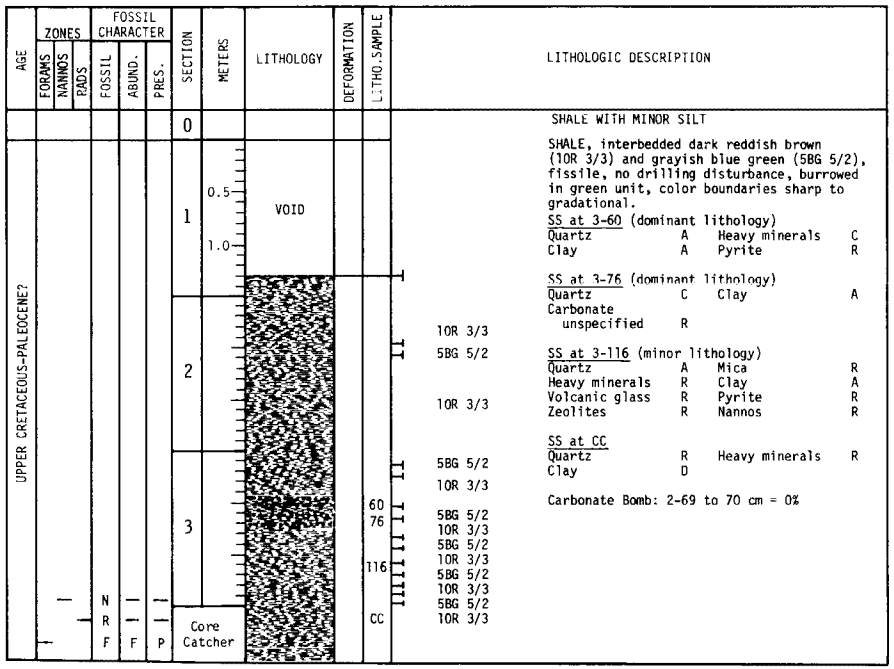
AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS?-LOWER EOCENE?							0					INTERBEDDED CLAYSTONE AND SILTSTONE CLAYSTONE, olive black (5Y 2/1) and olive gray (5Y 4/1), hard, no drilling disturbance, bioturbated, basal contact of darker bed sharp, upper contact gradational, fine wavy laminations. Pyrite rosettes occur in Sections 3 and 4. SILTSTONE, olive black (5Y 2/1), hard, occur as 1 to 5 cm thick beds scattered throughout core - sometimes making up over 50% of a section (i.e. Section 3). Thickness of interbeds vary between 1 and 40 cm. Carbonate Bomb: 3-146 to 147 cm = 0%
							1	0.5 1.0				
							2					
							3		Fe Fe Fe			
							4		Fe			
							5					
							6					
	—		N	—	—							
		—	R	—	—							
	—		F	—	—		Core Catcher					

Site 368 Hole Core 47 Cored Interval: 645.5-655.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER CRETACEOUS?-LOWER EOCENE?							0					INTERBEDDED CLAYSTONE AND SILTSTONE CLAYSTONE, olive black (5Y 2/1) interbedded with dark greenish gray (5GY 4/1), hard, no drilling disturbance, bioturbated, load casts, SILT stringers and siderite-cemented siltstones scattered throughout. SS at 2-62 (minor lithology) Feldspar R Heavy minerals R Clay C Pyrite R Siderite A Rads R SS at 2-91 (minor lithology) Clay D Pyrite R Siderite C SS at 6-85 (dominant lithology) Quartz R Clay D Pyrite R Siderite R Carbonate Bomb: 3-121 to 122 cm = 0%
							1	0.5 1.0				
							2				62 91	
							3					
							4					
							5					
							6				85	
	—			N	—	—						
	—			F	R	P	Core Catcher					

Site 368, Core 48, Cored Interval: 664.5-674.0 m: NO RECOVERY
Site 368, Core 49, Cored Interval: 693.0-702.5 m: NO RECOVERY

Site 368 Hole Core 50 Cored Interval: 702.5-712.0 m



LITHOLOGIC DESCRIPTION

SHALE WITH MINOR SILT

SHALE, interbedded dark reddish brown (10R 3/3) and grayish blue green (5BG 5/2), fissile, no drilling disturbance, burrowed in green unit, color boundaries sharp to gradational.

SS at 3-60 (dominant lithology)

Quartz	A	Heavy minerals	C
Clay	A	Pyrite	R

SS at 3-76 (dominant lithology)

Quartz	C	Clay	A
Carbonate unspecified	R		

SS at 3-116 (minor lithology)

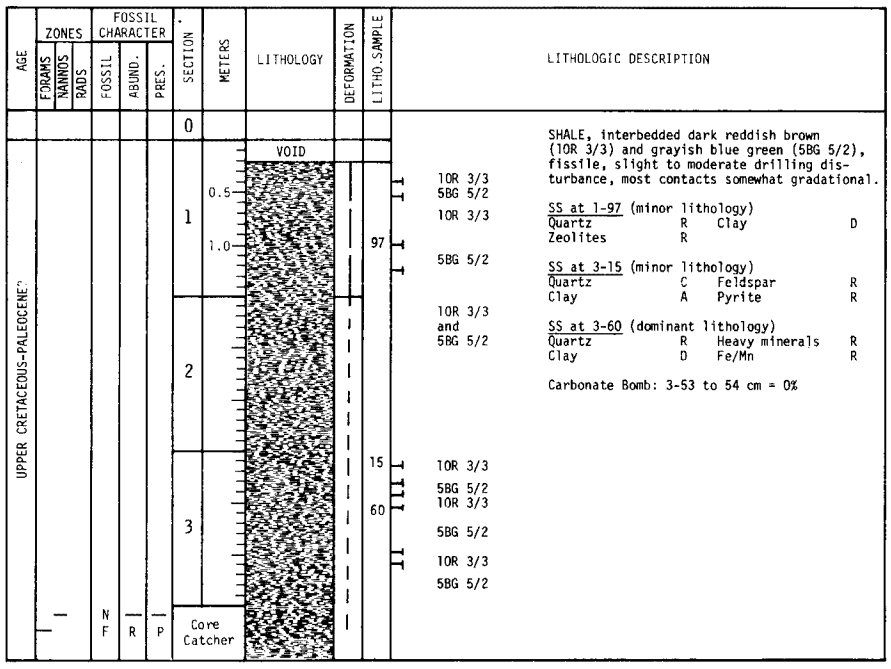
Quartz	A	Mica	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Pyrite	R
Zeolites	R	Nannos	R

SS at CC

Quartz	R	Heavy minerals	R
Clay	D		

Carbonate Bomb: 2-69 to 70 cm = 0%

Site 368 Hole Core 51 Cored Interval: 712.0-721.5 m



LITHOLOGIC DESCRIPTION

SHALE, interbedded dark reddish brown (10R 3/3) and grayish blue green (5BG 5/2), fissile, slight to moderate drilling disturbance, most contacts somewhat gradational.

SS at 1-97 (minor lithology)

Quartz	R	Clay	D
Zeolites	R		

SS at 3-15 (minor lithology)

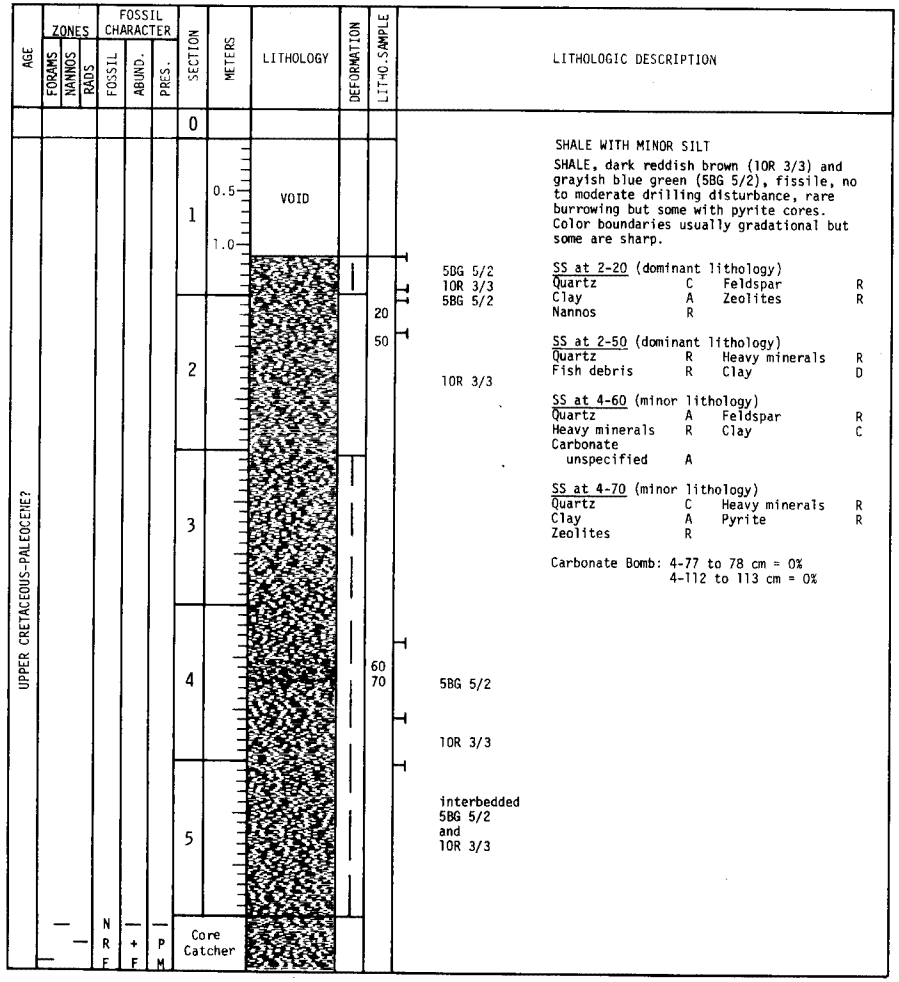
Quartz	C	Feldspar	R
Clay	A	Pyrite	R

SS at 3-60 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Fe/Mn	R

Carbonate Bomb: 3-53 to 54 cm = 0%

Site 368 Hole Core 52 Cored Interval: 721.5-731.0 m



LITHOLOGIC DESCRIPTION

SHALE WITH MINOR SILT

SHALE, dark reddish brown (10R 3/3) and grayish blue green (5BG 5/2), fissile, no to moderate drilling disturbance, rare burrowing but some with pyrite cores. Color boundaries usually gradational but some are sharp.

SS at 2-20 (dominant lithology)

Quartz	C	Feldspar	R
Clay	A	Zeolites	R
Nannos	R		

SS at 2-50 (dominant lithology)

Quartz	R	Heavy minerals	R
Fish debris	R	Clay	D

SS at 4-60 (minor lithology)

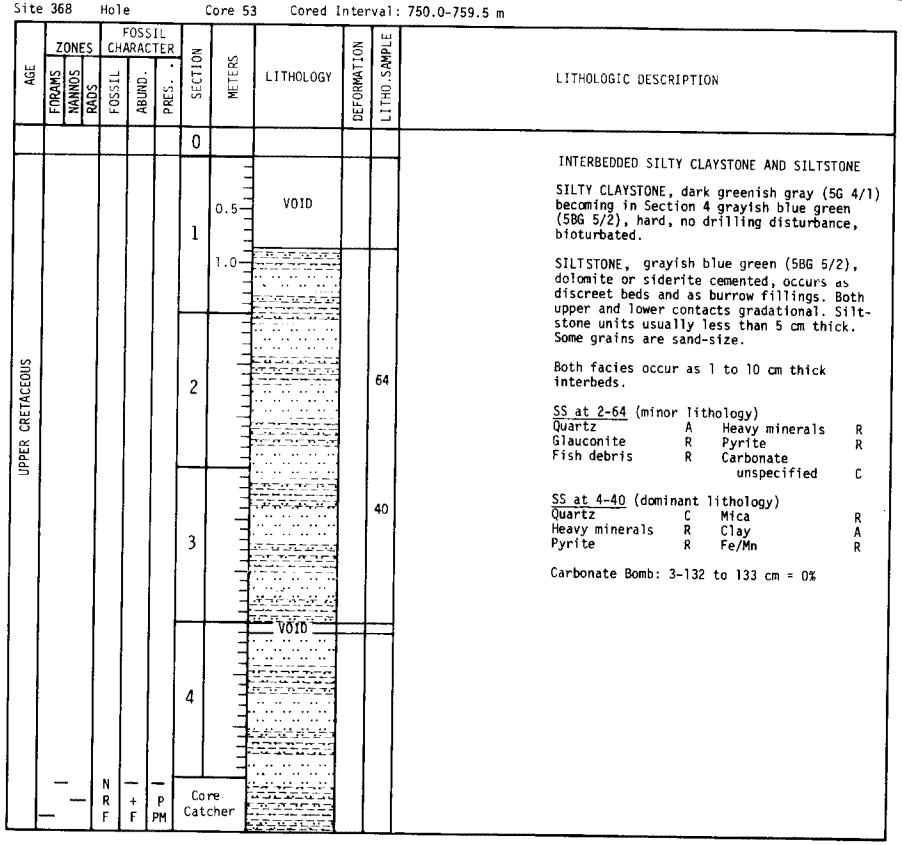
Quartz	A	Feldspar	R
Heavy minerals	R	Clay	C
Carbonate unspecified	A		

SS at 4-70 (minor lithology)

Quartz	C	Heavy minerals	R
Clay	A	Pyrite	R
Zeolites	R		

Carbonate Bomb: 4-77 to 78 cm = 0%
4-112 to 113 cm = 0%

Site 368 Hole Core 53 Cored Interval: 750.0-759.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED SILTY CLAYSTONE AND SILTSTONE

SILTY CLAYSTONE, dark greenish gray (5G 4/1) becoming in Section 4 grayish blue green (5BG 5/2), hard, no drilling disturbance, bioturbated.

SILTSTONE, grayish blue green (5BG 5/2), dolomite or siderite cemented, occurs as discreet beds and as burrow fillings. Both upper and lower contacts gradational. Siltstone units usually less than 5 cm thick. Some grains are sand-size.

Both facies occur as 1 to 10 cm thick interbeds.

SS at 2-64 (minor lithology)

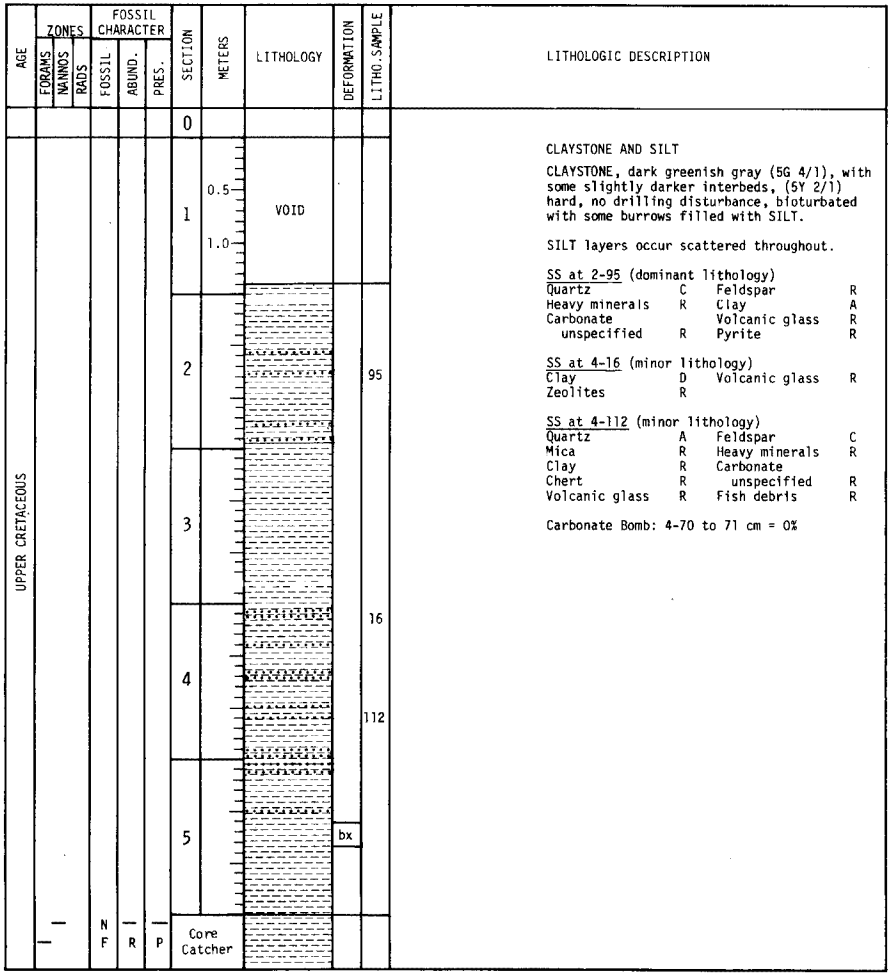
Quartz	A	Heavy minerals	R
Glauconite	R	Pyrite	R
Fish debris	R	Carbonate unspecified	C

SS at 4-40 (dominant lithology)

Quartz	C	Mica	R
Heavy minerals	R	Clay	A
Pyrite	R	Fe/Mn	R

Carbonate Bomb: 3-132 to 133 cm = 0%

Site 368 Hole Core 54 Cored Interval: 797.5-807.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND SILT

CLAYSTONE, dark greenish gray (5G 4/1), with some slightly darker interbeds, (5Y 2/1) hard, no drilling disturbance, bioturbated with some burrows filled with SILT.

SILT layers occur scattered throughout.

SS at 2-95 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Carbonate unspecified	R	Volcanic glass	R
		Pyrite	R

SS at 4-16 (minor lithology)

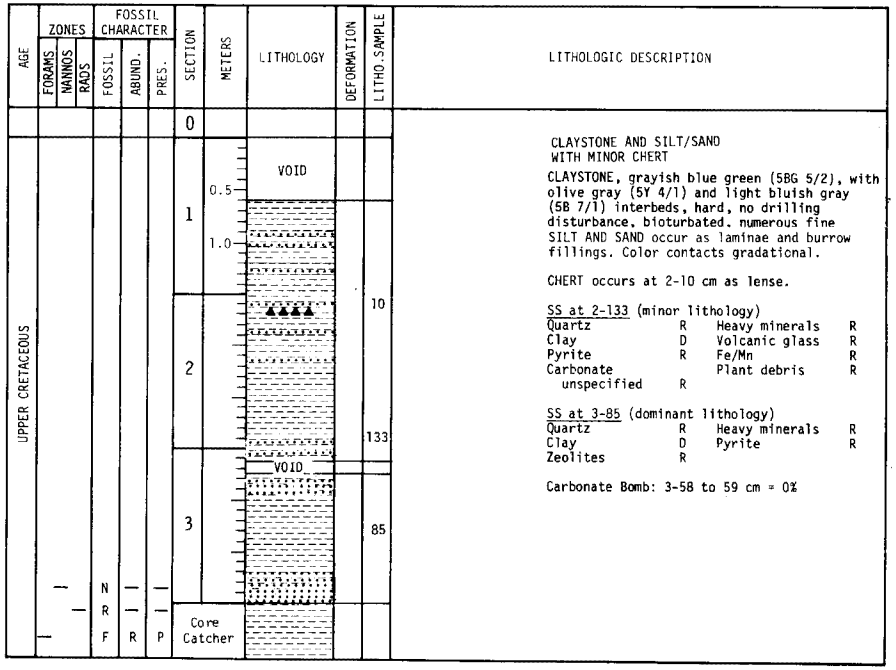
Clay	D	Volcanic glass	R
Zeolites	R		

SS at 4-112 (minor lithology)

Quartz	A	Feldspar	C
Mica	R	Heavy minerals	R
Clay	R	Carbonate unspecified	R
Chert	R	Fish debris	R
Volcanic glass	R		

Carbonate Bomb: 4-70 to 71 cm = 0%

Site 368 Hole Core 55 Cored Interval: 837.5-845.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE AND SILT/SAND WITH MINOR CHERT

CLAYSTONE, grayish blue green (5BG 5/2), with olive gray (5Y 4/1) and light bluish gray (5B 7/1) interbeds, hard, no drilling disturbance, bioturbated, numerous fine SILT AND SAND occur as laminae and burrow fillings. Color contacts gradational.

CHERT occurs at 2-10 cm as lense.

SS at 2-133 (minor lithology)

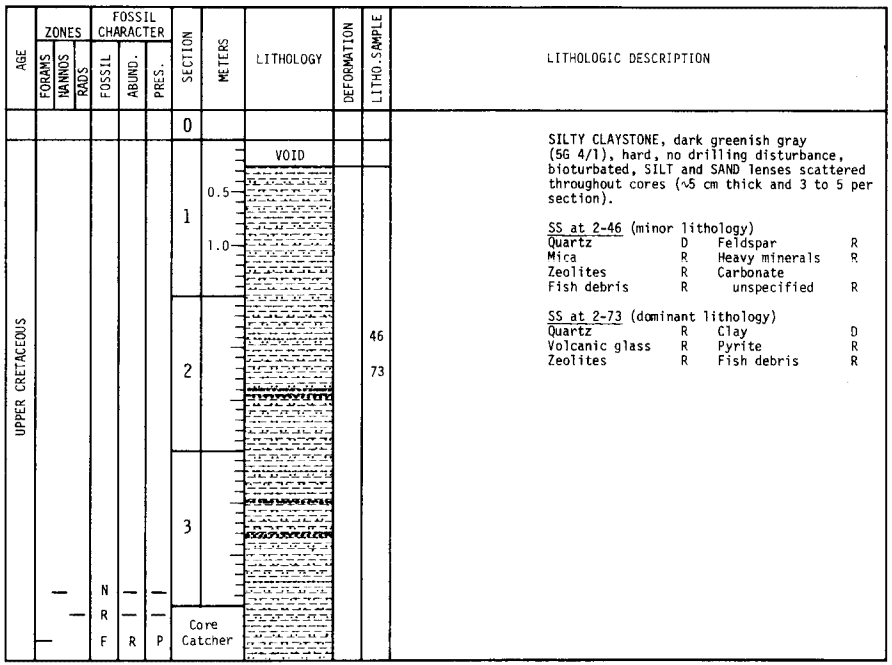
Quartz	R	Heavy minerals	R
Clay	D	Volcanic glass	R
Pyrite	R	Fe/Mn	R
Carbonate unspecified	R	Plant debris	R

SS at 3-85 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Zeolites	R		

Carbonate Bomb: 3-58 to 59 cm = 0%

Site 368 Hole Core 56 Cored Interval: 845.0-844.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAYSTONE, dark greenish gray (5G 4/1), hard, no drilling disturbance, bioturbated, SILT and SAND lenses scattered throughout cores (~5 cm thick and 3 to 5 per section).

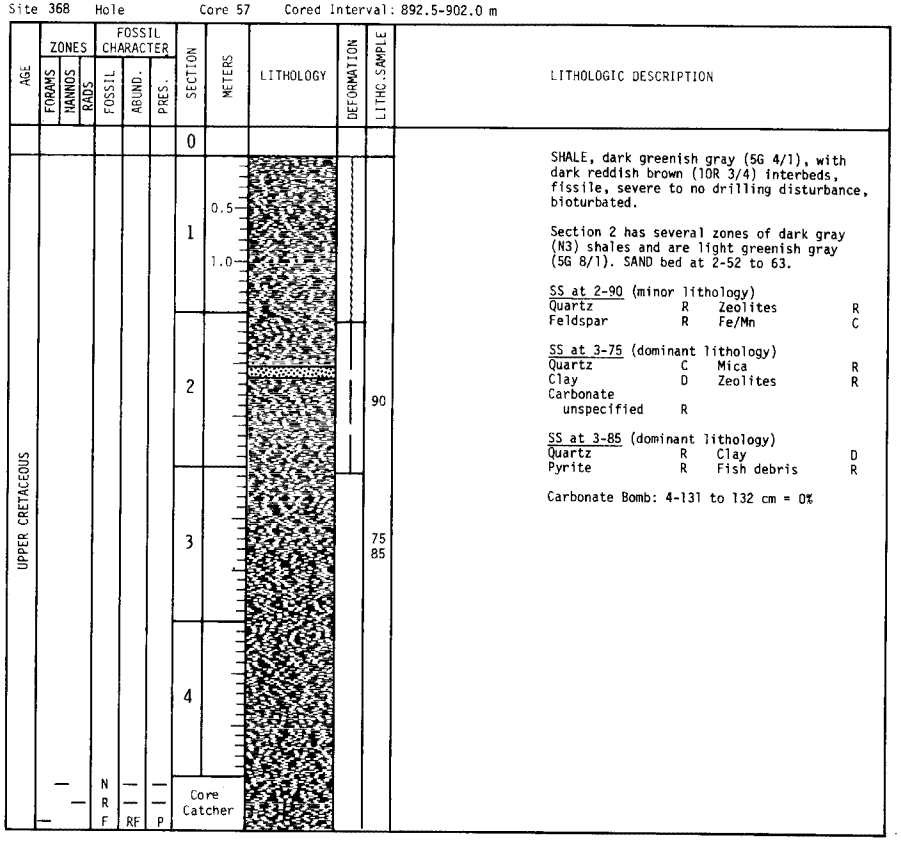
SS at 2-46 (minor lithology)

Quartz	D	Feldspar	R
Mica	R	Heavy minerals	R
Zeolites	R	Carbonate unspecified	R
Fish debris	R		

SS at 2-73 (dominant lithology)

Quartz	R	Clay	D
Volcanic glass	R	Pyrite	R
Zeolites	R	Fish debris	R

Site 368 Hole Core 57 Cored Interval: 892.5-902.0 m



LITHOLOGIC DESCRIPTION

SHALE, dark greenish gray (5G 4/1), with dark reddish brown (10R 3/4) interbeds, fissile, severe to no drilling disturbance, bioturbated.

Section 2 has several zones of dark gray (N3) shales and are light greenish gray (5G 8/1). SAND bed at 2-52 to 63.

SS at 2-90 (minor lithology)

Quartz	R	Zeolites	R
Feldspar	R	Fe/Mn	C

SS at 3-75 (dominant lithology)

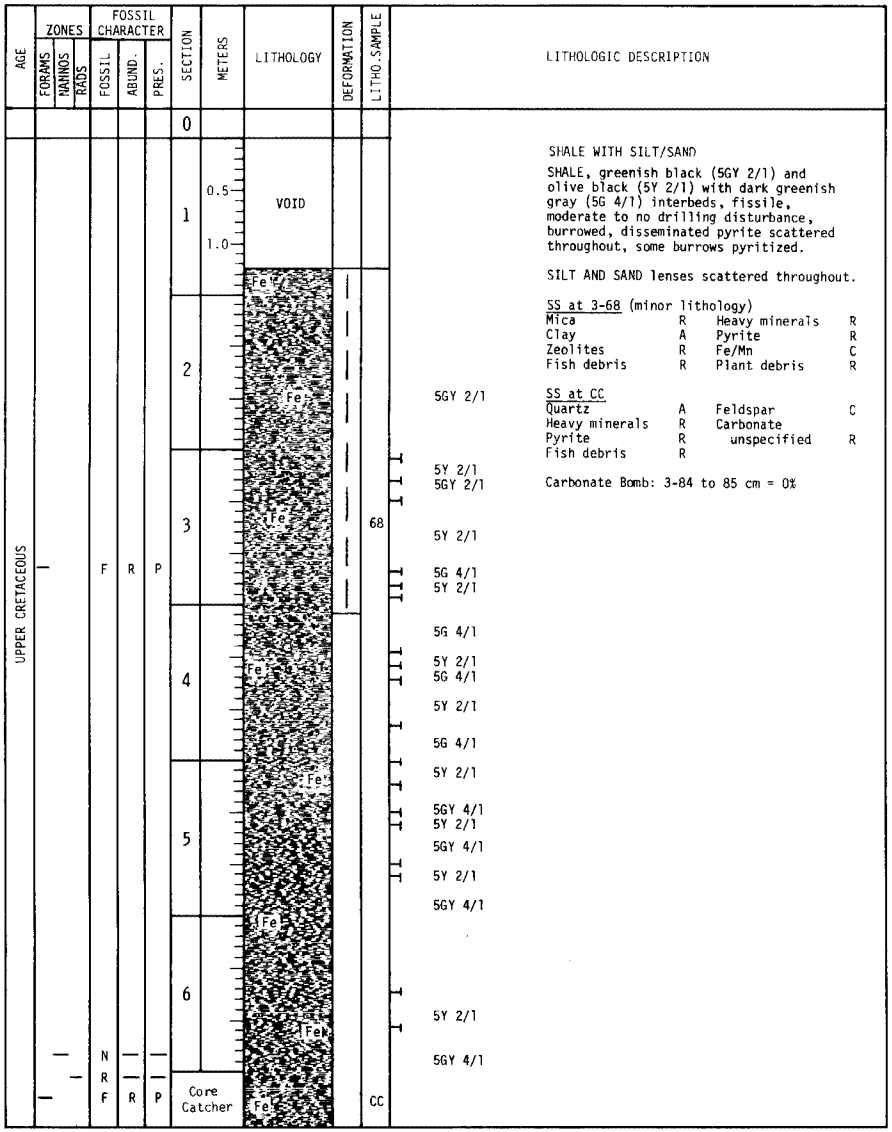
Quartz	C	Mica	R
Clay	D	Zeolites	R
Carbonate unspecified	R		

SS at 3-85 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Fish debris	R

Carbonate Bomb: 4-131 to 132 cm = 0%

Site 368 Hole Core 58 Cored Interval: 921.0-930.5 m



LITHOLOGIC DESCRIPTION

SHALE WITH SILT/SAND

SHALE, greenish black (5GY 2/1) and olive black (5Y 2/1) with dark greenish gray (5G 4/1) interbeds, fissile, moderate to no drilling disturbance, burrowed, disseminated pyrite scattered throughout, some burrows pyritized.

SILT AND SAND lenses scattered throughout.

SS at 3-68 (minor lithology)

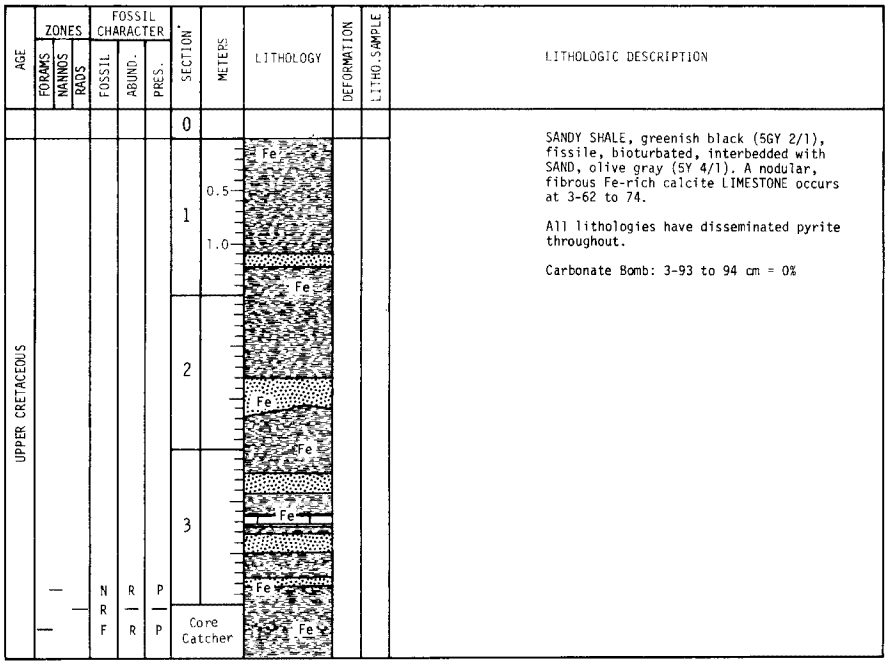
Mica	R	Heavy minerals	R
Clay	A	Pyrite	R
Zeolites	R	Fe/Mn	C
Fish debris	R	Plant debris	R

SS at CC

Quartz	A	Feldspar	C
Heavy minerals	R	Carbonate unspecified	R
Pyrite	R		
Fish debris	R		

Carbonate Bomb: 3-84 to 85 cm = 0%

Site 368 Hole Core 59 Cored Interval: 938.5-948.0 m



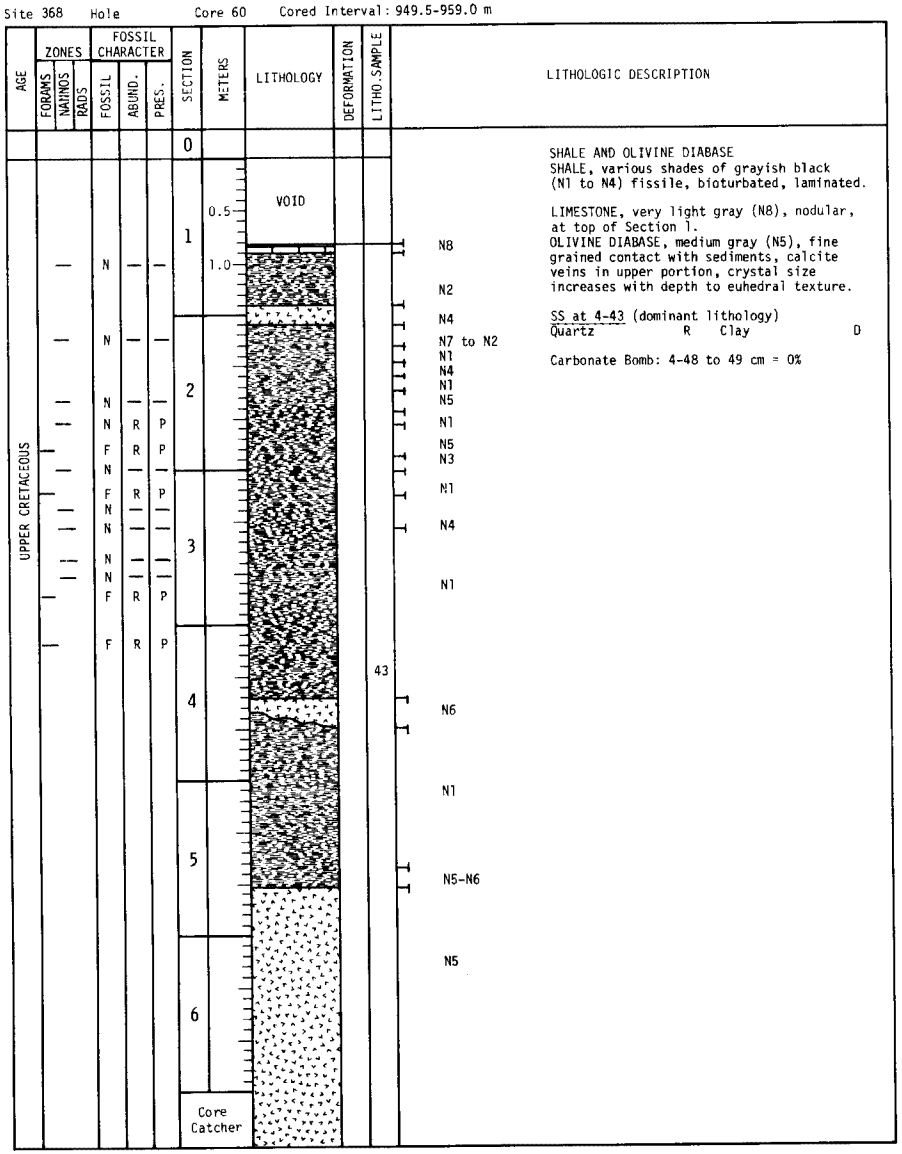
LITHOLOGIC DESCRIPTION

SANDY SHALE, greenish black (5GY 2/1), fissile, bioturbated, interbedded with SAND, olive gray (5Y 4/1). A nodular, fibrous Fe-rich calcite LIMESTONE occurs at 3-62 to 74.

All lithologies have disseminated pyrite throughout.

Carbonate Bomb: 3-93 to 94 cm = 0%

Site 368 Hole Core 60 Cored Interval: 949.5-959.0 m



LITHOLOGIC DESCRIPTION

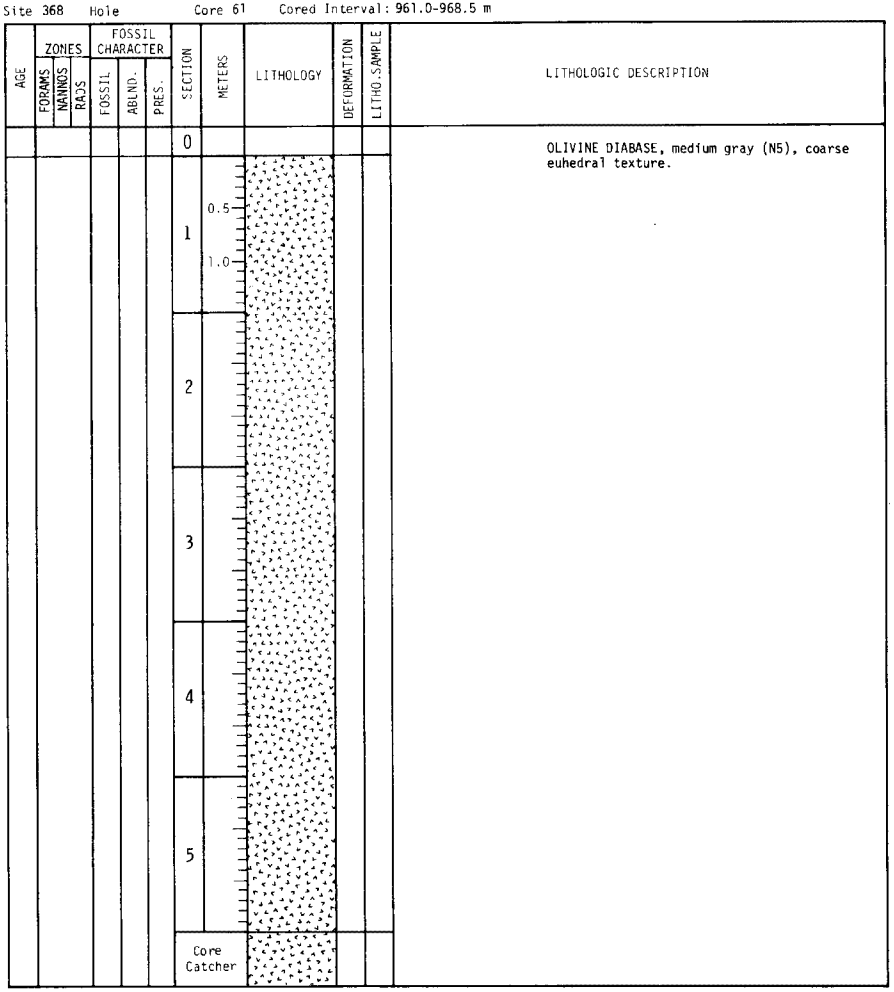
SHALE AND OLIVINE DIABASE
SHALE, various shades of grayish black (N1 to N4) fissile, bioturbated, laminated.

LIMESTONE, very light gray (N8), nodular, at top of Section 1.
OLIVINE DIABASE, medium gray (N5), fine grained contact with sediments, calcite veins in upper portion, crystal size increases with depth to euhedral texture.

SS at 4-43 (dominant lithology)
Quartz R Clay D

Carbonate Bomb: 4-48 to 49 cm = 0%

Site 368 Hole Core 61 Cored Interval: 961.0-968.5 m



LITHOLOGIC DESCRIPTION

OLIVINE DIABASE, medium gray (N5), coarse euhedral texture.

Site 368 Hole Core 62 Cored Interval: 968.5-975.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					
ALBIAN-TURONIAN							1	0.5 1.0				OLIVINE DIABASE AND SHALE OLIVE DIABASE, medium gray (N5), coarse euhedral texture becoming finer with depth. Baked contact zone of SHALE, medium light gray (N6), light brownish gray (5YR 6/1) to dark gray (N3), very hard and fissile, baked zone extends from 3-7 cm to 100 cm, burrowed in unbaked portion. SS at 4-36 (dominant lithology) Quartz C Volcanic glass R Pyrite C Nannos R
							2					N5
							3					N6 + N3
	—			F	R	P	4			36		N1
	—			N	F	P						N4
	—			F	R	P						N1
	—			N	F	P						
	—			N	R	P						
							Core Catcher					

Site 368 Hole Core 63 Cored Interval: 975.0-984.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
							0					
ALBIAN-TURONIAN							1	0.5 1.0	VOID			SHALE, black (N1) with thin (~5 cm) interbeds of greenish gray (5G 4/1), fissile, bioturbated, a few scattered finely laminated silt interbeds. Shale becomes olive black (5Y 2/1) in Sections 3 and 4. SS at 1-85 (minor lithology) Quartz A Mica R Clay A Pyrite C Carbonate Forams R unspecified R Nannos R Rads R SS at 1-120 (dominant lithology) Quartz R Mica R Heavy minerals R Clay D Pyrite C Carbonate Plant debris C unspecified R Carbonate Bomb: 3-127 to 128 cm = 19%
	—			N	F	P					85	
	—			N	F	P					120	N1 and 5G 4/1
							2					
							3					5Y 2/1
							4					
	—			N	F	P	Core Catcher					
	—			F	R	P						

DEEP SEA DRILLING PROJECT

LEG 41 SITE 369 (HOLE 369A)

SITE SUMMARY SHEET

PRINCIPAL RESULTS:

Continental Slope off Spanish Sahara

The upper part of the sediment section of the continental slope off Cape Bojador was continuously cored down to 488.5 meters. The sediments are predominantly pelagic with only a minor coarse terrigenous contribution. They consist mainly of nannofossil marls, with some limestone and chalk. The section can be summarized as follows (from top to bottom); 1) Quaternary to early Miocene nannofossil marl and ooze with minor volcanic ash; 2) early Miocene to middle Eocene siliceous nannofossil marl; 3) middle Eocene to late Cretaceous argillaceous nannofossil limestone and chalk with occasional chert; and 4) late Cretaceous to late Aptian dark-colored silty nannofossil marls.

No shallow water material was observed and redeposition by slumping appears to be relatively minor in importance. The stratigraphy seems to be relatively continuous but minor hiatuses were found in the late Pliocene and early late Eocene, and larger ones affect the early Eocene, Paleocene and Turonian to late Albian. Water depth conditions do not show appreciable variations and the sediments reflect a continental slope environment above the CCD since the late Aptian. The dark brown to blackish Aptian-Albian silty marls contain barite rosettes and layers partially replaced by calcite, possibly resulting from the upward and/or lateral migration of solutions. A strong lower reflector is of middle to late Eocene age and corresponds with an angular unconformity. Another reflector marks the passage from relatively carbonate-poor to carbonate-rich sediments during the early Miocene. The hole had to be abandoned for safety reasons when relatively low methane/ethane ratios in gas were encountered.

Date occupied	2335 March 23, 1975
Date departed	2050 March 26, 1975
Time on site	2 days, 21 hrs, 15 minutes
Position: Latitude	26°35.5'N
Longitude	14°59.9'W
Water depth (sea level)	1752 corrected meters
Water depth (rig floor)	1762 corrected meters

LEG 41 SITE 369 (HOLE 369A)
SITE SUMMARY SHEET, con't.

Penetration	488.5 meters
Number of holes	2
Number of cores	52
Total length of cored section	488.5 meters
Total core recovered	386.4 meters
Percentage core recovery	79%
<u>Oldest Sediment Cored</u>	
Depth subbottom	488.5 meters
Nature	Silty marl
Age	Aptian
Measured velocity	1.9 km/sec

Site 369 Hole Core 1 Cored Interval: 0.0-4.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							0					
LOWER PLIOCENE	N23 Emiliania huxleyi (NN20/21)	Gephyrocapsa oceanica (NN14-NN15)	Reticulofenestra pseudoumbilica	F R N	A R A	G M G	1	0.5 1.0	VOID			
							2				133 144 100	
							3					
	N19 Discoaster asymmetricus			R N F	R A A	P G G	Core Catcher					

CLAYEY NANNO OOZE, greenish gray (5GY 8/1) with top 50 cm grayish orange (10YR 7/4) and greenish gray (5GY 6/1), soft, severe drilling disturbance, black streaks and blebs throughout, rare bioturbation apparent.

10YR 7/4

5GY 6/1

5GY 3/1

SS at 1-133 (minor lithology)

Quartz	R	Clay	A
Glauconite	R	Fe/Mn	R
Carbonate rhombs	R	Aragonite	R
Forams	C	Nannos	A
Detrital carbonate	R	Diatoms	R
		Rads	R
Silicoflagellates	R	Fish debris	R

SS at 1-144 (minor lithology)

Quartz	R	Clay	C
Glauconite	R	Fe/Mn	R
Carbonate unspecified	C	Carbonate rhombs	R
		Forams	C
Nannos	A	Rads	R
Sponge spicules	R	Silicoflagellates	R
Fish debris	R	Pollen	R

SS at 2-100 (dominant lithology)

Quartz	R	Clay	C
Glauconite	R	Fe/Mn micronodules	R
Carbonate rhombs	R	Forams	R
Nannos	D		

Site 369 Hole Core 2 Cored Interval: 4.0-13.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER PLIOCENE	Globorotalia margaritae						0					
							1	0.5 1.0				
							2					
							3					
							4					
							5					
							6					
	N18/19 Globorotalia margaritae evoluta Discoaster asymmetricus-Reticulofenestra pseudoumbilica (NN14-NN15)			N R F	A R A	M-G P G	Core Catcher					

CLAYEY NANNO OOZE, greenish gray (5GY 6/1), soft, homogeneous, severe drilling disturbance, faint light olive gray (5Y 6/1) streaking, black streaks and blebs throughout.

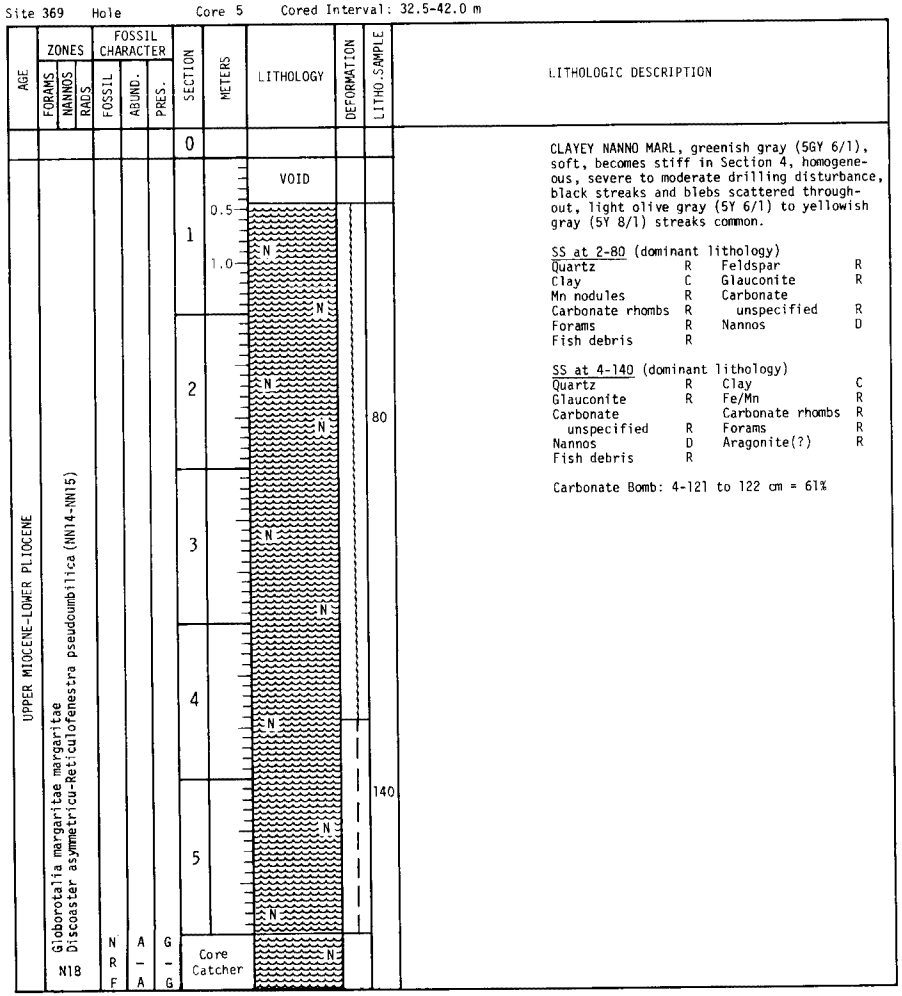
Site 369 Hole Core 3 Cored Interval: 13.5-23.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE-LOWER PLIOCENE	Globorotalia margaritae	Discoaster asymmetricus-Reticulofenestra pseudoumbilica (NN14-NN15)	N18 ?	N R F	A T A	M-G P M	0					CLAYEY FORAM-BEARING NANNO OOZE, greenish gray (5GY 6/1), soft, homogeneous, severe drilling disturbance. Streaks of light olive gray (5Y 6/1), throughout - black streaks and blebs scattered throughout.
							1	0.5 1.0			100	SS at 1-100 (dominant lithology) Quartz R, Clay C Glauconite R, Fe/Mn R Carbonate rhombs R, Forams C Nannos D, Fish debris R
							2					
							3					
							4					
							5					
							6					
							Core Catcher					

Site 369 Hole Core 4 Cored Interval: 23.0-32.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE-LOWER PLIOCENE	Globorotalia margaritae	Discoaster asymmetricus-Reticulofenestra pseudoumbilicus (NN14-NN15)	N18	N R F	A - A	G - M	0					CLAYEY FORAM-BEARING NANNO MARL, greenish gray (5GY 6/1), soft, homogeneous, streaks of light olive gray (5Y 6/1), black blebs and streaks scattered throughout, severe drilling disturbance.
							1	0.5 1.0				SS at 2-70 (dominant lithology) Quartz R, Feldspar R Clay C, Glauconite R Fe/Mn R, Carbonate rhombs R Forams C, Nannos A Rads R, Fish debris R
							2				70	Carbonate Bomb: 5-84 to 85 cm = 43%
							3					
							4					
							5					
							Core Catcher					

Site 369 Hole Core 5 Cored Interval: 32.5-42.0 m



CLAYEY NANNO MARL, greenish gray (5GY 6/1), soft, becomes stiff in Section 4, homogeneous, severe to moderate drilling disturbance, black streaks and blebs scattered throughout, light olive gray (5Y 6/1) to yellowish gray (5Y 8/1) streaks common.

SS at 2-80 (dominant lithology)

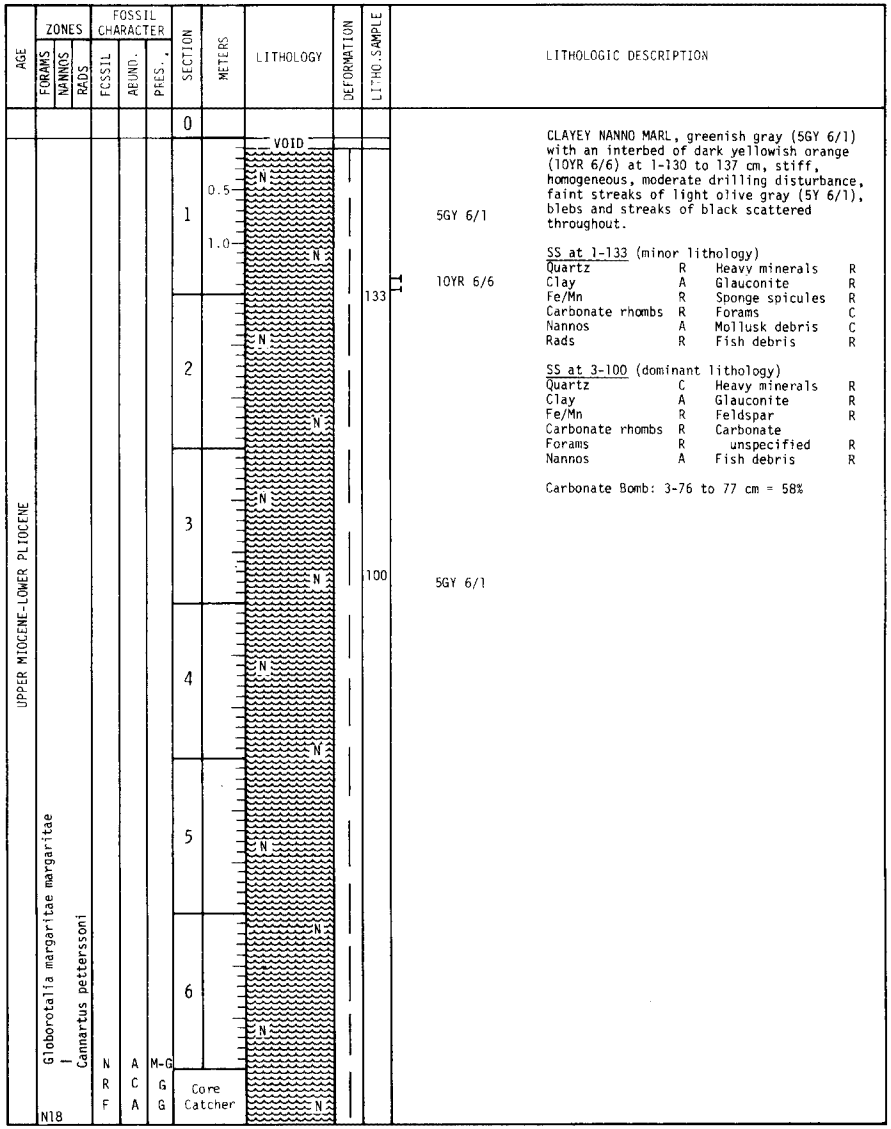
Quartz	R	Feldspar	R
Clay	C	Glauconite	R
Mn nodules	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	D
Forams	R		
Fish debris	R		

SS at 4-140 (dominant lithology)

Quartz	R	Clay	C
Glauconite	R	Fe/Mn	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	D	Forams	R
Fish debris	R	Aragonite(?)	R

Carbonate Bomb: 4-121 to 122 cm = 61%

Site 369 Hole A Core 1 Cored Interval: 42.0-51.5 m



CLAYEY NANNO MARL, greenish gray (5GY 6/1) with an interbed of dark yellowish orange (10YR 6/6) at 1-130 to 137 cm, stiff, homogeneous, moderate drilling disturbance, faint streaks of light olive gray (5Y 6/1), blebs and streaks of black scattered throughout.

SS at 1-133 (minor lithology)

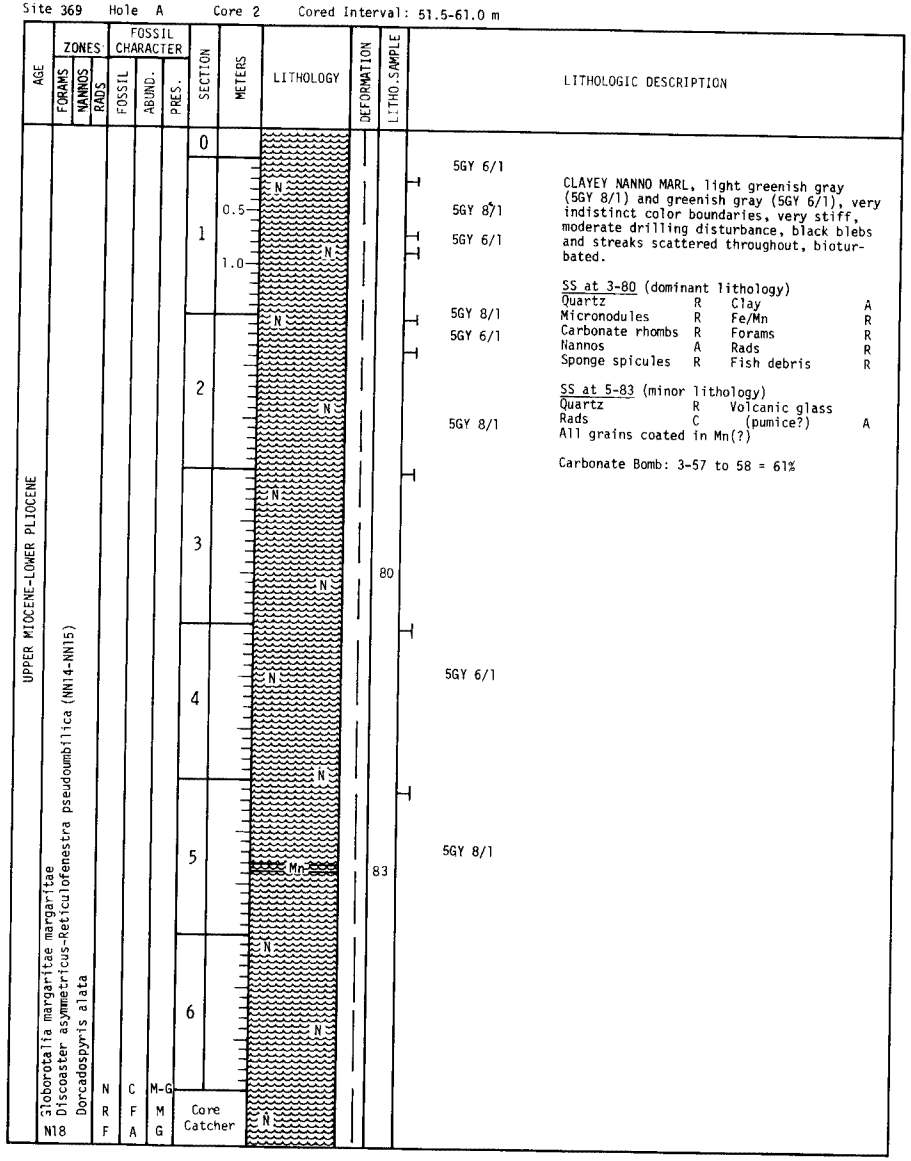
Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Fe/Mn	R	Sponge spicules	R
Carbonate rhombs	R	Forams	C
Nannos	A	Mollusk debris	C
Rads	R	Fish debris	R

SS at 3-100 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Glauconite	R
Fe/Mn	R	Feldspar	R
Carbonate rhombs	R	Carbonate unspecified	R
Forams	R	Fish debris	R
Nannos	A		

Carbonate Bomb: 3-76 to 77 cm = 58%

Site 369 Hole A Core 2 Cored Interval: 51.5-61.0 m



5GY 6/1
5GY 8/1
5GY 6/1
5GY 8/1
5GY 6/1
5GY 8/1
5GY 6/1
5GY 8/1

LITHOLOGIC DESCRIPTION

CLAYEY NANNO MARL, light greenish gray (5GY 8/1) and greenish gray (5GY 6/1), very indistinct color boundaries, very stiff, moderate drilling disturbance, black blebs and streaks scattered throughout, bioturbated.

SS at 3-80 (dominant lithology)

Quartz	R	Clay	A
Micronodules	R	Fe/Mn	R
Carbonate rhombs	R	Forams	R
Nannos	A	Rads	R
Sponge spicules	R	Fish debris	R

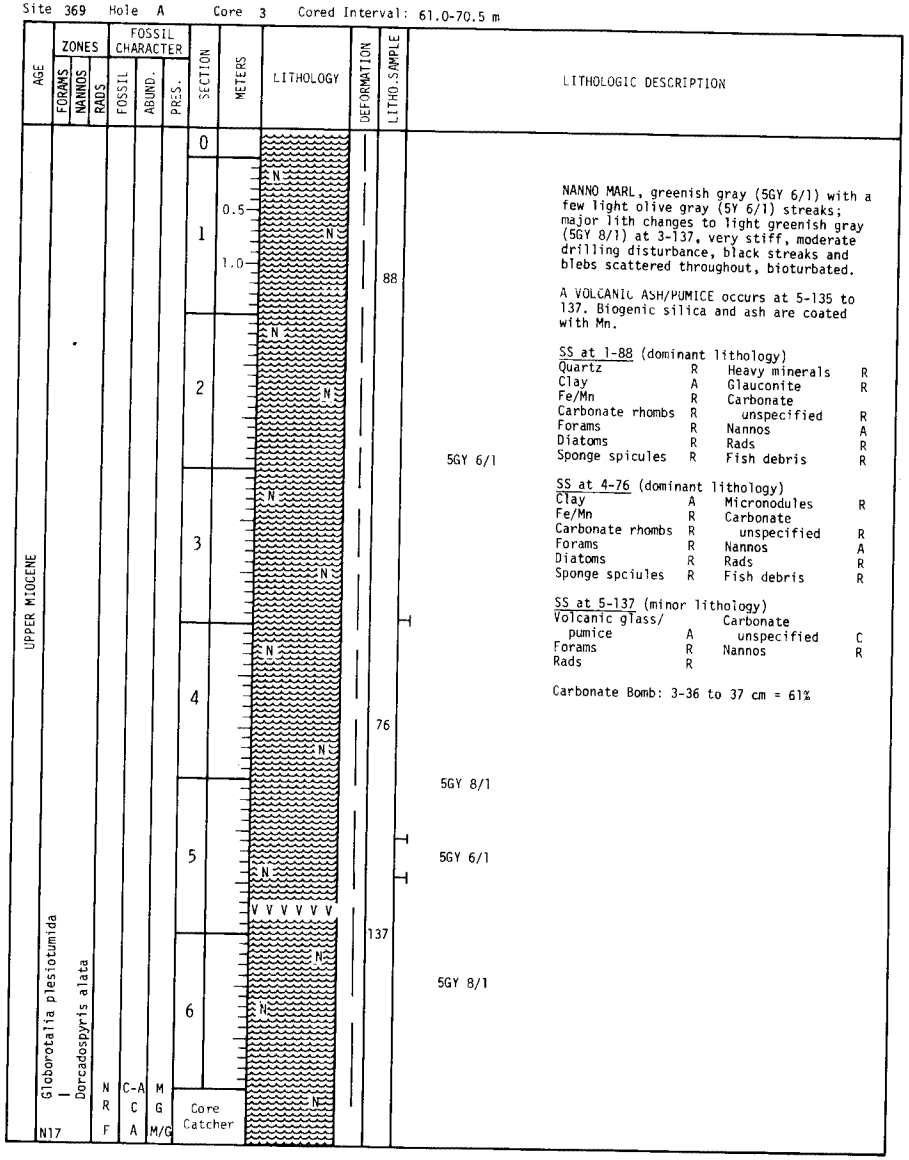
SS at 5-83 (minor lithology)

Quartz	R	Volcanic glass (pumice?)	A
Rads	C		

All grains coated in Mn(?)

Carbonate Bomb: 3-57 to 58 = 61%

Site 369 Hole A Core 3 Cored Interval: 61.0-70.5 m



5GY 6/1
5GY 8/1
5GY 6/1
5GY 8/1

LITHOLOGIC DESCRIPTION

NANNO MARL, greenish gray (5GY 6/1) with a few light olive gray (5Y 6/1) streaks; major lith changes to light greenish gray (5GY 8/1) at 3-137, very stiff, moderate drilling disturbance, black streaks and blebs scattered throughout, bioturbated.

A VOLCANIC ASH/PUMICE occurs at 5-135 to 137. Biogenic silica and ash are coated with Mn.

SS at 1-88 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	R	Rads	R
Diatoms	R	Fish debris	R
Sponge spicules	R		

SS at 4-76 (dominant lithology)

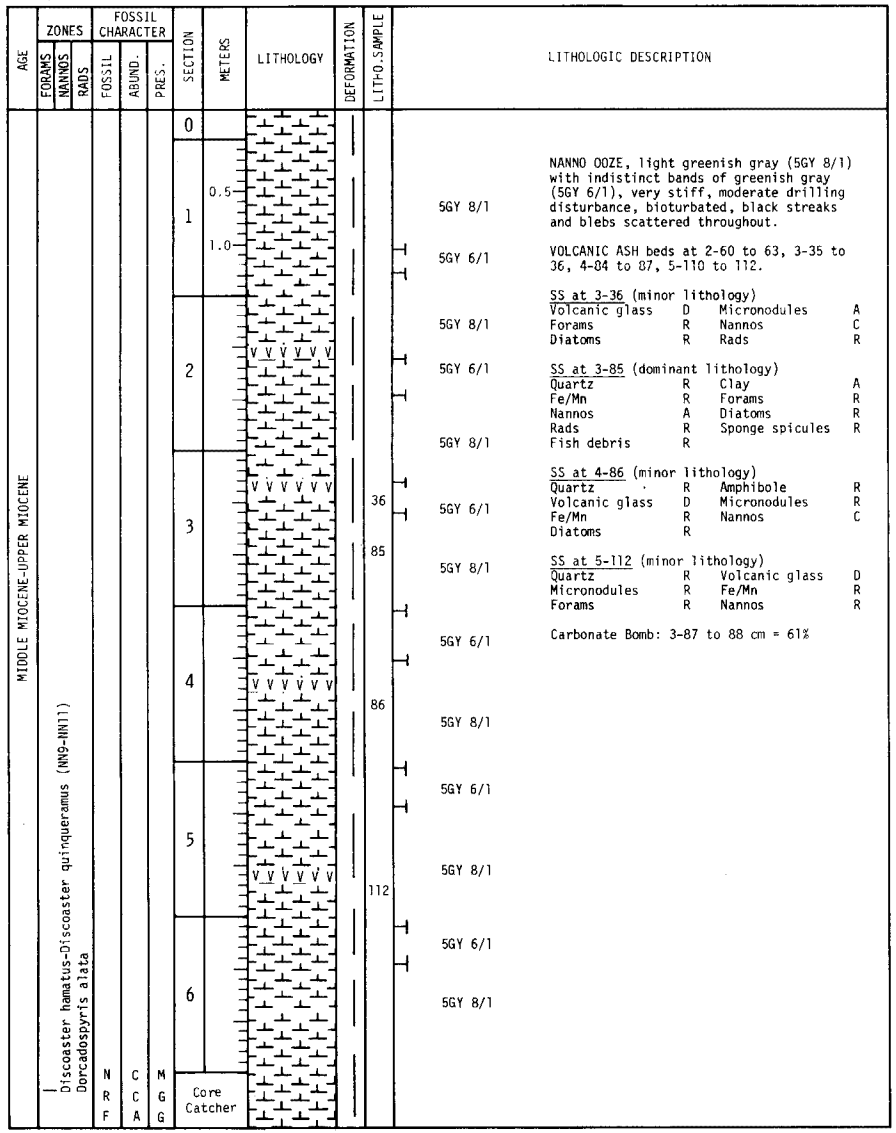
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	R	Rads	R
Diatoms	R	Fish debris	R
Sponge spciules	R		

SS at 5-137 (minor lithology)

Volcanic glass/ pumice	A	Carbonate unspecified	C
Forams	R	Nannos	R
Rads	R		

Carbonate Bomb: 3-36 to 37 cm = 61%

Site 369 Hole A Core 4 Cored Interval: 70.5-80.0 m



LITHOLOGIC DESCRIPTION

NANNO OOZE, light greenish gray (5GY 8/1) with indistinct bands of greenish gray (5GY 6/1), very stiff, moderate drilling disturbance, bioturbated, black streaks and blebs scattered throughout.

VOLCANIC ASH beds at 2-60 to 63, 3-35 to 36, 4-84 to 87, 5-110 to 112.

SS at 3-36 (minor lithology)

Volcanic glass	D	Micronodules	A
Forams	R	Nannos	C
Diatoms	R	Rads	R

SS at 3-85 (dominant lithology)

Quartz	R	Clay	A
Fe/Mn	R	Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

SS at 4-86 (minor lithology)

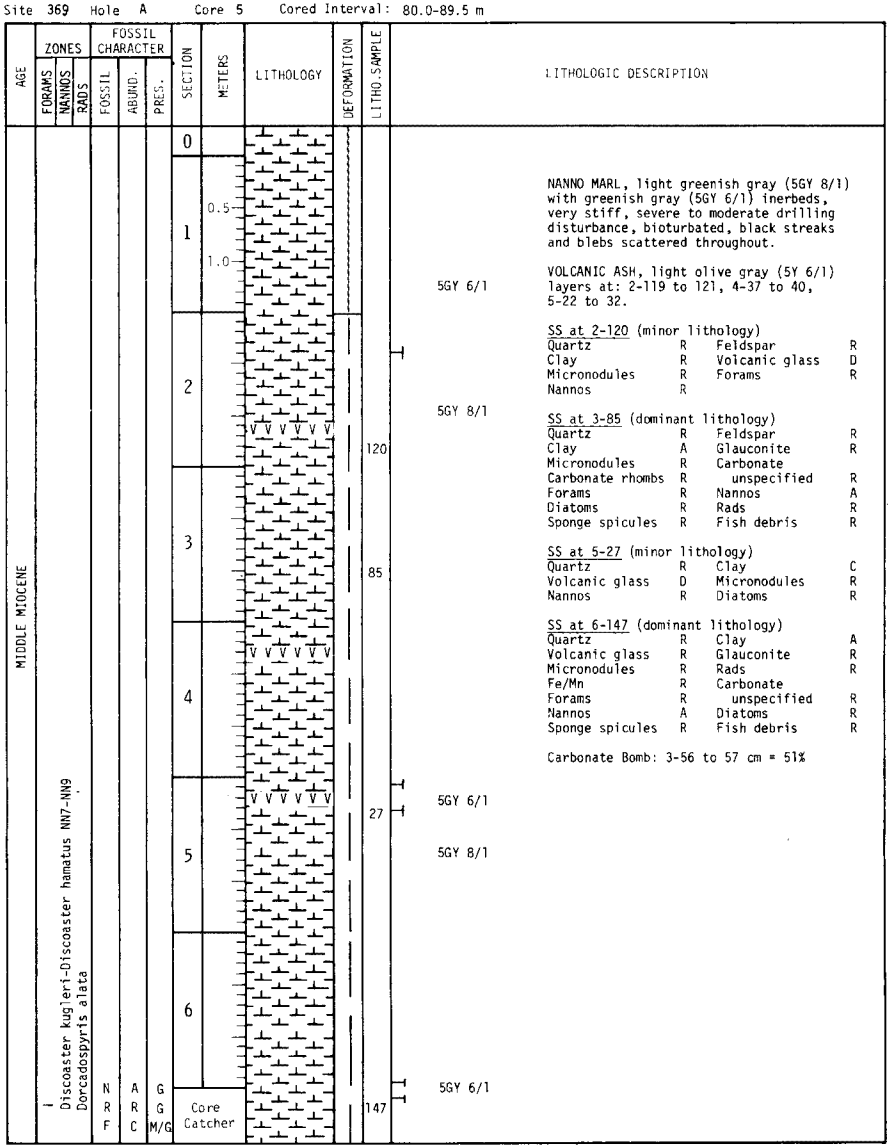
Quartz	R	Amphibole	R
Volcanic glass	D	Micronodules	R
Fe/Mn	R	Nannos	C
Diatoms	R		

SS at 5-112 (minor lithology)

Quartz	R	Volcanic glass	D
Micronodules	R	Fe/Mn	R
Forams	R	Nannos	R

Carbonate Bomb: 3-87 to 88 cm = 61%

Site 369 Hole A Core 5 Cored Interval: 80.0-89.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, light greenish gray (5GY 8/1) with greenish gray (5GY 6/1) inerbeds, very stiff, severe to moderate drilling disturbance, bioturbated, black streaks and blebs scattered throughout.

VOLCANIC ASH, light olive gray (5Y 6/1) layers at: 2-119 to 121, 4-37 to 40, 5-22 to 32.

SS at 2-120 (minor lithology)

Quartz	R	Feldspar	R
Clay	R	Volcanic glass	D
Micronodules	R	Forams	R
Nannos	R		

SS at 3-85 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Glauconite	R
Micronodules	R	Carbonate unspecified	R
Carbonate rhombs	R		
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Fish debris	R

SS at 5-27 (minor lithology)

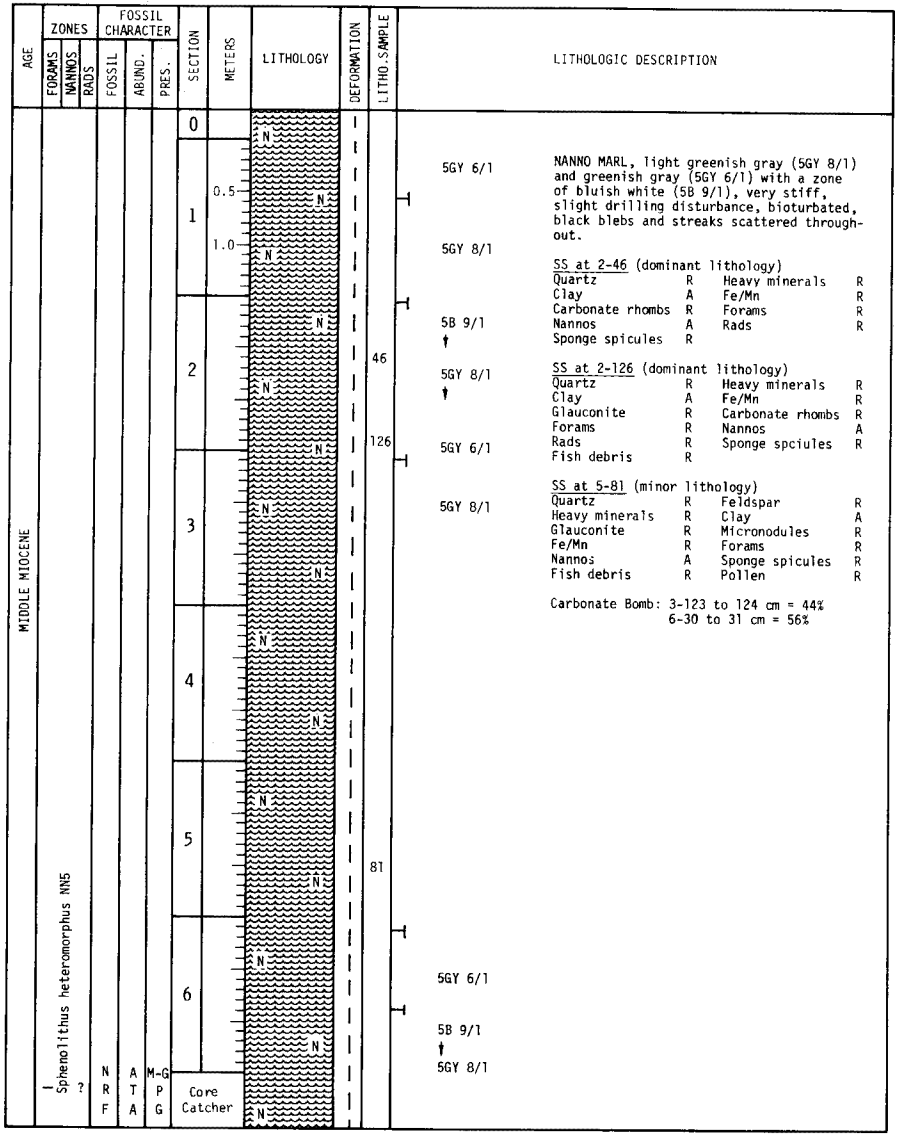
Quartz	R	Clay	C
Volcanic glass	D	Micronodules	R
Nannos	R	Diatoms	R

SS at 6-147 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Glauconite	R
Micronodules	R	Rads	R
Fe/Mn	R	Carbonate unspecified	R
Forams	R		
Nannos	A	Diatoms	R
Sponge spicules	R	Fish debris	R

Carbonate Bomb: 3-56 to 57 cm = 51%

Site 369 Hole A Core 6 Cored Interval: 89.5-99.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL, light greenish gray (5GY 8/1) and greenish gray (5GY 6/1) with a zone of bluish white (5B 9/1), very stiff, slight drilling disturbance, bioturbated, black blebs and streaks scattered throughout.

SS at 2-46 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Fe/Mn	R
Carbonate rhombs	R	Forams	R
Nannos	A	Rads	R
Sponge spicules	R		

SS at 2-126 (dominant lithology)

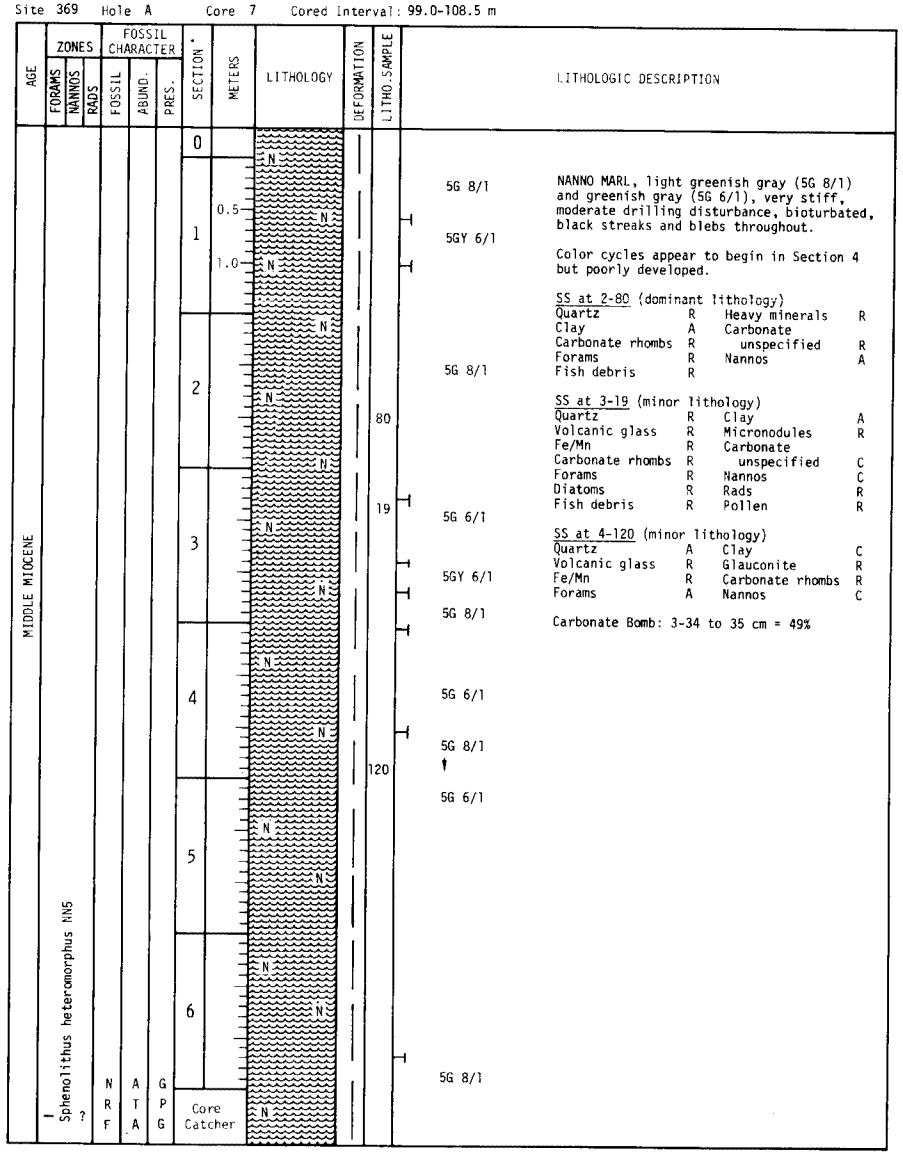
Quartz	R	Heavy minerals	R
Clay	A	Fe/Mn	R
Glauconite	R	Carbonate rhombs	R
Forams	R	Nannos	A
Rads	R	Sponge spciules	R
Fish debris	R		

SS at 5-81 (minor lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Micronodules	R
Fe/Mn	R	Forams	R
Nannos	A	Sponge spicules	R
Fish debris	R	Pollen	R

Carbonate Bomb: 3-123 to 124 cm = 44%
6-30 to 31 cm = 56%

Site 369 Hole A Core 7 Cored Interval: 99.0-108.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, light greenish gray (5G 8/1) and greenish gray (5G 6/1), very stiff, moderate drilling disturbance, bioturbated, black streaks and blebs throughout.

Color cycles appear to begin in Section 4 but poorly developed.

SS at 2-80 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	R		
Fish debris	R		

SS at 3-19 (minor lithology)

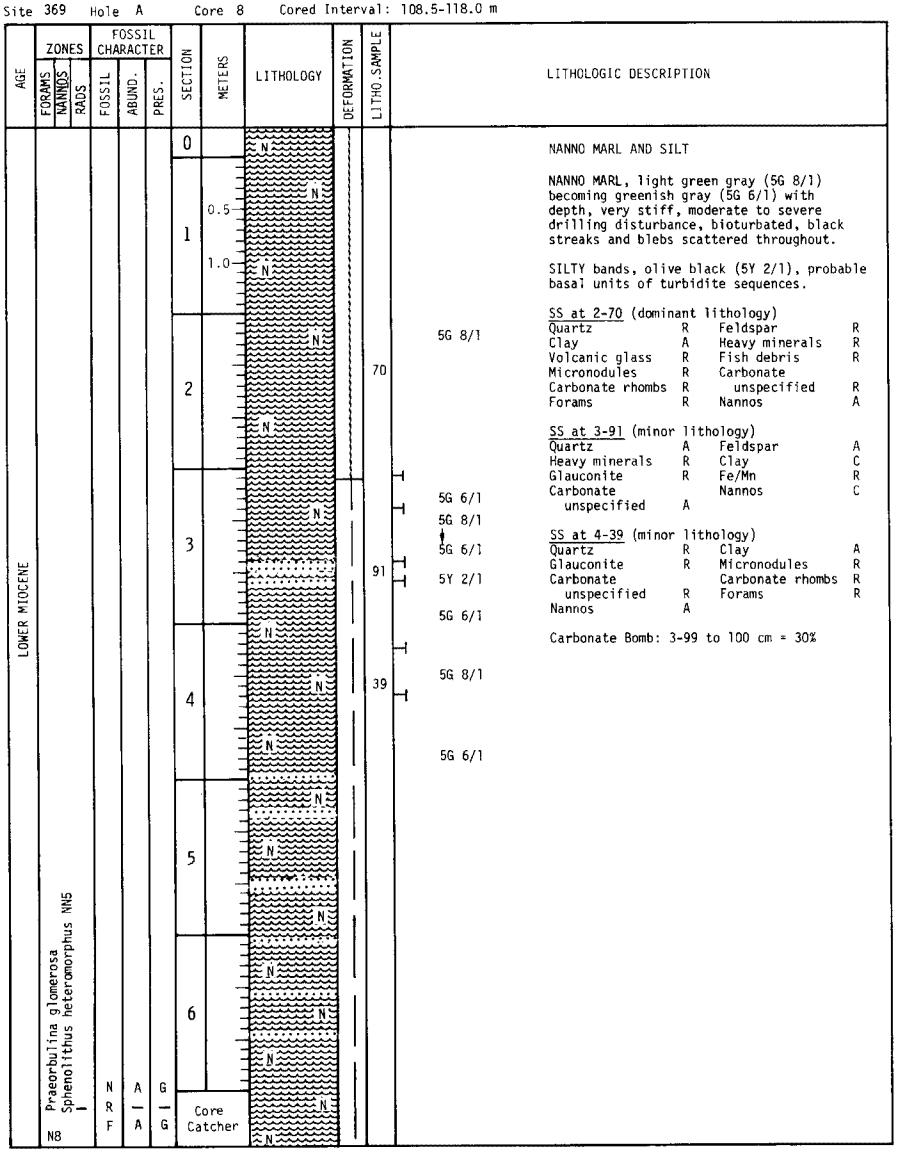
Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Fe/Mn	R	Carbonate unspecified	C
Carbonate rhombs	R	Nannos	C
Forams	R	Rads	R
Diatoms	R	Pollen	R
Fish debris	R		

SS at 4-120 (minor lithology)

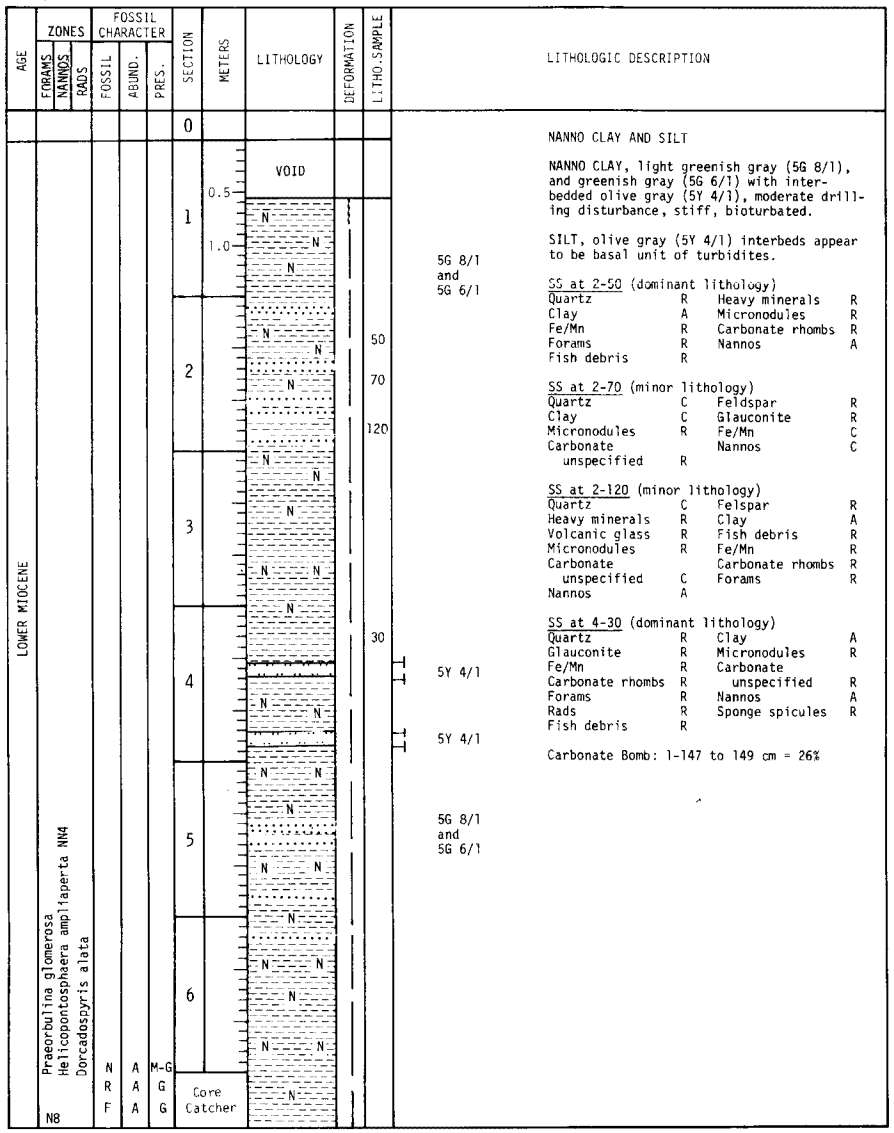
Quartz	A	Clay	C
Volcanic glass	R	Glauconite	R
Fe/Mn	R	Carbonate rhombs	R
Forams	A	Nannos	C

Carbonate Bomb: 3-34 to 35 cm = 49%

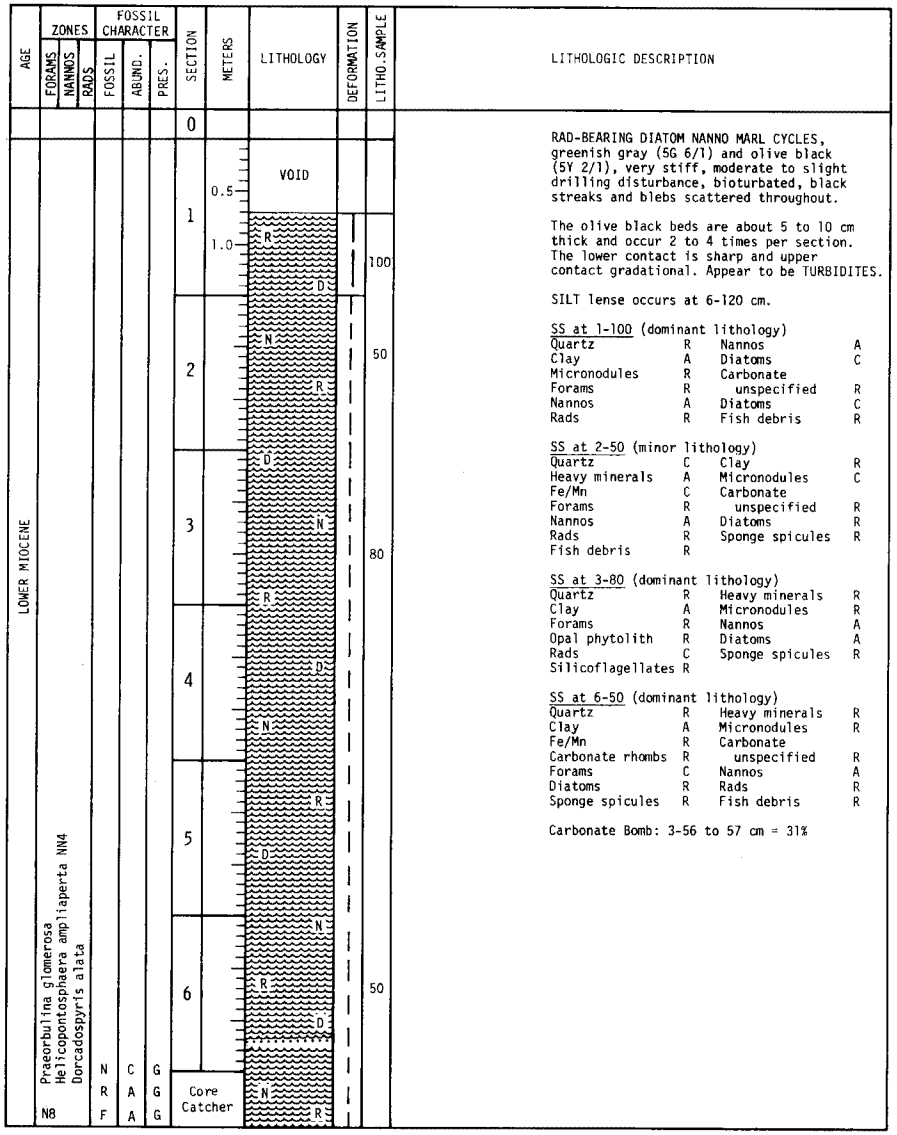
Site 369 Hole A Core 8 Cored Interval: 108.5-118.0 m



Site 369 Hole A Core 9 Cored Interval: 118.0-127.5 m



Site 369 Hole A Core 10 Cored Interval: 127.5-137.0 m



LITHOLOGIC DESCRIPTION

RAD-BEARING DIATOM NANNO MARL CYCLES, greenish gray (5G 6/1) and olive black (5Y 2/1), very stiff, moderate to slight drilling disturbance, bioturbated, black streaks and blebs scattered throughout.

The olive black beds are about 5 to 10 cm thick and occur 2 to 4 times per section. The lower contact is sharp and upper contact gradational. Appear to be TURBIDITES.

SILT lense occurs at 6-120 cm.

SS at 1-100 (dominant lithology)

Quartz	R	Nannos	A
Clay	A	Diatoms	C
Micronodules	R	Carbonate unspecified	R
Forams	R	Diatoms	C
Nannos	A	Fish debris	R
Rads	R		

SS at 2-50 (minor lithology)

Quartz	C	Clay	R
Heavy minerals	A	Micronodules	C
Fe/Mn	C	Carbonate unspecified	R
Forams	R	Diatoms	R
Nannos	A	Sponge spicules	R
Rads	R		
Fish debris	R		

SS at 3-80 (dominant lithology)

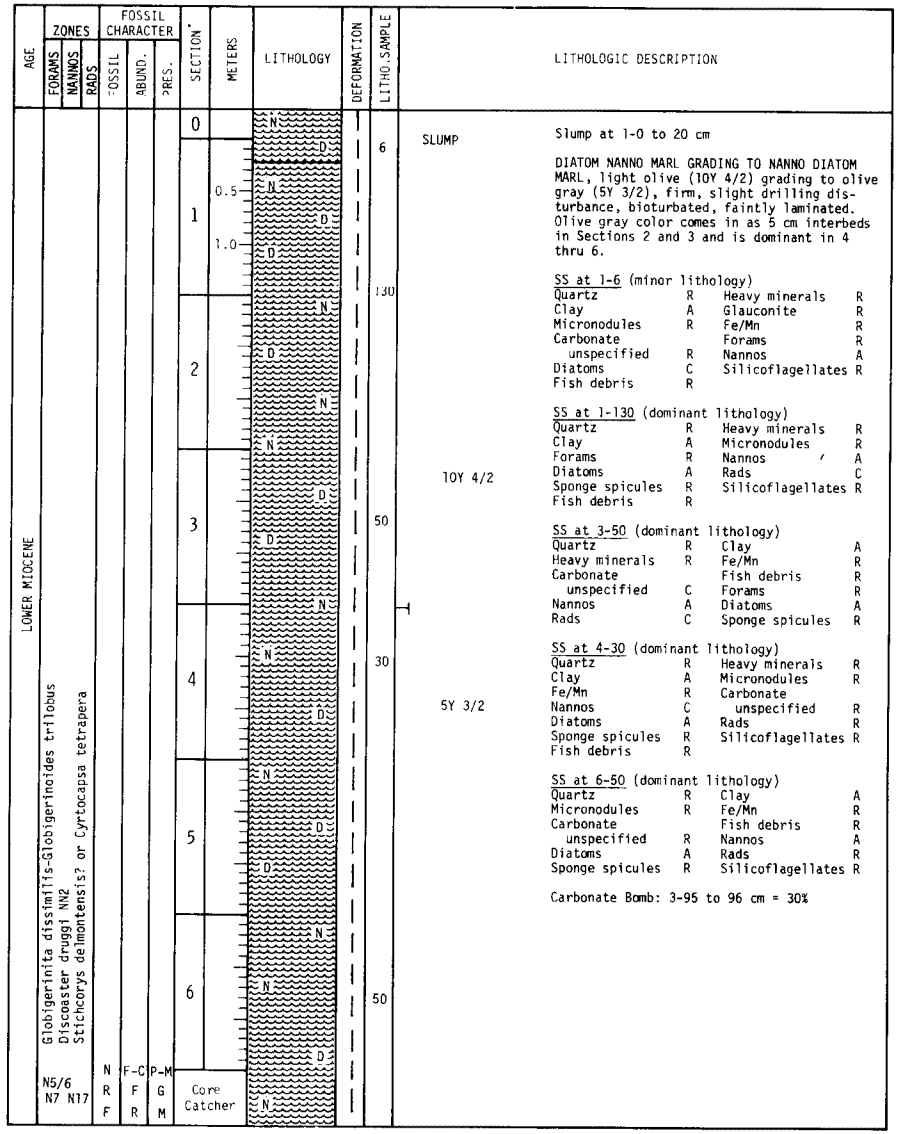
Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Forams	R	Nannos	A
Opal phytolith	R	Diatoms	A
Rads	C	Sponge spicules	R
Silicoflagellates	R		

SS at 6-50 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	C	Rads	R
Diatoms	R	Fish debris	R
Sponge spicules	R		

Carbonate Bomb: 3-56 to 57 cm = 31%

Site 369 Hole A Core 11 Cored Interval: 137.0-146.5 m



LITHOLOGIC DESCRIPTION

Slump at 1-0 to 20 cm

DIATOM NANNO MARL GRADING TO NANNO DIATOM MARL, light olive (10Y 4/2) grading to olive gray (5Y 3/2), firm, slight drilling disturbance, bioturbated, faintly laminated. Olive gray color comes in as 5 cm interbeds in Sections 2 and 3 and is dominant in 4 thru 6.

SS at 1-6 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Micronodules	R	Fe/Mn	R
Carbonate unspecified	R	Forams	R
Diatoms	C	Nannos	A
Fish debris	R	Silicoflagellates	R

SS at 1-130 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Forams	R	Nannos	A
Diatoms	A	Rads	C
Sponge spicules	R	Silicoflagellates	R
Fish debris	R		

SS at 3-50 (dominant lithology)

Quartz	R	Clay	A
Heavy minerals	R	Fe/Mn	R
Carbonate unspecified	C	Fish debris	R
Nannos	A	Forams	R
Rads	C	Diatoms	A
		Sponge spicules	R

SS at 4-30 (dominant lithology)

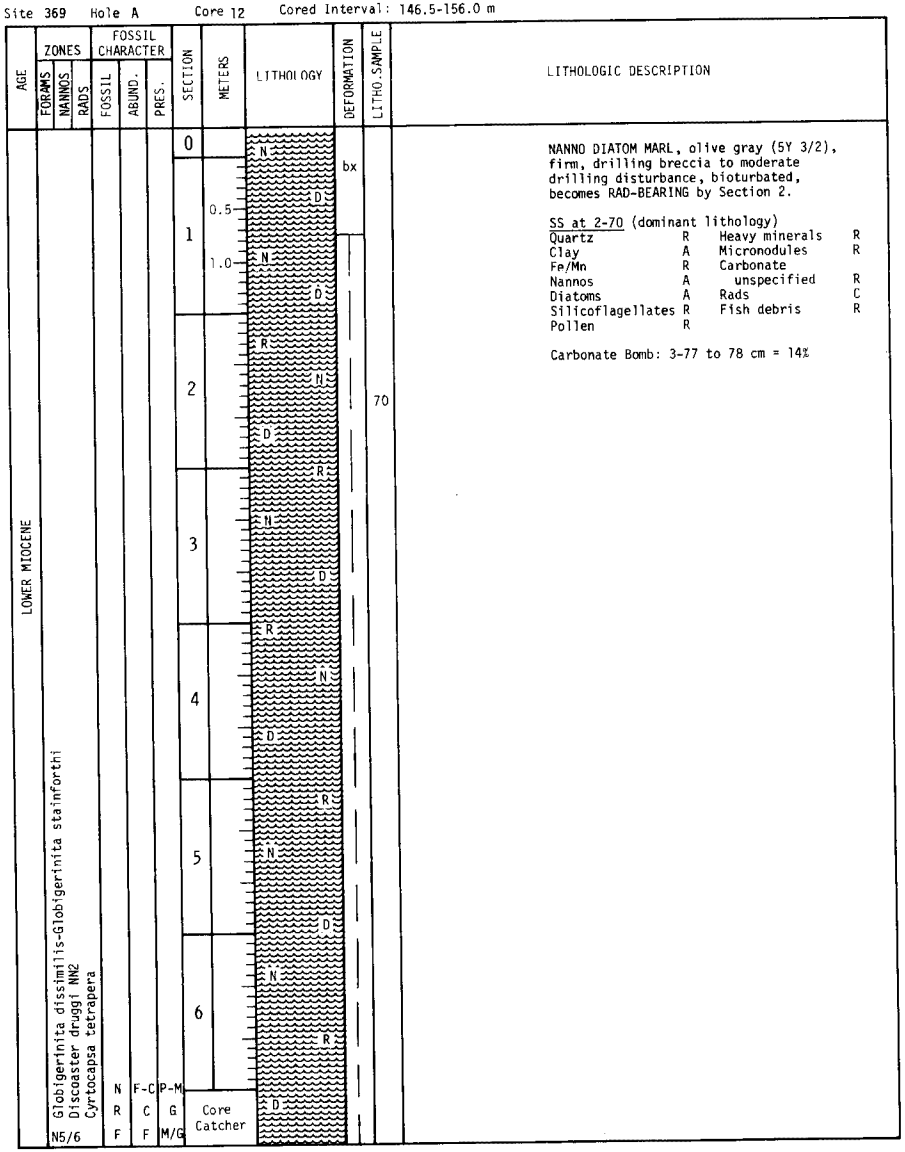
Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate unspecified	R
Nannos	C	Rads	R
Diatoms	A	Silicoflagellates	R
Sponge spicules	R		
Fish debris	R		

SS at 6-50 (dominant lithology)

Quartz	R	Clay	A
Micronodules	R	Fe/Mn	R
Carbonate unspecified	R	Fish debris	R
Diatoms	A	Nannos	A
Sponge spicules	R	Rads	R
		Silicoflagellates	R

Carbonate Bomb: 3-95 to 96 cm = 30%

Site 369 Hole A Core 12 Cored Interval: 146.5-156.0 m



LITHOLOGIC DESCRIPTION

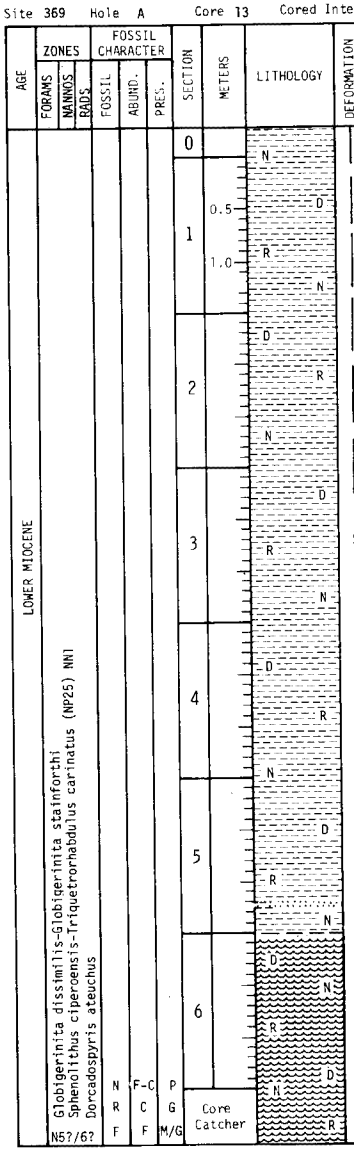
NANNO DIATOM MARL, olive gray (5Y 3/2), firm, drilling breccia to moderate drilling disturbance, bioturbated, becomes RAD-BEARING by Section 2.

SS at 2-70 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate unspecified	R
Nannos	A	Rads	C
Diatoms	A	Fish debris	R
Silicoflagellates	R		
Pollen	R		

Carbonate Bomb: 3-77 to 78 cm = 14%

Site 369 Hole A Core 13 Cored Interval: 156.0-165.5 m



LITHOLOGIC DESCRIPTION

RAD-BEARING NANNO DIATOM CLAY, olive gray (5Y 3/2) becoming grayish olive (10Y 4/2) in Section 4, firm, moderate drilling disturbance, bioturbated, SILTY zone at 5-120 to 125 cm.

The clay grades to a ?DOLOMITIC MARL in Section 6.

SS at 3-80 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	A	Rads	C
Silicoflagellates	R	Fish debris	R

SS at 6-70 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Feldspar	R
Volcanic glass	R	Glauconite	R
Micronodules	R	Fe/Mn	R
Dolomite	A	Forams	R
Nannos	A	Diatoms	C
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-82 to 83 cm = 17%

5Y 3/2

10Y 4/2

5Y 3/2

Site 369 Hole A Core 14 Cored Interval: 165.5-175.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER OLIGOCENE	Sphenolithus ciperoensis NP25 Dorcadospyris ateuchus?			N R F	C-F + R	P P P	0				
							1	0.5, 1.0	VOID; N	bx	
							2		D; N; N		
							3		D; D		50
							4		N; D; D		
							5		N; D; D		
							6		N; N		
							Core Catcher		D		

LITHOLOGIC DESCRIPTION

NANNO DIATOM MARL, olive gray (5Y 3/2), very firm, slight drilling disturbance except for drilling breccia at top 80 cm, bioturbated, yellowish flecks throughout (may be fossil hash), some zones of sharp contact between fine grained clay-size and coarse silt/sand. Whole unit may be a slump.

SS at 3-50 (dominant lithology)

Quartz	R	Clay	A
Micronodules	R	Mollusk debris	R
Carbonate rhombs	R	Forams	R
Nannos	A	Diatoms	A
Rads	R	Sponge spicules	R
Fish debris	R		

Site 369 Hole A Core 15 Cored Interval: 175.0-184.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER OLIGOCENE	P21 Globorotalia opima opima Sphenolithus ciperoensis NP25 Dorcadospyris ateuchus			N R F	C F R	M M G	0				
							1	0.5, 1.0	N; N		
							2		N; N		100
							3		N; N		
							4		N		
							5		N; N		62
							6		N; N		
							Core Catcher		N		

LITHOLOGIC DESCRIPTION

NANNO MARL, olive gray (5Y 3/2), slight drilling disturbance, very firm, bioturbated, light yellow flecks scattered throughout (may be mollusk fragments). A fossil hash zone occurs at 5-52 to 66.

SS at 2-100 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Micronodules	R
Zeolites	R	Carbonate rhombs	R
Forams	R	Nannos	A

SS at 5-62 (minor lithology)

Quartz	C	Feldspar	R
Clay	C	Volcanic glass	R
Micronodules	R	Fish debris	R
Zeolites	R	Mollusk debris	R
Forams	R	Nannos	C
Diatoms	R	Rads	R

Carbonate Bomb: 3-79 to 80 cm = 28%

Site 369 Hole A Core 16 Cored Interval: 184.5-194.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER OLIGOCENE	P21 Globorotalia opima opima	Sphenolithus distentus NP29	Dorcadospyris ateuchus	F R N	A C C	G G M-G	0 1 Core Catcher	0.5 1.0	VOID N N N		100

LITHOLOGIC DESCRIPTION

NANNO MARL, olive gray (5Y 3/2), very firm, slight drilling disturbance, bioturbated, light yellow flecks scattered throughout (may be mollusk fragments).

SS at 1-100

Quartz	C	Clay	A
Volcanic glass	R	Micronodules	R
Zeolites	R	Carbonate rhombs	R
Mollusk fragments	R	Forams	R
Nannos	A	Sponge spicules	R
Fish debris	R		

Site 369 Hole A Core 17 Cored Interval: 194.0-203.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
UPPER OLIGOCENE	P21 Globorotalia opima opima	Sphenolithus distentus NP24	Dorcadospyris ateuchus	N R F	C C C	M G G	0 1 2 3 4 5 6 Core Catcher	0.5 1.0	N N D D N D N D N N D N N N D N N D D N		100

LITHOLOGIC DESCRIPTION

NANNO DIATOM CLAY, similar to that of Core 11, grayish olive (10Y 4/2), very firm, slight to moderate drilling disturbance, bioturbated (Zoophycos, chondrites), color varies within grayish olive shades.

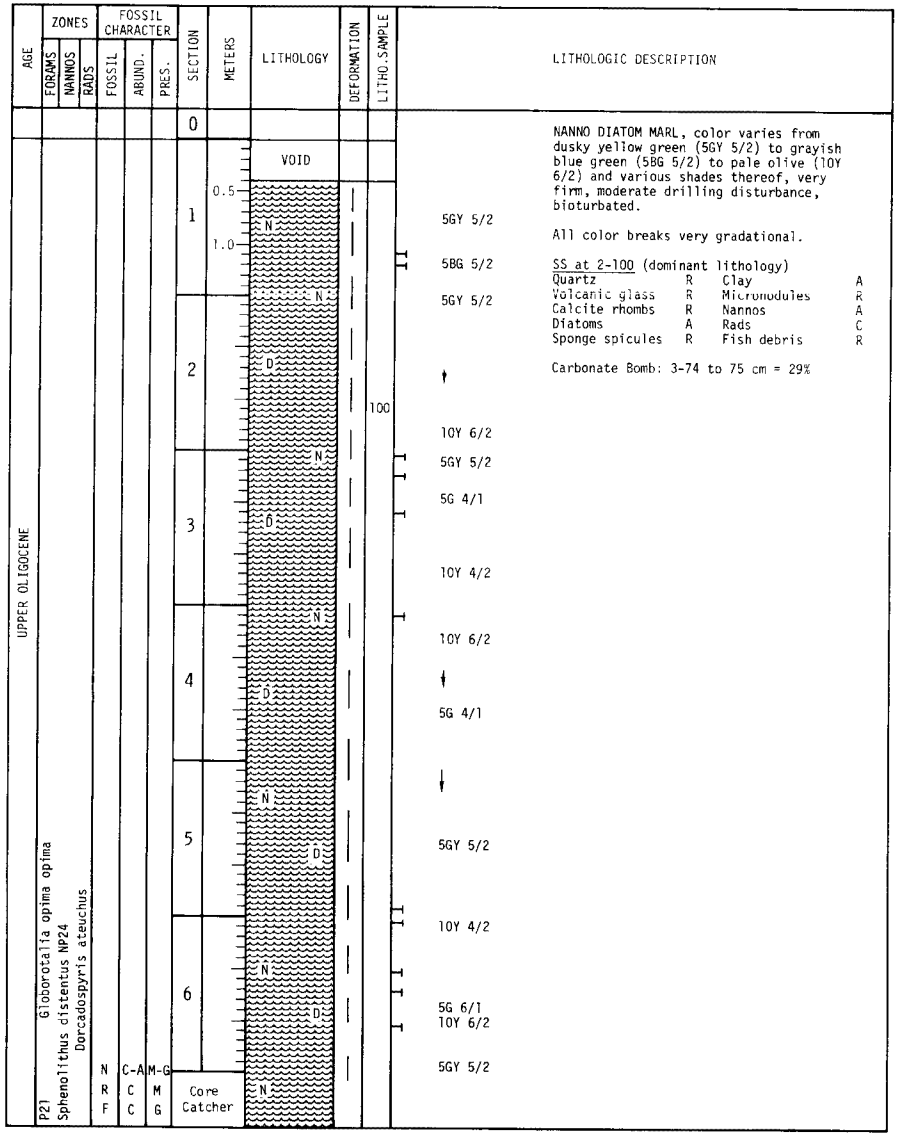
SS at 3-100 (dominant lithology)

Clay	A	Micronodules	R
Carbonate rhombs	R	Nannos	A
Diatoms	A	Sponge spicules	R
Rads	C		

Carbonate Bomb: 3-89 to 90 cm = 20%

10Y 4/2
10Y 6/2
5GY 5/2
10Y 6/2
5BG 7/2
10Y 4/2
10Y 6/2
5G 4/1
10Y 4/2
10Y 6/2
5G 4/1

Site 369 Hole A Core 18 Cored Interval: 203.5-213.0 m



LITHOLOGIC DESCRIPTION

NANNO DIATOM MARL, color varies from dusky yellow green (5GY 5/2) to grayish blue green (5BG 5/2) to pale olive (10Y 6/2) and various shades thereof, very firm, moderate drilling disturbance, bioturbated.

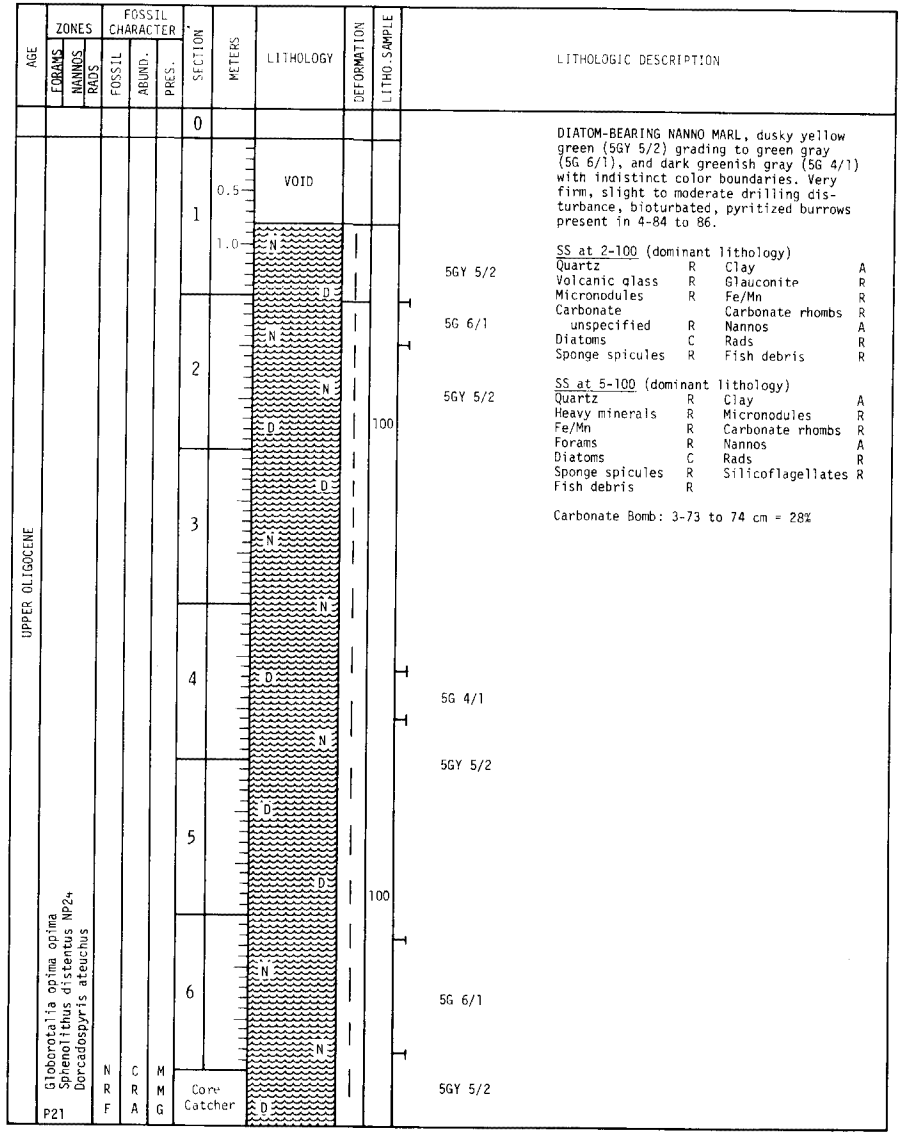
All color breaks very gradational.

SS at 2-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Calcite rhombs	R	Nannos	A
Diatoms	A	Rads	C
Sponge spicules	R	Fish debris	R

Carbonate Bomb: 3-74 to 75 cm = 29%

Site 369 Hole A Core 19 Cored Interval: 213.0-222.5 m



LITHOLOGIC DESCRIPTION

DIATOM-BEARING NANNO MARL, dusky yellow green (5GY 5/2) grading to green gray (5G 6/1), and dark greenish gray (5G 4/1) with indistinct color boundaries. Very firm, slight to moderate drilling disturbance, bioturbated, pyritized burrows present in 4-84 to 86.

SS at 2-100 (dominant lithology)

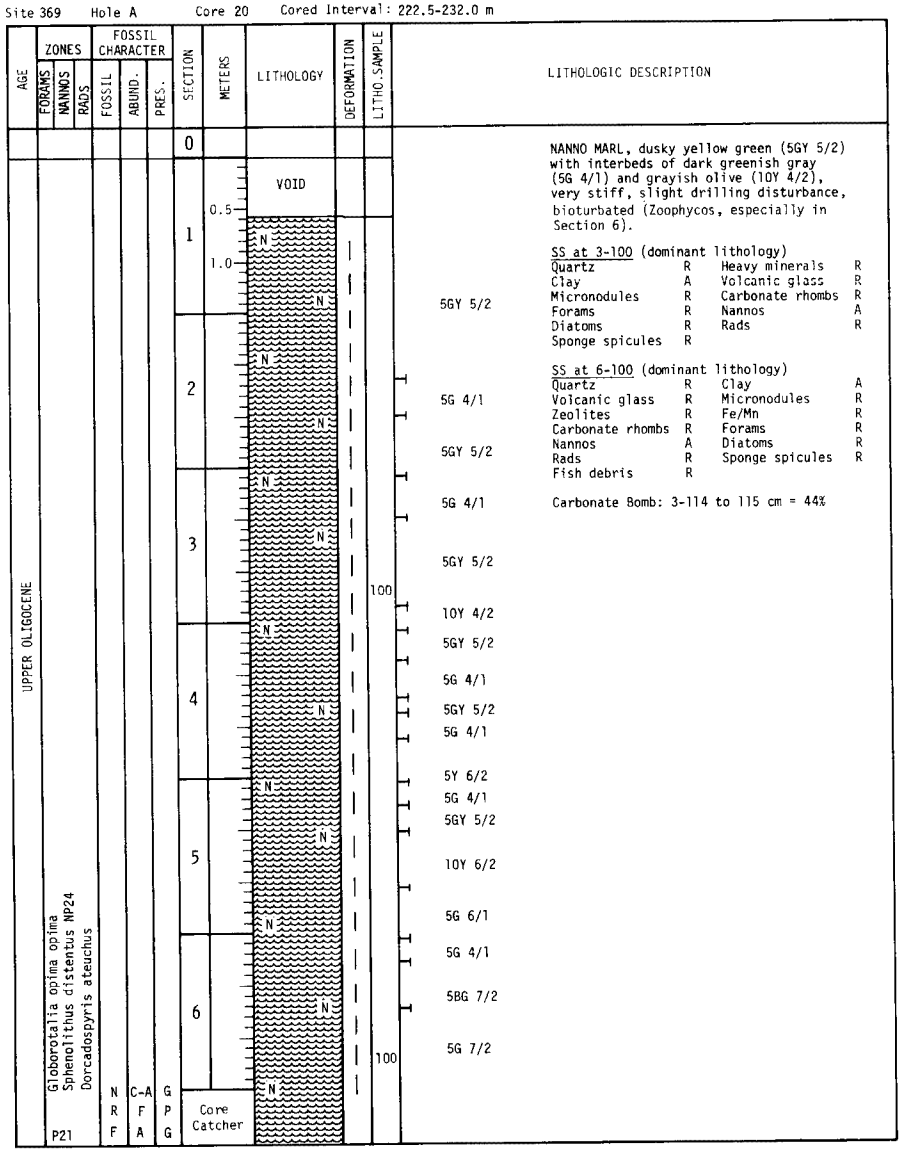
Quartz	R	Clay	A
Volcanic glass	R	Glauconite	R
Micronodules	R	Fe/Mn	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	A
Diatoms	C	Rads	R
Sponge spicules	R	Fish debris	R

SS at 5-100 (dominant lithology)

Quartz	R	Clay	A
Heavy minerals	R	Micronodules	R
Fe/Mn	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	C	Rads	R
Sponge spicules	R	Silicoflagellates	R
Fish debris	R		

Carbonate Bomb: 3-73 to 74 cm = 28%

Site 369 Hole A Core 20 Cored Interval: 222.5-232.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL, dusky yellow green (5GY 5/2) with interbeds of dark greenish gray (5G 4/1) and grayish olive (10Y 4/2), very stiff, slight drilling disturbance, bioturbated (Zoophycos, especially in Section 6).

SS at 3-100 (dominant lithology)

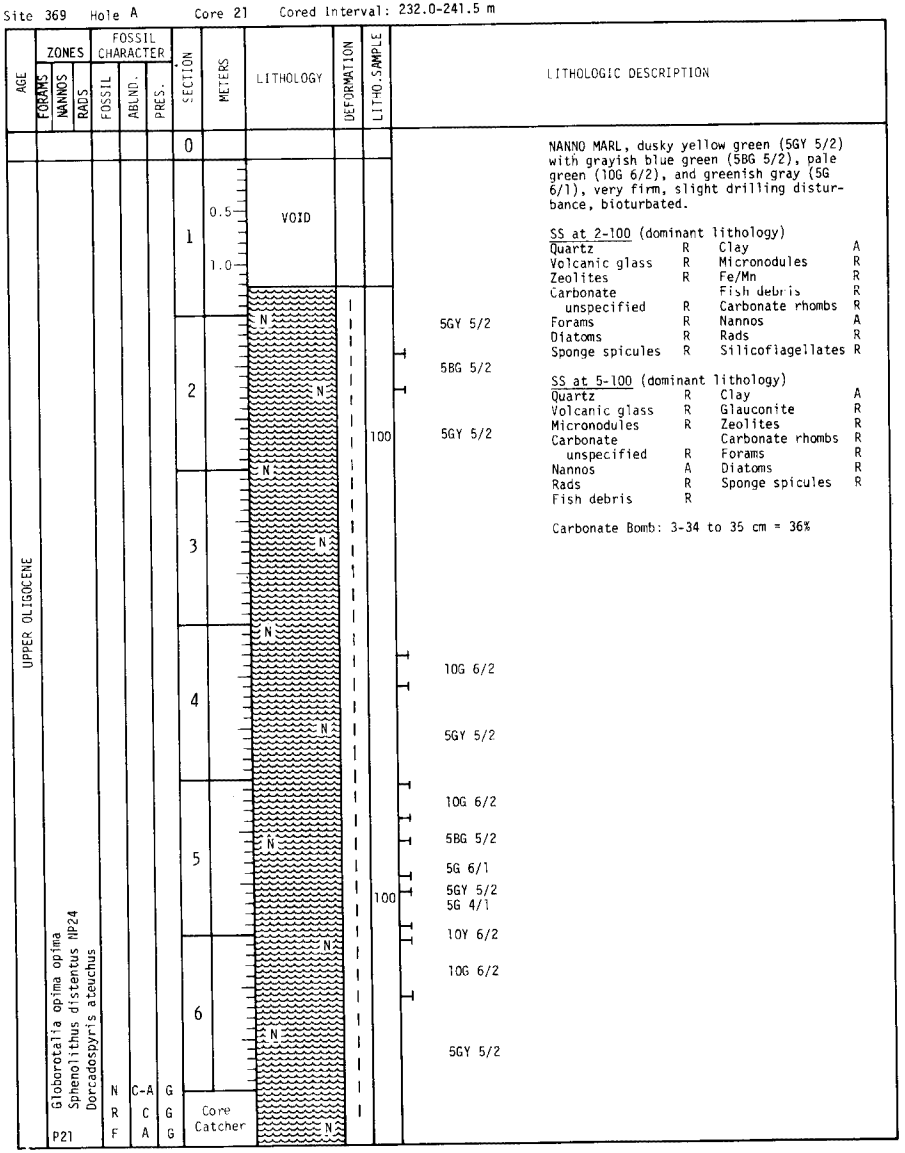
Quartz	R	Heavy minerals	R
Clay	A	Volcanic glass	R
Micronodules	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R		

SS at 6-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Zeolites	R	Fe/Mn	R
Carbonate rhombs	R	Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-114 to 115 cm = 44%

Site 369 Hole A Core 21 Cored Interval: 232.0-241.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, dusky yellow green (5GY 5/2) with grayish blue green (5BG 5/2), pale green (10G 6/2), and greenish gray (5G 6/1), very firm, slight drilling disturbance, bioturbated.

SS at 2-100 (dominant lithology)

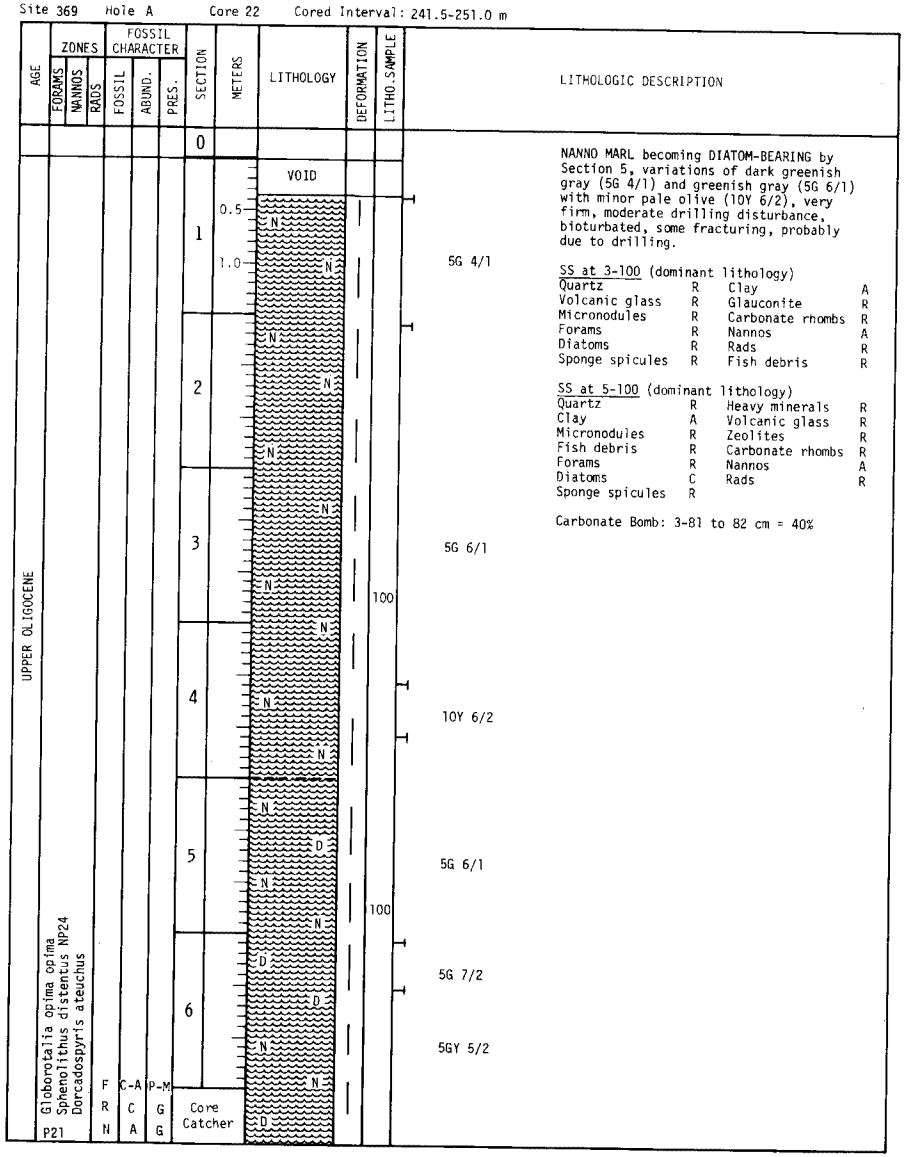
Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Zeolites	R	Fe/Mn	R
Carbonate unspecified	R	Fish debris	R
		Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Silicoflagellates	R

SS at 5-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Glauconite	R
Micronodules	R	Zeolites	R
Carbonate unspecified		Carbonate rhombs	R
		Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-34 to 35 cm = 36%

Site 369 Hole A Core 22 Cored Interval: 241.5-251.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL becoming DIATOM-BEARING by Section 5, variations of dark greenish gray (5G 4/1) and greenish gray (5G 6/1) with minor pale olive (10Y 6/2), very firm, moderate drilling disturbance, bioturbated, some fracturing, probably due to drilling.

SS at 3-100 (dominant lithology)

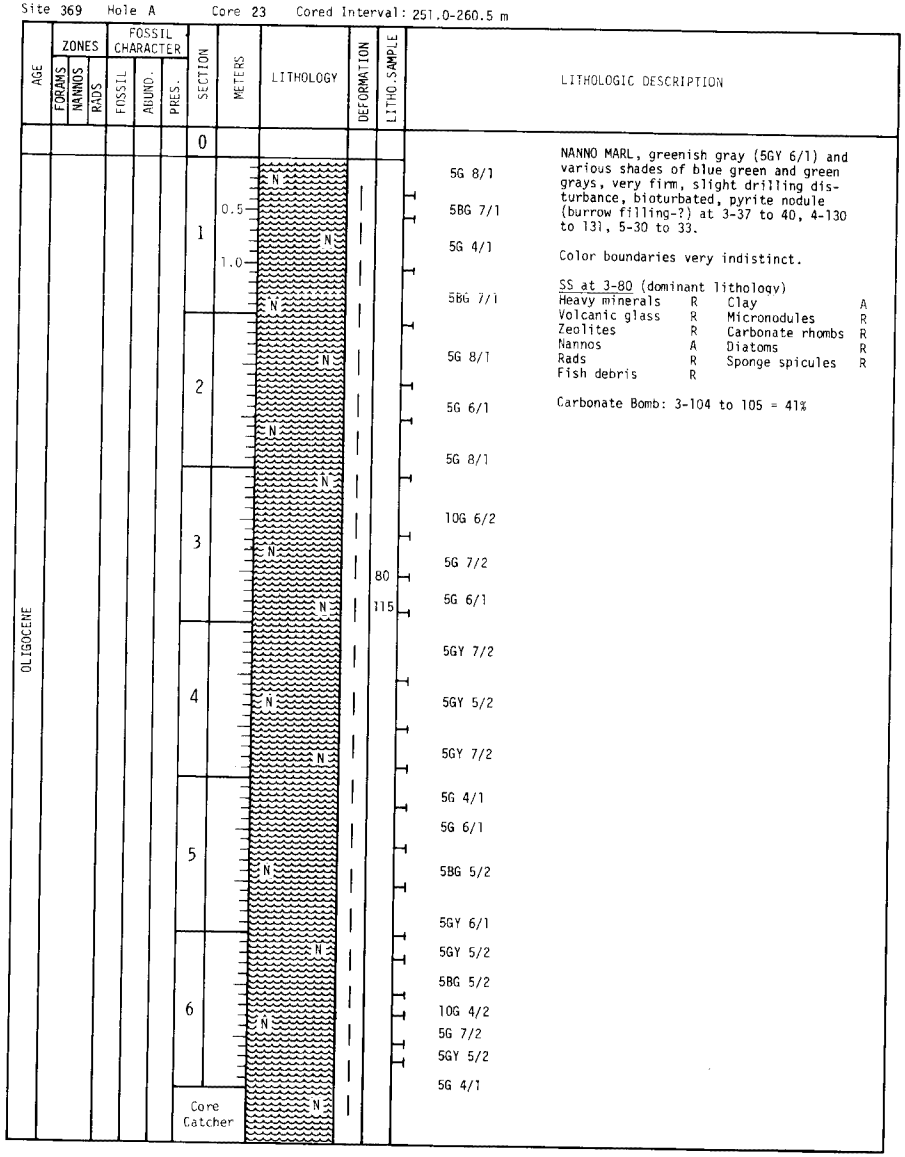
Quartz	R	Clay	A
Volcanic glass	R	Glauconite	R
Micronodules	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Fish debris	R

SS at 5-100 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Volcanic glass	R
Micronodules	R	Zeolites	R
Fish debris	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	C	Rads	R
Sponge spicules	R		

Carbonate Bomb: 3-81 to 82 cm = 40%

Site 369 Hole A Core 23 Cored Interval: 251.0-260.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, greenish gray (5GY 6/1) and various shades of blue green and green grays, very firm, slight drilling disturbance, bioturbated, pyrite nodule (burrow filling-?) at 3-37 to 40, 4-130 to 131, 5-30 to 33.

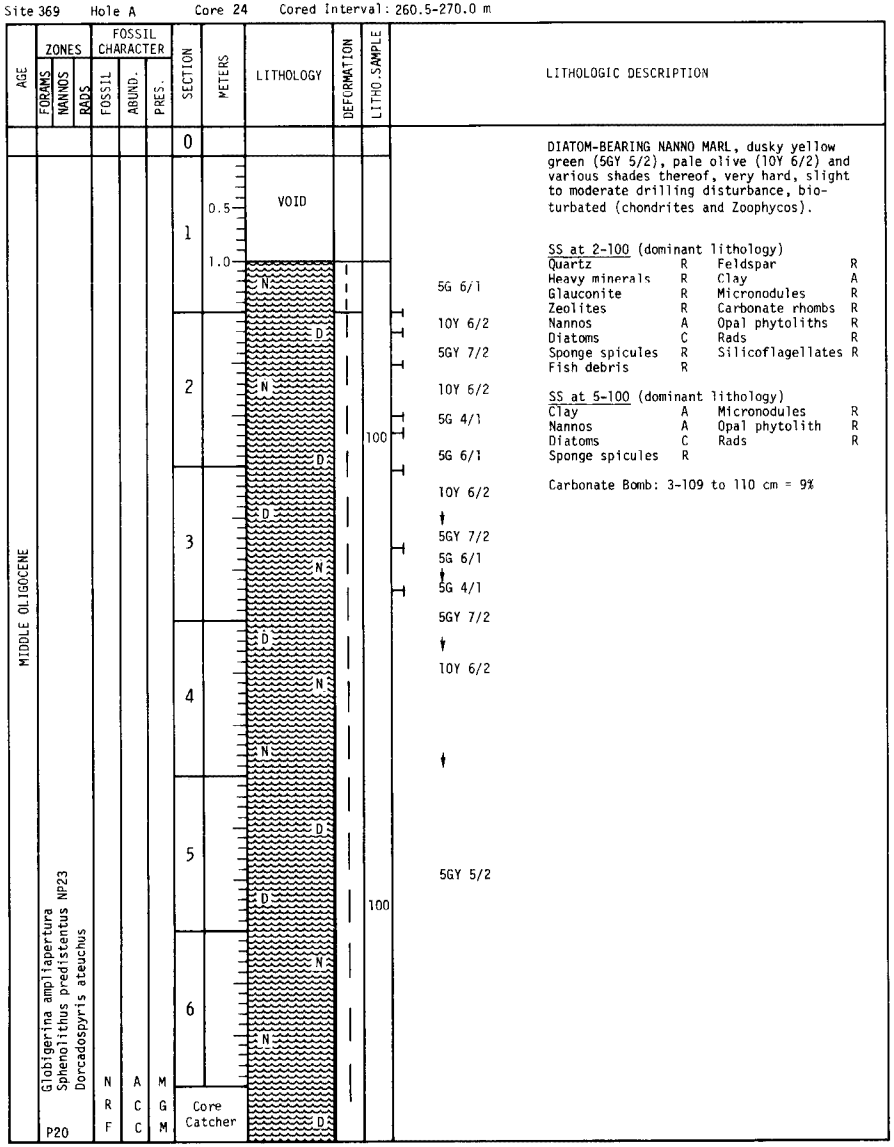
Color boundaries very indistinct.

SS at 3-80 (dominant lithology)

Heavy minerals	R	Clay	A
Volcanic glass	R	Micronodules	R
Zeolites	R	Carbonate rhombs	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-104 to 105 = 41%

Site 369 Hole A Core 24 Cored Interval: 260.5-270.0 m



LITHOLOGIC DESCRIPTION

DIATOM-BEARING NANNO MARL, dusky yellow green (5GY 5/2), pale olive (10Y 6/2) and various shades thereof, very hard, slight to moderate drilling disturbance, bioturbated (chondrites and Zoophycos).

SS at 2-100 (dominant lithology)

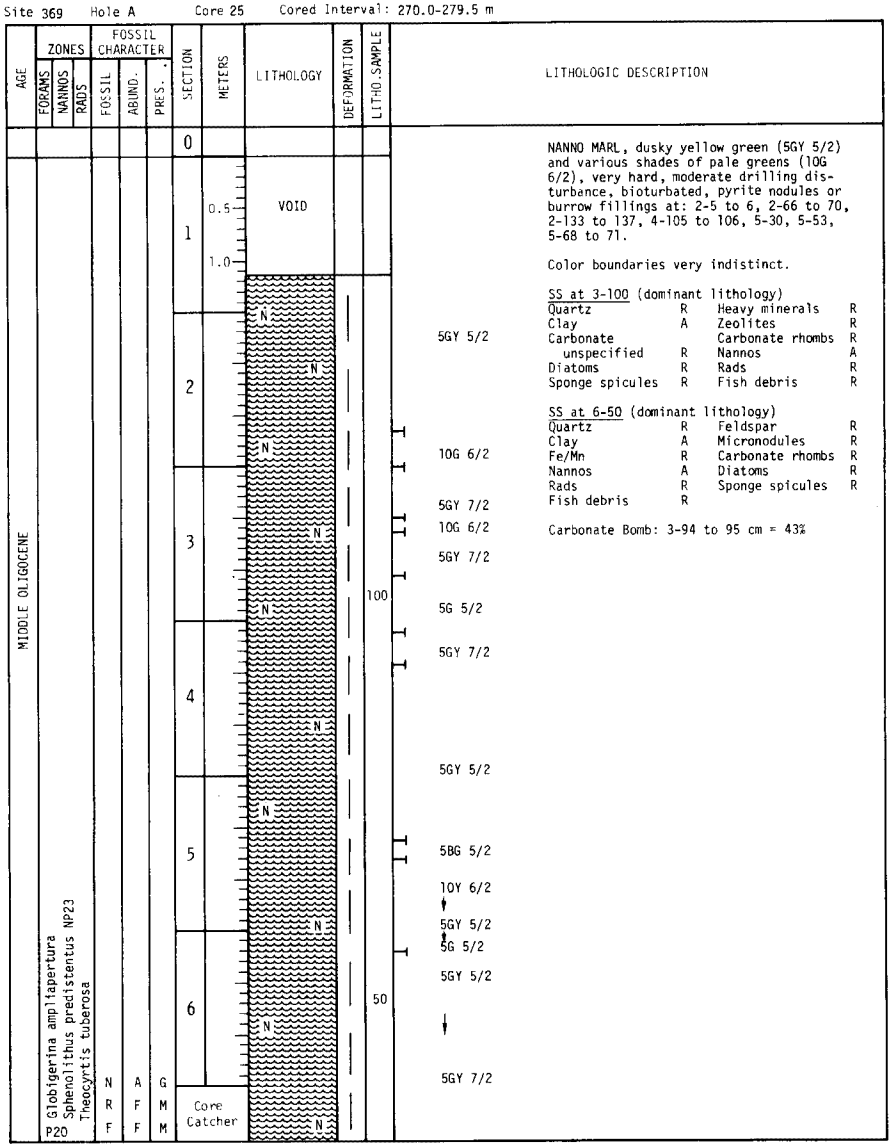
Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Micronodules	R
Zeolites	R	Carbonate rhombs	R
Nannos	A	Opal phytoliths	R
Diatoms	C	Rads	R
Sponge spicules	R	Silicoflagellates	R
Fish debris	R		

SS at 5-100 (dominant lithology)

Clay	A	Micronodules	R
Nannos	A	Opal phytolith	R
Diatoms	C	Rads	R
Sponge spicules	R		

Carbonate Bomb: 3-109 to 110 cm = 9%

Site 369 Hole A Core 25 Cored Interval: 270.0-279.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL, dusky yellow green (5GY 5/2) and various shades of pale greens (10G 6/2), very hard, moderate drilling disturbance, bioturbated, pyrite nodules or burrow fillings at: 2-5 to 6, 2-66 to 70, 2-133 to 137, 4-105 to 106, 5-30, 5-53, 5-68 to 71.

Color boundaries very indistinct.

SS at 3-100 (dominant lithology)

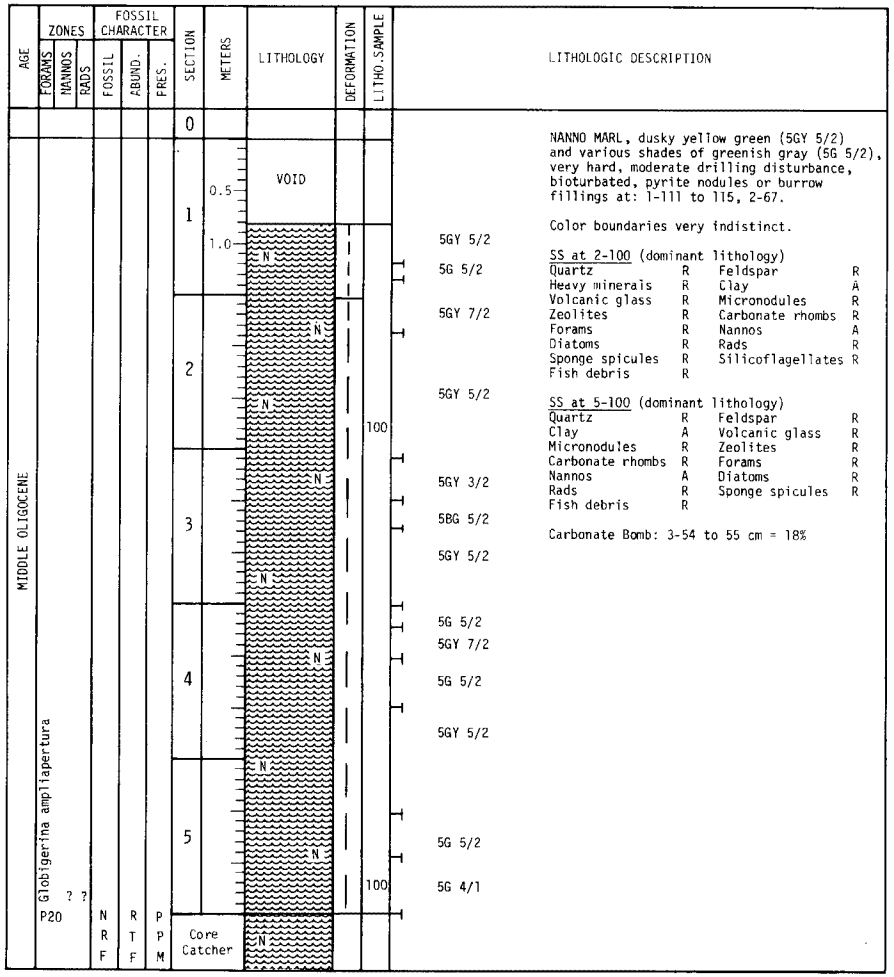
Quartz	R	Heavy minerals	R
Clay	A	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Fish debris	R

SS at 6-50 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate rhombs	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-94 to 95 cm = 43%

Site 369 Hole A Core 26 Cored Interval: 279.5-289.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL, dusky yellow green (5GY 5/2) and various shades of greenish gray (5G 5/2), very hard, moderate drilling disturbance, bioturbated, pyrite nodules or burrow fillings at: 1-111 to 115, 2-67.

Color boundaries very indistinct.

SS at 2-100 (dominant lithology)

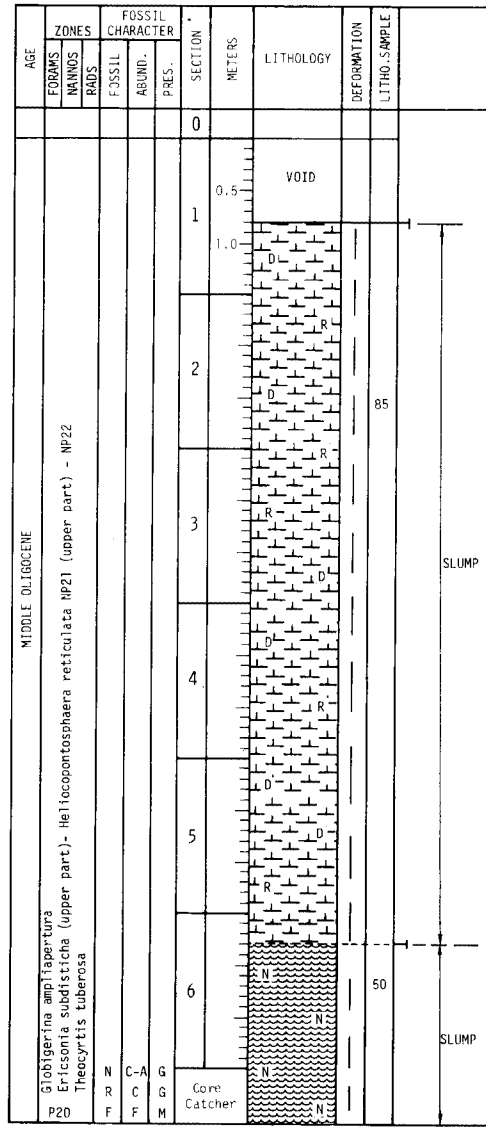
Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Micronodules	R
Zeolites	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Silicoflagellates	R
Fish debris	R		

SS at 5-100 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Volcanic glass	R
Micronodules	R	Zeolites	R
Carbonate rhombs	R	Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 3-54 to 55 cm = 18%

Site 369 Hole A Core 27 Cored Interval: 289.0-298.5 m



LITHOLOGIC DESCRIPTION

RAD-BEARING DIATOM NANNO OOZE, variations of olive greens and grays. LARGE SLUMP with flow structures, overturned beds, microtectonics, wild folding, color variations, etc.

SS at 2-85

Quartz	R	Feldspar	R
Clay	A	Volcanic glass	R
Micronodules	R	Carbonate rhombs	R
Forams	R	Nannos	A
Diatoms	A	Rads	C
Sponge spicules	R	Silicoflagellates	R

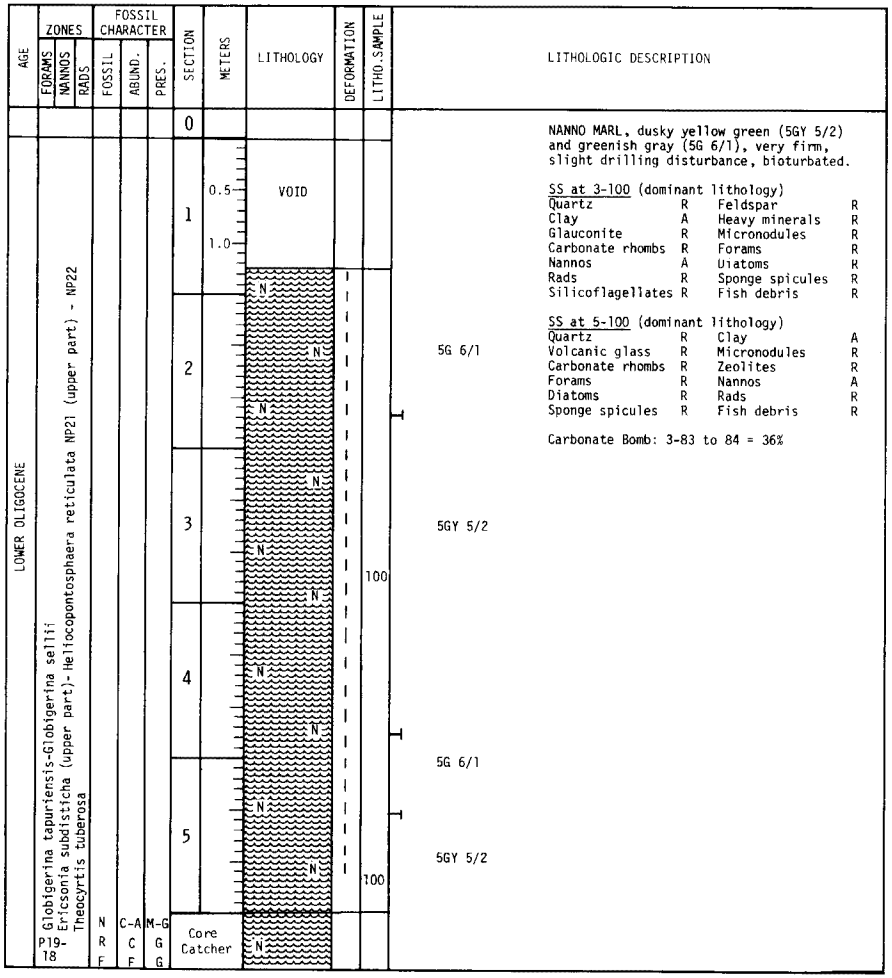
This smear slide sample looks fairly typical for the slump but it may not be representative.

By 6-35 the slump features are indistinct although Section 6 may still be in slump. Sediment is NANNO MARL, dusky yellow green (5GY 5/2), burrowed.

SS at 6-50

Quartz	R	Clay	A
Micronodules	R	Carbonate rhombs	R
Fish debris	R	Nannos	A
Mollusk debris	R	Diatoms	R
Rads	R	Sponge spicules	R

Site 369 Hole A Core 28 Cored Interval: 298.5-308.0 m



NANNO MARL, dusky yellow green (5GY 5/2) and greenish gray (5G 6/1), very firm, slight drilling disturbance, bioturbated.

SS at 3-100 (dominant lithology)

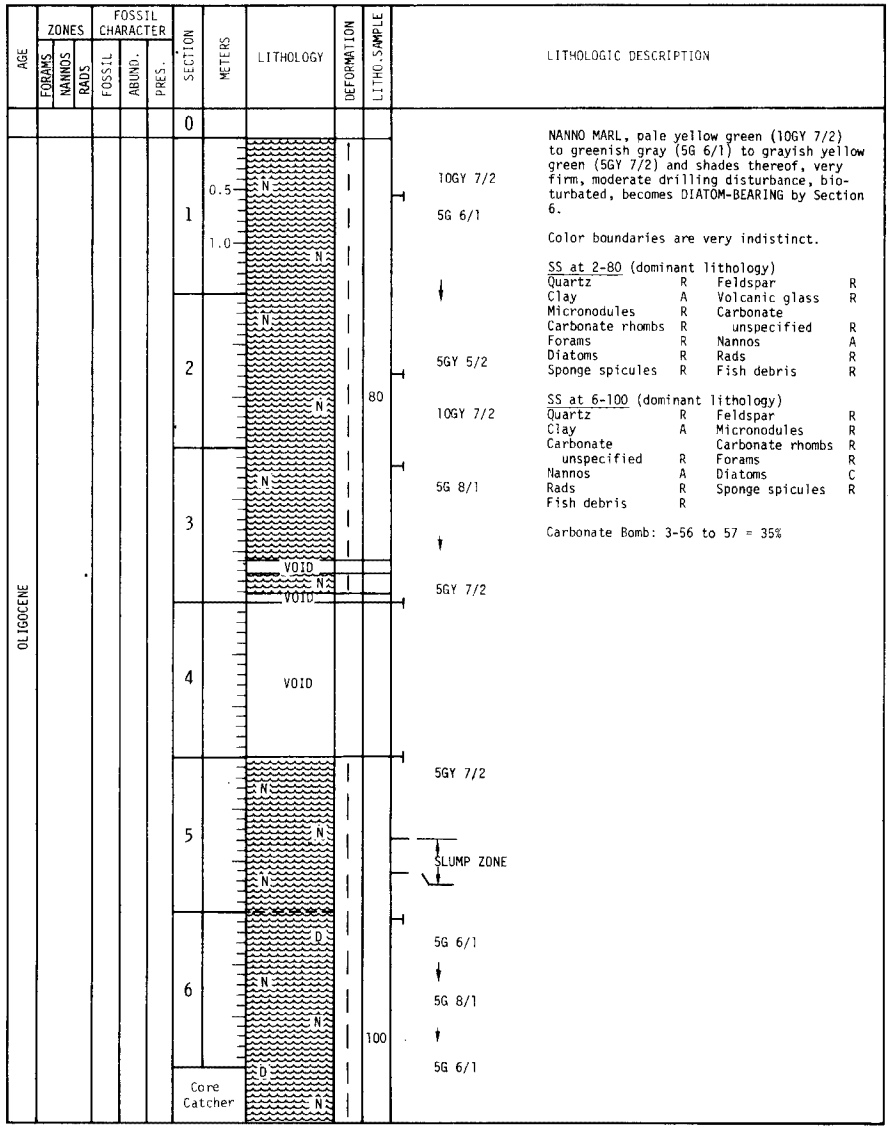
Quartz	R	Feldspar	R
Clay	A	Heavy minerals	R
Glauconite	R	Micronodules	R
Carbonate rhombs	R	Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Silicoflagellates	R	Fish debris	R

SS at 5-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Carbonate rhombs	R	Zeolites	R
Forams	R	Nannos	A
Diatoms	R	Rads	R
Sponge spicules	R	Fish debris	R

Carbonate Bomb: 3-83 to 84 = 36%

Site 369 Hole A Core 29 Cored Interval: 308.0-317.5 m



NANNO MARL, pale yellow green (10GY 7/2) to greenish gray (5G 6/1) to grayish yellow green (5GY 7/2) and shades thereof, very firm, moderate drilling disturbance, bioturbated, becomes DIATOM-BEARING by Section 6.

Color boundaries are very indistinct.

SS at 2-80 (dominant lithology)

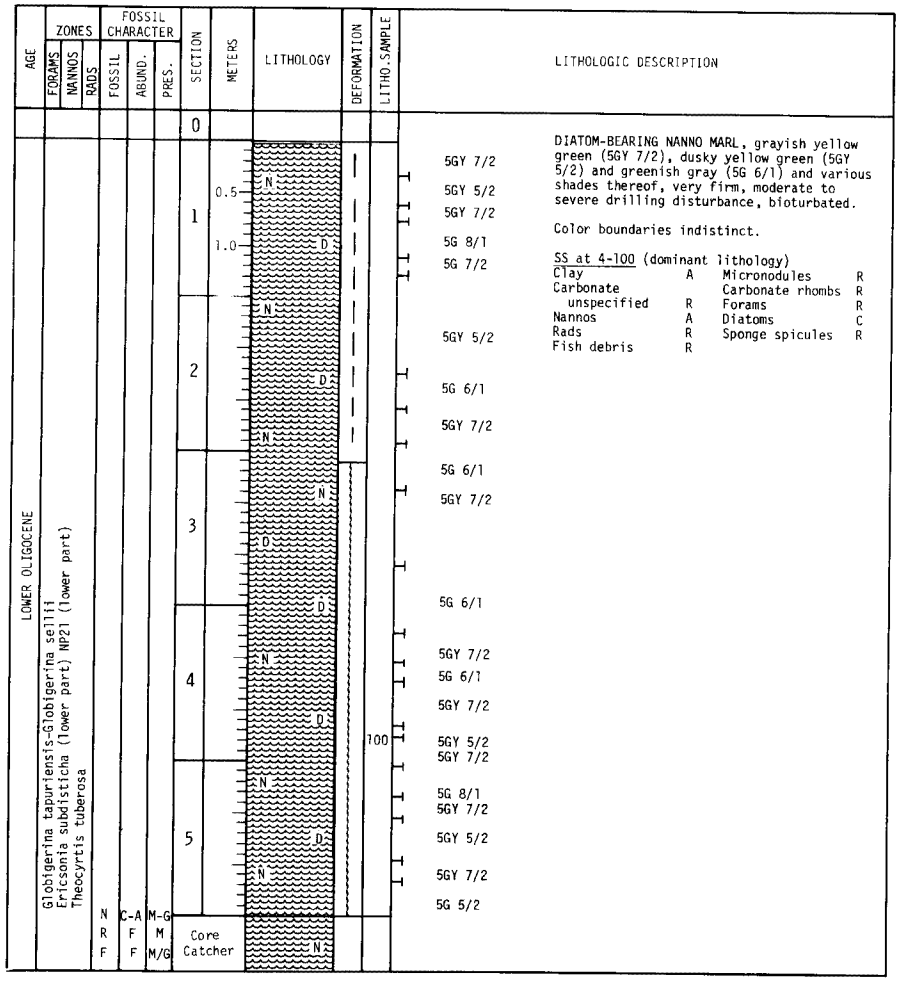
Quartz	R	Feldspar	R
Clay	A	Volcanic glass	R
Micronodules	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	R	Rads	R
Diatoms	R	Fish debris	R
Sponge spicules	R		

SS at 6-100 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	A	Forams	R
Rads	R	Diatoms	C
Fish debris	R	Sponge spicules	R

Carbonate Bomb: 3-56 to 57 = 35%

Site 369 Hole A Core 30 Cored Interval: 317.5-327.0 m



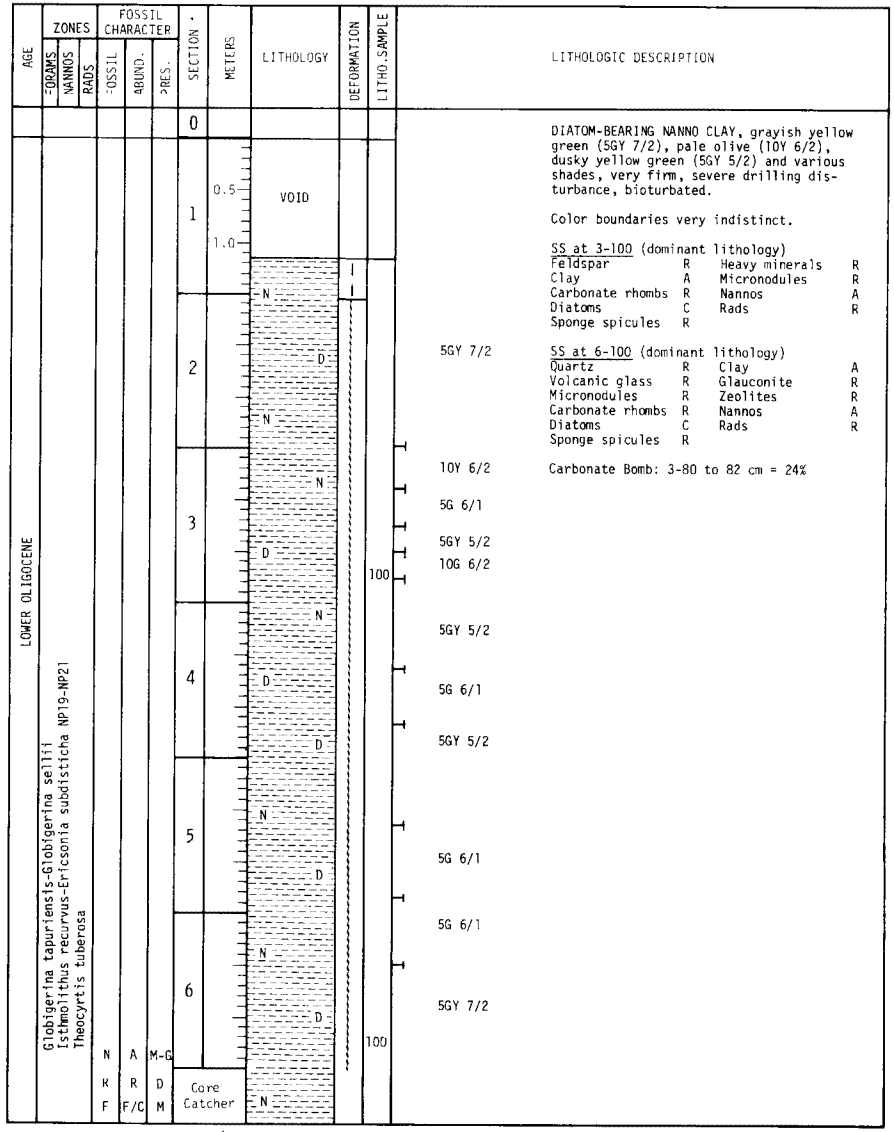
DIATOM-BEARING NANNO MARL, grayish yellow green (5GY 7/2), dusky yellow green (5GY 5/2) and greenish gray (5G 6/1) and various shades thereof, very firm, moderate to severe drilling disturbance, bioturbated.

Color boundaries indistinct.

SS at 4-100 (dominant lithology)

Clay	A	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	A	Forams	R
Rads	R	Diatoms	C
Fish debris	R	Sponge spicules	R

Site 369 Hole A Core 31 Cored Interval: 327.0-336.5 m



DIATOM-BEARING NANNO CLAY, grayish yellow green (5GY 7/2), pale olive (10Y 6/2), dusky yellow green (5GY 5/2) and various shades, very firm, severe drilling disturbance, bioturbated.

Color boundaries very indistinct.

SS at 3-100 (dominant lithology)

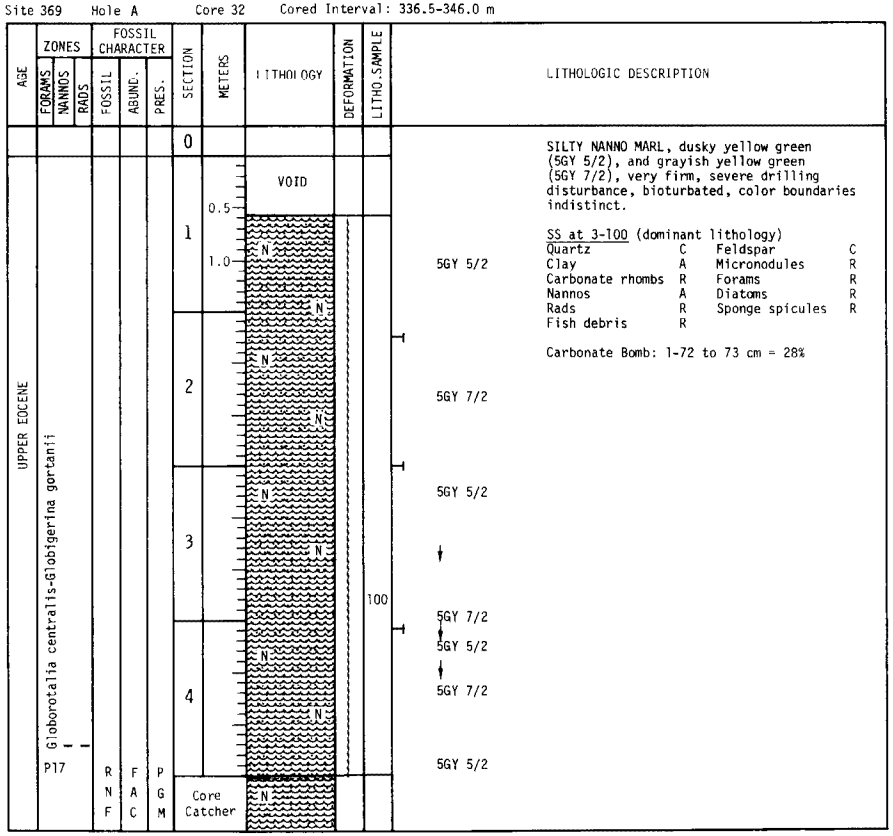
Feldspar	R	Heavy minerals	R
Clay	A	Micronodules	R
Carbonate rhombs	R	Nannos	A
Diatoms	C	Rads	R
Sponge spicules	R		

SS at 6-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Glauconite	R
Micronodules	R	Zeolites	R
Carbonate rhombs	R	Nannos	A
Diatoms	C	Rads	R
Sponge spicules	R		

Carbonate Bomb: 3-80 to 82 cm = 24%

Site 369 Hole A Core 32 Cored Interval: 336.5-346.0 m



LITHOLOGIC DESCRIPTION

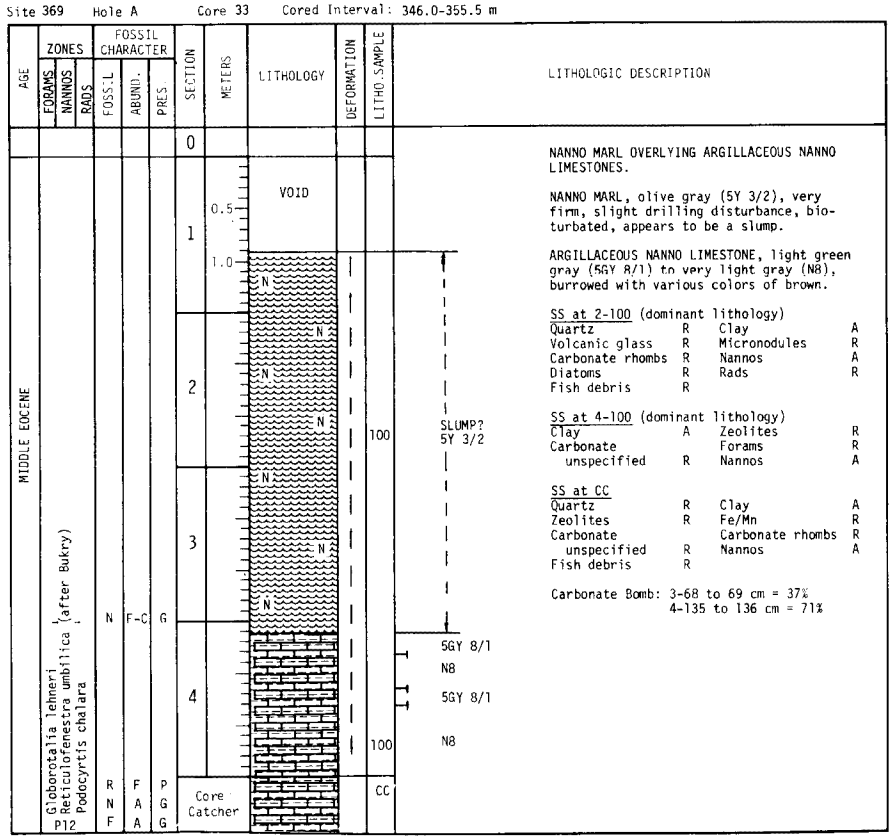
SILTY NANNO MARL, dusky yellow green (5GY 5/2), and grayish yellow green (5GY 7/2), very firm, severe drilling disturbance, bioturbated, color boundaries indistinct.

SS at 3-100 (dominant lithology)

Quartz	C	Feldspar	C
Clay	A	Micronodules	R
Carbonate rhombs	R	Forams	R
Nannos	A	Diatoms	R
Rads	R	Sponge spicules	R
Fish debris	R		

Carbonate Bomb: 1-72 to 73 cm = 28%

Site 369 Hole A Core 33 Cored Interval: 346.0-355.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL OVERLYING ARGILLACEOUS NANNO LIMESTONES.

NANNO MARL, olive gray (5Y 3/2), very firm, slight drilling disturbance, bioturbated, appears to be a slump.

ARGILLACEOUS NANNO LIMESTONE, light green gray (5GY 8/1) to very light gray (N8), burrowed with various colors of brown.

SS at 2-100 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R	Micronodules	R
Carbonate rhombs	R	Nannos	A
Diatoms	R	Rads	R
Fish debris	R		

SS at 4-100 (dominant lithology)

Clay	A	Zeolites	R
Carbonate unspecified	R	Forams	R
		Nannos	A

SS at CC

Quartz	R	Clay	A
Zeolites	R	Fe/Mn	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	A
Fish debris	R		

Carbonate Bomb: 3-68 to 69 cm = 37%
4-135 to 136 cm = 71%

Site 369 Hole A Core 34 Cored interval: 355.5-365.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Globorotalia kugleri P11 Reticulofenestra umbilica (after Bukry) Podocyrtis mitra			R N F	F A A	P G M	0					ARGILLACEOUS NANNO LIMESTONE, very light gray (N8) to light greenish gray (5GY 8/1), bioturbated.
							1	0.5 1.0	VOID			
							2				35	
							Core Catcher					

SS at 35 (dominant lithology)

Quartz	R	Clay	A
Zeolites	R	Carbonate unspecified	C
Carbonate rhombs	R	Nannos	A
Forams	R		

Carbonate Bomb: 2-131 to 132 cm = 55%

Site 369 Hole A Core 35 Cored Interval: 365.0-374.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Globorotalia kugleri-(?Hantkenina aragonensis)						0					ARGILLACEOUS NANNO LIMESTONE WITH MINOR PORCELLANITE AND CHERT
							1	0.5 1.0	VOID			ARGILLACEOUS NANNO LIMESTONE, very light gray (N8) to very light greenish gray (5GY 8/1), bioturbated, blue black (Mn?) halos and liesegang banding. Color banding in limestone correlates to degree of cementation - the N8 sections are considerably harder than the others. Pyrite is scattered throughout.
							2				78	N8 to 5GY 8/1
							3				78	PORCELLANITES and CHERT occur in the color cycles - always occuring in the N8 layer.
	P11/10?			F	C	M	4					multicolored
												5GY 8/1
	P11/10?			F	C	M	5					5BG 5/2
												5GY 8/1
MAESTRICHTIAN	Abathomphalus mayaroensis ?Micula mura			F R N F	A F A A	M/G M M-G M/G					100	5B 9/1 and 5G 6/1
							Core Catcher					

At 5-122, ARGILLACEOUS NANNO LIMESTONE, blue white (5B 9/1) and greenish gray (5G 6/1) interbedded, bioturbated, contact with overlying limestone very sharp.

SS at 2-78 (dominant lithology)

Quartz	R	Clay	A
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	A
Forams	R		

SS at 3-78 (minor lithology, very hard layer)

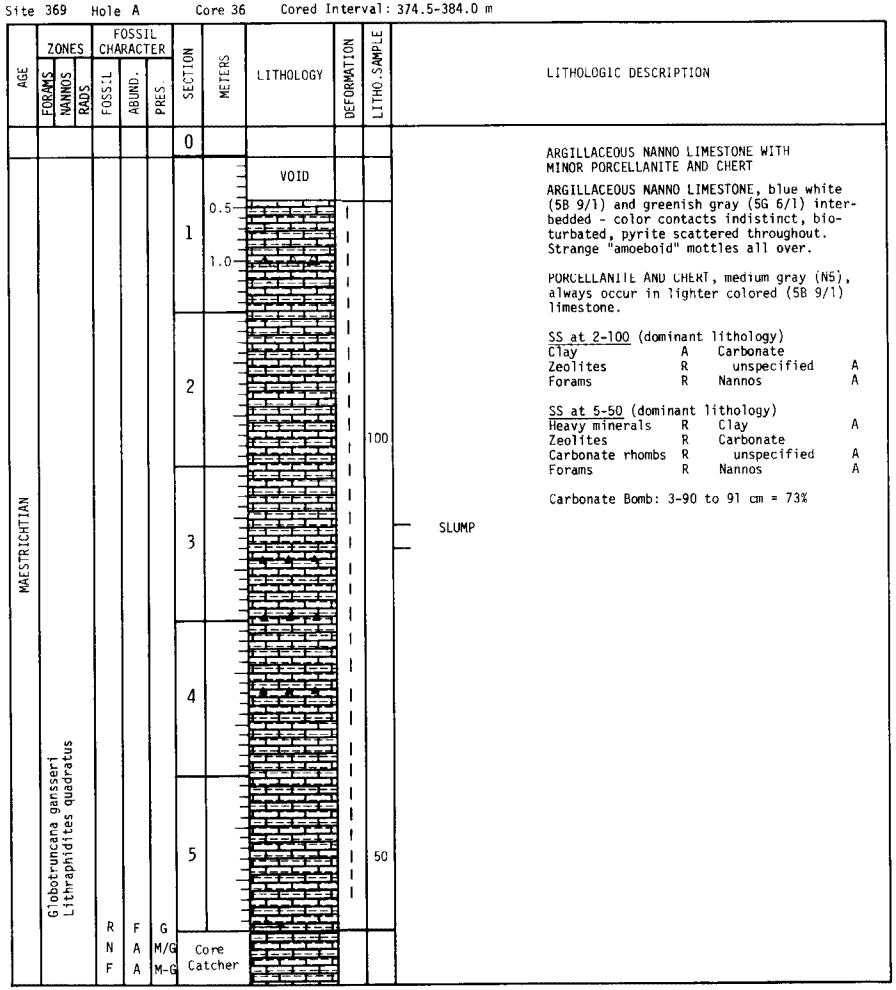
Clay	A	Carbonate unspecified	A
Forams	R		
Nannos	A		

SS at 5-100 (dominant lithology)

Clay	A	Zeolites	R
Carbonate unspecified	C	Forams	R
		Nannos	C

Carbonate Bomb: 2-98 to 99 cm = 79%

Site 369 Hole A Core 36 Cored Interval: 374.5-384.0 m



LITHOLOGIC DESCRIPTION

ARGILLACEOUS NANNO LIMESTONE WITH MINOR PORCELLANITE AND CHERT

ARGILLACEOUS NANNO LIMESTONE, blue white (5B 9/1) and greenish gray (5G 6/1) interbedded - color contacts indistinct, bioturbated, pyrite scattered throughout. Strange "amoeboid" mottles all over.

PORCELLANITE AND CHERT, medium gray (N5), always occur in lighter colored (5B 9/1) limestone.

SS at 2-100 (dominant lithology)

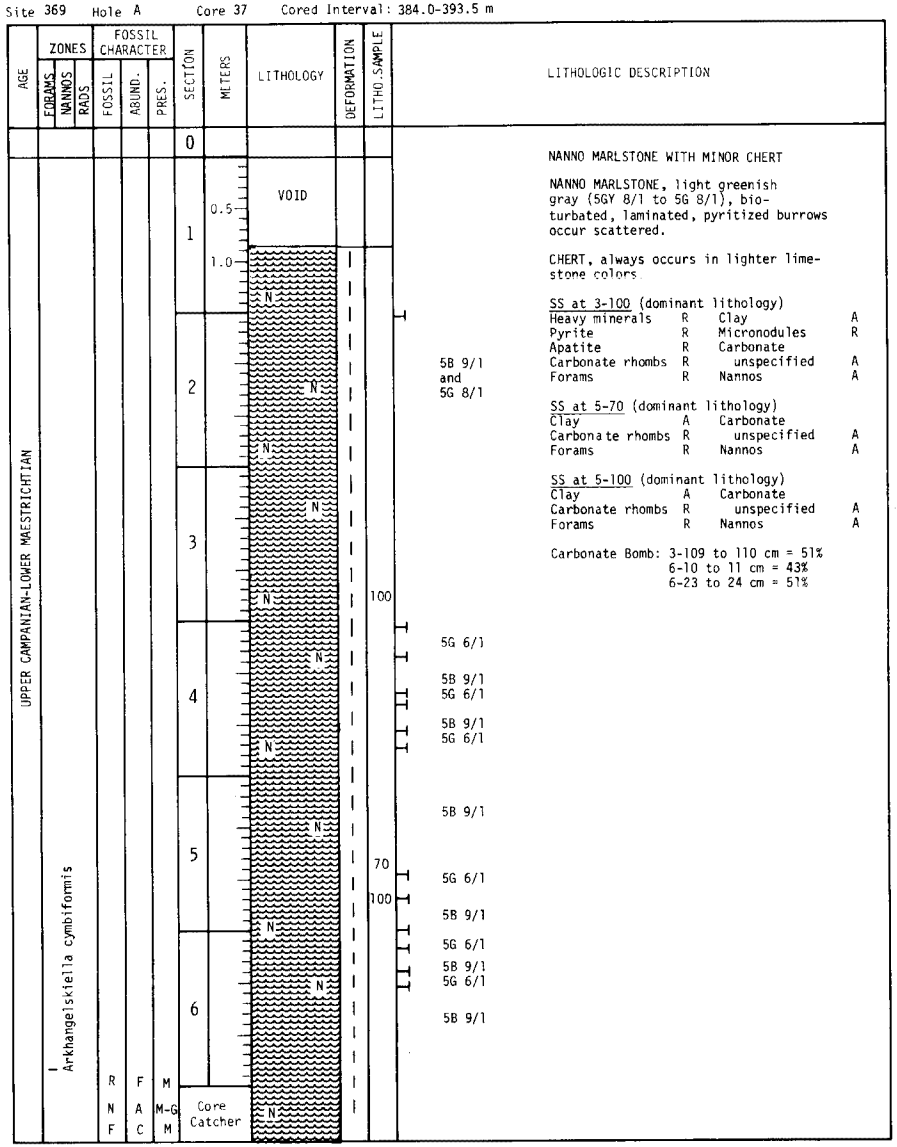
Clay	A	Carbonate	
Zeolites	R	unspecified	A
Forams	R	Nannos	A

SS at 5-50 (dominant lithology)

Heavy minerals	R	Clay	A
Zeolites	R	Carbonate	
Carbonate rhombs	R	unspecified	A
Forams	R	Nannos	A

Carbonate Bomb: 3-90 to 91 cm = 73%

Site 369 Hole A Core 37 Cored Interval: 384.0-393.5 m



LITHOLOGIC DESCRIPTION

NANNO MARLSTONE WITH MINOR CHERT

NANNO MARLSTONE, light greenish gray (5GY 8/1 to 5G 8/1), bioturbated, laminated, pyritized burrows occur scattered.

CHERT, always occurs in lighter limestone colors

SS at 3-100 (dominant lithology)

Heavy minerals	R	Clay	A
Pyrite	R	Micronodules	R
Apatite	R	Carbonate	
Carbonate rhombs	R	unspecified	A
Forams	R	Nannos	A

SS at 5-70 (dominant lithology)

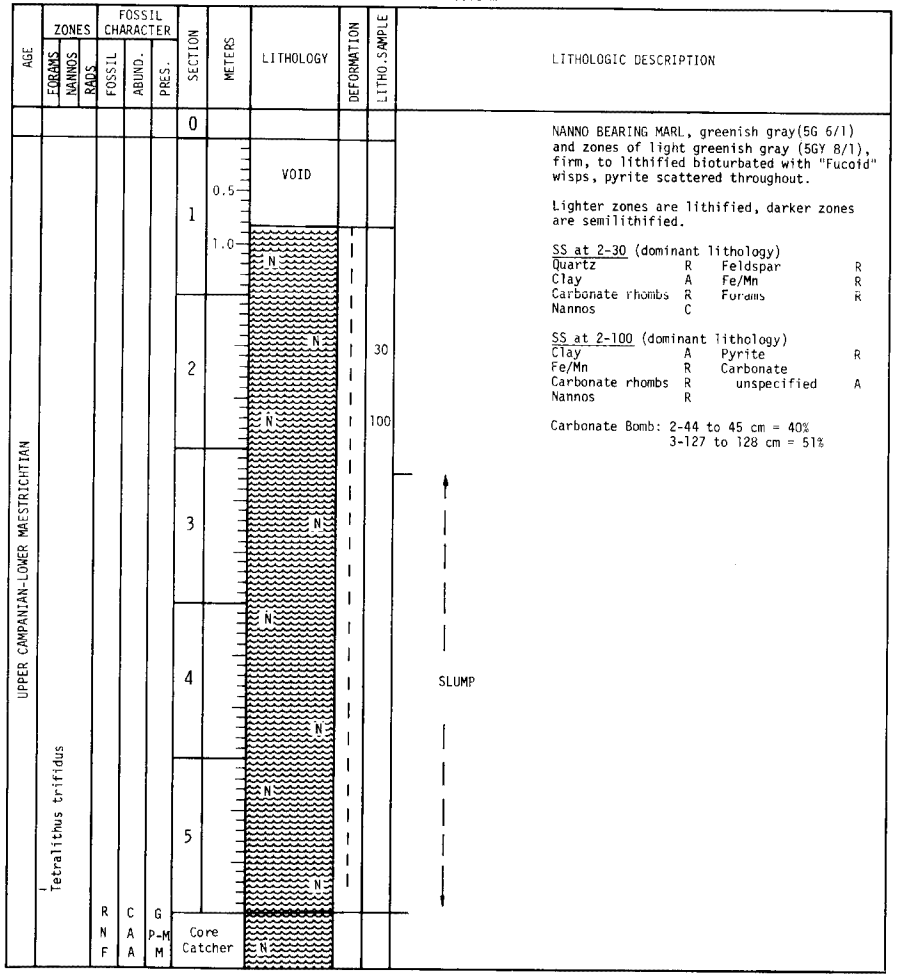
Clay	A	Carbonate	
Carbonate rhombs	R	unspecified	A
Forams	R	Nannos	A

SS at 5-100 (dominant lithology)

Clay	A	Carbonate	
Carbonate rhombs	R	unspecified	A
Forams	R	Nannos	A

Carbonate Bomb: 3-109 to 110 cm = 51%
6-10 to 11 cm = 43%
6-23 to 24 cm = 51%

Site 369 Hole A Core 38 Cored Interval: 393.5-403.0 m



LITHOLOGIC DESCRIPTION

NANNO BEARING MARL, greenish gray(5G 6/1) and zones of light greenish gray (5GY 8/1), firm, to lithified bioturbated with "Fucoid" wisps, pyrite scattered throughout.

Lighter zones are lithified, darker zones are semilithified.

SS at 2-30 (dominant lithology)

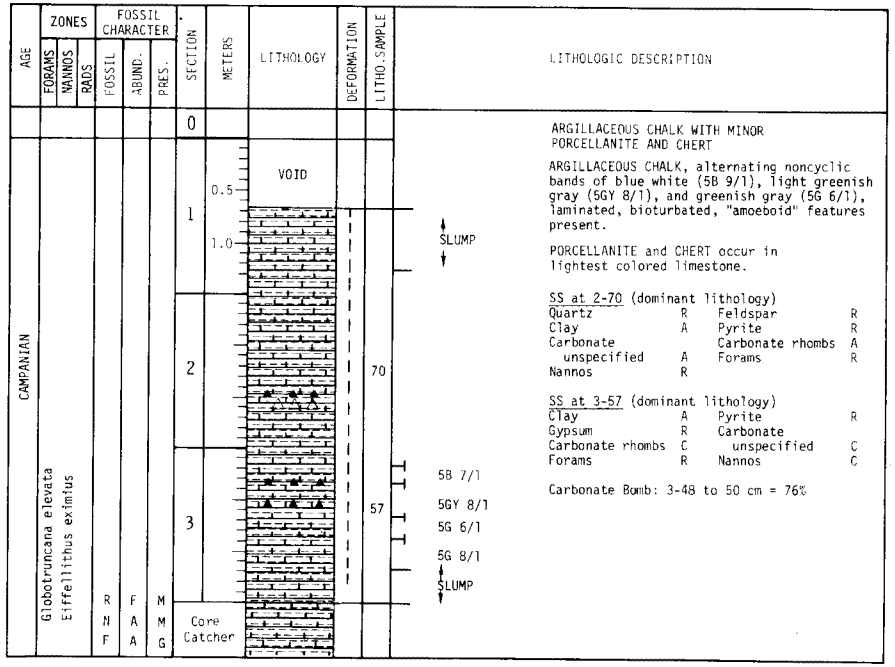
Quartz	R	Feldspar	R
Clay	A	Fe/Mn	R
Carbonate rhombs	R	Forams	R
Nannos	C		

SS at 2-100 (dominant lithology)

Clay	A	Pyrite	R
Fe/Mn	R	Carbonate unspecified	A
Carbonate rhombs	R		
Nannos	R		

Carbonate Bomb: 2-44 to 45 cm = 40%
3-127 to 128 cm = 51%

Site 369 Hole A Core 39 Cored Interval: 403.0-412.5 m



LITHOLOGIC DESCRIPTION

ARGILLACEOUS CHALK WITH MINOR PORCELLANITE AND CHERT

ARGILLACEOUS CHALK, alternating noncyclic bands of blue white (5B 9/1), light greenish gray (5GY 8/1), and greenish gray (5G 6/1), laminated, bioturbated, "amoeboid" features present.

PORCELLANITE and CHERT occur in lightest colored limestone.

SS at 2-70 (dominant lithology)

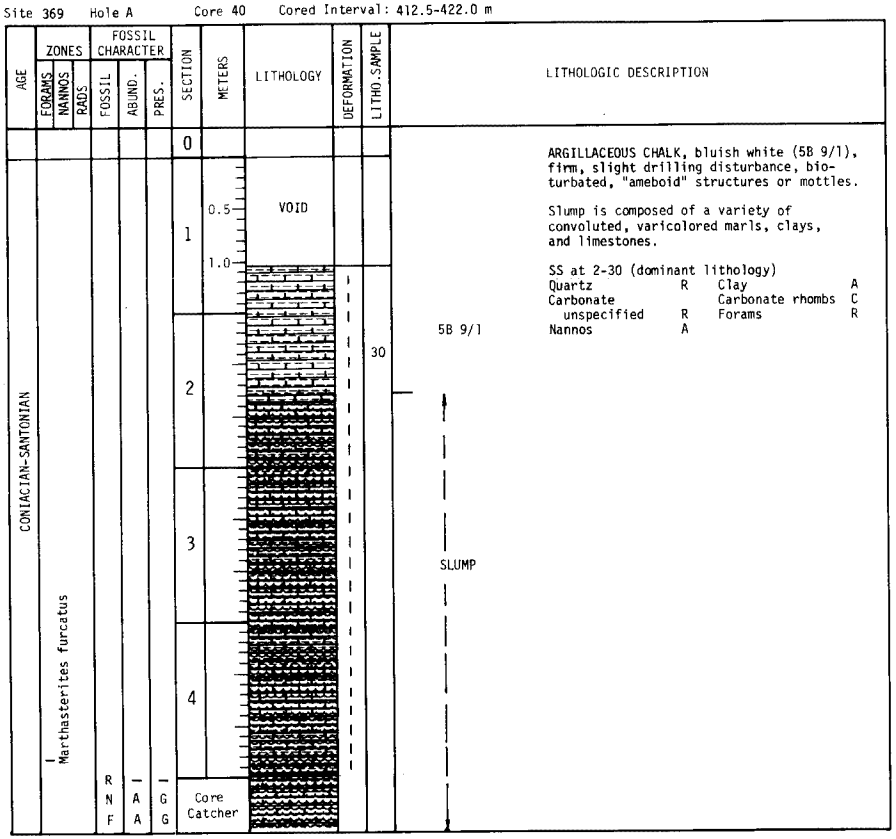
Quartz	R	Feldspar	R
Clay	A	Pyrite	R
Carbonate unspecified	A	Carbonate rhombs	A
Nannos	R	Forams	R

SS at 3-57 (dominant lithology)

Clay	A	Pyrite	R
Gypsum	R	Carbonate unspecified	C
Carbonate rhombs	C		
Forams	R	Nannos	C

Carbonate Bomb: 3-48 to 50 cm = 76%

Site 369 Hole A Core 40 Cored Interval: 412.5-422.0 m



LITHOLOGIC DESCRIPTION

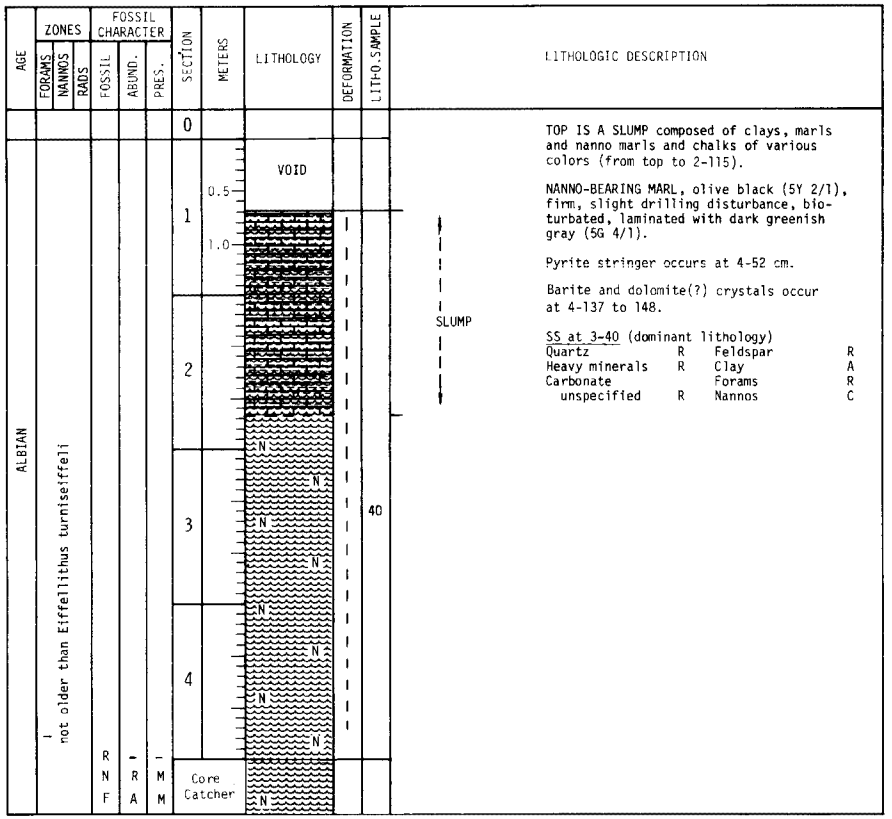
ARGILLACEOUS CHALK, bluish white (5B 9/1), firm, slight drilling disturbance, bioturbated, "ameboid" structures or mottles.

Slump is composed of a variety of convoluted, varicolored marls, clays, and limestones.

SS at 2-30 (dominant lithology)

Quartz	R	Clay	A
Carbonate unspecified	R	Carbonate rhombs	C
Nannos	A	Forams	R

Site 369 Hole A Core 41 Cored Interval: 422.0-431.5 m



LITHOLOGIC DESCRIPTION

TOP IS A SLUMP composed of clays, marls and nanno marls and chalks of various colors (from top to 2-115).

NANNO-BEARING MARL, olive black (5Y 2/1), firm, slight drilling disturbance, bioturbated, laminated with dark greenish gray (5G 4/1).

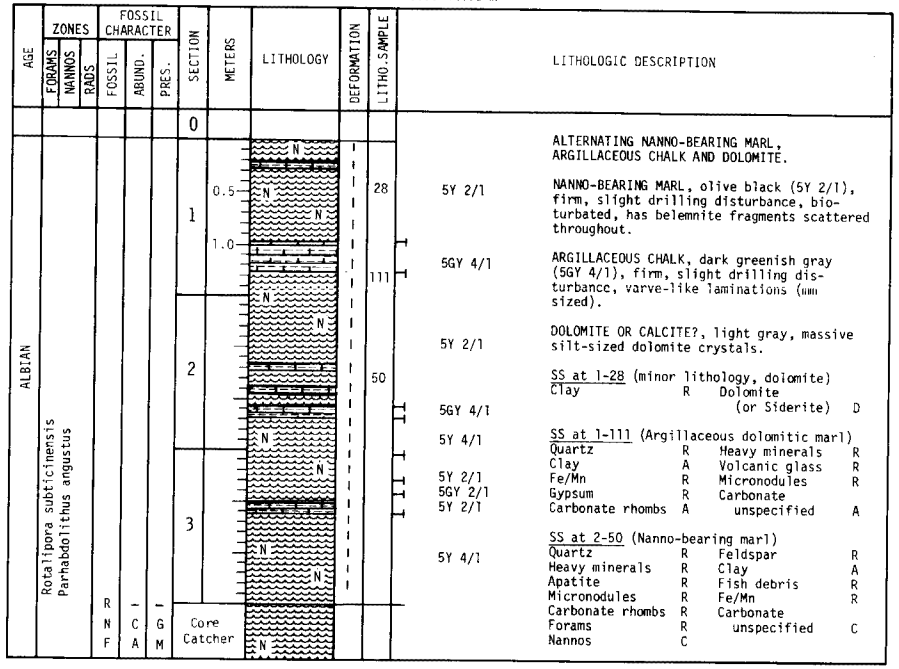
Pyrite stringer occurs at 4-52 cm.

Barite and dolomite(?) crystals occur at 4-137 to 148.

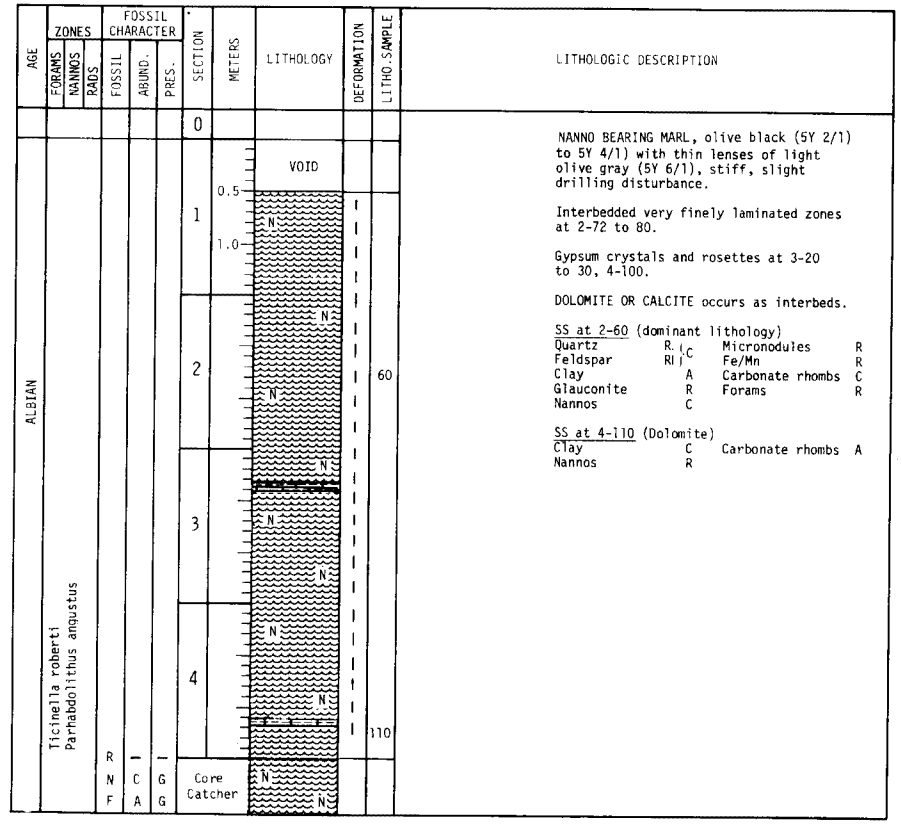
SS at 3-40 (dominant lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Carbonate unspecified	R	Forams	R
		Nannos	C

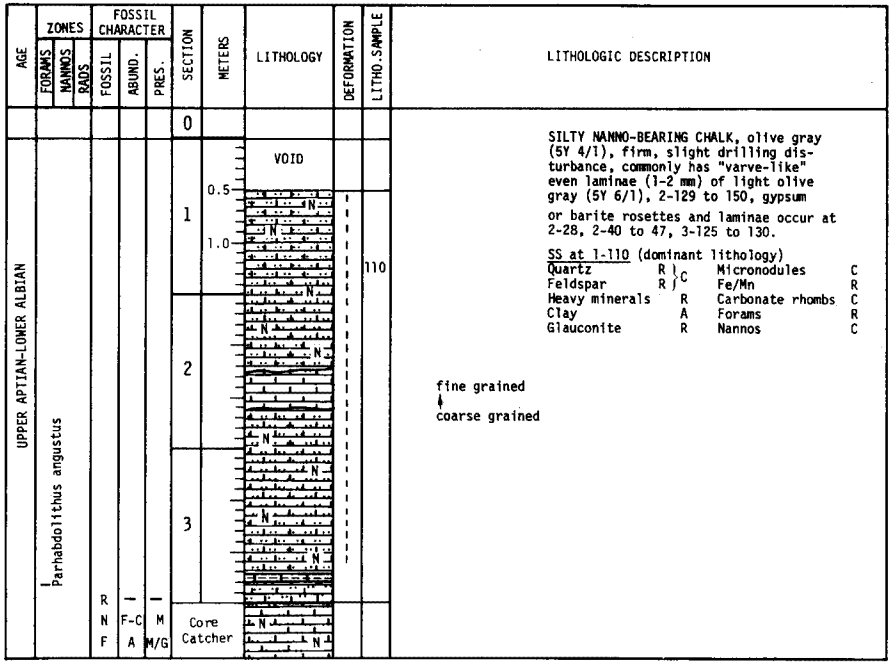
Site 369 Hole A Core 42 Cored Interval: 431.5-441.0 m



Site 369 Hole A Core 43 Cored Interval: 441.0-450.5 m



Site 369 Hole A Core 44 Cored Interval: 450.5-460.0 m



LITHOLOGIC DESCRIPTION

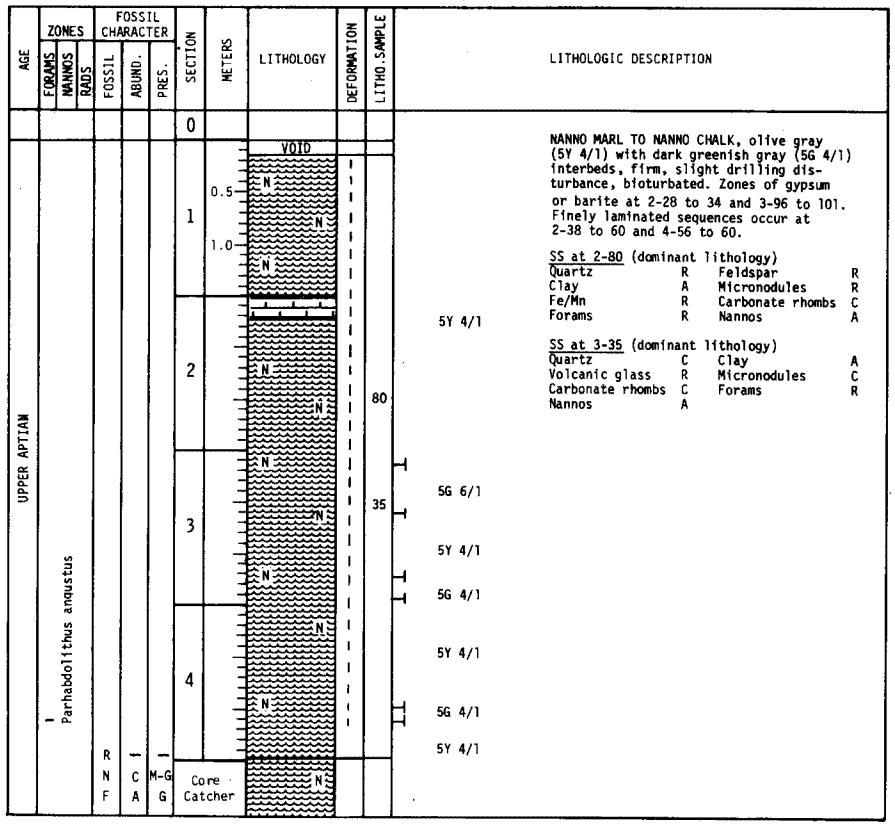
SILTY NANNO-BEARING CHALK, olive gray (5Y 4/1), firm, slight drilling disturbance, commonly has "varve-like" even laminae (1-2 mm) of light olive gray (5Y 6/1), 2-129 to 150, gypsum or barite rosettes and laminae occur at 2-28, 2-40 to 47, 3-125 to 130.

SS at 1-110 (dominant lithology)

Quartz	R } C	Micronodules	C
Feldspar	R }	Fe/Mn	R
Heavy minerals	R	Carbonate rhombs	C
Clay	A	Forams	R
Glauconite	R	Nannos	C

fine grained
↓
coarse grained

Site 369 Hole A Core 45 Cored Interval: 460.0-469.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL TO NANNO CHALK, olive gray (5Y 4/1) with dark greenish gray (5G 4/1) interbeds, firm, slight drilling disturbance, bioturbated. Zones of gypsum or barite at 2-28 to 34 and 3-96 to 101. Finely laminated sequences occur at 2-38 to 60 and 4-56 to 60.

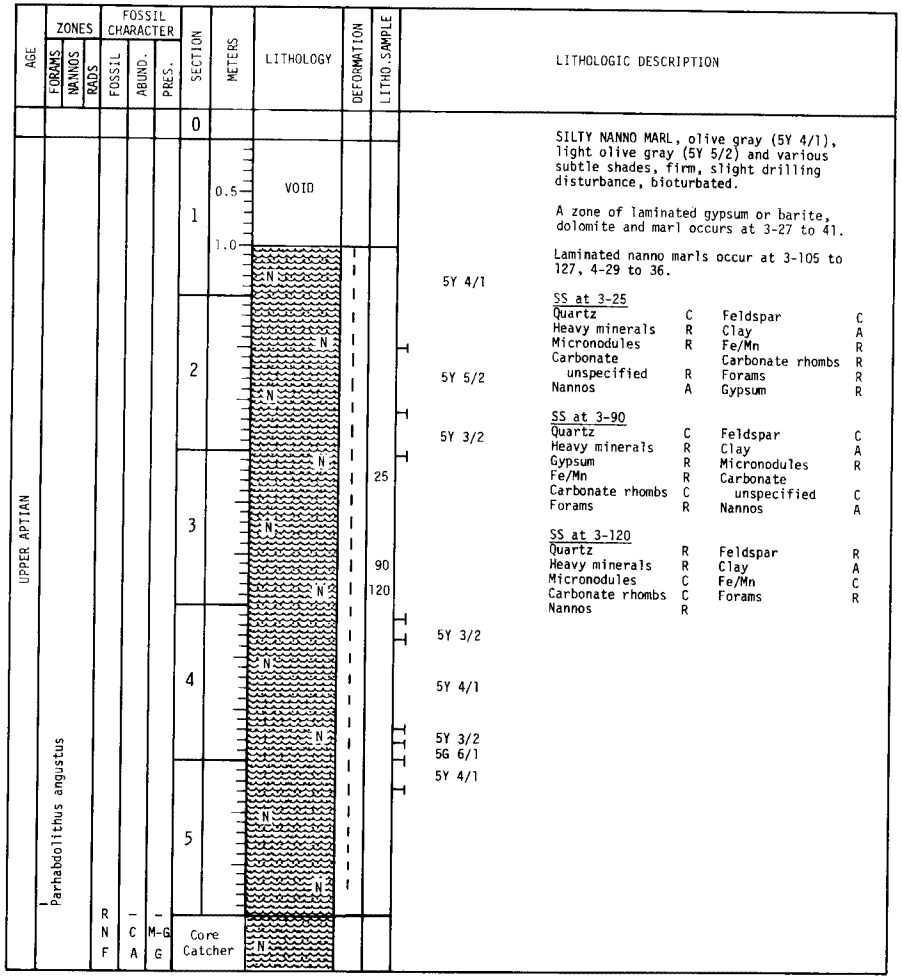
SS at 2-80 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Micronodules	R
Fe/Mn	R	Carbonate rhombs	C
Forams	R	Nannos	A

SS at 3-35 (dominant lithology)

Quartz	C	Clay	A
Volcanic glass	R	Micronodules	C
Carbonate rhombs	C	Forams	R
Nannos	A		

Site 369 Hole A Core 46 Cored Interval: 469.5-479.0 m



LITHOLOGIC DESCRIPTION

SILTY NANNO MARL, olive gray (5Y 4/1), light olive gray (5Y 5/2) and various subtle shades, firm, slight drilling disturbance, bioturbated.

A zone of laminated gypsum or barite, dolomite and marl occurs at 3-27 to 41.

Laminated nanno marls occur at 3-105 to 127, 4-29 to 36.

SS at 3-25

Quartz	C	Feldspar	C
Heavy minerals	R	Clay	A
Micronodules	R	Fe/Mn	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	A	Forams	R
		Gypsum	R

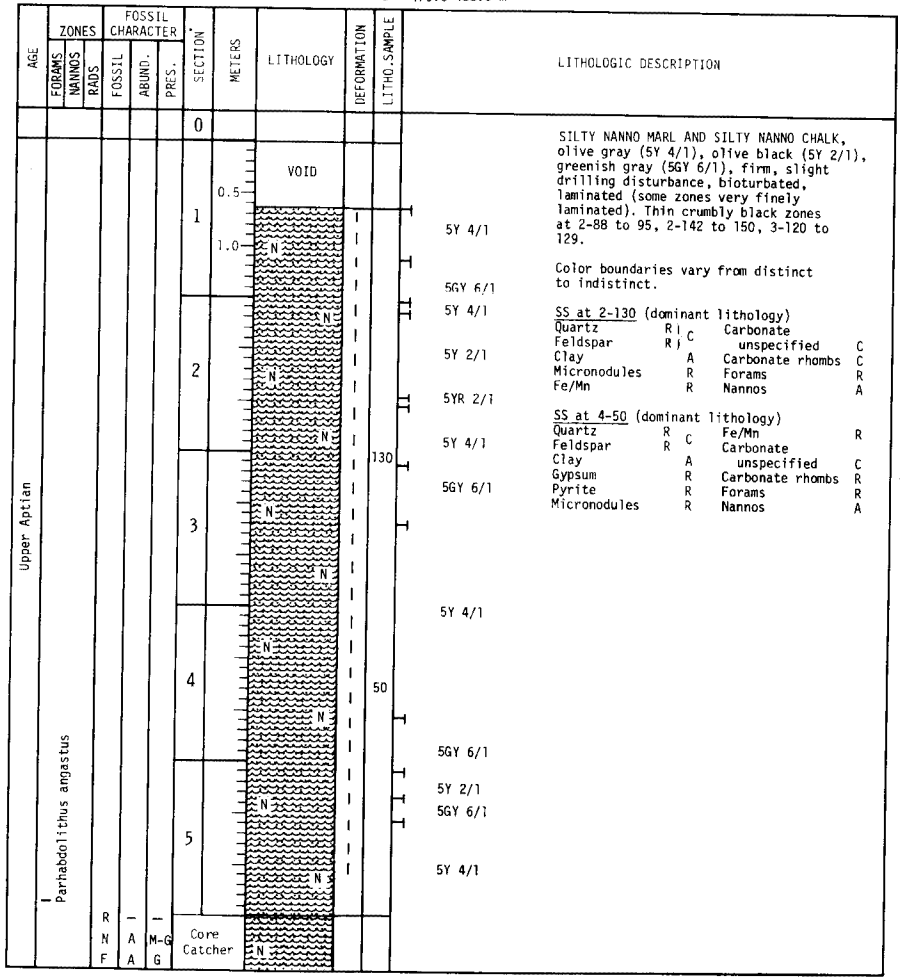
SS at 3-90

Quartz	C	Feldspar	C
Heavy minerals	R	Clay	A
Gypsum	R	Micronodules	R
Fe/Mn	R	Carbonate unspecified	C
Carbonate rhombs	C	Nannos	A
Forams	R		

SS at 3-120

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Micronodules	C	Fe/Mn	C
Carbonate rhombs	C	Forams	R
Nannos	R		

Site 369 Hole A Core 47 Cored Interval: 479.0-488.5 m



LITHOLOGIC DESCRIPTION

SILTY NANNO MARL AND SILTY NANNO CHALK, olive gray (5Y 4/1), olive black (5Y 2/1), greenish gray (5GY 6/1), firm, slight drilling disturbance, bioturbated, laminated (some zones very finely laminated). Thin crumbly black zones at 2-88 to 95, 2-142 to 150, 3-120 to 129.

Color boundaries vary from distinct to indistinct.

SS at 2-130 (dominant lithology)

Quartz	R	Carbonate unspecified	C
Feldspar	R	Carbonate rhombs	C
Clay	A	Forams	R
Micronodules	R	Nannos	A
Fe/Mn	R		

SS at 4-50 (dominant lithology)

Quartz	R	Fe/Mn	R
Feldspar	R	Carbonate unspecified	C
Clay	A	Carbonate rhombs	R
Gypsum	R	Forams	R
Pyrite	R	Nannos	A
Micronodules	R		

137

DEEP SEA DRILLING PROJECT

LEG 41 SITE 370

SITE SUMMARY SHEET

PRINCIPAL RESULTS:

Deep Basin off Morocco

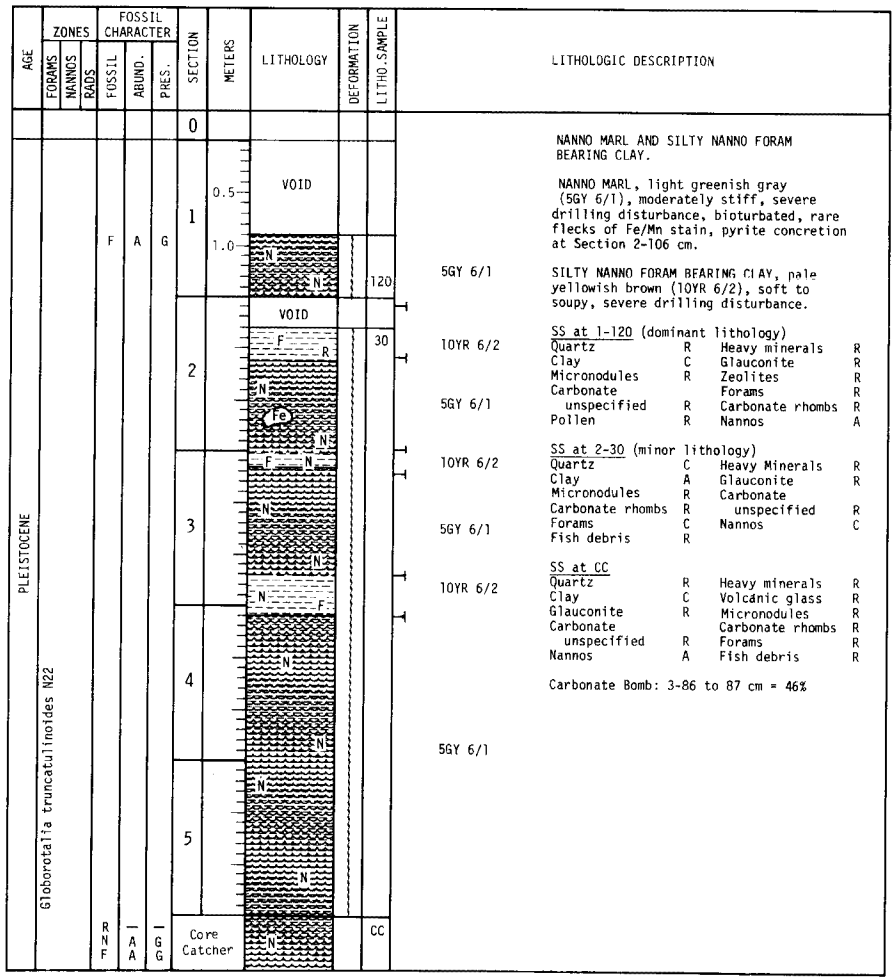
Nearly 1200 meters of the sediment section of the oceanic basin off the Moroccan continental margin was sampled. The uppermost section, down to 420 meters, was very sparsely cored but below that level coring was closely spaced until time constraints forced us to abandon the site. The sediments are predominantly hemipelagic containing silt and sand layers and occasionally conglomerates; most of these layers probably are turbidites. The section reflects an evolution different from that of the Cape Verde Basin and of the North American Basin because here a strong terrigenous influence was felt from the lower Cretaceous to the Pleistocene. The section can be summarized as follows (from top to bottom): 1) Pleistocene clay with nannofossil and foraminifera; 2) Pleistocene to middle Miocene clay and silty nannofossil marls interbedded with silt and sand; 3) middle Miocene to late Paleocene clays with occasional radiolarians, chert, silt, sand and gravel; 4) late to early Paleocene nannofossil marls and clays; 5) early Cenomanian to Berriasian calcareous silty claystones interbedded with siltstones, sandstone and conglomerates. A hiatus of 35 m.y. separates late Cenomanian from early Paleocene sediments. No well-defined black shales were found in Aptian to Cenomanian sediments although the claystones are dark in this interval and have organic carbon contents reaching 5%. Rosettes of barite partially replaced by calcite, as at Site 369, might indicate migration of calcium sulfate-rich solutions originating from possible underlying evaporites. Calcite cementation of sandstone and siltstone beds below about 835 meters might be also related to such migration.

Date occupied	0100 March 29, 1975
Date departed	0110 April 8, 1975
Time on site	10 days, and 10 minutes
Position: Latitude	32°50.2'N
Longitude	10°46.6'W
Water depth (sea level)	4214 corrected meters
Water depth (rig floor)	4224 corrected meters
Penetration	1176.5 meters

LEG 41 SITE 370
SITE SUMMARY SHEET, con't.

Number of holes	1
Number of cores	51
Total length of cored section	483 meters
Total core recovered	202.7 meters
Percentage core recovery	42%
<u>Oldest Sediment Cored</u>	
Depth subbottom	1176.5 meters
Nature	Claystone and siltstone
Age	Berriasian
Measured velocity	3.82 km/sec

Site 370 Hole Core 1 Cored Interval: 0.0-8.0 m



LITHOLOGIC DESCRIPTION

NANNO MARL AND SILTY NANNO FORAM BEARING CLAY.

NANNO MARL, light greenish gray (5GY 6/1), moderately stiff, severe drilling disturbance, bioturbated, rare flecks of Fe/Mn stain, pyrite concretion at Section 2-106 cm.

SILTY NANNO FORAM BEARING CLAY, pale yellowish brown (10YR 6/2), soft to soupy, severe drilling disturbance.

SS at 1-120 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	C	Glauconite	R
Micronodules	R	Zeolites	R
Carbonate unspecified	R	Forams	R
Pollen	R	Carbonate rhombs	R
		Nannos	A

SS at 2-30 (minor lithology)

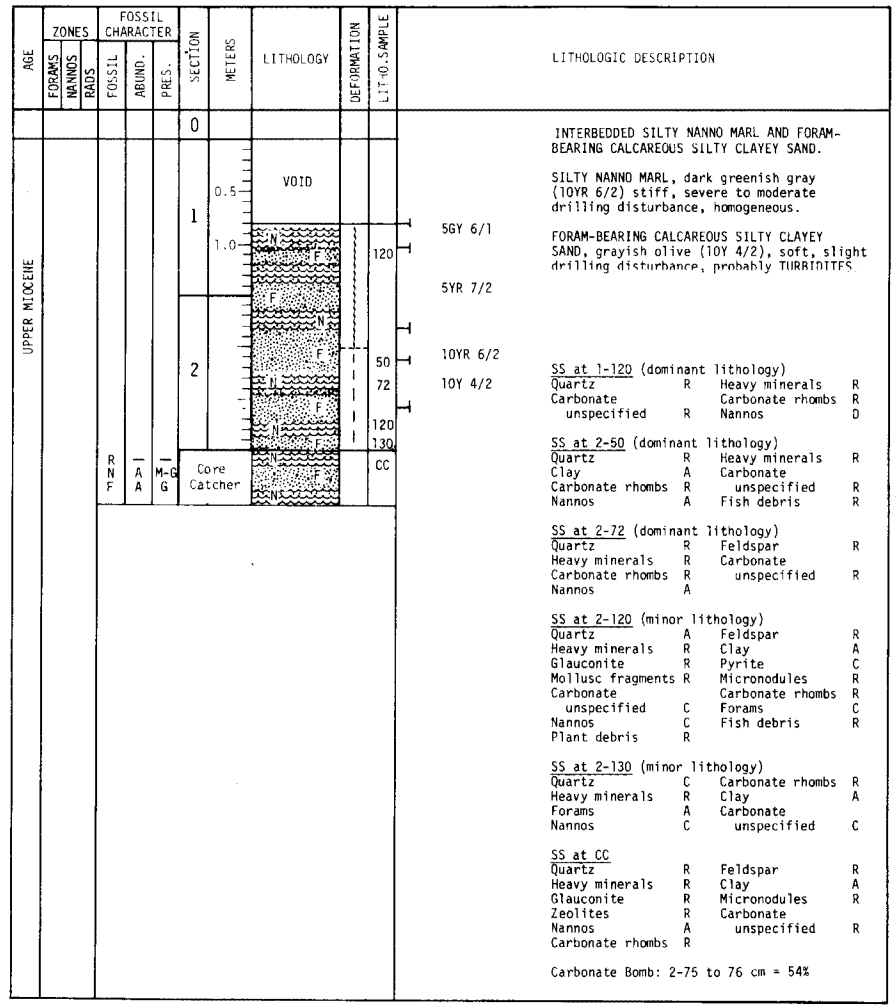
Quartz	C	Heavy Minerals	R
Clay	A	Glauconite	R
Micronodules	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	C
Forams	C		
Fish debris	R		

SS at CC

Quartz	R	Heavy minerals	R
Clay	C	Volcanic glass	R
Glauconite	R	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	A	Forams	R
		Fish debris	R

Carbonate Bomb: 3-86 to 87 cm = 46%

Site 370 Hole Core 2 Cored Interval: 103.0-112.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED SILTY NANNO MARL AND FORAM-BEARING CALCAREOUS SILTY CLAYEY SAND.

SILTY NANNO MARL, dark greenish gray (10YR 6/2) stiff, severe to moderate drilling disturbance, homogeneous.

FORAM-BEARING CALCAREOUS SILTY CLAYEY SAND, grayish olive (10Y 4/2), soft, slight drilling disturbance, probably TURBIDITES.

SS at 1-120 (dominant lithology)

Quartz	R	Heavy minerals	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	D

SS at 2-50 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Carbonate unspecified	R
Carbonate rhombs	R	Fish debris	R
Nannos	A		

SS at 2-72 (dominant lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A		

SS at 2-120 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	C
Mollusc fragments	R	Micronodules	R
Carbonate unspecified	C	Carbonate rhombs	R
Nannos	C	Forams	C
Plant debris	R	Fish debris	R

SS at 2-130 (minor lithology)

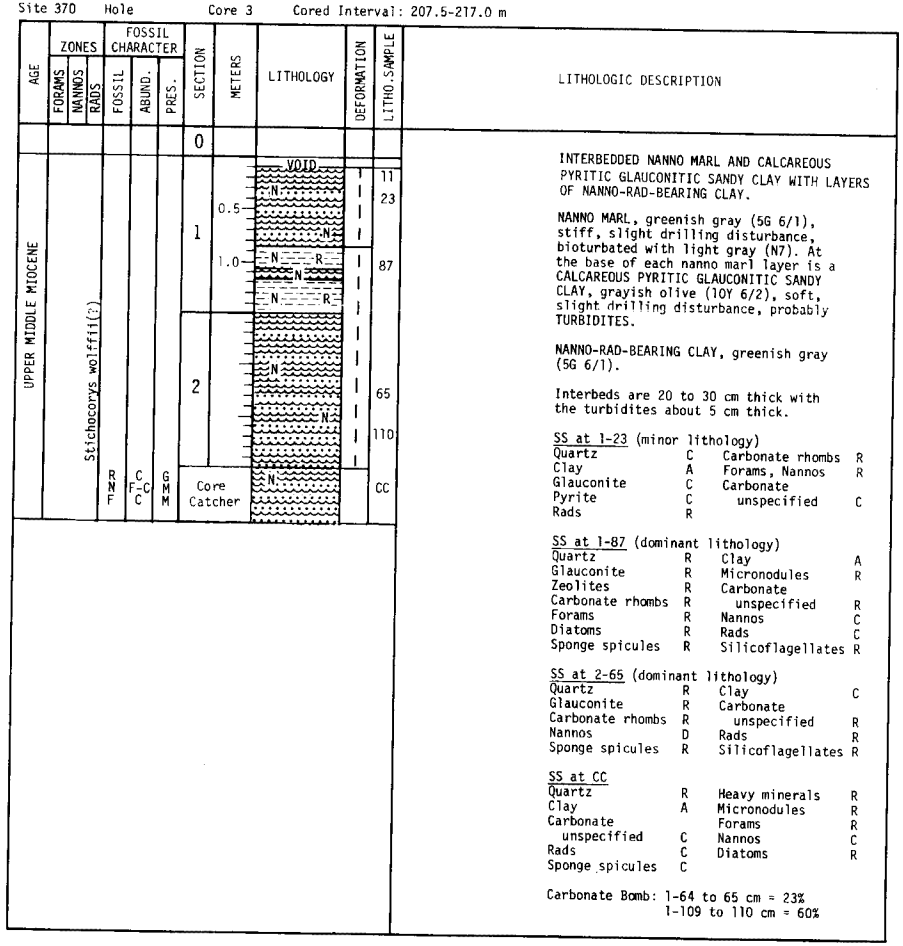
Quartz	C	Carbonate rhombs	R
Heavy minerals	R	Clay	A
Forams	A	Carbonate unspecified	C
Nannos	C		

SS at CC

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Nannos	A		
Carbonate rhombs	R		

Carbonate Bomb: 2-75 to 76 cm = 54%

Site 370 Hole Core 3 Cored Interval: 207.5-217.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO MARL AND CALCAREOUS PYRITIC GLAUCONITIC SANDY CLAY WITH LAYERS OF NANNO-RAD-BEARING CLAY.

NANNO MARL, greenish gray (5G 6/1), stiff, slight drilling disturbance, bioturbated with light gray (N7). At the base of each nanno marl layer is a CALCAREOUS PYRITIC GLAUCONITIC SANDY CLAY, grayish olive (10Y 6/2), soft, slight drilling disturbance, probably TURBIDITES.

NANNO-RAD-BEARING CLAY, greenish gray (5G 6/1).

Interbeds are 20 to 30 cm thick with the turbidites about 5 cm thick.

SS at 1-23 (minor lithology)

Quartz	C	Carbonate rhombs	R
Clay	A	Forams, Nannos	R
Glauconite	C	Carbonate unspecified	C
Pyrite	C		
Rads	R		

SS at 1-87 (dominant lithology)

Quartz	R	Clay	A
Glauconite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	C
Forams	R	Rads	C
Diatoms	R	Silicoflagellates	R
Sponge spicules	R		

SS at 2-65 (dominant lithology)

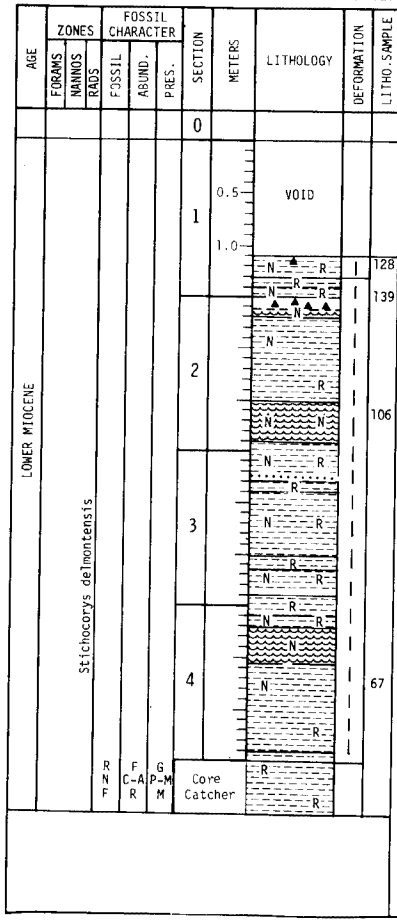
Quartz	R	Clay	C
Glauconite	R	Carbonate unspecified	R
Carbonate rhombs	R	Rads	R
Nannos	D	Silicoflagellates	R
Sponge spicules	R		

SS at CC

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Carbonate unspecified	C	Forams	R
Rads	C	Nannos	C
Sponge spicules	C	Diatoms	R

Carbonate Bomb: 1-64 to 65 cm = 23%
1-109 to 110 cm = 60%

Site 370 Hole Core 4 Cored Interval: 217.0-226.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO RAD BEARING CLAY, RAD BEARING CLAY, AND NANNO MARL WITH MINOR SILT SAND AND CHERT.

NANNO-RAD-BEARING CLAY, light olive gray (5Y 5/2), stiff, slight drilling disturbance, burrowed.

RAD-BEARING CLAY, pale green (10G 6/2), firm, slight drilling disturbance.

NANNO MARL, light greenish gray (5GY 8/1), firm, slight drilling disturbance, bioturbated.

Interbedded SILT and SAND - probably turbidites in Section 3. CHERT nodules occur near the top of the core.

SS at 1-128 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R	Diatoms	R
Nannos	C	Sponge spicules	R
Rads	C		

SS at 1-139 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R	Diatoms	R
Nannos	R	Sponge spicules	R
Rads	C		
Fish debris	R		

SS at 2-106 (dominant lithology)

Quartz	R	Zeolites	R
Clay	A	Carbonate rhombs	R
Glauconite	R	Nannos	A
Micronodules	R	Diatoms	R
Carbonate unspecified	R	Rads	R
		Sponge spicules	R

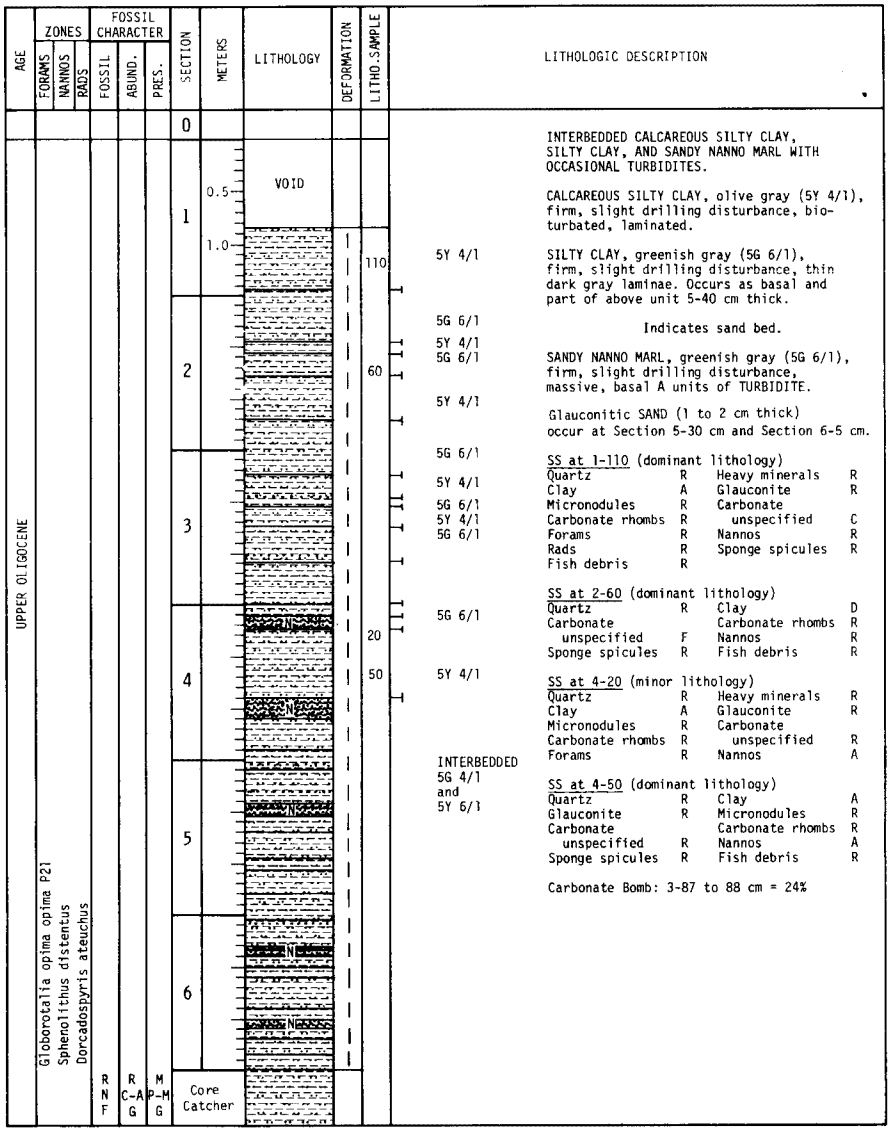
SS at 4-67 (dominant lithology)

Quartz	R	Clay	A
Glauconite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Fish debris	R	Forams	R
Carbonate rhombs	R	Diatoms	R
Nannos	C	Sponge spicules	R
Rads	C		

Carbonate Bomb: 3-49 to 50 cm = 24%

140

Site 370 Hole Core 5 Cored Interval: 321.5-331.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CALCAREOUS SILTY CLAY, SILTY CLAY, AND SANDY NANNO MARL WITH OCCASIONAL TURBIDITES.

CALCAREOUS SILTY CLAY, olive gray (5Y 4/1), firm, slight drilling disturbance, bioturbated, laminated.

SILTY CLAY, greenish gray (5G 6/1), firm, slight drilling disturbance, thin dark gray laminae. Occurs as basal and part of above unit 5-40 cm thick.

Indicates sand bed.

SANDY NANNO MARL, greenish gray (5G 6/1), firm, slight drilling disturbance, massive, basal A units of TURBIDITE.

Glauconitic SAND (1 to 2 cm thick) occur at Section 5-30 cm and Section 6-5 cm.

SS at 1-110 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Micronodules	R	Carbonate unspecified	C
Carbonate rhombs	R		
Forams	R	Nannos	R
Rads	R	Sponge spicules	R
Fish debris	R		

SS at 2-60 (dominant lithology)

Quartz	R	Clay	D
Carbonate unspecified	F	Carbonate rhombs	R
Sponge spicules	R	Nannos	R
		Fish debris	R

SS at 4-20 (minor lithology)

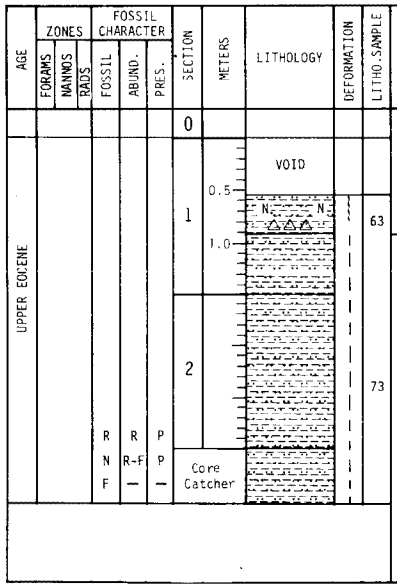
Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Micronodules	R	Carbonate unspecified	R
Carbonate rhombs	R		
Forams	R	Nannos	A

SS at 4-50 (dominant lithology)

Quartz	R	Clay	A
Glauconite	R	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Sponge spicules	R	Nannos	A
		Fish debris	R

Carbonate Bomb: 3-87 to 88 cm = 24%

Site 370 Hole Core 6 Cored Interval: 426.0-435.5 m



LITHOLOGIC DESCRIPTION

CALCAREOUS NANNO-BEARING SILTY CLAY AND SILTY CLAY WITH MINOR PORCELLANITE.

CALCAREOUS NANNO-BEARING SILTY CLAY, olive gray (5Y 4/1), firm, slight to moderate drilling disturbance, laminated with greenish gray (5G 6/1).

SILTY CLAY, dark greenish gray (5G 4/1), firm to semilithified, slight drilling disturbance, parallel and irregular faint laminations.

PORCELLANITE, dark gray (N3), occurs in the upper part of the core.

SS at 1-63 (dominant lithology)

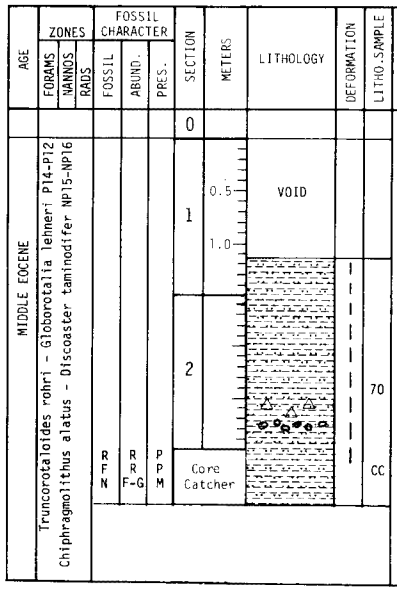
Quartz	R	Feldspar	R
Clay	A	Glauconite	R
Micronodules	R	Carbonate unspecified	C
Carbonate rhombs	R		
Nannos	C	Rads	R
Sponge spicules	R	Fish debris	R

SS at 2-73 (dominant lithology)

Quartz	R	Feldspar	R
Clay	D	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R		

Carbonate Bomb: 2-73 to 74 cm = 6%

Site 370 Hole Core 7 Cored Interval: 445.0-454.5 m



LITHOLOGIC DESCRIPTION

SILTY CLAY WITH MINOR PORCELLANITE.

SILTY CLAY, dark greenish gray (5G 4/1), firm to semilithified, slight drilling disturbance, parallel and irregular faint laminations.

PORCELLANITE, olive gray (5Y 4/1), at 2-110 to 115.

CONGLOMERATE at 2-130 to 135 consists of rounded pebbles (up to 1 cm) of brown mudstone with forams, mollusc shells, and glauconite.

SS at 2-70 (dominant lithology)

Quartz	R	Feldspar	R
Clay	D	Glauconite	R
Micronodules	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R		

SS at CC

Quartz	R	Clay	D
Glauconite	R	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	R	Forams	R
		Fish debris	R

Site 370 Hole Core 8 Cored Interval: 464.0-473.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
MIDDLE EOCENE	Chiphragmolithus alatus - Discoaster taninodifer NP15-NP16			R F N	R F	P P-M	0				
							1	0.5, 1.0	VOID		
							2		N N		125
							Core Catcher				

LITHOLOGIC DESCRIPTION

SILTY CLAY OVERLYING CLAYSTONE WITH MINOR PORCELLANITE THROUGHOUT.

PORCELLANITES, olive gray (5Y 4/1).

SECTION 1:
SILTY CLAY, dark greenish gray (5G 4/1), firm to semilithified, no drilling disturbance, parallel and irregular faint laminations.
SECTION 2:
CLAYSTONE, olive gray (5Y 3/2), lithified, no drilling disturbance, massive, bio turbated, streaks and laminae of pale green (10G 6/2).
MICROCONGLOMERATE, at Section 2-14 cm consists of grains of brownish mudstone (up to 2 mm). Basalt contact is sharp with scouring.

NANNO-BEARING CLAYSTONE at Section 2-112 to 115 cm, yellowish gray (5Y 8/1), lithified, bioturbated, sharp boundaries.

SS at 1-125 (dominant lithology)

Quartz	R	Clay	D
Glauconite	R	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Rads	R	Nannos	R
		Fish debris	R

SS at 2-114 (minor lithology)

Quartz	R	Clay	D
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	C	Forams	R

SS at CC

Quartz	R	Feldspar	R
Clay	D	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R
		Plant debris	R

Carbonate Bomb: 2-82 to 83 cm = 19%

Site 370 Hole Core 9 Cored Interval: 483.0-492.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
MIDDLE EOCENE	Chiphragmolithus alatus - Discoaster taninodifier NP15-NP16						0				
							1	0.5, 1.0	VOID		
											93
				F N R	R R-F R	P P-M P	Core Catcher				CC

LITHOLOGIC DESCRIPTION

CLAYSTONE WITH MINOR PROCELLANITE.

CLAYSTONE, grayish olive green (5GY 3/2), lithified, laminated, very rare bioturbation, a chevron fold occurs at ~90 cm.
PORCELLANITE, olive gray (5Y 4/1).

SS at 93

Quartz	R	Feldspar	R
Clay	D	Glauconite	R
Pyrite	R	Micronodule	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R	Fish debris	R

SS at CC

Quartz	R	Clay	D
Glauconite	R	Pyrite	R
Micronodule	R	Carbonate unspecified	R
Carbonate rhombs	R		
Fish debris	R		

Carbonate Bomb: 1-122 to 123 cm = 13%

Site 370 Hole Core 10 Cored Interval: 502.0-511.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
MIDDLE EOCENE	Chipragmolithus alatus - Discoaster taninodifer NP15-NP16 Thyrsocyrtis triacantha						0				
							1	0.5, 1.0	VOID		
							2				20
				R F N	R R F	P P M	Core Catcher				CC

LITHOLOGIC DESCRIPTION

SILTY CLAYSTONE WITH MINOR PORCELLANITE.

SILTY CLAYSTONE, olive gray (5Y 4/1), lithified, fine horizontal laminations. Scattered pebbles (0.5 to 1 cm diameter) of brownish mudstone. Silt and sand laminae and floating pebbles occur throughout. Silt content increases below 2-30.

PORCELLANITE, at top of core, olive gray (5Y 4/1), encloses some sub-rounded pebbles of brown mudstone (up to 2 cm in size).

SS at 2-20 (dominant lithology)

Quartz	C	Clay	D
Pyrite	R	Micronodules	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Forams	R

SS at CC

Quartz	R	Clay	D
Glauconite	R	Pyrite	R
Micronodules	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

Carbonate Bomb: 2-50 to 51 cm = 15%

Site 370 Hole Core 11 Cored Interval: 521.0-530.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Chiphragmolithus alatus - Discoaster tanimodifer NP15-NP16			F N	R F-C	P M	0 Core Catcher					1 cm of CALCAREOUS SILTY CLAYSTONE, light olive gray (5Y 5/2).

Site 370 Hole Core 12 Cored Interval: 540.0-549.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE EOCENE	Chiphragmolithus alatus - Discoaster tani nodifer NP15-NP16			N F R	F R R	P-M P P	0 1 2 Core Catcher	0.5 1.0	VOID		10 100	CALCAREOUS SILTY CLAYSTONE AND PEBBLY MUDSTONE WITH MINOR PORCELLANITE. CALCAREOUS SILTY CLAYSTONE, grayish olive (10Y 4/2) with laminae of greenish gray (5G 6/1) and thin silt laminae, lithified, sharp basal contact. PEBBLE CONGLOMERATE, olive gray (5Y 4/1), pebbles rounded>subangular, size 1 to 2 cm, composed of porcellanite, mudstone, glauconite, and rare forams, all cemented with silica. PORCELLANITE consists of pebbles and cement within the conglomerate and of scattered subrounded pebbles near the base of Section 2. SS at 2-10 (minor lithology) Quartz C; Feldspar R Mica R; Heavy minerals R Clay A; Glauconite R Pyrite R; Micronodules R Carbonate unspecified C; Forams R; Nannos R Fish debris R; Mollusc debris R SS at 2-100 (dominant lithology) Quartz R; Feldspar R Heavy minerals R; Clay A Glauconite R; Pyrite R Micronodules R; Carbonate unspecified C Carbonate rhombs R Nannos R; Fish debris R

Site 370 Hole Core 13 Cored Interval: 549.5-559.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER EOCENE	Globorotalia aragonensis - Globorotalia palmerae P8-P9	Martinasterites tribrachiatus - Discoaster tani nodifer NP12-NP16		R F N	R R F	P P P-M	0 1 2 Core Catcher	0.5 1.0	VOID		50 56 97 CC	CALCAREOUS SILTY CALYSTONE WITH MINOR LIMESTONE AND PORCELLANITE. CALCAREOUS SILTY CLAYSTONE, grayish olive (10Y 4/2), lithified, moderately bioturbated, scattered sand-sized porcellanite, irregular laminae of fine sand grains composed of mudstone, cemented by calcite, rare clay laminae. LIMESTONE, microcrystalline, bluish white (5B 9/1). PORCELLANITE, olive gray (5Y 4/1). SS at 2-50 (dominant lithology) Quartz C; Feldspar R Heavy minerals R; Clay A Fish debris R; Micronodules R Carbonate rhombs R Carbonate unspecified C; Forams R Nannos R SS at 2-56 (minor lithology) Quartz C; Feldspar R Heavy minerals R; Clay A Mudstone clasts C; Glauconite R Pyrite R; Fish debris R Micronodules R; Zeolites R Carbonate rhombs R Carbonate unspecified C; Forams R Nannos R; Rads R Sponge spicules R SS at 2-97 (minor lithology) Clay C; Carbonate unspecified D Carbonate rhombs R Nannos R SS at CC Quartz R; Feldspar R Heavy minerals R; Clay A Glauconite R; Pyrite R Micronodules R; Zeolites R Carbonate rhombs C Carbonate unspecified R; Forams R Nannos R; Fish debris R Carbonate Bomb: 2-101 to 102 cm = 70% 2-75 to 76 cm = 9%

Site 370 Hole Core 14 Cored Interval: 568.5-578.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
LOWER EOCENE	Globorotalia aragonensis - Globorotalia palmerae P8-P9	Marthasterites tribrachiatus - Discoaster tani nodifer NP12-NP16					0				
							1	0.5, 1.0	VOID		76
							2				122
							3				
							4		VOID		108
			R F N	— F C	— M P-M		Core Catcher				

LITHOLOGIC DESCRIPTION

CALCAREOUS SILTY CLAYSTONE WITH MINOR CHERT, OVERLYING CALCAREOUS CLAYEY SILTSTONE TO SANDSTONE.

CALCAREOUS SILTY CLAYSTONE, olive gray (5Y 3/2), moderately bioturbated with occasional Zoophycos, thin silt laminae with sharp basal contacts. More siliceous at 2-35 to 40, 2-60 to 63, 2-115 to 123.

CHERT, olive gray (5Y 3/2).

CALCAREOUS CLAYEY SILTSTONE AND SANDSTONE below 4-80, dark yellowish brown (10YR 4/2), consists of brownish grains of claystone with rare forams, cemented by calcite.

SS at 1-76 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Chalcedony	R	Glauconite	R
Sponge spicules	R	Pyrite	R
Micronodules	R	Carbonate unspecified	C
Carbonate rhombs	C	Nannos	R
Forams	R		
Fish debris	R		

SS at 2-122 (minor lithology)

Quartz	C	Feldspar	R
Clay	A	Chalcedony	C
Pyrite	R	Carbonate unspecified	C
Carbonate rhombs	R		
Nannos	R		

SS at 4-108 (minor lithology)

Quartz	C	Feldspar	R
Clay	A	Mudstone clasts	C
Chalcedony	R	Glauconite	R
Sponge spicules	R	Fish debris	R
Pyrite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	C
Carbonate rhombs	R	Nannos	R
Forams	R		

Carbonate Bomb: 1-98 to 99 cm = 20%

Site 370 Hole Core 15 Cored Interval: 587.5-597.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
LOWER EOCENE							0				
							1	0.5, 1.0	VOID		
							2				93
							3				
				R F N	R — —	P — —	Core Catcher				

LITHOLOGIC DESCRIPTION

INTERBEDDED CALCAREOUS MARLSTONE AND CLAYEY SILTSTONE WITH MINOR CHERT.

CALCAREOUS MARLSTONE, light olive gray (5Y 5/2), with thin beds of CLAYEY SILTSTONE, slightly bioturbated.

CHERT, light gray (N3) and black (N8).

At 2-10 to 22 cm and at 2-135 to 145 cm coarse pebbly siltstone with chert pebbles.

5Y

5GY 6/1

5Y 5/2

SS at 2-93 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	C
Carbonate rhombs	R	Nannos	R
Forams	R		
Fish debris	R		

Carbonate Bomb: 3-121 to 122 cm = 47%

Site 370 Hole Core 16 Cored Interval: 616.0-625.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER EOCENE	Globorotalia aragonensis - Globorotalia palmerae P8-P9	Marthasterites tribrachiatus - Discoaster sublodoensis NP12-NP14		R F N	— R F	— P P-M	0				
							1	0.5, 1.0	VOID		138, 146
							2				98
							3				
							4				
							Core Catcher				

LITHOLOGIC DESCRIPTION

INTERBEDDED CLACAREOUS CLAYSTONE AND SILTSTONE, WITH CHERT.

CALCAREOUS CLAYSTONE, grayish brown (5YR 3/2) with thin whispy laminae of pale blue green (5BG 7/2) CLAY. Thin SILTSTONE laminae occur scattered throughout.

CHERT, blackish brown (5YR 2/1).

SS at 1-138 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	C	Carbonate rhombs	C
		Nannos	R

SS at 1-146 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Chalcedony	C	Pyrite	R
Carbonate unspecified	C	Carbonate rhombs	C

SS at 2-98 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Mudstone clasts	C	Sponge spicules	R
Fish debris	R	Chalcedony	R
Glauconite	R	Carbonate unspecified	C
Carbonate rhombs	R	Nannos	R
Forams	R		

5YR 3/2

5Y 5/2

5YR 3/2

Site 370 Hole Core 17 Cored Interval: 616.0-625.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
LOWER EOCENE	Globorotalia aragonensis - Globorotalia palmerae P8-P9	Marthasterites tribrachiatus - Discoaster sublodoensis NP12-NP14		F N R	C R —	M P-M —	0				
							1	0.5, 1.0			147, 16
							2				
							Core Catcher				

LITHOLOGIC DESCRIPTION

CALCAREOUS NANNO BEARING CLAYSTONE INTERBEDDED WITH SILTY CLAYSTONE AND CLAYEY SILTSTONE/SANDSTONE, WITH CHERT.

CALCAREOUS NANNO-BEARING CLAYSTONE, light olive gray (5Y 5/2) with pale blue green (5BG 7/2) calcareous silty claystone laminae (0.5 to 1 cm thick), slightly bioturbated. SILTY CLAY and CLAYEY SILT laminae occur throughout.
CHERT, occurs as nodules and interbeds.

SS at 1-147 (dominant lithology)

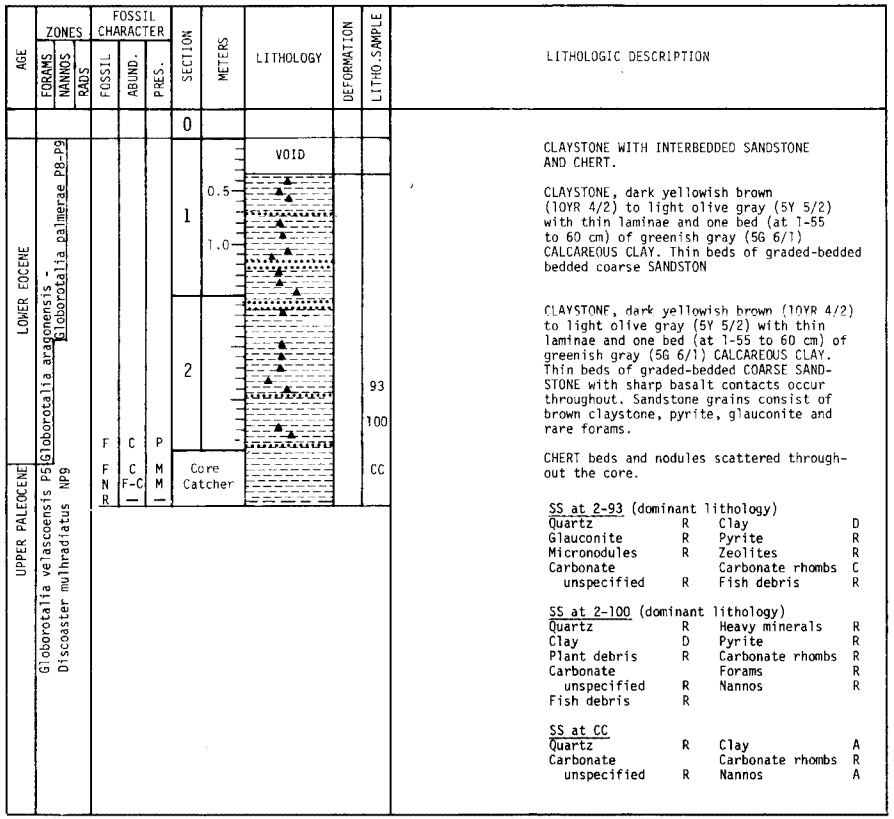
Quartz	R	Pyrite	R
Feldspar	R	Carbonate rhombs	R
Heavy minerals	R	Forams	R
Clay	A	Nannos	C
Chalcedony	R	Rads	R
Carbonate unspecified	C	Sponge spicules	R

SS at 2-16 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Micronodules	R
Carbonate unspecified	C	Carbonate rhombs	C
Fish debris	R	Nannos	R

Carbonate Bomb: 2-14 to 15 cm = 30%

Site 370 Hole Core 18 Cored Interval: 635.0-644.5 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH INTERBEDDED SANDSTONE AND CHERT.

CLAYSTONE, dark yellowish brown (10YR 4/2) to light olive gray (5Y 5/2) with thin laminae and one bed (at 1-55 to 60 cm) of greenish gray (5G 6/1) CALCAREOUS CLAY. Thin beds of graded-bedded bedded coarse SANDSTON

CLAYSTONE, dark yellowish brown (10YR 4/2) to light olive gray (5Y 5/2) with thin laminae and one bed (at 1-55 to 60 cm) of greenish gray (5G 6/1) CALCAREOUS CLAY. Thin beds of graded-bedded COARSE SANDSTONE with sharp basalt contacts occur throughout. Sandstone grains consist of brown claystone, pyrite, glauconite and rare forams.

CHERT beds and nodules scattered throughout the core.

SS at 2-93 (dominant lithology)

Quartz	R	Clay	D
Glauconite	R	Pyrite	R
Micronodules	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	C
		Fish debris	R

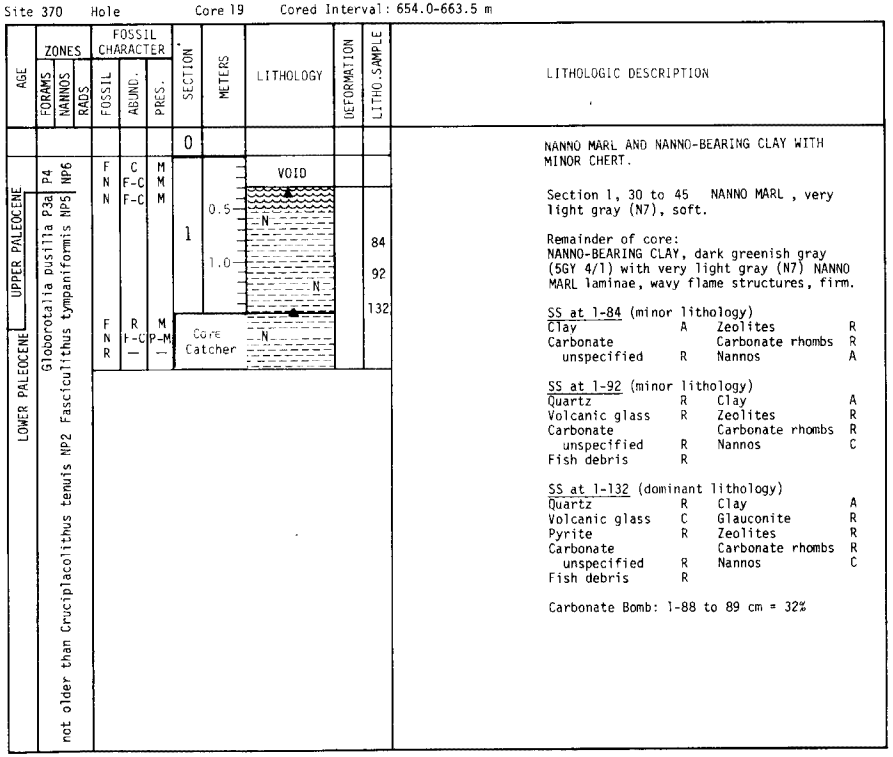
SS at 2-100 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Plant debris	R	Carbonate rhombs	R
Carbonate unspecified	R	Forams	R
		Nannos	R
Fish debris	R		

SS at CC

Quartz	R	Clay	A
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	A

Site 370 Hole Core 19 Cored Interval: 654.0-663.5 m



LITHOLOGIC DESCRIPTION

NANNO MARL AND NANNO-BEARING CLAY WITH MINOR CHERT.

Section 1, 30 to 45 NANNO MARL , very light gray (N7), soft.

Remainder of core:
NANNO-BEARING CLAY, dark greenish gray (5GY 4/1) with very light gray (N7) NANNO MARL laminae, wavy flame structures, firm.

SS at 1-84 (minor lithology)

Clay	A	Zeolites	R
Carbonate		Carbonate rhombs	R
unspecified	R	Nannos	A

SS at 1-92 (minor lithology)

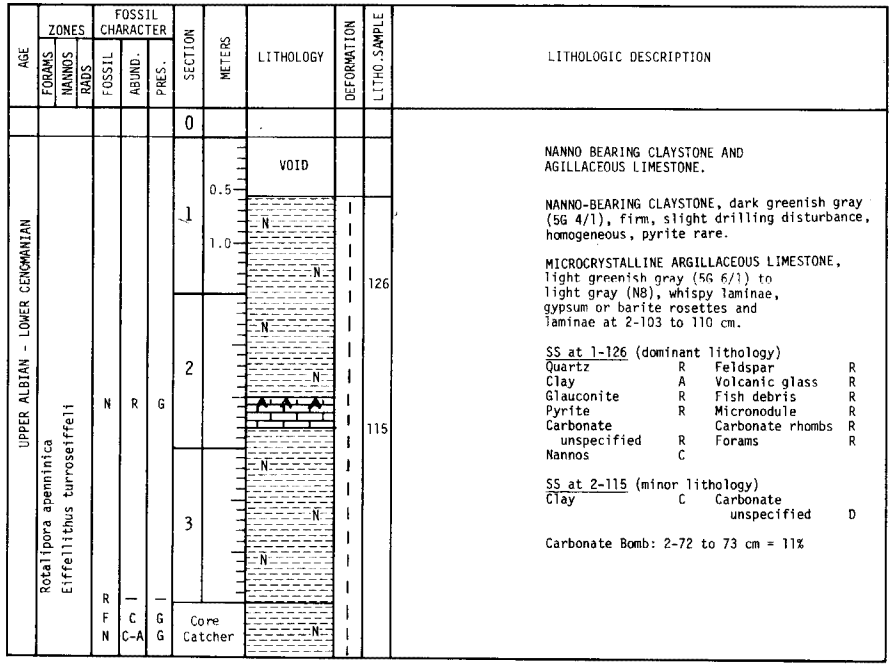
Quartz	R	Clay	A
Volcanic glass	R	Zeolites	R
Carbonate		Carbonate rhombs	R
unspecified	R	Nannos	C
Fish debris	R		

SS at 1-132 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	C	Glauconite	R
Pyrite	R	Zeolites	R
Carbonate		Carbonate rhombs	R
unspecified	R	Nannos	C
Fish debris	R		

Carbonate Bomb: 1-88 to 89 cm = 32%

Site 370 Hole Core 20 Cored Interval: 673.0-682.5 m



LITHOLOGIC DESCRIPTION

NANNO BEARING CLAYSTONE AND AGILLACEOUS LIMESTONE.

NANNO-BEARING CLAYSTONE, dark greenish gray (5G 4/1), firm, slight drilling disturbance, homogeneous, pyrite rare.

MICROCRYSTALLINE ARGILLACEOUS LIMESTONE, light greenish gray (5G 6/1) to light gray (N8), whispy laminae, gypsum or barite rosettes and laminae at 2-103 to 110 cm.

SS at 1-126 (dominant lithology)

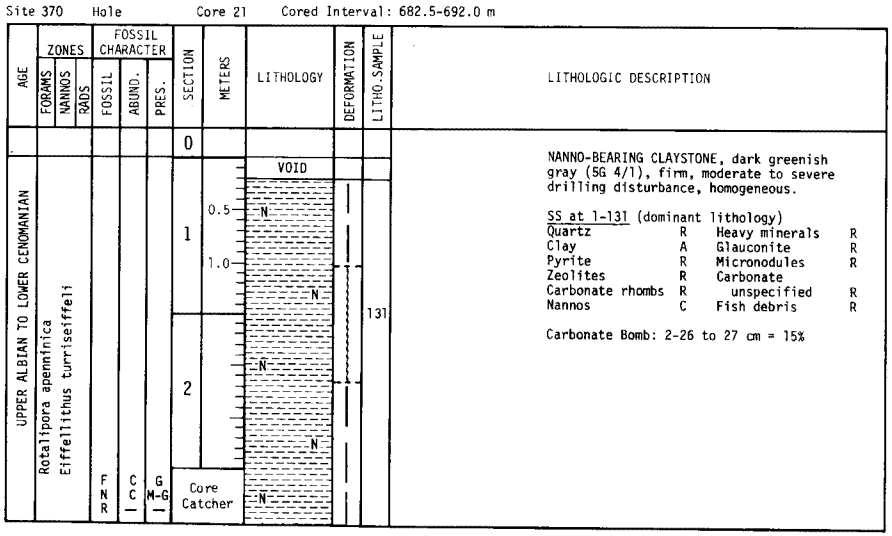
Quartz	R	Feldspar	R
Clay	A	Volcanic glass	R
Glauconite	R	Fish debris	R
Pyrite	R	Micronodule	R
Carbonate unspecified	R	Carbonate rhombs	R
Nannos	C	Forams	R

SS at 2-115 (minor lithology)

Clay	C	Carbonate unspecified	D

Carbonate Bomb: 2-72 to 73 cm = 11%

Site 370 Hole Core 21 Cored Interval: 682.5-692.0 m



LITHOLOGIC DESCRIPTION

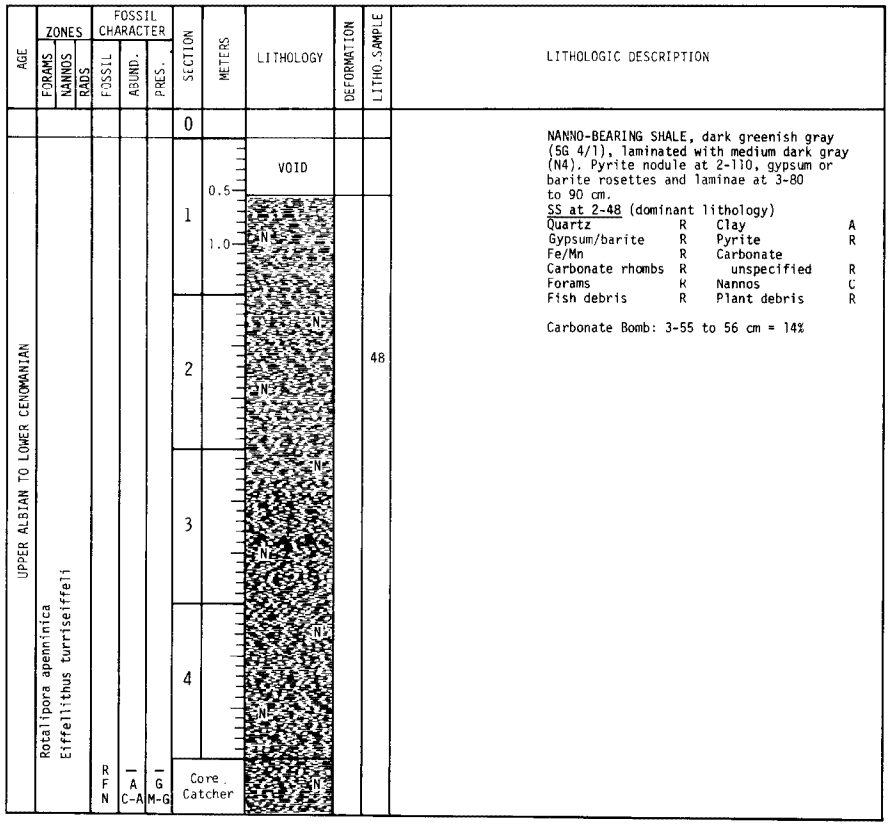
NANNO-BEARING CLAYSTONE, dark greenish gray (5G 4/1), firm, moderate to severe drilling disturbance, homogeneous.

SS at 1-131 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R	Fish debris	R
Nannos	C		

Carbonate Bomb: 2-26 to 27 cm = 15%

Site 370 Hole Core 22 Cored Interval: 692.0-701.5 m



LITHOLOGIC DESCRIPTION

NANNO-BEARING SHALE, dark greenish gray (5G 4/1), laminated with medium dark gray (N4). Pyrite nodule at 2-110, gypsum or barite rosettes and laminae at 3-80 to 90 cm.

SS at 2-48 (dominant lithology)

Quartz	R	Clay	A
Gypsum/barite	R	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R		
Forams	R	Nannos	C
Fish debris	R	Plant debris	R

Carbonate Bomb: 3-55 to 56 cm = 14%

Site 370 Hole Core 23 Cored Interval: 701.5-711.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	
UPPER ALBIAN TO LOWER CENOMANIAN	Rotalipora apenninica / Eiffellithus turriseiffeli			R N F	I C C	I M M	0					
							1	0.5, 1.0	VOID			
							2				50	
							3					5Y 2/1
							4				64, 109, 129	5YR 4/1, 5G 6/1
							Core Catcher					

LITHOLOGIC DESCRIPTION

NANNO-BEARING SHALE, olive black (5Y 2/1), homogeneous, rare horizontal mm thick laminae.

SS at 2-50 (dominant lithology)

Quartz	R	Clay	D
Fe/Mn	R	Pyrite	R
Gypsum/barite	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	R
Forams	R	Plant debris	R
Fish debris	R		

SS at 4-64 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Gypsum	R
Pyrite	R	Fe/Mn	R
Carbonate unspecified	R	Carbonate rhombs	R
Plant debris	R	Nannos	C

SS at 4-109 (minor lithology)

Quartz	R	Clay	A
Fe/Mn	R	Carbonate unspecified	C
Carbonate rhombs	C		
Nannos	C		

SS at 4-129 (dominant lithology)

Quartz	R	Clay	D
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	C		
Nannos	R		

Carbonate Bomb: 3-85 to 86 cm = 8%

Site 370 Hole Core 24 Cored Interval: 711.0-720.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	
UPPER ALBIAN TO LOWER CENOMANIAN	Rotalipora apenninica / Eiffellithus turroseiffeli			R N T	I C A	I G G	0					
							1	0.5, 1.0	VOID			
							2				114, 102	
							3				28	
							4					
							5					
							Core Catcher					

LITHOLOGIC DESCRIPTION

NANNO-BEARING SHALE, brownish olive gray (5Y 6/1), fissile, dark greenish gray laminae, horizontal, some laminae are calcareous.

SS at 1-114 (minor lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	D
Gypsum/barite	R	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R	Nannos	C
Forams	R		
Plant debris	R		

SS at 2-102 (dominant lithology)

Quartz	R	Clay	D
Pyrite	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C

SS at 3-28 (minor lithology)

Quartz	R	Clay	D
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C		

Carbonate Bomb: 3-85 to 86 cm = 9%

Site 370 Hole Core 25 Cored Interval: 721.5-731.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER ALBIAN TO LOWER CENOMANIAN	Rotalipora apenninica Eiffellithus turriseiffeli			N F	C C	M M	0 1 2 Core Catcher	0.5 1.0	VOID		63 126

LITHOLOGIC DESCRIPTION

SHALE, dark greenish gray (5G 4/1), with olive gray laminae, possibly bioturbated.

SS at 2-63 (minor lithology)

Quartz	R	Clay	D
Pyrite	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	R

SS at 2-126 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Fish debris	R

Carbonate Bomb: 2-65 to 66 cm = 3%

Site 370 Hole Core 26 Cored Interval: 730.0-739.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER ALBIAN TO LOWER CENOMANIAN	Rotalipora apenninica			R N F	— — R	— — P	0 1 2 3 4 Core Catcher	0.5 1.0	VOID		127 70 108 CC

LITHOLOGIC DESCRIPTION

SHALE, dark greenish gray (5G 4/1), severe drilling disturbance, scattered dark olive black (5Y 2/1) laminae, some silt laminae and rare pyrite filling burrows. Rare fine laminae of microcrystalline carbonate.

SS at 2-127 (dominant lithology)

Quartz	R	Clay	D
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Plant debris	R	Nannos	R

SS at 3-70 (minor lithology)

Quartz	R	Clay	C
Carbonate unspecified	D	Carbonate rhombs	R

SS at 4-108 (dominant lithology)

Quartz	R	Clay	D
Gypsum/barite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Plant debris	R	Nannos	R

SS at CC

Quartz	C	Feldspar	R
Clay	A	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R		
Fish debris	R		

Carbonate Bomb: 3-65 to 66 cm = 23%

Site 370 Hole Core 27 Cored Interval: 749.0-758.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
ALBIAN?				N F	R R	P P	0 1 2 3 Core Catcher	0.5 1.0	VOID		77 104

LITHOLOGIC DESCRIPTION

INTERBEDDED SILTY CLAYSTONE AND CARBONACEOUS SILTY CLAY.

SILTY CLAYSTONE, pale green (10G 6/2), firm, slightly bioturbated, siltstone pebbles, at 1-70 to 73 cm. Becomes clayey silt in places, pyrite nodule at 3-72 to 73 cm.

Fish fragment at 1-70 cm.

SILTY CLAY, olive black (5Y 2/1), with grayish brown (5YR 3/2) laminae, organic rich unit. Rounded siltstone pebble at 3-28 to 30 cm (3 cm in diameter).

SS at 1-77 (dominant lithology)

Quartz	C	Clay	D
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	C		
Sponge spicules	R	Fish debris	R

SS at 3-104 (minor lithology)

Quartz	C	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	C		
Plant debris	C		

Carbonate Bomb: 3-92 to 93 cm = 5%

Site 370 Hole Core 28 Cored Interval: 768.0-777.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER APTIAN TO LOWER ALBIAN	Parhabdolithus angustus			R N F	— C R	— G P	0				
							1	0.5, 1.0	VOID		
							2				
							3				
							4				
							Core Catcher				

LITHOLOGIC DESCRIPTION

ALTERNATIONS OF SILTY CLAY AND CARBONACEOUS SILTY CLAY.

SILTY CLAY, pale green (10G 6/2), bioturbated with dark gray (N3), pyrite concretion occurs at 1-40, smaller concretions are scattered in Section 4. CARBONACEOUS SILTY CLAY, olive black (5Y 2/1), homogeneous, locally bioturbated with very thin burrows, lower boundary usually sharp, upper boundary usually bioturbated. Light gray carbonate lower at 2-124, 129 and 143. The carbonaceous silty clay is usually 5 to 30 cm thick whereas the silty clay is 15 to 60 cm thick and typically dominant. Section 3-94 to 95 cm ARGILLACEOUS MICROCRYSTALLINE LIMESTONE, greenish gray (5GY 6/1), laminated bladed calcite.

LITHO.SAMPLE: 101, 110, 117, 95, 140

10G 6/2 — 5Y 2/1 — 10G 6/2 — 5Y 2/1 — 10G 6/2 — 5Y 2/1 — 10G 6/1 — 5Y 2/1 — 10G 6/1 — 5Y 2/1 — 5Y 2/1 — 5Y 2/1

SS at 1-101 (dominant lithology)

Quartz	C	Clay	A
Volcanic glass	R	Gypsum/Barite	R
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Fish debris	R

SS at 1-110 (dominant lithology)

Quartz	C	Feldspar	R
Clay	A	Gypsum/Barite	R
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Plant debris	C

SS at 1-117 (dominant lithology)

Quartz	C	Clay	D

SS at 3-94 (minor lithology)

Carbonate unspecified	D

SS at 3-140 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Carbonate unspecified	C
Carbonate rhombs	R	Fish debris	R
Nannos	R		
Plant debris	R		

Carbonate Bomb: 3-51 to 52 cm = 0%

Site 370 Hole Core 29 Cored Interval: 787.0-796.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER APTIAN TO LOWER ALBIAN				N F	— R	— P	0				
							1	0.5, 1.0	VOID		
							Core Catcher				

LITHOLOGIC DESCRIPTION

SILTY SHALE, dark gray (N3) with olive black and dark brownish gray laminae.

Site 370 Hole Core 30 Cored Interval: 806.0-815.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
UPPER APTIAN TO LOWER ALBIAN	Parhabdolithus angustus			R N F	— R	— P	0				
							1	0.5, 1.0	VOID, N, N		85, 105
							2		N, N		
							3		N, N		
							4		N, N, N		
							Core Catcher				CC

LITHOLOGIC DESCRIPTION

ALTERNATING NANNO-BEARING CLAYSTONE AND SILTY CLAYSTONE.

NANNO-BEARING CLAYSTONE, olive black (5Y 2/1), laminated with darker and lighter shades of (5Y 2/1), occasional scattered pyrite, especially at 3-110 and 3-124 where larger nodules occur. SILTY CLAYSTONE, grayish blue green (5BG 5/2), bioturbated, some burrows filled with dark gray clay. Section 4 has rare floating quartz grains and fragments of calcareous siltstone.

Concentrated fish debris in a silt layer at 2-70.

5BG 5/2 — 5Y 2/1 — 5BG 5/2 — 5Y 2/1 — 5BG 5/2 — 5BG 5/2 and 5Y 2/1 — 5BG 5/2 — 5Y 2/1

SS at 1-85 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C
		Plant debris	R

SS at 1-105 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	D
Pyrite	R	Zeolites	R
Carbonate rhombs	R	Fish debris	R

SS at CC

Quartz	R	Clay	D
Pyrite	R	Micronodules	R
Zeolites	R	Carbonate unspecified	R
Fish debris	R		

SS at CC

Quartz	D	Feldspar	R
Heavy minerals	R	Carbonate unspecified	R
Clay	C	Zeolites	R
Pyrite	R		
Carbonate rhombs	R		

Carbonate Bomb: 3-70 to 71 cm = 0%

Site 370 Hole Core 31 Cored Interval: 825.0-834.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER APTIAN TO LOWER ALBIAN	Parhabdolithus angustus			N	F	M	0					ALTERNATING NANNO-BEARING CLAYSTONE AND SILTY CLAYSTONE, olive black (5Y 2/1) with varying silt content, in places bioturbated, some intervals thinly laminated with silt and sand occasionally graded. A slump occurs at 1-75 to 100 cm.
							1	0.5 1.0			68 87	SILTY CLAYSTONE, dark greenish gray (5GY 4/1), bioturbated with thin burrows (Fucoids).
							2				140 52	
				N	R	P	3					
				N	F-C	M	4				42 59	
				N	—	—	Core Catcher					
				R N F	— — F	— — P						

Lithologic description (Core 31):

ALTERNATING NANNO-BEARING CLAYSTONE AND SILTY CLAYSTONE, olive black (5Y 2/1) with varying silt content, in places bioturbated, some intervals thinly laminated with silt and sand occasionally graded. A slump occurs at 1-75 to 100 cm.

SILTY CLAYSTONE, dark greenish gray (5GY 4/1), bioturbated with thin burrows (Fucoids).

5GY 4/1; 5Y 2/1; 5GY 4/1; 5Y 2/1 and 5GY 4/1; 5Y 2/1

SS at 1-68 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	D
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Fish debris	R		

5Y 2/1 and 5GY 4/1; 5Y 2/1; 5GY 4/1; 5Y 2/1

SS at 1-81 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R	Fish debris	R
Plant debris	R		

5Y 2/1

SS at 1-140 (minor lithology)

Quartz	C	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Plant debris	R

5Y 2/1

SS at 2-52 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Forams	R
Nannos	R	Fish debris	R

5GY 4/1; 5Y 2/1

SS at 4-42 (dominant lithology)

Quartz	R	Feldspar	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Forams	R
Nannos	C	Fish debris	R
Plant debris	R		

SS at 4-59 (minor lithology)

Quartz	A	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Forams	R
Fish debris	R		

Site 370 Hole Core 32 Cored Interval: 834.5-844.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
NEOCOMIAN TO LOWER APTIAN							0					SILTY SHALE AND NANNO-BEARING SHALE WITH SMALL SLUMPS AND MUD CONGLOMERATE, olive black (5Y 2/1), homogeneous. At base is 5 cm thick ARGILLACEOUS SILTSTONE, medium light gray (N6), laminated, both contacts sharp, pyrite. Shale is laminated with thin silty beds and occasionally sandstone ripples and cross-bedding are common in Section 4.
							1	0.5 1.0	VOID		108	NANNO-BEARING SHALE, grayish brown (5YR 3/2), clasts, include flat claystone, calcareous siltstone, fossil fragments. Probably a slump.
							2				82	CONGLOMERATE at 4-116 to 123, fragments of argillaceous rocks, angular, glauconite. Brownish siltstone pebble at 4-89 to 90, pebble rounded, 4 cm diameter and a wood fragment.
							3					
							4				25 97	
				R N F	— C-A —	— M-G —	Core Catcher					

Lithologic description (Core 32):

SILTY SHALE AND NANNO-BEARING SHALE WITH SMALL SLUMPS AND MUD CONGLOMERATE, olive black (5Y 2/1), homogeneous. At base is 5 cm thick ARGILLACEOUS SILTSTONE, medium light gray (N6), laminated, both contacts sharp, pyrite. Shale is laminated with thin silty beds and occasionally sandstone ripples and cross-bedding are common in Section 4.

5Y 2/1

NANNO-BEARING SHALE, grayish brown (5YR 3/2), clasts, include flat claystone, calcareous siltstone, fossil fragments. Probably a slump.

5YR 3/2

CONGLOMERATE at 4-116 to 123, fragments of argillaceous rocks, angular, glauconite.

Brownish siltstone pebble at 4-89 to 90, pebble rounded, 4 cm diameter and a wood fragment.

5Y 2/1

SS at 1-108 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	D
Pyrite	R	Zeolites	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R	Fish debris	R
Plant debris	R		

SS at 2-82 (minor lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	D
Glauconite	R	Pyrite	R
Fe/Mn	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Fish debris	R
Plant debris	R		

SS at 4-25 (dominant lithology)

Quartz	C	Clay	D
Pyrite	R		

SS at 4-97 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Glauconite	R
Pyrite	C	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	R
Fish debris	R	Plant debris	R

Site 370 Hole Core 33 Cored Interval: 853.5-863.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
NEOCOMIAN (BARREMIAN?)				N F	C-A R	M-G P	0 Core Catcher				CC	CLAYSTONE, grayish olive (10Y 4/2) and QUARTZ SILTSTONE, light yellowish brown (10YR 6/2) probably siderite cemented.

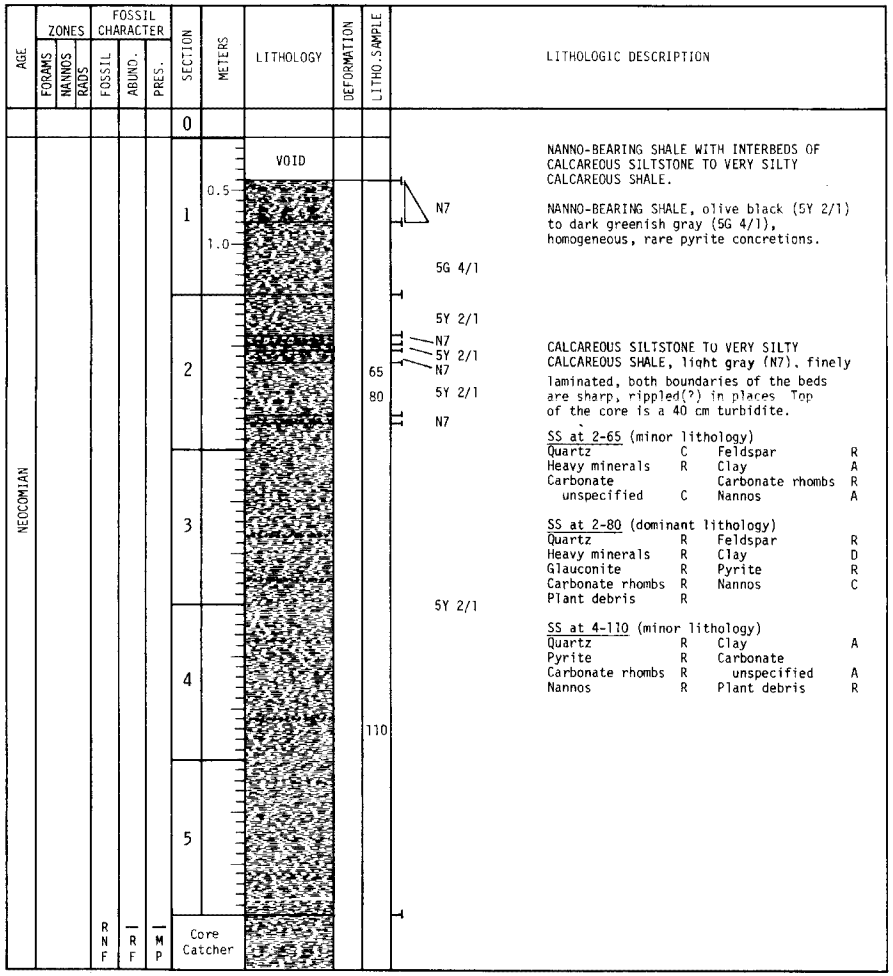
SS at CC

Quartz	R	Clay	D
Pyrite	R	Carbonate rhombs	R
Nannos	R	Fish debris	R
Plant debris	R		

SS at CC

Quartz	A	Feldspar	R
Heavy minerals	R	Glauconite	R
Carbonate unspecified	A	Dolomite	R

Site 370 Hole Core 34 Cored Interval: 872.5-882.0 m



LITHOLOGIC DESCRIPTION

NANNO-BEARING SHALE WITH INTERBEDS OF CALCAREOUS SILTSTONE TO VERY SILTY CALCAREOUS SHALE.

NANNO-BEARING SHALE, olive black (5Y 2/1) to dark greenish gray (5G 4/1), homogeneous, rare pyrite concretions.

CALCAREOUS SILTSTONE TO VERY SILTY CALCAREOUS SHALE, light gray (N7), finely laminated, both boundaries of the beds are sharp, rippled(?) in places. Top of the core is a 40 cm turbidite.

SS at 2-65 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Carbonate unspecified	C	Carbonate rhombs	R
		Nannos	A

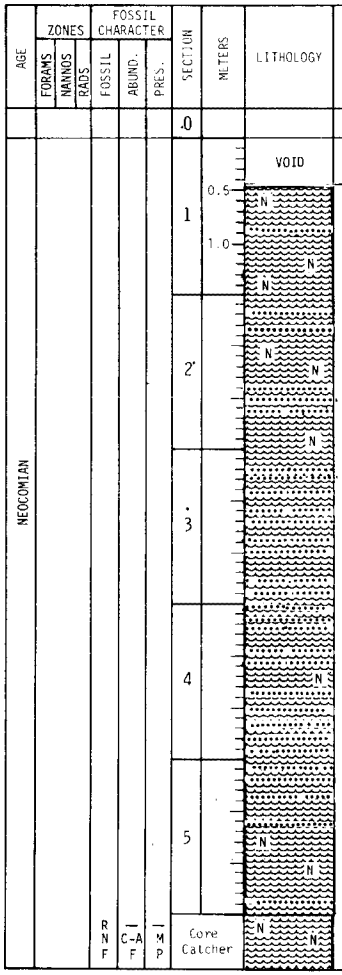
SS at 2-80 (dominant lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	D
Glauconite	R	Pyrite	R
Carbonate rhombs	R	Nannos	C
Plant debris	R		

SS at 4-110 (minor lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	A
Carbonate rhombs	R		
Nannos	R	Plant debris	R

Site 370 Hole Core 35 Cored Interval: 882.0-891.5 m



LITHOLOGIC DESCRIPTION

NANNO MARLSTONE WITH INTERBEDDED VERY SILTY NANNO-BEARING CLAY.

NANNO MARLSTONE, olive gray (5Y 4/1), homogeneous, with laminae and beds of light gray CALCAREOUS SILTSTONE, occasional cross bedding and scour marks. Becomes shaly in 3-65 to 90 cm.

VERY SILTY NANNO-BEARING CLAY, light gray (N7), laminated, some cross bedding in silts.

At 2-105 to 110, 4-123 to 130, 5-90 to 102, GLAUCONITIC CALCAREOUS SANDSTONE, medium grained, grading into laminated siltstone, lower boundary sharp, upper boundary gradation (turbidites).

SS at 2-56 (dominant lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Forams	R	Nannos	A
Plant debris	R		

SS at 2-105 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Fish debris	R
Plant debris	R	Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Forams	R	Nannos C	

SS at 3-70 (dominant lithology)

Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C
Fish debris	R		

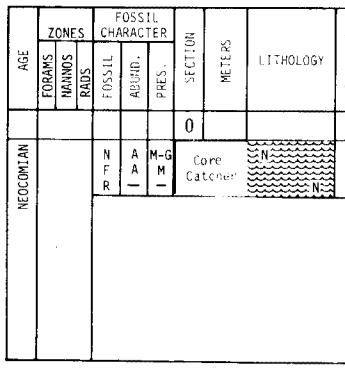
SS at 4-74 (dominant lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A	Fish debris	R
Plant debris	R		

SS at 5-64 (minor lithology)

Quartz	C	Feldspar	R
Clay	A	Pyrite	R
Carbonate unspecified	A	Carbonate rhombs	R
		Nannos	R
Fish debris	R		

Site 370 Hole Core 36 Cored Interval: 901.0-910.5 m



LITHOLOGIC DESCRIPTION

NANNO MARLSTONE, light olive gray (5Y 5/2) and a 12 cm long piece of QUARTZ SILTY LIMESTONE, medium light gray (N6), clastic carbonate grains, quartz silt, rare glauconite, fish fragments concentrated in thin laminae, vertical stylolite through limestone.

SS at CC

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A	Plant debris	R

Site 370 Hole Core 37 Cored Interval: 920.0-929.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
NEOCOMIAN				N F R	C-A C —	M-G P —	Core Catcher		NS		CC CC CC

LITHOLOGIC DESCRIPTION

CALCAREOUS SANDY SILTSTONE, medium gray (N5), with fine grained laminae.

NANNO MARLSTONE, olive gray (5Y 3/2), with dark greenish gray (5GY 4/1) laminae, bioturbated, some burrows filled with pyrite.

CALCAREOUS CLAYSTONE, greenish gray (5G 6/1).

SS at CC (Calcareous claystone)

Clay	A	Pyrite	R
Carbonate unspecified	A	Carbonate rhombs	R
		Nannos	R

SS at CC (Nanno marlstone)

Quartz	R	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	A

SS at CC (Nanno marlstone)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Plant debris	R	Nannos	A

Site 370 Hole Core 38 Cored Interval: 939.0-948.5 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
NEOCOMIAN							1	0.5 1.0	VOID		
							2				
							3				26 70
							4				24
							5				
				R N F	— A F	— G P	Core Catcher				CC

LITHOLOGIC DESCRIPTION

SILTY MARLSTONE, grayish olive green (5GY 3/2) with interbeds of grayish green (5G 5/2) and medium gray (N5), laminae of SILTY CALCAREOUS SHALE to ARGILLACEOUS SILTSTONE and SILTY LIMESTONE. Upper and lower contacts sharp, ripple marks occur in siltstones. All of these interbeds are 2 to 3 cm thick.

SS at 3-26 (dominant lithology)

Quartz	R	Feldspar	R
Heavy minerals	R	Clay	A
Plant debris	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	A

SS at 3-70 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Fish debris	R	Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A		

SS at 4-24 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Pyrite	R	Carbonate unspecified	A
Nannos	R		
Fish debris	R		

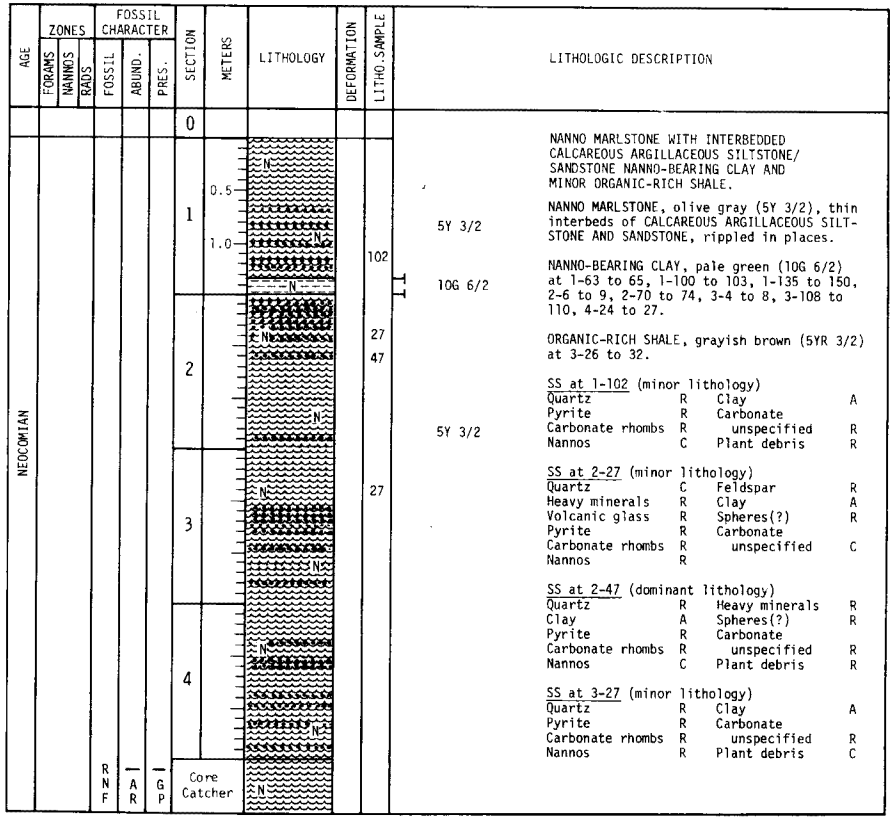
SS at CC

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Fish debris	R	Pyrite	R
Carbonate unspecified	A	Carbonate rhombs	R
		Nannos	R

SS at CC

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A		

Site 370 Hole Core 39 Cored Interval: 948.5-958.0 m



NANNO MARLSTONE WITH INTERBEDDED CALCAREOUS ARGILLACEOUS SILTSTONE/ SANDSTONE NANNO-BEARING CLAY AND MINOR ORGANIC-RICH SHALE.

NANNO MARLSTONE, olive gray (5Y 3/2), thin interbeds of CALCAREOUS ARGILLACEOUS SILTSTONE AND SANDSTONE, rippled in places.

NANNO-BEARING CLAY, pale green (10G 6/2) at 1-63 to 65, 1-100 to 103, 1-135 to 150, 2-6 to 9, 2-70 to 74, 3-4 to 8, 3-108 to 110, 4-24 to 27.

ORGANIC-RICH SHALE, grayish brown (5YR 3/2) at 3-26 to 32.

SS at 1-102 (minor lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate	
Carbonate rhombs	R	unspecified	R
Nannos	C	Plant debris	R

SS at 2-27 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Spheres(?)	R
Pyrite	R	Carbonate	
Carbonate rhombs	R	unspecified	C
Nannos	R		

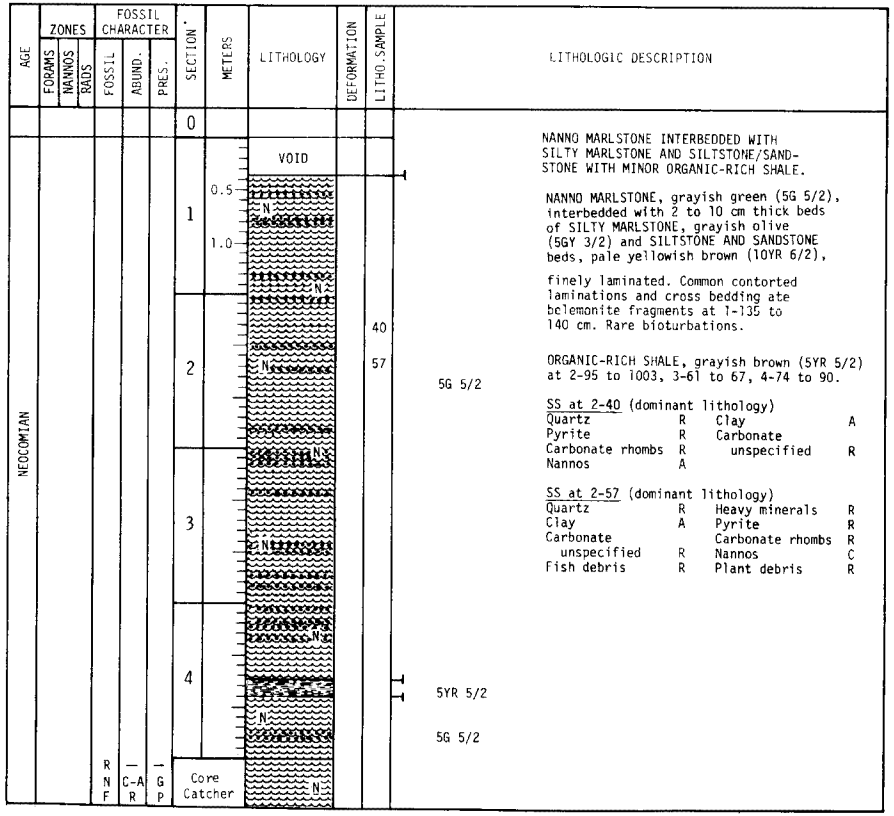
SS at 2-47 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Spheres(?)	R
Pyrite	R	Carbonate	
Carbonate rhombs	R	unspecified	R
Nannos	C	Plant debris	R

SS at 3-27 (minor lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate	
Carbonate rhombs	R	unspecified	R
Nannos	R	Plant debris	C

Site 370 Hole Core 40 Cored Interval: 967.5-977.0 m



NANNO MARLSTONE INTERBEDDED WITH SILTY MARLSTONE AND SILTSTONE/SANDSTONE WITH MINOR ORGANIC-RICH SHALE.

NANNO MARLSTONE, grayish green (5G 5/2), interbedded with 2 to 10 cm thick beds of SILTY MARLSTONE, grayish olive (5GY 3/2) and SILTSTONE AND SANDSTONE beds, pale yellowish brown (10YR 6/2), finely laminated. Common contorted laminations and cross bedding ate belemonite fragments at 1-135 to 140 cm. Rare bioturbations.

ORGANIC-RICH SHALE, grayish brown (5YR 5/2) at 2-95 to 1003, 3-61 to 67, 4-74 to 90.

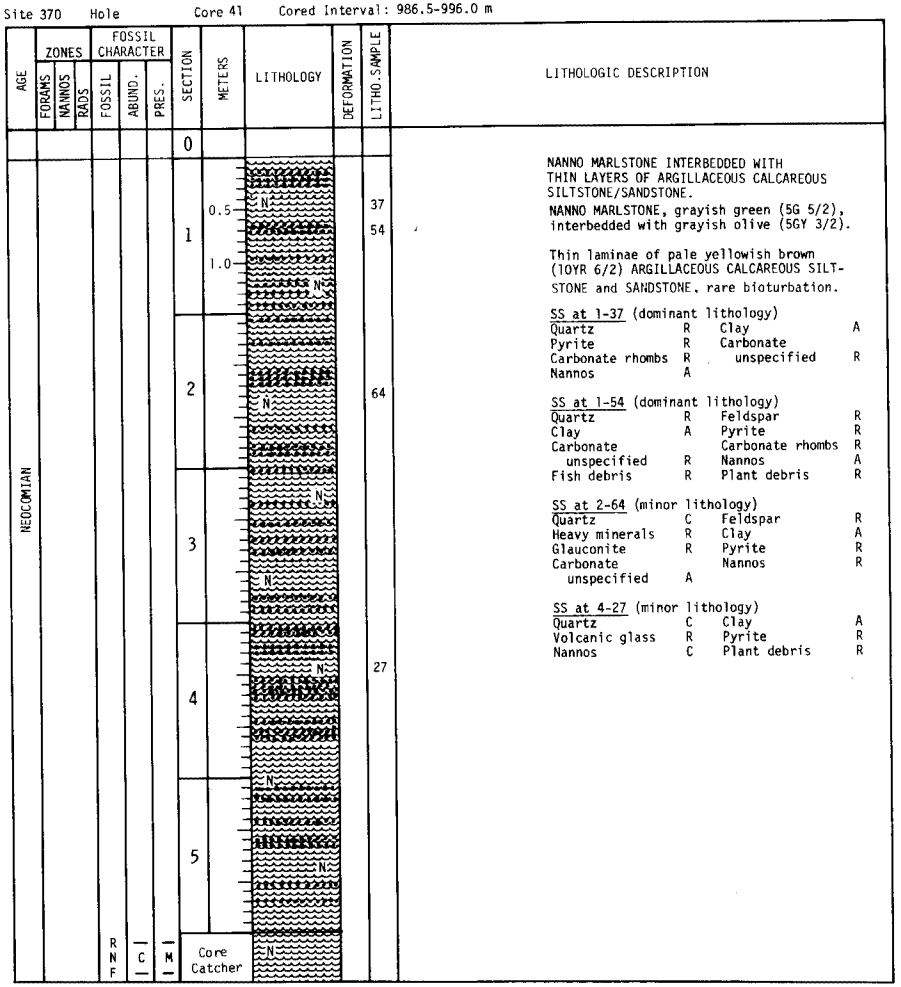
SS at 2-40 (dominant lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate	
Carbonate rhombs	R	unspecified	R
Nannos	A		

SS at 2-57 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate		Carbonate rhombs	R
unspecified	R	Nannos	C
Fish debris	R	Plant debris	R

Site 370 Hole Core 41 Cored Interval: 986.5-996.0 m



LITHOLOGIC DESCRIPTION

NANNO MARLSTONE INTERBEDDED WITH THIN LAYERS OF ARGILLACEOUS CALCAREOUS SILTSTONE/SANDSTONE.

NANNO MARLSTONE, grayish green (5G 5/2), interbedded with grayish olive (5GY 3/2).

Thin laminae of pale yellowish brown (10YR 6/2) ARGILLACEOUS CALCAREOUS SILTSTONE and SANDSTONE, rare bioturbation.

SS at 1-37 (dominant lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A		

SS at 1-54 (dominant lithology)

Quartz	R	Feldspar	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	A
		Plant debris	R

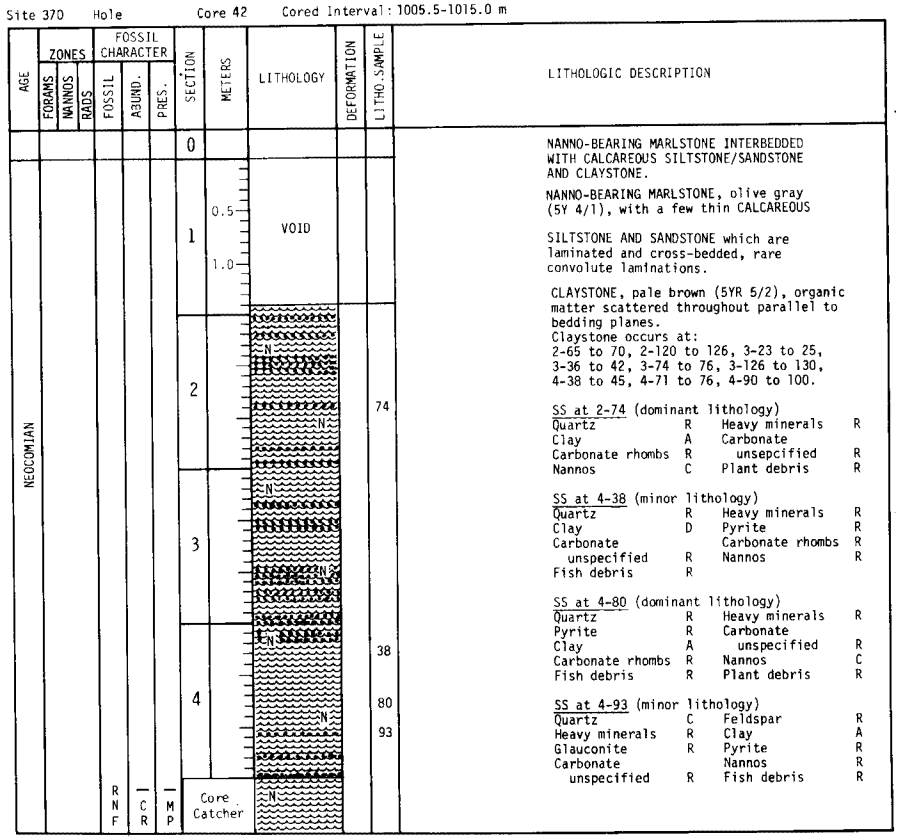
SS at 2-64 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	A	Nannos	R

SS at 4-27 (minor lithology)

Quartz	C	Clay	A
Volcanic glass	R	Pyrite	R
Nannos	C	Plant debris	R

Site 370 Hole Core 42 Cored Interval: 1005.5-1015.0 m



LITHOLOGIC DESCRIPTION

NANNO-BEARING MARLSTONE INTERBEDDED WITH CALCAREOUS SILTSTONE/SANDSTONE AND CLAYSTONE.

NANNO-BEARING MARLSTONE, olive gray (5Y 4/1), with a few thin CALCAREOUS

SILTSTONE AND SANDSTONE which are laminated and cross-bedded, rare convolute laminations.

CLAYSTONE, pale brown (5YR 5/2), organic matter scattered throughout parallel to bedding planes.
Claystone occurs at:
2-65 to 70, 2-120 to 126, 3-23 to 25, 3-36 to 42, 3-74 to 76, 3-126 to 130, 4-38 to 45, 4-71 to 76, 4-90 to 100.

SS at 2-74 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Carbonate unsepcified	R
Carbonate rhombs	R	Plant debris	R
Nannos	C		

SS at 4-38 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

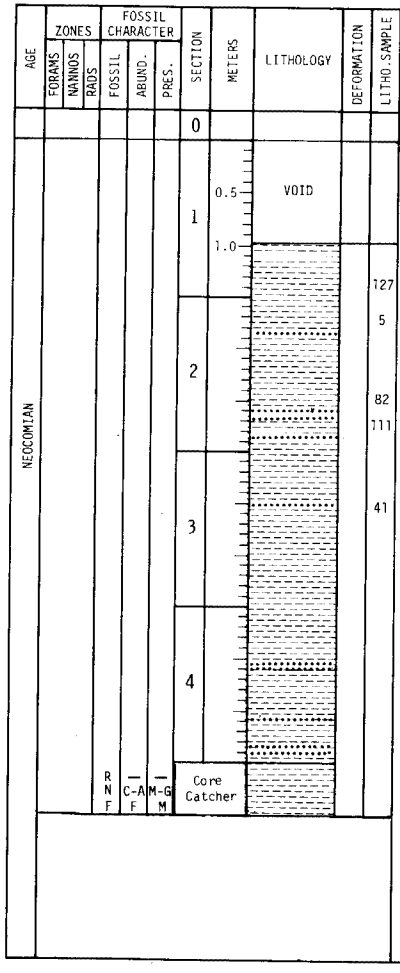
SS at 4-80 (dominant lithology)

Quartz	R	Heavy minerals	R
Pyrite	R	Carbonate unspecified	R
Clay	A	Nannos	C
Carbonate rhombs	R	Plant debris	R
Fish debris	R		

SS at 4-93 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Nannos	R
		Fish debris	R

Site 370 Hole Core 43 Cored Interval: 1024.5-1034.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED CLAYSTONES of three colors, each 5 to 15 cm thick.

NANNO-BEARING CLAYSTONE, olive gray (5Y 4/1), firm.

CLAYSTONE, pale brown (5YR 5/2), laminated in part.

CLAYSTONE, grayish blue green (5BG 5/2), thinly laminated.

CALCAREOUS ARGILLACEOUS SILTSTONE, medium light gray (N6), occurs scattered as 2 to 5 cm thick beds in Sections 2, 3 and 4.

Occasional convolute laminations and cross-bedding. Rare pyrite.

SS at 1-127 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A		
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C		

SS at 2-82 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A		
Fish debris	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	R

SS at 2-111 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Carbonate unspecified	A
Carbonate rhombs	R	Fish debris	R
Nannos	R		
Plant debris	R		

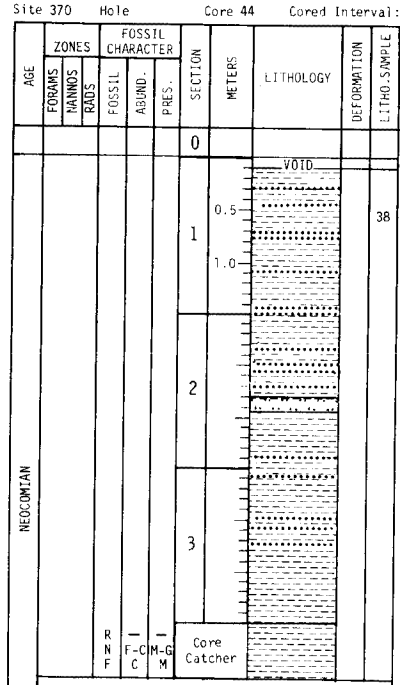
SS at 3-41 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	C
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R
		Plant debris	A

SS at 2-5 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C

Site 370 Hole Core 44 Cored Interval: 1043.5-1053.0 m



LITHOLOGIC DESCRIPTION

SILTY NANNO-BEARING CLAYSTONE WITH INTERBEDDED CALCAREOUS ARGILLACEOUS SILTSTONE.

SILTY NANNO-BEARING CLAYSTONE, grayish green (5G 5/2) to olive gray (5Y 4/1), laminated.

CALCAREOUS ARGILLACEOUS SILTSTONE, medium gray (N5).

SS at 1-38 (dominant lithology)

Quartz	C	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

SS at 1-50 (dominant lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C

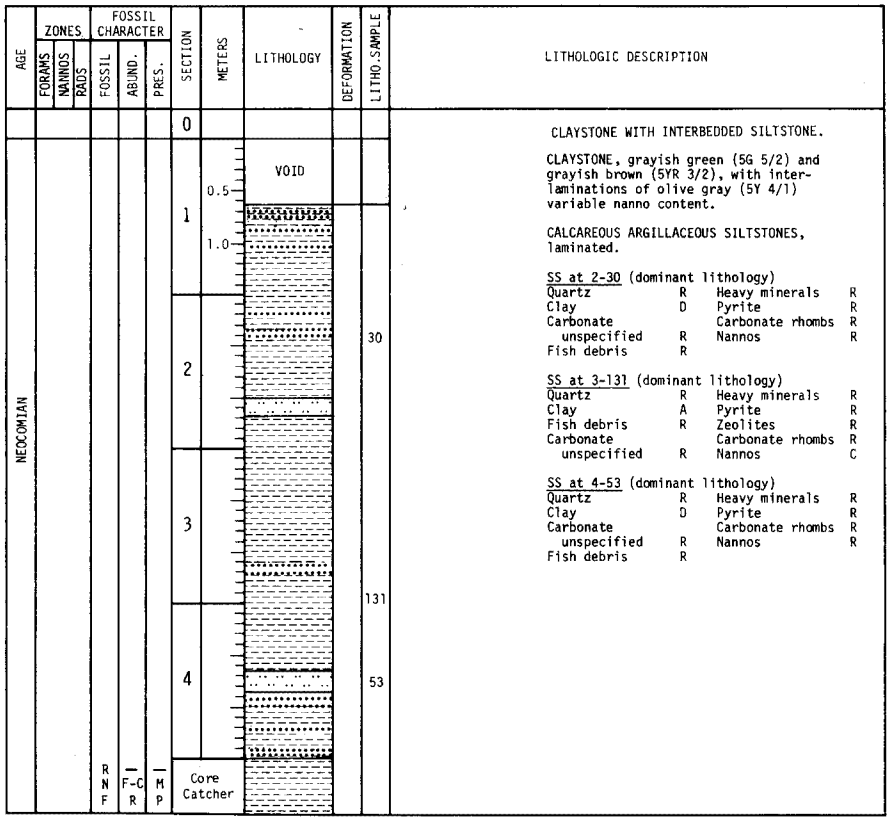
SS at 1-107 (minor lithology)

Quartz	A	Clay	A
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

SS at 3-31 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
		Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

Site 370 Hole Core 45 Cored Interval: 1062.5-1072.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH INTERBEDDED SILTSTONE.

CLAYSTONE, grayish green (5G 5/2) and grayish brown (5YR 3/2), with inter-laminations of olive gray (5Y 4/1) variable nanno content.

CALCAREOUS ARGILLACEOUS SILTSTONES, laminated.

SS at 2-30 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

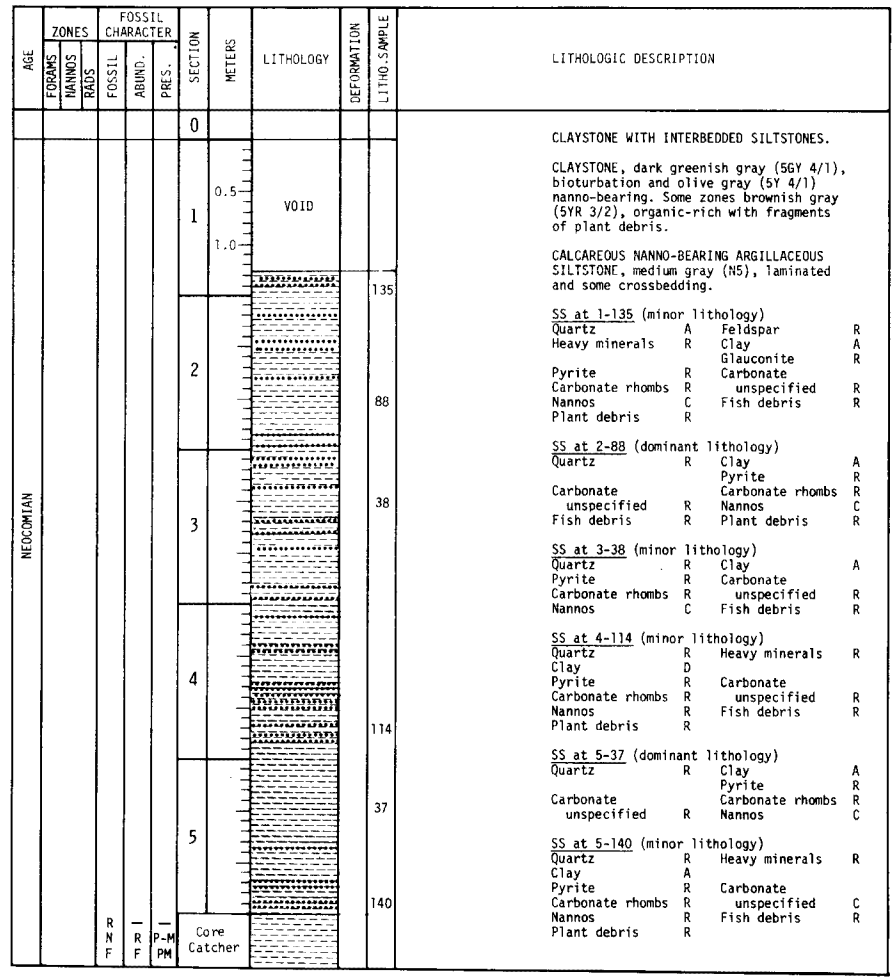
SS at 3-131 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Fish debris	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C

SS at 4-53 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R

Site 370 Hole Core 46 Cored Interval: 1100.5-1110.0 m



LITHOLOGIC DESCRIPTION

CLAYSTONE WITH INTERBEDDED SILTSTONES.

CLAYSTONE, dark greenish gray (5GY 4/1), bioturbation and olive gray (5Y 4/1) nanno-bearing. Some zones brownish gray (5YR 3/2), organic-rich with fragments of plant debris.

CALCAREOUS NANNO-BEARING ARGILLACEOUS SILTSTONE, medium gray (N5), laminated and some crossbedding.

SS at 1-135 (minor lithology)

Quartz	A	Feldspar	R
Heavy minerals	R	Clay	A
		Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R	Fish debris	R
Nannos	C		
Plant debris	R		

SS at 2-88 (dominant lithology)

Quartz	R	Clay	A
		Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C
		Plant debris	R

SS at 3-38 (minor lithology)

Quartz	R	Clay	A
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R	Fish debris	R
Nannos	C		

SS at 4-114 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D		
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R	Fish debris	R
Nannos	R		
Plant debris	R		

SS at 5-37 (dominant lithology)

Quartz	R	Clay	A
		Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C

SS at 5-140 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A		
Pyrite	R	Carbonate unspecified	C
Carbonate rhombs	R	Fish debris	R
Nannos	R		
Plant debris	R		

Site 370 Hole Core 47 Cored Interval: 1100.5-1110.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
NEOCOMIAN							1	0.5 1.0	VOID N N		
							2		N N N		3
				N	F-C	M	3		N N N		48 51 56
				R	—	—	Core Catcher				
				F	R	P					

LITHOLOGIC DESCRIPTION

CLAYSTONE WITH INTERBEDDED SILTSTONE.

CALCAREOUS SILTY CLAYSTONE AND SILTSTONE, medium gray (N6) and brownish gray (5YR 4/1), laminated, contorted, becomes pale yellowish brown (10YR 6/2) in Section 3.

NANNO-BEARING CLAYSTONE, olive gray (5Y 4/1), with thin interbeds of dark greenish gray (5G 4/1), laminated.

SS at 2-3 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D		
Glauconite	R	Pyrite	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	R	Fish debris	R
Plant debris	R		

SS at 3-48 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Fish debris	R
Plant debris	R		

SS at 3-51 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Zeolites	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C

SS at 3-56 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	C
		Plant debris	R

Site 370 Hole Core 48 Cored Interval: 1119.5-1129.0 m

AGE	ZONES: FORAMS	ZONES: NANNOS	ZONES: RADS	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE
							0				
NEOCOMIAN							1	0.5 1.0	N N		55 106 113 140
							2		N N		
				N F R	C C —	M PM —	Core Catcher		N		

LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO MARL, SILTY NANNO MARL AND CALCAREOUS ARGILLACEOUS SILTSTONE.

NANNO MARL, grayish olive (10Y 4/2).

SILTY NANNO MARL, pale blue green (5BG 5/2), laminated.

CALCAREOUS ARGILLACEOUS SILTSTONE, light brownish gray (5YR 6/1), crossbedded, contorted, rippled.

SS at 1-55 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A		
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A	Fish debris	R
Plant debris	R		

SS at 1-106 (minor lithology)

Quartz	C	Heavy minerals	R
Clay	A		
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A		

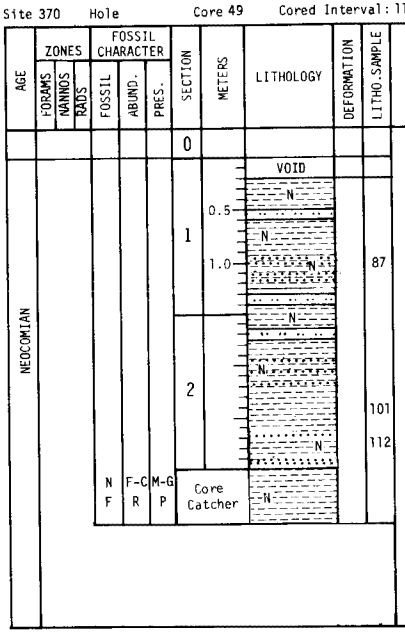
SS at 1-113 (minor lithology)

Quartz	C	Feldspar	R
Heavy minerals	R	Clay	A
Volcanic glass	R	Fish debris	R
Glauconite	R	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
Fish debris	R	Nannos	R
		Plant debris	R

SS at 1-140 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Glauconite	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	A	Fish debris	R
Plant debris	R		

Site 370 Hole Core 49 Cored Interval: 1138.5-1148.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO-BEARING CLAYSTONE AND CALCAREOUS ARGILLACEOUS SILTSTONE.

NANNO-BEARING CLAYSTONE, olive gray (5Y 3/2), laminated with grayish green (10G 5/2) nanno-bearing claystone.

CALCAREOUS ARGILLACEOUS SILTSTONE, pale yellowish brown (5YR 6/1), thinly laminated, some crossbedding.

SS at 1-87 (dominant lithology)

Quartz	R	Clay	A
Volcanic glass	R		
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Plant debris	R

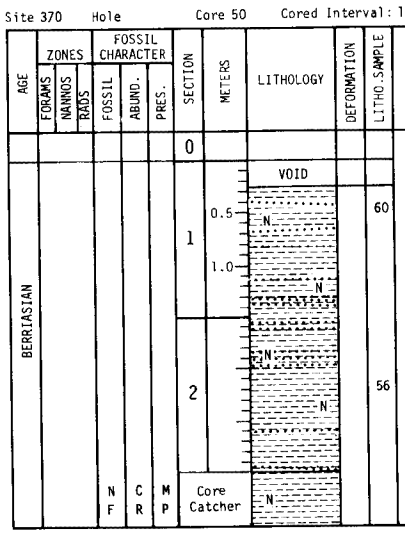
SS at 1-101 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	D	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C

SS at 2-112 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Carbonate unspecified	R	Carbonate rhombs	R
		Nannos	C
Fish debris	R	Plant debris	R

Site 370 Hole Core 50 Cored Interval: 1157.5-1167.0 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO-BEARING CLAYSTONE AND CALCAREOUS ARGILLACEOUS SILTSTONE.

NANNO-BEARING CLAYSTONE, olive gray (5Y 3/2), laminated with grayish green (10G 5/2) nanno-bearing claystone.

CALCAREOUS ARGILLACEOUS SILTSTONE, pale yellowish brown (5YR 6/1), thinly laminated, some crossbedding.

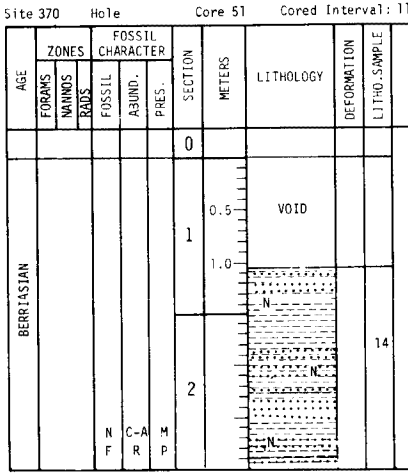
SS at 1-60 (minor lithology)

Quartz	R	Heavy minerals	R
Clay	A	Volcanic glass	R
		Pyrite	R
Zeolites	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Plant debris	R

SS at 2-56 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Pyrite	R
Plant debris	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Fish debris	R

Site 370 Hole Core 51 Cored Interval: 1167.0-1176.5 m



LITHOLOGIC DESCRIPTION

INTERBEDDED NANNO-BEARING CLAYSTONE AND CALCAREOUS ARGILLACEOUS SILTSTONE.

NANNO-BEARING CLAYSTONE, olive gray (5Y 3/2), laminated with grayish green (10G 5/2) nanno-bearing claystone.

CALCAREOUS ARGILLACEOUS SILTSTONE, pale yellowish brown (5YR 6/1), thinly laminated, some crossbedding.

SS at 2-14 (dominant lithology)

Quartz	R	Heavy minerals	R
Clay	A	Spheres?	R
Pyrite	R	Carbonate unspecified	R
Carbonate rhombs	R		
Nannos	C	Fish debris	R