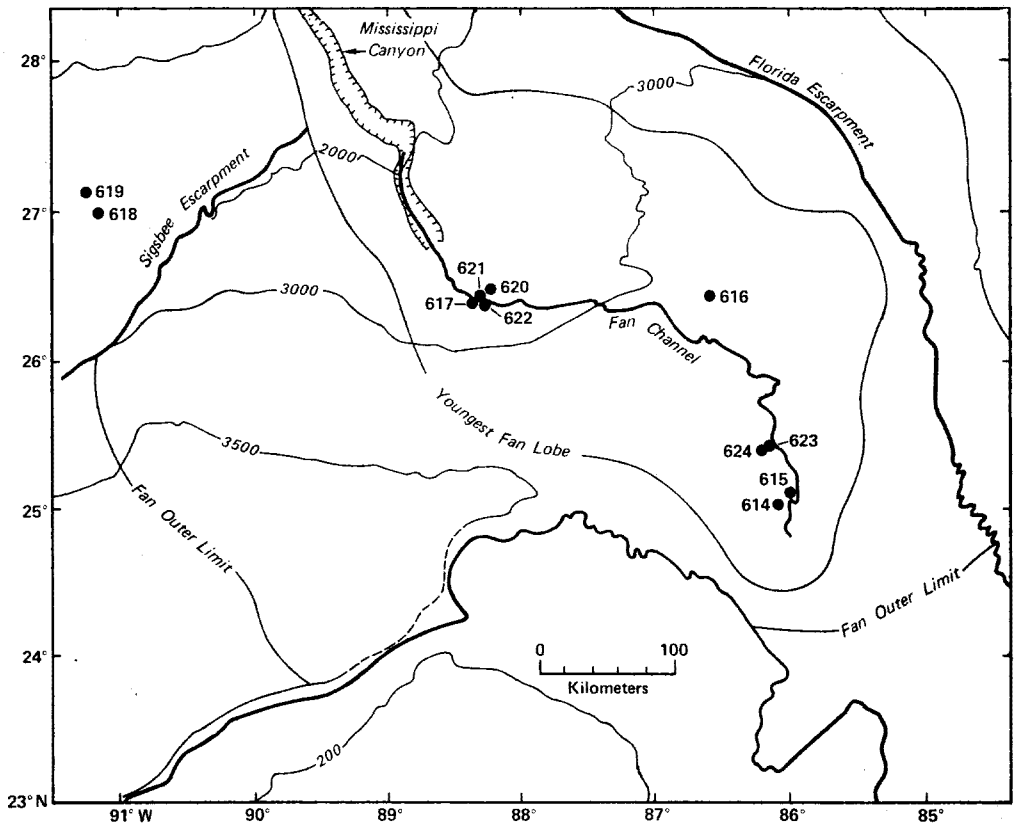
INITIAL CORE DESCRIPTIONS

DEEP SEA DRILLING PROJECT

LEG 96
GULF OF MEXICO



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Prime Contractor for the Project

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Deep Sea Drilling Project, A-031

LA JOLLA, CALIFORNIA 92093

January 15, 1985

Dear Colleague:

This document has been produced and distributed by the Deep Sea Drilling Project for the purpose of sample selection by interested earth scientists. Sample requests are honored two months after publication of the Initial Core Descriptions. It is an interim and informal document consisting of site data and sedimentologic and paleontologic data and interpretations as known six (6) months post-cruise. These data, while adequate for most sample selection needs, are subject to slight revision by the time of issue of 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,

Yves Lancelot
Chief Scientist
Deep Sea Drilling Project

YL:eb

INITIAL CORE DESCRIPTIONS

DEEP SEA DRILLING PROJECT

LEG 96

GULF OF MEXICO

September 29—November 8, 1983

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

MEMBER ORGANIZATIONS

Institute of Geophysics, University of Hawaii
Lamont-Doherty Geological Observatory, Columbia University
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Bundesanstalt fur Geowissenschaften und Rohstoffe, Hannover
Ocean Research Institute, University of Tokyo
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** Participating on second half only.

EXPLANATORY NOTES

INTRODUCTION

This *Initial Core Description* is presented here to aid investigators in selecting samples for detailed study. Samples from this leg become available to the public about 8 months after the cruise, with the completion of this *Initial Core Description.*

Potential investigators who desire to obtain samples should refer to the DSDP-NSF Sample Distribution Policy. Sample request forms may be obtained from:

The Curator
Deep Sea Drilling Project, A-031
University of California, San Diego
La Jolla, California 92093

Requests must be as specific as possible: include site, core, section, interval within a section, and volume of sample required. The purpose of this publication is to aid interested investigators in understanding the (1) terminology, labeling, and numbering conventions used by the Deep Sea Drilling Project (DSDP); (2) sediment classification and biostratigraphic framework used; and in addition, (3) to present the preliminary lithologic and paleontologic data on core forms, so that sampling can be guided. However, the investigator should be aware that the data is subject to future revision.

NUMBERING OF SITES, HOLES, CORES, SAMPLES

DSDP drill sites are numbered consecutively from the first site drilled by *Glomar Challenger* in 1968. Site numbers are slightly different from hole numbers. A site number refers to one or more holes drilled while the ship was positioned over one acoustic beacon. These holes could be located within a radius as great as 900 meters from the beacon. Several holes may be drilled at a single site by pulling the drill pipe above the sea floor (out of one hole) and moving the ship 100 meters or more from the previous hole, and then begin drilling another hole.

The first (or only) hole drilled at a site takes the site number. A letter suffix distinguishes each additional hole at the same site. For example: the first hole takes only the site number; the second takes the site number with suffix A; the third takes the site number with suffix B, and so forth. It is important, for sampling purposes, to distinguish the holes drilled at a site, since recovered sediments or rocks from different holes usually do not come from equivalent positions in the stratigraphic column.

There are two types of coring systems used on the *Glomar Challenger*: (1) the standard DSDP rotary-coring system, which cuts ~9.5 meter-long cores and has been used since Leg 1; and (2) the Hydraulic Piston Coring (HPC) system, used since Leg 64.

HPC holes are not assigned a special letter designation. The HPC operates on the principle of a core barrel which is lowered inside the drill string, hydraulically ejected into the sediment and retrieved. The pipe is then lowered to the next interval and

the procedure repeated. Disturbance can occur in the top 50–100 cm of HPC cores especially near the top of a hole. The standard DSDP rotary coring system typically disturbs the cores in the upper 100 meters of any hole, and generally half or more of each core is quite disturbed.

The cored interval is measured in meters below the sea floor. The depth interval of an individual core is the depth below sea floor that the coring operation began to the depth that the coring operation ended. For example, in the rotary-coring system, each coring interval is generally 9.5 meters long, which is the nominal length of a core barrel; however, the coring interval may be shorter or longer (rare). "Cored intervals" are not necessarily adjacent to each other, but may be separated by "drilled intervals". In soft sediment, the drill string can be "washed ahead" with the core barrel in place, but no recovering sediment, by pumping water down the pipe at high pressure to wash the sediment out of the way of the bit and up the space between the drill pipe and wall of the hole; however, if thin hard rock layers are present, then it is possible to get "spotty" sampling of these resistant layers within the washed interval, and thus have a cored interval greater than 9.5 meters. In drilling hard rock, a center bit may replace the core barrel if it is necessary to drill without core recovery.

Cores taken from a hole are numbered serially from the top of the hole downward. Core numbers and their associated cored interval in meters below the sea floor are normally unique for a hole; however, problems may arise if an interval is cored twice. When this situation occurs, the core number is assigned a suffix, such as "S"* for supplementary.

In the rotary-coring system, full recovery for a single core is normally 9.28 meters of sediment or rock, which is in a plastic liner (6.6 cm I. D.), plus about a 0.2 meter-long sample (without a plastic liner) in the Core-Catcher. The Core-Catcher is a device at the bottom of the core barrel which prevents the cored sample from sliding out when the barrel is being retrieved from the hole. The sediment-core, which is in the plastic liner, is then cut into 1.5 meter-long sections and numbered serially from the top of the sediment-core (Figure 1). When we obtain full recovery, the sections are numbered from 1 through 7 with the last section possibly being shorter than 1.5 meters. The Core-Catcher sample is placed below the last section when the core is described, and labeled Core-Catcher (CC): it is treated as a separate section.

When recovery is less than 100 percent, and if the sediment or rock is contiguous, the recovered sediment is placed in the top of the cored interval, and then 1.5 meter-long sections are numbered serially, starting with Section 1 at the top. There will be as many sections as are needed to accommodate the length of the core recovered (Figure 1); for example, 3 meters of core sample in plastic liners will be divided into two 1.5 meter-long sections. Sections are cut starting at the top of the recovered sediment, and the last section may be shorter than the normal 1.5 meter length.

This technique differs from the labeling systems used on Legs 1 through 45, which had a designation called "zero section". On Legs 1–45 there were seven sections labeled 0, 1, 2, 3, 4, 5, and 6. The new system used from Legs 46 to the present, has seven sections, but they are labeled 1, 2, 3, 4, 5, 6, and 7.

When recovery is less than 100 percent, the sediment's original stratigraphic position in the cored interval is unknown, so we employ the convention assigning the top of the sediment recovered to the top of the cored interval. This is done for convenience in data handling, and consistency. If recovery is less than 100 percent, and core fragments are separated, and if shipboard scientists believe the sediment was not contiguous, then sections are numbered serially and the intervening sections

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* Note that this designation has been used on previous legs as a prefix to the core number for sidewall core samples.

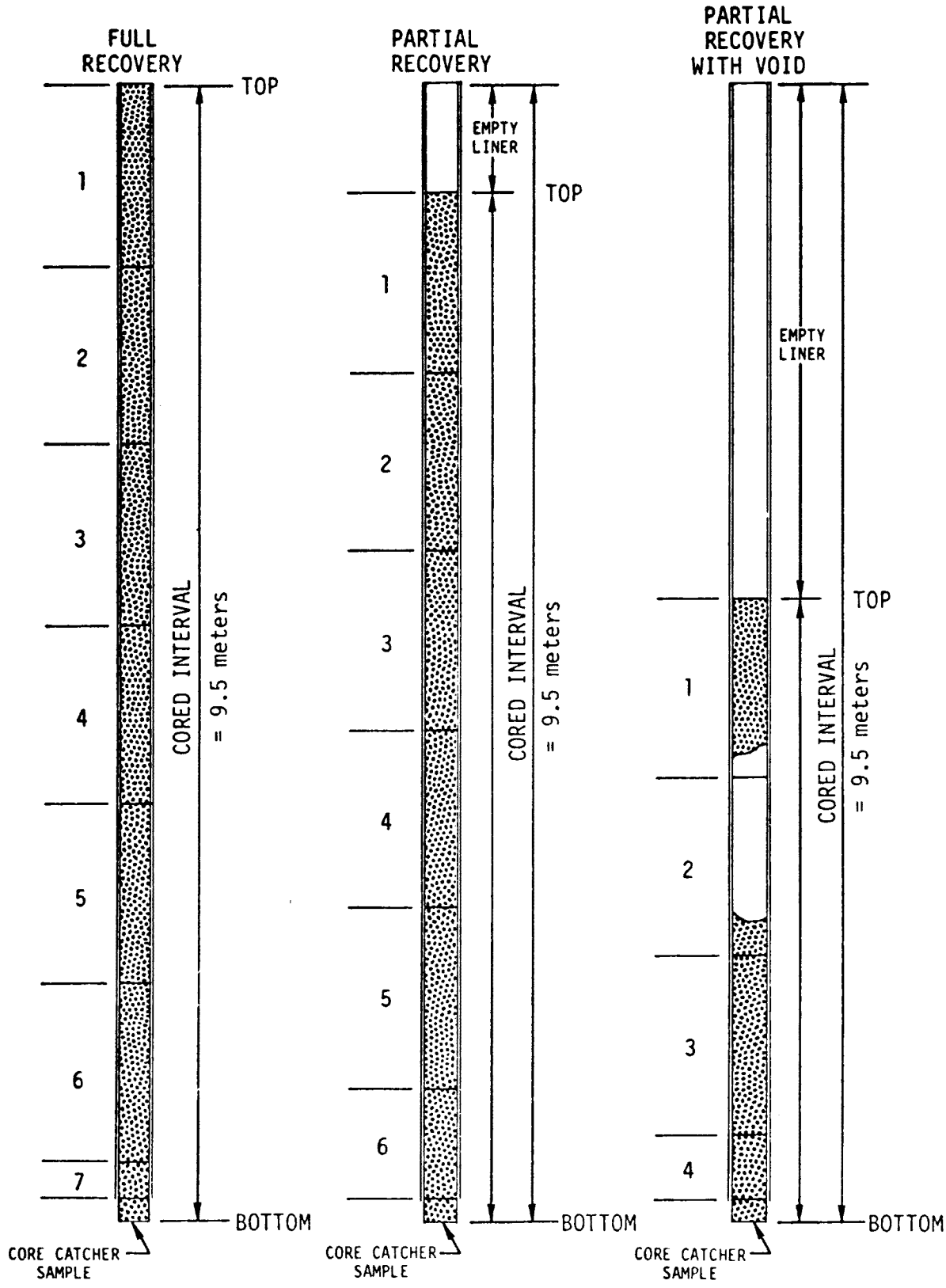

Figure 1. Diagram showing procedure in cutting and labeling of core sections.

are noted as void, whether it is contiguous or not. The Core-Catcher sample is described in the visual core descriptions beneath the lowest section.

Samples are designated by centimeter distances from the top of each section to the top and bottom of the sample in that section. A full identification number for a sample consists of the following information:

Leg

Site

Hole

Core Number

Interval in centimeters from the top of section

For example, a sample identification number of "75-531A-6-3, 12–14 cm" is interpreted as follows: 12–14 cm designates a sample taken at 12 to 14 cm from the top of Section 3 of Core 6, from the second hole drilled at Site 531 during Leg 75. A sample from the Core-Catcher of this core is designated as "75-531A-6, CC, 12–14 cm".

The depth below the seafloor for a sample numbered at "75-531A-6-3, 12–14 cm", is the summation of the following: (1) the depth to the top of the cored interval for Core 6, which is 430 meters; (2) plus 3 meters for Sections 1 and 2 (each 1.5 meters long); and plus the 12 cm depth below the top of Section 3. All of these variables add up to 433.21 meters*, which by convention is the sample depth below the sea floor.

HANDLING OF CORES CONTAINING SEDIMENTS

A core containing sediments is normally cut into 1.5 meter sections, sealed, and labeled; and then the sections are brought into the core laboratory for processing. The following determinations are normally made before the sections are split: gas analysis, and continuous wet-bulk density determinations using the Gamma Ray Attenuation Porosity Evaluation (GRAPE) as described in Boyce (1976).

The cores are then split longitudinally into "work" and "archive" halves**. Samples are extracted from the "work" half, including those for determination of grain-size distribution, mineralogy by x-ray diffraction, sonic velocity by the Hamilton Frame method as described in Boyce (1976), wet-bulk density by a static GRAPE technique (Boyce, 1976), water content by gravimetric analysis, carbon-carbonate analysis, percent calcium carbonate (Carbonate Bomb), geochemical analysis, paleontological studies, and others.

Smear slides or thin sections from each major lithology, and most minor lithologies, are prepared and examined microscopically. The archive half is then described and photographed. Physical disturbance by the drill bit, color, texture (for uncemented lithologies), and sedimentary and igneous structures and composition (±20%) of the various lithologies are noted on standard core description sheets.

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* Sample requests should refer to a specific interval within a core-section, rather than the level below sea floor.

** In the HPC system the cores are oriented relative to each other, thus, for example, all archive halves are on the same side of the hole. We do not know, however, their orientation relative to the Earth's magnetic north.

After the cores are sampled and described, they are maintained in cold storage aboard *Glomar Challenger* until they can be transferred to the DSDP repository. Core sections which are removed for organic geochemistry study are frozen immediately on board ship and kept frozen. Frozen cores are presently stored at the DSDP West Coast Repository (Scripps Institution of Oceanography).

These core descriptions, smear slide descriptions (plus occasional peels and thin sections) and carbonate bomb (% $CaCO_3$) determinations (all of these data are determined aboard ship) serve as the data for the visual core descriptions presented here. These samples, and their location in the core, are coded with a symbol on the core description sheets. The key to these codes, in order to identify the samples, is in Figures 2–6.

SPECIAL CORES AND SAMPLES

Occasionally, special cores or samples are recovered that require specific identification. These are designated as follows:

- X = miscellaneous debris or out-of-sequence core material.
- C = center bit samples; i. e., samples obtained upon removal of the center bit (a device to prevent core recovery while drilling or washing ahead for some interval).
- S = side-wall core; i.e., a core taken in the side of the hole, usually to obtain a sample of material not recovered during previous coring.
- H = a wash core; i. e., a core taken while washing ahead for an interval larger than 9.5 m (say, 50 m), but without the center bit in place. Such a core may sample at several places in the washed interval, but their depths cannot be specified within that interval.
- B = bit material; i. e., material removed from core bits upon retrieval of the drill string following completion of a hole, or prior to re-entry with a new core bit.

Cores or samples of these types are designated X1, X2, H1, H2, etc., each type in the sequence they were obtained. Additional types of special samples may be designated by the shipboard party or cruise operations manager. The letter designation for these samples is chosen in consultation with the DSDP curatorial representative and laboratory officer, and is indicated on each core description form.

DESCRIPTION OF SEDIMENTS

The following is the sediment description and classification scheme devised by the JOIDES Sedimentary Petrology and Physical Properties Panel, and approved by the JOIDES Planning Committee in March, 1974. In the past, shipboard parties have, in some instances, found it necessary to modify or amend the classification for their particular situation. Any modifications to the classification for the cores described herein are presented in the section following the JOIDES classification.

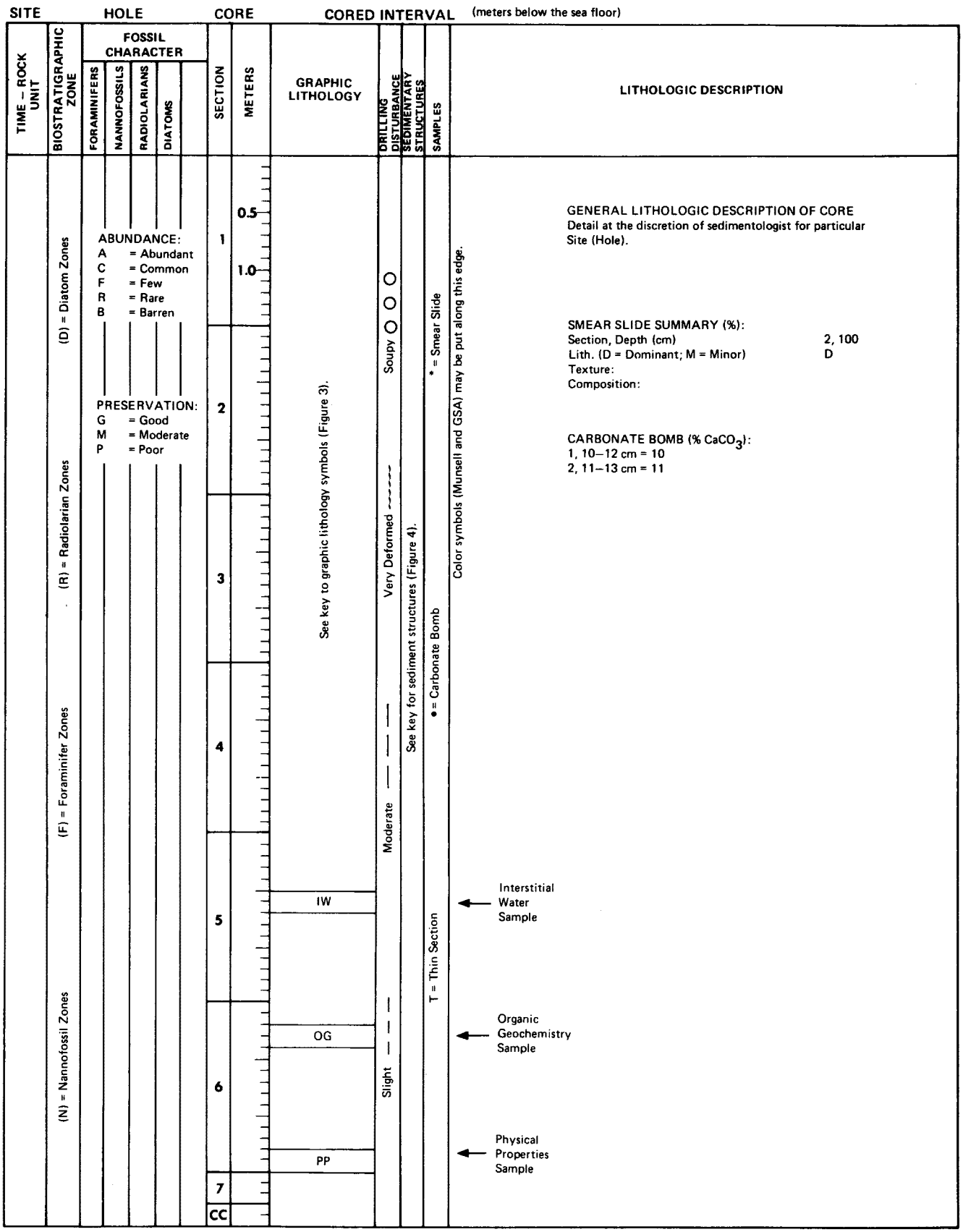


Figure 2. This is a typical sedimentary core description sheet, with the sediment deformation symbols, sample codes, and other general information.

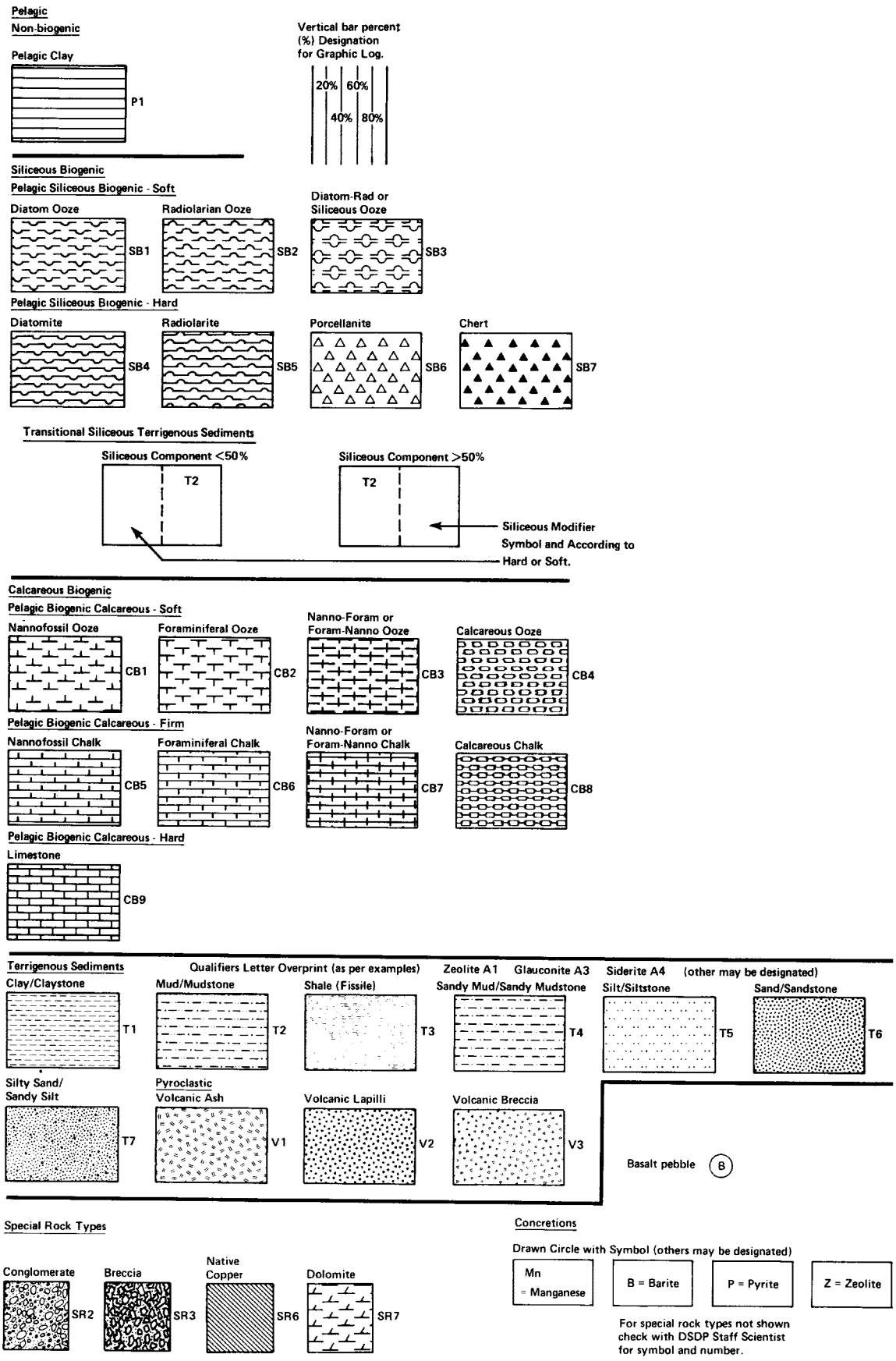
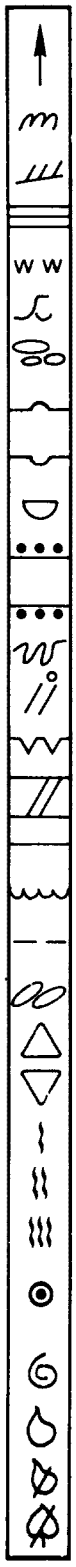


Figure 3. Graphic symbols corresponding to the lithologic visual core descriptions for sediment and sedimentary rocks.



Primary Structures

Interval over which primary sedimentary structures occur

Current ripples

Micro-cross–laminae (including climbing ripples)

Parallel laminae

Wavy bedding

Flaser bedding

Lenticular bedding

Slump blocks or slump folds

Load casts

Scour

Graded bedding (NORMAL)

Graded bedding (REVERSED)

Convolute and contorted bedding

Water escape pipes

Mudcracks

Cross-stratification

Sharp contact

Scoured, sharp contact

Gradational contact

Imbrication

Fining-upward sequence

Coarsening-upward sequence

Bioturbation - minor (30% surface area)

Biotrubation - moderate (30-60% surface area)

Bioturbation - strong (more than 60% surface area)

Secondary Structures

Concretions

Compositional Symbols

Fossils in general (megafossils)

Shells (complete)

Shell fragments

Wood fragments

Figure 4. Structure symbol code for sediments.

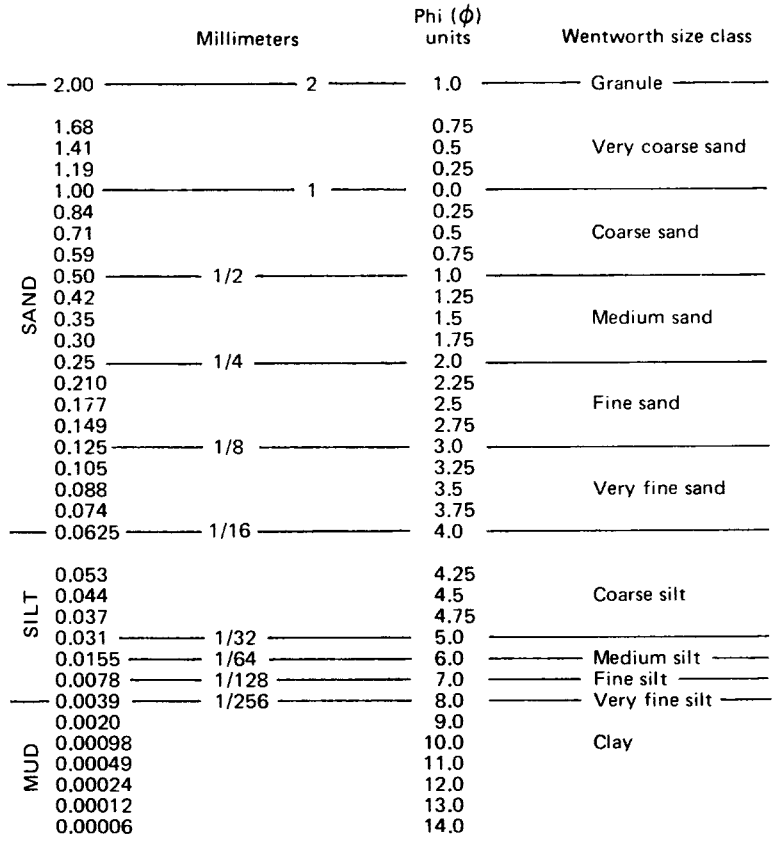


Figure 5. Grade scales for terrigenous sediments.

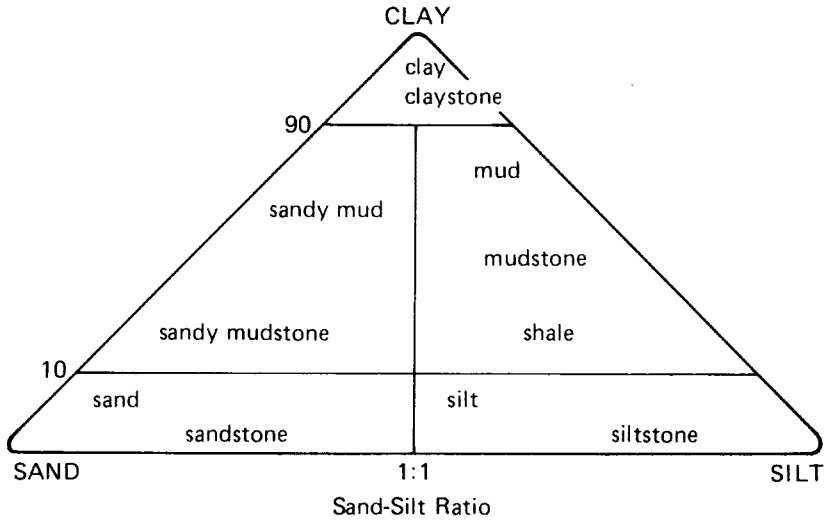


Figure 6. Class boundaries for terrigenous sediments.

CLASSIFICATION OF SEDIMENTS

Several lithologic classifications designed for the construction of the several graphic core and hole summaries have been used during the lifetime of the Deep Sea Drilling Project. The classification system described here has been devised by the JOIDES Panel on Sedimentary Petrology and Physical Properties and adopted for use by the JOIDES Planning Committee in March 1974.

Principles Used in Classification

1 This is a lithologic summary classification designed to generalize core descriptive material of greater detail into a form suitable for standard core and hole logs. Its systematic use will facilitate core to core and leg to leg comparisons.

2 The classification covers most of the lithologic types encountered so far but does not attempt to be comprehensive. A category "Special Rock Types" shows additional definitions and terminology at the discretion of the shipboard staff for rock types not covered.

3 Sediment names are those in common usage and have been defined within the limits of existing definitions.

4 Categories are based on sediment parameters measured on board ship. Refinement by shore laboratory data is possible but not necessary.

5 The classification is descriptive and genetic implications are not intended.

6 The degree of detail of the classification is scaled to the space limitations of printed graphic hole and core summaries.

Shipboard Parameters Measured

Sediment and rock names are defined solely on the basis of compositional and textural parameters. The compositional factors are most important for description of those deposits more characteristic of open marine conditions, with textural factors becoming more important for the classification of hemipelagic and near-shore facies. Sediment names are thus based solely upon these parameters as determined in smear slides aided by compositional and textural properties apparent to the naked eye or under the hand lens. Other descriptive parameters include: induration, sediment disturbance, sedimentary structures, and color. The determination of these parameters is as follows:

1) Composition – biogenic and mineral components are estimated in percent from smear slides. $CaCO_3$ content is estimated by using the carbonate bomb available on the ship. Even with rapid use, a value to ±5% is achievable.

2) Texture – visual estimates from smear slide examination.

3) Induration – The determination of induration is highly subjective, but field geologists have successfully made similar distinctions for many years. The categories suggested here are thought to be practical and significant. The criteria of Moberly and Heath (1971) are used for calcareous deposits; subjective estimate or behavior in core cutting for others. There are three classes for calcareous sediments; two for all others.

a) Calcareous sediments

(i) Soft: Oozes have little strength and are readily deformed under the finger or the broad blade of a spatula.

(ii) Firm: Chalks are partly indurated oozes: they are friable limestones that are readily deformed under the fingernail or the edge of a spatula blade. More indurated chalks are termed limestones (see below).

(ii) Hard: Limestones as a term should be restricted to cemented rocks.

b) The following criteria are recommended for all but calcareous sediments:

(i) If the material is low state of induration as to allow the core to be split with a wire cutter, the sediment name only is used (e. g., silty clay: mud).

(ii) If the core must be cut on the band saw or diamond saw, the suffix 'stone' is used (e. g., silty claystone: mudstone; or shale, if fissile.)

4) Sediment Disturbance – Deformational structures are generally of the type found in piston cores, and are usually simple to visualize and interpret.

a) Soft to firm sediment: The following categories are recommended.

(i) Slightly deformed – bedding contacts are slightly bent.

(ii) Moderately deformed – bedding contacts have undergone extreme bowing.

(iii) Very deformed – bedding is completely disturbed, sometimes showing symmetrical diapir-like structure.

(iv) Soupy – water saturated intervals which have lost all aspects of original bedding.

b) Hard sediments: There is also the need to indicate the degree of fracturing in hard sediments/rock. This is best accomplished with a written description in the Lithologic Description portion of the Core Form (Figure 2).

c) Drilling "Biscuits" – semi-indurated sediments are broken into flat 3–5 cm or so "biscuits" which internally are undeformed, but were rotated against each other resulting in lenses of soft, intensely deformed mud or ooze in-between. Description of this is also best accomplished using the Lithologic Description portion of the Core Form (Figure 2).

5) Sedimentary structures – in many cores it is extremely difficult to differentiate between natural and coring-induced structures. Consequently, the description of sedimentary structures is optional. The following approach is suggested as a guideline, but the specialist is encouraged to use his own preferred system and set of symbols.

a) Median grain size profile: For the sections of terrigenous sediments, with interbeds of varying textural characteristics, the construction of median grain size profile based on hand lens observations provides a rapid method for illustrating graded and non-graded beds, bed thickness, and size distribution.

b) Sedimentary structures: A set of suggested symbols is provided for categories shown on Figure 4.

6) Color – According to standard Munsell and GSA color charts.

Use of the Core Form

1) Mandatory Graphic Lithology Column – This graphic column is based on the above classification scheme. Completion of the column using the appropriate symboles (Figure 3) must be done for each site, and will be inclued in the *Initial Core Description* (*ICD*) and *Initial Report Volume*. The "Special Rock Type" category should be used for sediment types not in the classification.

a) Optional graphic column: If circumstances or the special skills and interests of the shipboard staff indicate an additional modified or different classification, another graphic column may be added to the right of the Mandatory Column using definitions, terminology, and symbols that, in the opinion of the shipboard staff, will increase the information yield. This Optional Column must not substitute for the Mandatory Column.

2) Sediment disturbance column – Completion of the sediment disturance column using symbols and distinctions given below is mandatory.

3) Sedimentary structure columns – Structures may be designated on the core form in the sedimentary structure column parallel to the sediment disturbance column, and/or on the median grain size profile (for the sections of terrigenous sediments, with interbeds of varying textural characteristics). The median grain size profile is located in the lithologic description portion of the core form. A set of suggested symbols for a few more common structures has been prepared by DSDP (Figure 4), but the shipboard geologist is free to use whatever additional symbols he may wish. These optional columns may not substitute for the mandatory sediment disturbance column and must be distinct from it.

4) Lithologic description column – Format, style, and terminology of the descriptive portion of the core sheets are not controlled by the mandatory column scheme, beyond the minimal name assignment which should be derived from this classification. However, colors and additional information on structure and textures should normally be included in the textural section of the core description.

Lithologic Classification Scheme

The following define compositional class boundaries and use of qualifiers in the lithologic classification scheme:

1) Compositional Class Boundaries

a) $CaCO_3$ content (determined by $CaCO_3$ bomb): 30% and 60%. With a 5% precision and given the natural frequency distribution of $CaCO_3$ contents in oceanic sediments, these boundaries can be reasonably ascertained.

b) Biogenic opal abundance (expressed as percent siliceous skeletal remains in smear slides): 10%, 30%, and 50%. Smear-slide estimates of identifiable siliceous skeletal material generally imply a significantly higher total opal abundance. The boundaries have been set to take this into account.

c) Abundance of authigenic components (zeolites, Fe, and Mn micronodules etc), fish bones, and other indicators of very slow sedimentation (estimated in smear slides); semiquantitative boundary: common 10%. These components are quite conspicuous and a semiquantitative estimate is adequate. Even a minor influx of calcareous, siliceous, or terrigenous material will, because of the large difference in sedimentation rate, dilute them to insignificance.

d) Abundance of terrigenous detrital material (estimated from smear slides): 30%.

e) Qualifiers: Numerous qualifiers are suggested; the options should be used freely. However, components of less than 5% (in smear slide) should not be used as a qualifier except in special cases. The most important component should be the last qualifier. No more than two qualifiers should be used.

Description of Sediment Types

1) Pelagic clay – Principally authigenic pelagic deposits that accumulate at very slow rates. The class is often termed brown clay, or red clay, but since these terms are confusing, they are not recommended.

a) Boundary with terrigenous sediments: Where authigenic components (Fe/Mn micronodules, zeolites), fish debris, etc., become common in smear slides. NOTE: Because of large discrepancy in accumulation rates, transitional deposits are exceptional.

b) Boundary with siliceous biogenic sediments: <30% identifiable siliceous remains.

c) Boundary with calcareous biogenous sediments: Generally the sequence is one passing from pelagic clay through siliceous ooze to calcareous ooze, with one important exception: at the base of many oceanic sections, black, brown, or red clays occur directly on basalt, overlain by or grading up into calcareous sediments. Most of the basal clayey sediments are rich in iron, manganese and metallic trace elements. For proper identification they require more elaborate geochemical work than is available on board. These sediments are placed in the "Special Rock" category, but care should be taken to distinguish them from ordinary pelagic clays.

2) Pelagic siliceous biogenic sediments — These are distinguished from the previous category because they have more than 30% identifiable siliceous microfossils. They are distinguished from the following category by a $CaCO_3$ content of less than 30%. There are two classes: *Pelagic biogenic siliceous sediments* (containing less than 30% silt and clay); and *transitional biogenic siliceous sediments* (containing more than 30% silt and clay and more than 10% diatoms).

a) Pelagic biogenic siliceous sediments:

soft: Siliceous ooze (radiolarian ooze, diatom ooze, depending on dominant component).

hard: radiolarite porcellanite

diatomite chert

(i) Qualifiers:

Radiolarians dominant: radiolarian ooze or radiolarite.

Diatoms dominant: diatom ooze or diatomite.

Where uncertain: siliceous (biogenic) ooze, or chert or porcellanite, when containing >10% $CaCO_3$, qualifiers are as follows:

indeterminate carbonate:	calcareous - -
or	
nannofossils only:	nannofossil - -
foraminifers only:	foraminifer - -
nannofossil-foraminifer - -	depending on dominant component
foraminiferal-nannofossil - -	

b) Transitional biogenic siliceous sediments:

Diatoms <50%	diatomaceous mud:	soft
	diatomaceous mudstone:	hard
Diatoms >50%	muddy diatom ooze:	soft
	muddy diatomite:	hard

Radiolarian equivalents in this category are rare and can be specifically described.

3) Pelagic biogenous calcareous sediments – These are distinguished from the previous categories by a $CaCO_3$ content in excess of 30%. There are two classes: Pelagic biogenic calcareous sediments (containing less than 30% silt and clay); and transitional biogenic calcareous sediments (containing more than 30% silt and clay).

a) Pelagic biogenic calcareous sediments:

soft: calcareous ooze

firm: chalk

hard: indurated chalk

The term *limestone* should preferably be restricted to *cemented rocks*.

(i) Compositional Qualifiers ⩽–

Principal components are: nannofossils and foraminifers.

One or two qualifiers may be used, for example:

Foram %	Name
<10	Nannofossil ooze, chalk, limestone
10–25	Foraminiferal-nannofossil ooze
25–50	Nannofossil-foraminifer ooze
>50	Foraminifer ooze

Calcareous sediment containing more than 10–20% identifiable siliceous fossils carry the qualifier radiolarian, diatomaceous, or siliceous depending on the quality of the identification. For example, radiolarian-foraminifer ooze.

b) Transitional biogenic calcareous sediments

(i) $CaCO_3$ = 30–60%: marly calcareous pelagic sediments

soft: marly calcareous (or nannofossil, foraminifer, etc.), ooze (see below)

firm: marly chalk

hard: marly limestone

(ii) $CaCO_3$ >60%: Calcareous pelagic sediments.

soft: calcareous (or nannofossil, foraminifer, etc.), ooze (see below)

firm: chalk

hard: limestone

NOTE: Sediments containing 10–30% $CaCO_3$ fall in other classes where they are denoted with the adjective "calcareous." Less than 10% $CaCO_3$ is ignored.

4) Terrigenous sediments

a) Sediments falling in this portion of the classification scheme are subdivided into textural groups on the basis of the relative preportions of three grain size constituents, i. e., clay, silt, and sand. Rocks coarser than sand size are treated as "Special Rock Types." The size limits for these constituents are those defined by Wentworth (1922) (Figure 5).

Five major textural groups are recognized on the accompanying triangular diagram (Figure 6). These groups are defined according to the abundance of clay (> 90%, 90–10%, < 10%) and the ratio of sand to silt (>1 or <1).

The terms *clay, mud, sandy mud, silt,* and *sand* are used for the soft or unconsolidated sediments which are cut with a wire in the shipboard core splitting process. The hard or unconsolidated equivalents for the same textural groups are *claystone, mudstone* (or shale, if fissile), *sandy mudstone, siltstone,* and *sandstone.* Sedimentary rocks falling into the consolidated category include those which must generally be cut with the band saw or diamond saw. Sands medium-, coarse-, or very coarse-grained sands and sandstones according to their median grain size.

(i) Qualifiers — In this group numerous qualifiers are possible, usually based on minor constituents, for example: glaconitic, pyritic, feldspathic. In the sand and sandstone category, conventional divisions such as arkose, graywacke, etc., are, of course, acceptable, providing the scheme is properly identified. Clays, muds, silts, and sands containing 10–30% $CaCO_3$ shall be called calcareous.

b) Volcanogenic sediments

Pyroclastic rocks are described according to the textural and compositional scheme of Wentworth and Williams (1932). The textural groups are:

Volcanic breccia >32 mm

Volcanic lapilli <32 mm

Volcanic ash (tuff, indurated) <4 mm

Compositionally, these pyroclastic rocks are described as vitric (glass), crystal or lithic.

c) Clastic sediments of volcanic provenance are described in the same fashion as the terrigenous sediments, noting the dominant composition of the volcanic grains where possible.

5) Special rock types — The definition and nomenclature of sediment and rock types not included in the system described above are left to the discretion of shipboard scientists with the recommendation that they adhere as closely as practical to conventional terminology.

In this category fall such rocks as:

Intrusive and extrusive igneous rocks;

Evaporites, halite, anhydrite, gypsum (as a rock), etc.;

Shallow water limestone (biostromal, biohermal, coquina, oolite, etc.);

Dolomite;

Gravels, conglomerates, breccias;

Metalliferous brown clays;

Concretions, barite, iron-manganese, phosphorite, pyrite, etc.;

Coal, asphalt, etc.;

and many others.

The mandatory graphic lithology column should be completed by shipboard staff with appropriate symbols for intervals containing special rock types. It is imperative that symbols and rock nomenclature be properly defined and described by shipboard staff.

Basement Description Conventions

Core Forms

Initial core description forms for igneous and metamorphic rocks are not the same as those used for sediments. The sediment barrel sheets are substantially those published in previous *Initial Reports.* Igneous rock representation on barrel sheets is too compressed to provide adequate information for potential sampling. Consequently, Visual Core Description forms, modified from those used on board ship, are used for more complete graphic representation. All shipboard data per 1.5-meter section of core are listed on the modified forms as well as summary hand-specimen and thin-section descriptions. The symbols and a number of format conventions for igneous rocks are presented on Figure 7.

Igneous and metamorphic rocks are split using a rock saw with a diamond blade into archive and working halves. The latter is described and sampled on board ship. On a typical igneous rock description form (Figure 8), the left column is a visual representation of the working half using the symbols of Figure 7. Two closely spaced horizontal lines in this column indicate the location of styrofoam spacers taped between basalt pieces inside the liner. Each piece is numbered sequentially from the top of each section, beginning with the number 1. Pieces are labeled on the rounded, not the sawed surface. Pieces which could be fitted together before splitting are given the same number, but are consecutively lettered, as 1A, 1B, 1C, etc. Spacers are placed between pieces with different number, but not between those with different letters and the same number. In general, addition of spacers represents a drilling gap (no recovery). However, in cores where recovery is high, it is impractical to use spacers. In these cases, drilling gaps are indicated only by a change in numbers. All pieces have orientation arrows pointing to the top of the section, both on archive and working halves, provided the original unsplit piece was cylindrical in the liner and of greater length than the diameter of the liner. Special procedures are used to ensure that orientation is preserved through every step of the sawing and labeling process. All pieces suitable for sampling requiring knowledge of top from bottom are indicated by upward-pointing arrows to the left of the piece numbers on the description forms. Since the pieces are rotated during drilling, it is not possible to sample for declination studies.

Samples are taken for various measurements on board ship. The type of measurement and approximate location are indicated in the column headed "Sample" using the following notation:

X = X-ray fluorescence analysis

M = magnetics measurements

S = sonic velocity measurements

T = thin section

D = density measurements

P = porosity measurements

Up to seven such visual representations can be included on a single igneous rock core description sheet (Figure 9), which includes a summary core description, and petrographic and analytical data.

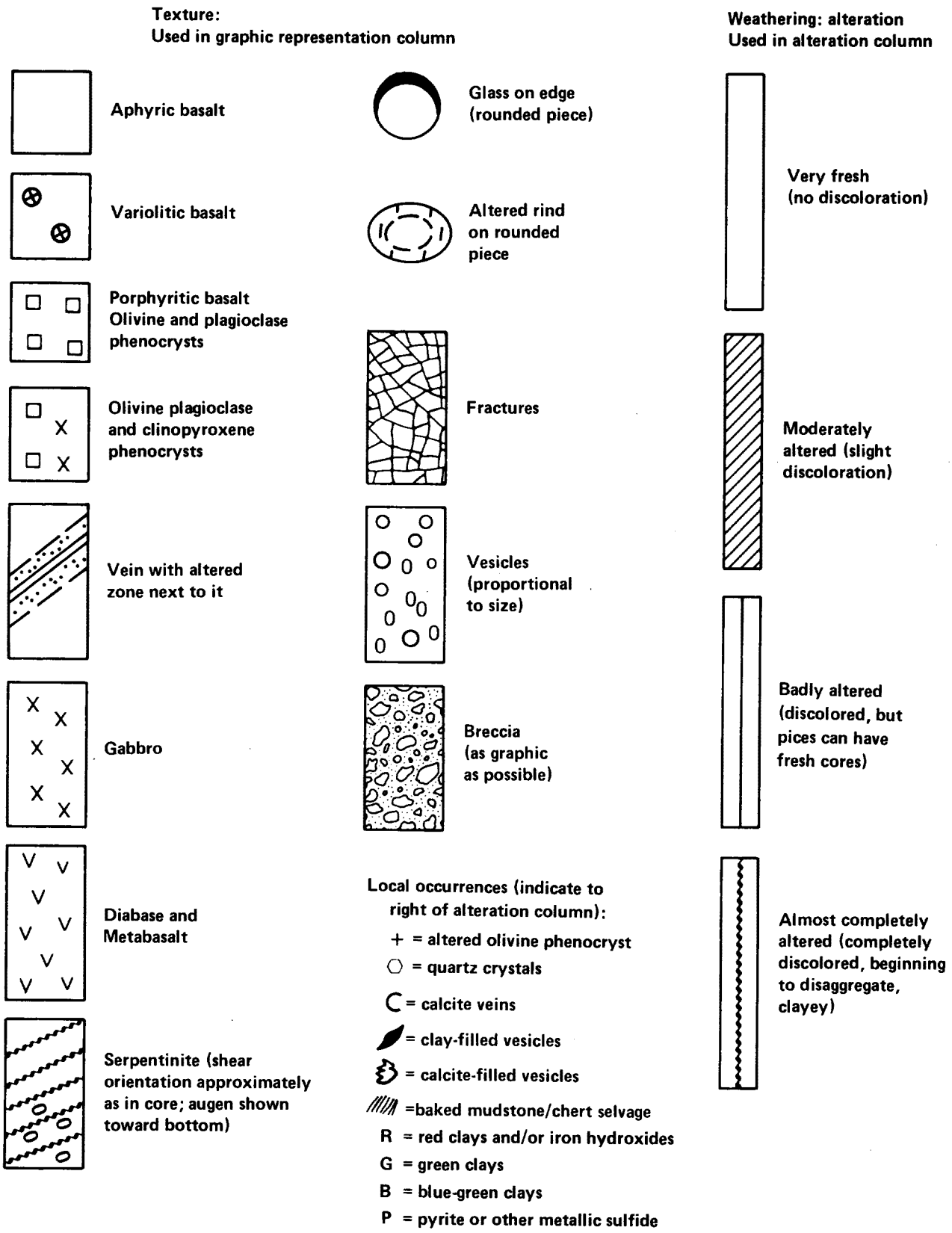
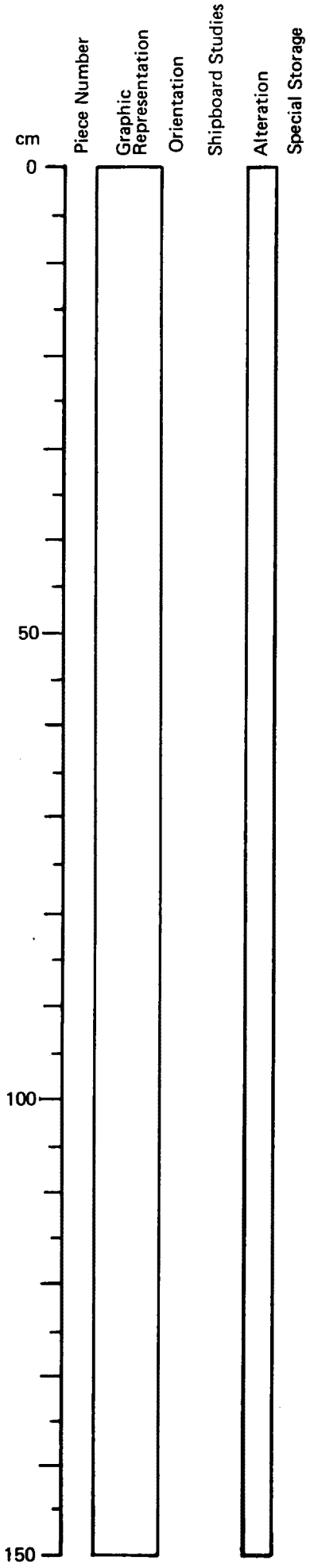


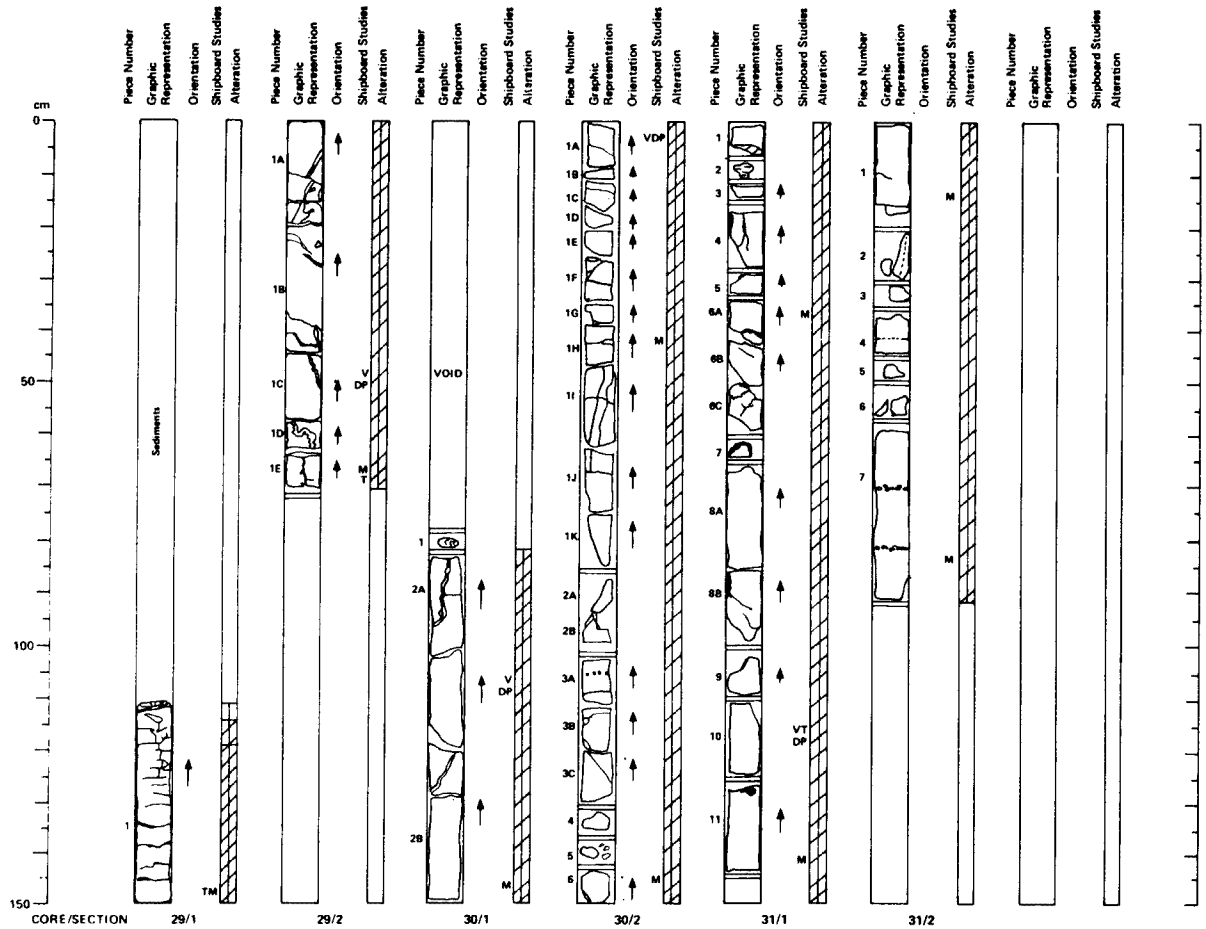
Figure 7. List of symbols for igneous rock description forms.



VISUAL CORE DESCRIPTION FOR IGNEOUS ROCKS

LEG	SITE	HOLE	CORE	SECT.

Figure 8. Typical igneous rock description form.



SITE 524, CORE 28, SECTION 3, 279.1–279.6 m

Macroscopic Description
See sediment description form.

Thin Section Summaries

Contact Zone below claystone at 61 cm, Sec. 3: Dark brown glass with tiny (~0.01 mm and less) spinifex plagioclase (hollow skeletal, swallow tails) microlites rimmed with spherulitic mantles. Spherulite zone noted away from contact. Section too thick and glass too dark for detailed examination (problem with plucking).

Interior of pillow at 71 cm, Sec. 3: Slight phyric basalt with sparse (~1%) relatively large plagioclase phenocrysts (0.7–1.6 mm) set in a hyalopilitic spinifex matrix composed of Na-rich (R. I. ~1.55), skeletal (hollow cores with smectite filling and crude swallow tails), elongate (0.04–0.5 mm, L:W = 1/3–1/35) plagioclase microlites, abundant ilmenite dendrite needles (0.001–0.004 mm thick and 0.04–0.2 mm long) in rectangular boxwork pattern, more sparse magnetite cubes and octahedra in two generations (first = 0.02–0.25 mm, second = 0.004–0.015 mm), skeletal pyroxene(?) anhedral (~0.006 mm), and hollow skeletal apatite euhedra (0.004–0.008 mm). All these in a mesostasis of pale green smectite or chlorite (devitrified glass ?). Plagioclase phenocrysts about half replaced by inclusion-filled albite and some smectite or chlorite. Approximate mode: plagioclase phenocrysts ~1, plagioclase microlites 30–40, ilmenite 10–15, magnetite 3–5, clinopyroxene 3–5, apatite 1–3, devitrified glass 40–50.

Shipboard Studies

Sample	D	P	V_l	V_s	NRM1	NRM2	S. I.
Sec. 3, 71 cm	–	–	–	–	32.014	-38.6	-36
Sec. 3, 110 cm	–	–	–	–	24.443	-49.1	-45

SITE 524, CORE 29, SECTIONS 1–2, 286.1–287.2 m

MAJOR ROCK TYPES – BASALT (or DIABASE), CLAYSTONE, SANDSTONE

Macroscopic Description

Basalt (or Diabase): Dark gray, aphyric. Sec. 1 has numerous calcite-filled veins arranged perpendicular to core axis and spaced every 2–3 cm. Calcite veins in Sec. 2 more irregular, some with green clay rims.

Sandstone and Claystone – see sediment description form.

Thin Section Summaries

Section 1, Piece 1: Fine- to medium coarse-grained aphyric olivine(?) basalt (or diabase) with intergrown intersertal texture, composed of dominant tabular, weakly compositionally zoned plagioclase anhedra (0.05–0.3 mm, $An_{43-?}$, R. I. <1.55) and subordinate intergranular, mostly subhedra grains of clinopyroxene (0.005–0.1 mm), opaque minerals (0.005–0.35 mm) and apatite needles (0.01–0.15 mm, L/W ~1/12), with intersertal patches of greenish brown smectite. There are sparse smectite patches that appear to be pseudomorphs of small (0.05–0.1 mm) euhedral olivine grains. Note: Sparse (<1%) clinopyroxene microphenocrysts (0.15–0.25 mm). Approximate mode: plagioclase 35–45, clinopyroxene 15–20, opaques 15–20, devitrified glass (smectite) 15–20, apatite 1–2, olivine(?) 2–3.

Section 2, Core-Catcher: Coarse-grained to very coarse-grained basalt or diabase, composed of anhedral to subhedral, strongly zoned (An_{45-17}) plagioclase (0.09–0.95 mm) with intergranular clinopyroxene ($2V_z$ ~55–80) (0.01–0.15 mm) and opaques (magnetite 0.01–0.35 mm and ilmenite) and intersertal olive brown smectite (high birefringence). Abundant (for this mineral) apatite (3–5%, 0.02–0.35 mm) of stubby to needle prismatic habit, often with hollow center. Apatite is euhedral and cuts across plagioclase. Ilmenite and magnetite are sometimes hollow skeletal.

Shipboard Studies

Sample	D	P	V_l	V_s	NRM1	NRM2	S. I.
Sec. 1, Piece 1	–	–	–	–	53.485	-44.7	-74
Sec. 2, Piece 1C	2.70	14.0	4.33	4.65	–	–	–
Sec. 2, Piece 1E	–	–	–	–	52.067	-43.4	-71

SITE 524, CORE 30, SECTIONS 1–2, 289.0–292.0 m

MAJOR ROCK TYPE – BASALT (or DIABASE)
MINOR ROCK TYPE – CALCAREOUS CLAYSTONE

Macroscopic Description

Basalt (or Diabase) – Dark gray, aphyric, coarse-grained basalt or diabase. Even grained, massive with widely spaced fractures (2–10 cm). Fractures in Piece 2A–8 (Sec. 1) filled with calcite and minor pyrite; some lined with green clay. Fractures in Pieces 1A, 1C, and 1I–K (Sec. 2) parallel lines of irregular vesicles. Pyrite or blue green clay lines vesicles.

Calcareous Claystone – Piece 1 (Sec. 1) is olive gray calcareous claystone with a large horizontal zoophycos burrow.

Shipboard Studies

Sample	D	P	V_l	V_s	NRM1	NRM2	S. I.
Sec. 1, Piece 2A	2.73	11.0	4.57	4.76	–	–	–
Sec. 1, Piece 2B	–	–	–	–	55.769	-57.8	-76
Sec. 2, Piece 1A	2.74	11.2	4.64	5.15	–	–	–
Sec. 2, Piece 1H	–	–	–	–	32.663	-64.4	-79
Sec. 2, Piece 6	–	–	–	–	43.596	-49.4	-73

SITE 524, CORE 31, SECTIONS 1–2, 294.5–296.9 m

MAJOR ROCK TYPE – BASALT (or DIABASE)
MINOR ROCK – CALCAREOUS CLAYSTONE

Macroscopic Description

Basalt (or Diabase) – Dark gray, aphyric, coarse, even-grained basalt (or diabase) with rare fractures filled with green clay. Small pyrite crystals in fractures and in discolored zones. Moderate alteration.

Calcareous Claystone – Piece 2 (Sec. 1) is reddish brown calcareous claystone.

Thin Section Summary

Section 1, Piece 10: Rock is very similar in texture and mineralogy to Core 29, Sec. 2, Core-Catcher, but slightly coarser and plagioclase grains show beautifully developed epitaxial mantles of alkali feldspar or oligoclase, optics (Ax. Pl. + 010, $2V_x$ <80°) indicate 3 possibilities, in order of likelihood: 1) anorthoclase or Na-sanidine, 2) oligoclase, and 3) K-rich sanidine. Choice 1 is favored because of sharply defined mantle boundary, oligoclase should give more gradational transition, and smaller R. I. difference than would be expected with K-rich sanidine.

Shipboard Studies

Sample	D	P	V_l	V_s	NRM1	NRM2	S. I.
Sec. 1, Piece 6A	–	–	–	–	28.924	-56.8	-65
Sec. 1, Piece 10	2.78	11.8	4.46	4.50	–	–	–
Sec. 1, Piece 11	–	–	–	–	26.664	-41.6	–
Sec. 2, Piece 1	–	–	–	–	29.817	-65.9	-667
Sec. 2, Piece 7	–	–	–	–	30.548	-38.6	-50

Figure 9. Igneous rock description sheet.

Igneous Rock Classification

Igneous rocks are classified mainly on the basis of mineralogy and texture. Thin-section work in general adds little new information to the hand-specimen classification.

Basalts are termed aphyric, sparsely phyric, moderately phyric, or phyric, depending on the proportion of phenocrysts visible with the binocular microscope ($\sim$x 12). The basalts are called aphyric if phenocrysts are absent. For practical purposes, this means that if one piece of basalt is found with a phenocryst or two in a section where all other pieces lack phenocrysts, and no other criteria such as grain size or texture distinguish this basalt from the others, then it is described as aphyric. A note on the rare phenocrysts is included in the general description, however. This approach enables us to restrict the number of lithologic units to those that appear to be clearly distinct.

Sparsely phyric basalts are those with 1–2% phenocrysts present in almost every piece of a given core or section. Clearly contiguous pieces without phenocrysts are included in this category, again with the lack of phenocrysts noted in the general description.

Moderately phyric basalts contain 2–10% phenocrysts. Aphyric basalts within a group of moderately phyric basalts are separately termed aphyric basalts.

Phyric basalts contain more than 10% phenocrysts. No separate designation is made for basalts with more than 20% phenocrysts; the proportion indicated in the core forms should be sufficient to guide the reader.

The basalts are further classified by phenocryst type, preceding the terms phyric, sparsely phyric, etc. For example, a plagioclase-olivine moderately phyric basalt contains 2–10% phenocrysts, most of them plagioclase, but with some olivine.

Other rock types which are less commonly recovered, such as gabbro, serpentinite, andesites, granite, or metamorphic rocks, are classified using standard references such as Williams, et al. (1954) or Moorhouse (1959).

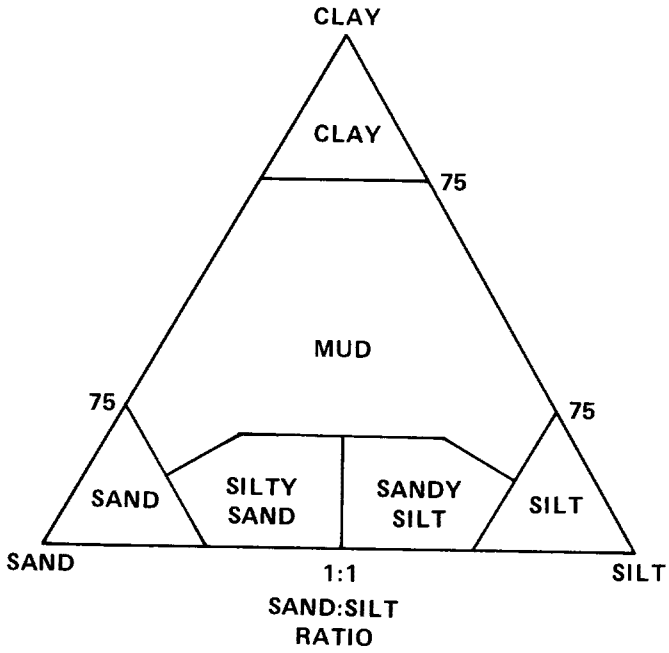
ADDITIONAL DATA TO LEG 96 EXPLANATORY NOTES

Cores collected at Holes 615A, 616B, 617A, and 624A were designated geotechnical cores. Cores from these holes were sectioned into 1.5 m-lengths, GRAPEd, left unsplit, stored vertically in the shipboard refrigerator, and transferred to Texas A & M University for shore-based studies by the Geotechnical Consortium. These sections are designated "GTC" on the core description sheets. Core Catchers from Holes 615A, 616B, and 617A were split and described according to standard DSDP procedures. Core Catchers from Hole 624A were left unsplit and included with the rest of the geotechnical cores.

There was an abundance of reworked material recovered on Leg 96. Biostratigraphic samples that consisted of reworked assemblages as indicated as such on the core description sheets by circled abundance and preservation codes in the Fossil Character column. An example follows:

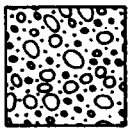
AG

The Leg 96 shipboard scientists chose to define class boundaries for terrigenous sediments in a different manner than that shown in Figure 6. Terrigenous sediments were classified according to their texture; sand, silt, and clay percentages were estimated under a microscope and the data are shown with the smear slide data on the core description sheets. The class boundaries used during Leg 96 are shown in the diagram below.

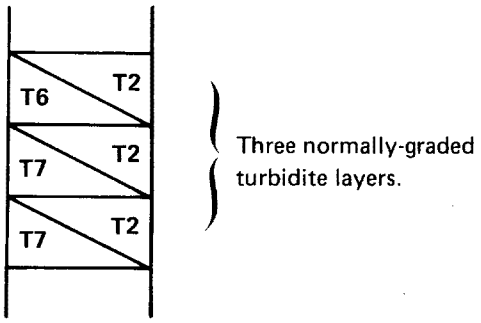


Two symbols used in the Graphic Lithology column of the core description sheets are defined differently than that shown in Figure 3:

(1)  T4 Denotes both sandy mud and silty mud, as there is no symbol signifying the latter in Figure 3.

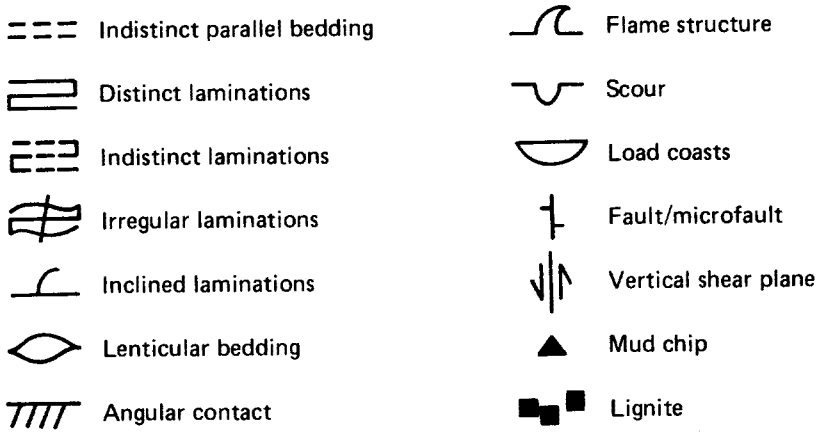
(2)  SR2 Denotes gravel, rather than conglomerate.

As much of the material recovered on Leg 96 consisted of normally-graded turbidites, the relative proportions of sand or silt and clay changed dramatically within a single turbidite layer. This change in grain size within each layer is diagrammatically shown in the Graphic Lithology column of the core description sheets as follows:



Portions of the Leg 96 cores that appeared brecciated due to drilling are labeled as such in the Drilling Disturbance column of the core description sheets as follows:

In addition to the standard sedimentary structure symbols shown in Figure 4, the following additional structure symbols are used in the Sediment Structure column of the core description sheets:



Designations for whole-round samples appear in the Sample column of the core description sheets. These designations are codes as follows:

IW = Interstitial water sample
OGP = Organic geochemistry sample
KB = Sample for geochemical studies by shipboard scientists James Brooks and Mahlon C. Kennicutt
BRY = Sample for physical properties studies by shipboard scientist Bill Bryant and the Geotechnical Consortium
KOH = Paleontologic sample for shipboard scientists
GTC = Geotechnical Consortium sample
WHE = Sample for microbiological culturing and associated studies by shipboard scientist Jean Whelan

Core type is indicated as follows:

H = Hydraulic piston core
R = Rotary core
X = Extended core barrel core
W = Wash core

REFERENCES

Boyce, R. E., 1976. Definitions and laboratory techniques of compressional sound velocity parameters and wet-water content, wet-bulk density, and porosity parameters by gravimeteric and gamma ray attenuation techniques. *In* Schlanger, S. D. Jackson, E. D., et al., *Init. Repts. DSDP,* 33: Washington (U. S. Govt. Printing Office), 931–958.

Moberly, R., Jr. and Heath, G. R., 1971. Carbonate sedimentary rocks from the western Pacific: Leg 7, Deep Sea Drilling Project. *In* Winterer, E. L., Riedel, W. R., et al., *Init. Repts. DSDP,* 7: Washington (U. S. Govt. Printing Office), 977–985.

Moorhouse, W. W., 1959. *The Study of Rocks in Thin Section*: New York (Harper and Row).

Wentworth, C. K., 1922. A scale of grade and class terms for clastic sediments. *J. Geol.* 30: 377–392.

Wentworth, C. K. and Williams, H., 1932. The classification and terminology of the pyroclastic rocks: *Bull. Nat. Res. Coun.* 89: 19–53.

Williams, H. Turner, F. J., and Gilbert, C. M., 1954. *Petrography: on Introduction to the Study of Rocks in Thin Sections:* San Francisco (W. H. Freeman and Co.).

SAMPLE DISTRIBUTION POLICY

Deep Sea Drilling Project/International Phase of Ocean Drilling

Distribution of Deep Sea Drilling samples for investigation will be undertaken in order to (1) provide supplementary data to support *Glomar Challenger* scientists in achieving the scientific objectives of their particular cruise, and in addition to serve as a mechanism for contributions to the *Initial Reports;* (2) provide individual investigators with materials to conduct detailed studies beyond the scope of the *Initial Reports;* and (3) provide the reference centers where paleontologic materials are stored with samples for reference and comparison purposes.

The National Science Foundation has established a Sample Distribution Panel to advise on the distribution of core materials. 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 cores and their contents. Funding for the proposed research must be secured separately by the investigator. It cannot be provided through the Deep Sea Drilling Project.

The Deep Sea Drilling Project's Curator is responsible for distributing the samples and controlling their quality, as well as preserving and conserving core material. He also is responsible for maintaining a record of all samples that have been distributed, shipboard and subsequent, indicating the recipient and the natures of the proposed investigation. This information is made available to all investigators of DSDP materials as well as to other interested researchers on request.

The distribution of samples is made directly from one of the two existing repositories, Lamont-Doherty Geological Observatory and Scripps Institution of Oceanography, by the Curator or his designated representative.

1. Distribution of Samples for Research Leading to Contributions to *Initial Reports*

Any investigator who wishes to contribute a paper to a given volume of the *Initial Reports* may write to the Chief Scientist, Deep Sea Drilling Project (A-031), Scripps Institution of Oceanography, University of California at San Diego, La Jolla, California 92093, U. S. A., requesting samples from a forthcoming cruise. Requests for a specific cruise should be received by the Chief Scientist TWO MONTHS in advance of the departure of the cruise in order to allow time for the review and consideration of all requests and to establish a suitable shipboard sampling program. The request should include a statement of the nature of the study proposed, size and approximate number of samples required to complete the study, and any particular sampling technique or equipment that might be required. The requests will be reviewed by the Chief Scientist of the Project and the cruise co-chief scientists; approval will be given in accordance with the scientific requirements of the cruise as determined by the appropriate JOIDES Advisory Panel(s). If approved, the requested samples will be taken, either by the shipboard party if the workload permits, or by the curatorial staff shortly following the return of the cores to the repository. Proposals must be of a scope to ensure that samples can be processed and a contribution completed in time for publication in the *Initial Reports*. Except for rare, specific instances involving ephemeral properties, sampling will not exceed one-quarter of the volume of core recovered, with no interval being depleted and one-half of all core being retained as an archive. Shipboard sampling shall not exceed approximately 100 igneous samples per investigator; in all cases co-chief scientists are requested to keep sampling to a minimum.

The co-chief scientists may elect to have special studies of selected core samples made by other investigators. In this event the names of these investigators and complete listings of all materials loaned or distributed must be forwarded, if possible, prior to the cruise or, as soon as possible following the cruise, to the Chief Scientist through the DSDP Staff Science Representative for that particular cruise. In such cases, all requirements of the Sample Distribution Policy shall also apply.

If a dispute arises or if a decision cannot be reached in the manner prescribed, the NSF Sample Distribution Panel will conduct the final arbitration.

Any publication of results other than in the *Initial Reports* within twelve (12) months of the completion of the cruise must be approved and authored by the whole shipboard party and, where appropriate, shore-based investigators. After twelve months, individual investigators may submit related papers for open publication provided they have submitted their contributions to the *Initial Reports*. Investigations not completed in time for inclusion in the *Initial Reports* for a specific cruise may not be published in other journals until final publication of that *Initial Reports* for which it was intended. Notice of submittal to other journals and a copy of the article should be sent to the DSDP Associate Chief Scientist, Science Services.

2. Distribution of Samples for Research Leading to Publication Other Than in *Initial Reports*

A. Researchers intending to request samples for studies beyond the scope of the *Initial Reports* should first obtain sample request forms from the Curator, Deep Sea Drilling Project (A-031), Scripps Institution of Oceanography, University of California at San Diego, La Jolla, California 92093, U. S. A. On the forms the researcher is requested to specify the quantities and intervals of the core required, make a clear statement of the proposed research, state time required to complete and submit results for publication, and specify the status of funding and the availability of equipment and space foreseen for the research.

In order to ensure that all requests for highly desirable but limited samples can be considered, approval of requests and distribution of samples will not be made prior to 2 months after publication of the *Initial Core Descriptions (I. C. D.). ICD's* are required to be published within 10 months following each cruise. The only exceptions to this policy will be for specific instances involving ephemeral properties. Requests for samples can be based on the *Initial Core Descriptions*, copies of which are on file at various institutions throughout the world. Copies of original core logs and data are kept on file at DSDP and at the repository at Lamont-Doherty Geological Observatory, Palisades, New York. Requests for samples from researchers in industrial laboratories will be handled in the same manner as those from academic organizations, with the same obligation to publish results promptly.

B. (1) The DSDP Curator is authorized to distribute samples up to 50 ml per meter of core. Requests for volumes of material in excess of this amount will be referred to the NSF Sample Distribution Panel for review and approval. Experience has shown that most investigations can be accomplished with 10 ml sized samples or less. All investigators are encouraged to be as judicious as possible with regard to sample size and, especially, frequency within any given core interval. The Curator will not automatically distribute any parts of the cores which appear to be in particularly high demand; requests for such parts will be referred to the Sample Distribution Panel for review. Requests for samples from thin layers or important stratigraphic boundaries will also require Panel review.

(2) If investigators wish to study certain properties which may deteriorate prior to the normal availability of the samples, they may request that the normal waiting period not apply. All such requests must be reviewed by the curators and approved by the NSF Sample Distribution Panel.

C. 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 A). If a sample request is dependent, either wholly or in part, on proposed funding, the Curator is prepared to 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.

D. Investigators receiving samples are responsible for:

(1) publishing significant results; however, contributions shall not be submitted for publication prior to 12 months following the termination of the appropriate leg;

(2) acknowledging, in publications, that samples were supplied through the assistance of the U. S. National Science Foundation and others as appropriate;

(3) submitting five (5) copies (for distribution to the Curator's file, the DSDP repositories, the *Glomar Challenger's* library, and the National Science Foundation) of all reprints of published results to the Curator, Deep Sea Drilling Project (A-012), Scripps Institution of Oceanography, University of California at San Diego, La Jolla, California 92093, U. S. A.;

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

E. Cores are made available at repositories for investigators to examine and to specify exact samples in such instances as may be necessary for the scientific purposes of the sampling, subject to the limitations of B (1 and 2) and D, with specific permission of the Curator or his delegate.

F. Shipboard-produced smear slides of sediments and thin sections of indurated sediments and igneous and metamorphic rocks will be returned to the appropriate repository at the end of each cruise or at the publication of the *Initial Reports* for that cruise. These smear slides and thin sections will form a reference collection of the cores stored at each repository and may be viewed at the respective repositories as an aid in the selection of core samples.

G. The Deep Sea Drilling Project routinely processes by computer most of the quantitative data presented in the *Initial Reports*. Space limitations in the *Initial Reports* preclude the 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. A charge will be made to recover expenses in excess of $50.00 incurred in filling requests.

3. Other Records

Magnetics, seismic reflection, downhole logging, and bathymetric data collected by the *Glomar Challenger* will also be available for distribution at the same time samples become available.

Requests for data may be made to:

Associate Chief Scientist, Science Services
Deep Sea Drilling Project (A-031)
Scripps Institution of Oceanography
University of California at San Diego
La Jolla, California 92093

A charge will be made to recover the expenses in excess of $50.00 in filling individual requests. If required, estimated charges can be furnished before the request is processed.

4. Reference Centers

As a separate and special category, samples will be distributed for the purpose of establishing up to five reference centers where paleontologic materials will be available for reference and comparison purposes. The first of these reference centers has been approved at Basel, Switzerland.

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SCRIPPS INSTITUTION OF OCEANOGRAPHY
Deep Sea Drilling Project

The accompanying informal report is a summary of the scientific results of Leg 96 of the Deep Sea Drilling Project, prepared from the shipboard files by the scientists who participated in this cruise. The material contained herein is provileged proprietary information and cannot be used for publication or quotation.

This summary was assembled under time restrictions and is not to be considered a formal publication which incorporates final works for conclusions of the scientists.

The Deep Sea Drilling Project, undertaken on the advice of JOIDES, is managed by Scripps Institution of Oceanography under contract from the National Science Foundation.

Yves Lancelot
Chief Scientist

SUMMARY OF DEEP SEA DRILLING PROJECT - LEG 96

The scientific party aboard D/V GLOMAR CHALLENGER for Leg 96 of the Deep Sea Drilling Project, International Phase of Ocean Drilling, consisted of:

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Attached is a brief summary of the scientific activities of Leg 96.

INTRODUCTION

DSDP-IPOD Leg 96 investigated a large deep-sea fan--the Mississippi Fan, Gulf of Mexico--and two types of intraslope basins on the continental slope off Louisiana. This was the first leg of the Project dedicated to sedimentological studies of a specific type of deposit.

Glomar Challenger left Fort Lauderdale, Florida on 29 September, and arrived in Mobile, Alabama on 8 November, 1983. Several sites and alternate sites had been approved; these sites are described in the Leg 96 Cruise Prospectus. A total of 11 sites was drilled of which 9 were located on the Mississippi Fan and one each in Orca and Pigmy intraslope basins (Fig. 1).

One of the most dramatic of deep-sea accumulations typically occurs seaward of large deltas and at the mouths of submarine canyons. In very short periods of geologic time large volumes of sediment are transported downslope from shelf environments, often via submarine canyons, onto the lower continental slope and rise as well as the abyssal plains, resulting in a thick sedimentary accumulation known as a deep-sea fan. Research on modern fans has thus far been restricted to geophysical and gravity and piston coring studies that cannot really address transport-depositional processes, distribution of sedimentary facies, vertical sedimentary sequences, time frames, and geochemical and geotechnical characteristics of deep-sea fans. Comparisons with ancient turbidite sequences have been partially

unsatisfactory because of differences in scale of observations and differences in data collecting techniques. Time equivalent deposition of sands and large volumes of muds and clays are especially difficult to document in modern environments when accumulation rates are high. Such relationships can seldom be determined in ancient deposits, which results in erroneous interpretations. Drilling of a modern deep-sea fan on Leg 96 was a very constructive approach in attempting to better understand ancient equivalents.

Drilling in the intraslope basins, formed between active salt and shale diapirs, provided insight into another mode of deep water sedimentation not yet recognized in the stratigraphic column. It was hoped that drilling results in these basins would determine if their depositional processes have any similarity to those on deep-sea fans.

MISSISSIPPI FAN

The Mississippi Fan is a semiconical, slope-rise depositional system of Quaternary deposits extending about 600 km from near the present Mississippi River delta onto the Sigsbee and Florida Abyssal Plains. It covers an area in excess of 290,000 km^2 and has a volume greater than 300,000 km^3. The thickest part of this sedimentary sequence (4.5 km) can be found in a water depth of about 2500 m at the base of the continental slope.

Seismic studies reveal that eight acoustic reflectors have

fan-wide occurrence and define at least seven depositional units. Structure and isopach mapping of these reflectors shows that the individual units or fan lobes are not stacked vertically, but rather that a shifting of both succeeding fan lobes and their submarine canyons takes place with time (Coleman, Bouma, Prior and Adams, in press). In addition, these fan lobes show a gradual progradation into deeper water with time. Each fan lobe has a convex upward cross section that forces the next one to be developed adjacent to it. The youngest fan lobe was the main study target of Leg 96, although we were able to drill into or through the next older one at a number of sites and thus provide more data on the time-stratigraphic framework of the Mississippi Fan.

The youngest fan lobe can be divided into four major zones, including the submarine canyon. The structure and isopach maps indicate that such divisions are characteristic of the underlying fan lobes as well, although the finer details are obscure because of lack of seismic resolution. The four major zones are:

1. An upslope erosional submarine canyon: Mississippi Canyon;

2. An upper fan lobe area at the base of slope, characterized by a large, nearly filled, erosional channel;

3. A middle fan lobe area which is aggradational in character, convex in cross section, and has a sinuous channel running along its apex;

4. A lower fan lobe area which is an aggradational zone with one recently active channel and several abandoned ones.

The modern fan lobe of the Mississippi Fan contains a very characteristic channel-levee complex. On the upper fan area this complex consists of a large scour-and-fill structure that is nearly filled. The channel in the upper (or northern) half of the area has a slightly irregular course and frequently changes in cross sectional shape because of the controlling influence of large diapirs. Further down the upper fan lobe the channel becomes slightly sinuous, has well-developed levees, and contains a recent central channel.

At the base of slope where the aggradational middle fan starts we see the central channel becoming very sinuous with well-developed levees and overbank areas. The size of the channel, as well as its sinuosity, decreases downfan; while the channel has a width of about 3 km on the upper part of the mid-fan and a modern depth (topographic relief) of 40-50 m, it is about 300-500 m wide and 10-25 m deep on the the lower fan at a water depth of 3100 m. Although difficult to distinguish on side-scan sonar, we see minor channel bifurcations near the channel terminations on the lower fan. Sonographs also reveal images paralleling the recent channel that are tentatively interpreted as abandoned channels. These images suggest that the channel shifts position frequently near the terminus of the fan-wide channel complex.

Each of the seven fan lobes identified seismically has a maximum thickness ranging from 300 to 600 m. The youngest lobe is about 400 m thick in the mid fan area. The bottom of the channel fill in the upper fan lobe is irregular in shape because of width variations but

shows an average depth of 400-700 m below the mud line. This same channel bottom is about 300 m below the mud line on the mid fan, and about 150 m below the mud line in the zone where the middle fan changes into the lower fan. In the outer part of the lower fan lobe parallel acoustical reflectors obscure channel fills. Very likely, they are minor and the small channels are short lived.

Four sites were drilled in the lower fan area: Site 614 to a depth of 150 m sub-bottom, Site 615 to 523 m sub-bottom, Site 623 to a depth of 191 m sub-bottom and Site 624 to a depth of 200 m sub-bottom (Fig. 1). An excellent set of well logs was collected at Sites 615, 623 and 624 providing stratigraphic information for many of the poorly-recovered sections, especially those in the thicker sand intervals.

A total of 5 sites was occupied on the mid-fan area, in an attempt to investigate all the significant morphologic and seismic characteristics of that region. Site 616 (penetration 371 m) proved to be located on a different fan lobe rather than on the outer flank of the modern fan lobe (Fig. 1). In addition, the upper section recovered at Site 616 has been interpreted as a large slump. For this reason, this site is discussed in the lower fan lobe section below. Sites 617, 620, 621, and 622 were all located along a cross sectional transect over the central channel area, including levees and overbank deposits (Fig. 1). Site 617 (penetration 191.2 m) was placed on the inner side of a meander bend in a swale between two ridges. Sites 621 (penetration 214.3 m) and 622 (penetration 208.0 m) were both located

within the central channel near the presently deepest part or thalweg and near the inner bend, respectively. Site 620 (penetration 422.7 m) was located on the northeastern flank or overbank area approximately 18 km from the channel. Core recovery was generally good to a depth of about 60 m, below which both the Hydraulic Piston Corer and the Advanced Piston Corer were unable to complete a full 9.5-m stroke. The Rotary Corer was used at Site 620 with poor results; although this was anticipated, it seemed the only tool capable of drilling deeper in stiff muds with sand interbeds. Interpretation of the lithostratigraphy in the unrecovered intervals was accomplished at Sites 620, 621 and 622 with a suite of well logs.

The Safety Panels did not provide clearance to core through the channel fill on the upper fan because of the potential problem of free gas or hydrocarbons. This unfortunately makes a complete understanding of the total fan somewhat tenuous.

Middle Fan Lobe Area

Sites were drilled on the mid-fan area in three different morphologic areas: Sites 621 and 622 in the central channel, Site 617 to the southwest in a swale near the inner bend of the local channel meander, and Site 620 in overbank deposits about 18 km northeast from the channel.

The central channel on the apex of the mid-fan shows good sinuosity in the drilled area, as initially reported by Garrison, Kenyon and Bouma (1982) based on GLORIA data and later recorded by Sea MARC I

from Lamont-Doherty Geological Observatory during the pre-cruise survey and partially detailed by Racal-Decca with their deep-towed side-scan sonar. The channel itself is about 3 km wide, shows bedforms on the bottom, and is flanked by a series of ridges and swales. The topographic and morphological characteristics suggest that the central channel has a migratory nature; seismic records are not of sufficient quality to confirm or deny this interpretation. Though we expected that documenting the abundance of sand and silt at the different mid-fan sites would help to unravel these problems, results at Sites 617 and 620 proved somewhat inconclusive; the findings at Sites 621 and 622 provided the answer.

Site 617 was cored to a depth of 191.2 m with the Advanced Piston Corer. Recovery was about 86%. The main objectives at this site were to study the characteristics of the sediments infilling the swales and of the underlying levee deposits, and to obtain information about the vertical sequence of sediments in the attempt at determining whether the sinuous channel has displayed meandering tendencies during its development.

The entire cored section consists of levee-overbank deposits, characterized by thin fine-grained turbidites (Fig. 2). The vertical sequence initially coarsens upward and then fines upward to the base of the thin overlying Holocene unit. The Holocene (Ericson Zone Z; Ericson and Wollin, 1968) consists of a 25-cm thick marly foraminiferal ooze at the top; an accumulation rate of about 67 cm/1000 yr. This grades downward into a section of thin-bedded mud turbidites,

muds with silt laminae and thin silt beds, and zones of "homogeneous" muds. Seismic correlation of Ericson Zone X to this site gives an accumulation rate of 1190 cm/1000 yr., which is much higher than at any of the sites located further down the fan (Fig. 3). This extremely high sedimentation adjacent to the channel is surprising considering the paucity of sand recovered.

Site 620 is located about 18.3 km north-northeast from the central channel. It is just inside the area reportedly covered by a large slump (see Site 616). This site was selected as being far enough from the channel to ensure a more or less constant deposition of overbank sediments without significant erosional unconformities. Thin-bedded turbidites were expected, and the proposed site was expected to penetrate through the upper two fan lobes and therefore provide good data on the overall deep-sea fan framework.

Total penetration at Site 620 was 422.7 m. Because the entire section was rotary cored in an attempt to reach the proposed total depth (770 m sub-bottom) without getting the drill pipe stuck, the quality of these unconsolidated mud and clay cores was very poor. Total recovery was only 47%, but successful logging provided lithostratigraphic information for the poorly recovered intervals.

The upper 20 cm of the Holocene (Ericson Zone Z) consists of a marly foraminiferal ooze. It has a computed accumulation rate of 25 cm/1000 yr. This is underlain by terrigenous clays and muds with varying amounts of silt and fine sand intercalations (Fig. 2). About 80% of the cored section shows no discernible sedimentary structures.

Its texture is about 20% silt and 80% clay. The gamma log supports these visual observations. Two sequences were observed, both showing a slight coarsening upward. Both belong to Ericson Zone Y and have a sedimentation rate of 1175 cm/1000 yr. (Fig. 3). The deposits are interpreted as fine-grained turbidites and hemipelagic sediments. They must have originated from the channel as overflow during the passing of major turbidity currents or other transport mechanisms.

Site 621 (214.8 m penetration) was located in the channel near the deepest part of a meander. The objectives of this site were to analyze the type of sediments that constitute the channel fill, and to obtain insight into the major transport mechanisms that move large quantities of sediment from shelf depths to the aggradational middle and lower fans in a very short geological time frame. We expected to find either large amounts of sand or, in the case of a conduit, major amounts of clays forming a passive fill.

The sediment section at Site 621 consists of a thin Holocene marly foraminiferal ooze, underlain by muds with some thin sandy and silty turbidites that gradually changed into "homogeneous" muds with increasing silt contents downhole (Fig. 2). With the exception of a few silt and sand beds and occasional color bands, it was a very monotonous section. At a depth of about 160 m, the gradual downhole coarsening trend became obvious because of an increase in the abundance of thin-bedded turbidites. At a depth of 195 m, a pebbly mudstone was encountered with pebbles ranging in size from a few millimeters to 5 cm (long axis). The petrology is variable, ranging

from mainly sedimentary to some metamorphics and igneous rocks. A few large shell fragments were observed. This unit was underlain by a thin interval of clayey muds and muds with some thin-bedded turbidites and silt laminae. Part of it showed a well-developed "horizontal" fold. The last core at Site 621 (211.8-214.8 m sub-bottom) contains a sand underlain by a pebbly-sandy mud underlain by gravel (Fig. 4). This clean gravel obviously was washed during coring and has to be a sandy gravel or gravelly sand. Both the pebbly mud and the gravel show up as high-amplitude reflectors on seismic records. The entire cored section falls within Ericson Zone Y. The average sedimentation rate is 1111 cm/1000 yr. (Fig. 3), although most of the sediments probably accumulated from discrete instantaneous geologic events.

The foraminifers in the channel fill sediments were mostly reworked and derived from neritic environments, similar to those found on the lower fan. The sediments at the overbank area (Site 620), however, contained a sparse population of reworked Cretaceous planktonics and in situ benthics. This means both that most foraminifera are transported as sand-sized clasts and do not overflow the channel. Certain bathyal benthic species can live in the overbank environment in spite of the high accumulation rate.

Drilling results at Site 621 clearly demonstrated the fact that the channel was a deep conduit through which gravel, sand and most silt moved by either turbidity current action and/or debris flows. Some or all of these transport mechanisms must have included density flows thicker than the channel depth to account for the large amount

of overbank material; transport of nearly all of the coarser material was confined inside the conduit. Based on the coring and faunal determinations, the minimum depth of the channel may have been 110-160 m.

Seismic records show an upward displacement of the channel floor in steps coupled with discrete lateral movements. This means that the channel is migratory in nature, and that its fill is mainly a lag overlain by a hemipelagic fill. Interpretation of the many ridges and swales seen on high-resolution seismic records and side-scan sonar now becomes possible: each time the channel became an active conduit it built up its floor and constructed levees. The next pulse caused a lateral move (migration), and the same process repeated itself. New levees were formed and the tops of older ones were eroded. The overall process is quite similar to a meandering fluvial system. The bedforms seen on the EDO side scan can only be interpreted as transverse sand waves constructed in the upper foraminiferal ooze. Studies other than coring or drilling will have to be used to further document these features.

Site 622 would ideally have been located near the inner bend of the same meander belt on which Site 621 was located. Because proximity to both the 13.5 and 16 kHz beacons prevented dropping of a third beacon at the desired location, the site had to be moved to a comparable morphologic position in the next meander to the east. The objectives of this site were to determine if any lateral sediment distribution patterns were present that appear similar to meandering

fluvial system. The hole was drilled to a depth of 208 m sub-bottom. The overlying Holocene marly foraminiferal ooze was 25 cm thick, which may be compatible to that at Site 621, if the influence of coring the interface is taken into account. The sediment section at Site 622 is very similar in overall aspect to that at Site 621. The pebbly mudstone was drilled at a depth of 199 m sub-bottom. Overlying is a fining-upward sequence of which the lower sands are much thicker (65 vs. 34 m) than at the thalweg site (Fig. 2).

Lower Fan Lobe Area

Four sites (Sites 614, 615, 623, and 624; Fig. 1) were occupied on the lower fan to identify the sediment characteristics and modes of sediment transport within the youngest fan lobe and to compare those with the older, underlying fan lobes. Other main objectives were to determine the biostratigraphic sequence and age relationships of several succeeding fan lobes, to establish accumulation rates for the uppermost fan lobes, and to identify the sediment provenance. Successful well logs were run at Sites 615, 623 and 624 to obtain more complete lithostratigraphic information than was possible in the poorly recovered intervals.

Site 614 (penetration 150.3 m) was located near the terminal end of the modern lower fan channels and their interfingering depositional lobes. Extremely stiff clays prevented good core recovery, while sands tended to be washed out. Poor core recovery prohibited accurate determinations of sand/clay ratios, but our estimates suggest that the

cored section contains 70% net sand. The recovered sediments were generally barren of planktonic foraminifers, but contained sparse benthics typical of inner and middle neritic environments. A thin Holocene cover, about 1.5 m thick, has a thin marly foraminiferal ooze at the top. The remainder of the cored section falls within Ericson's Zone Y (late Wisconsin glacial stage) and consists mainly of turbidites (Fig. 2).

Site 615 was drilled in the same general area, 21 km northeast of Site 614. It was located on the western levee of the central channel. The channel at this location is only about 400 m wide and 10 m deep. Total penetration at Site 615 was 523.2 m using a combination of the Advanced Piston Corer and the Extended Core Barrel. Three fan lobes and the top of a fourth one were cored. The sediments were dominantly graded muds containing only displaced fauna (Fig. 2). Planktonic as well as deep-water benthic fauna are very rare, implying a nearly continuous deposition of sands and clays during the late Wisconsin glacial stage. Recovered faunal assemblages indicate that most the sediments were derived from inner and middle neritic environments. As at Site 614, the major mode of sediment transport was by turbidity currents. Well logs from Site 615 show that the youngest fan lobe (199 m thick) contains a total of 82 m net sand (41%). A total of 184 m (65%) of the underlying, 267 m thick fan lobe is net sand. Both fan lobes fall within the Ericson Zone Y and have average accumulation rates of 646 cm/1000 yr. (Fig. 3). The fan lobe, or part of a fan lobe, that underlies the upper two consists of 29 m nannofossil ooze

(Ericson Zone X, late Wisconsin interstadial). That lobe shows grading upsection from a basal zone of thin breccia to a nannofossil foraminiferal ooze to a nannofossil ooze. It is interpreted as a debris flow deposit that likely originated near the De Soto Canyon area; the recovered fauna indicates a shallow carbonate platform origin including pinnacle reef environment. The ooze unit has an average accumulation rate of 75 cm/1000 yr., although it may have been one instantaneous geologic event. The lobe bottomed in Ericson Zone W (early Wisconsin glacial) muds with shallow water origin. The well logs clearly demonstrated that the nonrecovered core intervals were sandier than estimated from the recovered cores (core estimate is 15.6% while gamma log estimate is 59.6%).

Neither Site 614 nor 615 showed any gas except for traces of methane in the calcareous debris flow deposit at Site 615.

Sites 623 and 624 were located 55 km north-northwest of Site 615 in the transitional area between the middle and lower fan areas, where seismic reflection profiles show a buried channel. The main objective of these sites was to core and log this zone where the influence of the channel on sand and silt transport starts to decrease before "fanning out" in lower fan depositional lobes. One hole (Site 623) was drilled through the edge of the buried channel (total depth 191 m below sub-bottom) and one hole (Site 624) 4.8 km away to study levee and overbank deposits in this part of the modern fan lobe (total depth 200 m sub-bottom). Both sites were logged successfully; a duplicate hole was taken at Site 624 in the levee and overbank deposits and

recovered cores were reserved for shore based geotechnical studies.

Both Sites 623 and 624 contain similar lithologic sections, although the sediments at Site 624 are slightly finer grained. The sediment cores and the well logs suggest one indistinct fining-upward sequence, although this sequence could also be divided into many indistinct fining-upward (channel deposits), coarsening-upward (overbank deposits), and saw-tooth patterns (levee deposits). Without further analyses, boundaries are insufficiently clear to present a final interpretation.

Cores and well logs collected at Sites 623 and 624, together with the acoustic patterns of slightly irregular reflectors (rather than good channel cuts or distinct parallel reflectors), strongly suggest that the channel maintains its position for only a short time, does not significantly meander, and frequently shifts to a new position.

Site 616 (total depth 371.0 m sub-bottom) was initially thought to be located on the outer flank of the middle fan lobe. There were two main objectives for drilling this site: first, the upper 100 to 110 m at this location had been interpreted by Walker and Massingill (1970) as a wide-spread slump based on USNS Kane 3.5 kHz records; it was hoped that drilling this site would successfully test this interpretation. Second, we hoped to investigate the sedimentologic, paleontologic, geochemical and geotechnical properties of the flank deposits and to locate the boundary between the modern fan lobe flank and the underlying lobe. The drill pipe became stuck at 371 m sub-bottom and had to be severed at the lowermost joint of the 5½ in.

drilling pipe. Although the entire cored section was much finer grained than observed at the lower fan sites, it subsequently became obvious that the results did not agree with those from other sites drilled on the mid-fan. Reexamination of seismic records indicated a series of acoustical zones that offlap onto a deeper reflector at 445 m sub-bottom and thin out toward the north and east (Fig. 5). Those offlapping units are present at Site 620 but not at Site 617. We therefore conclude that we drilled a different fan lobe at Site 616 than at all other sites.

The upper 100 to 105 m drilled at Site 616 consists of a fine-grained mud with silt and fine sand intercalations that display steep dips (up to 65°) in discrete zones separated by thin units of highly disturbed material (Fig. 2). This sequence obviously resulted from emplacement by mass-movement processes. The source of the sediment is unknown because the foraminiferal assemblages were poorly developed. Our current interpretation is that this upper zone represents a number of slides. Underlying these slides we penetrated two fan lobes (Fig. 2). The uppermost lobe is approximately 88 m thick with a total of 33.8 m of sand (38.5%) and represents an upward-fining sequence. The lower lobe was only partially cored. It appears to display a coarsening-upward sequence with a minimum of 7% net sand. Both lobes fall in Ericson's Zone Y. These fan lobes have a minimum accumulation rate of 373 cm/1000 yr., excluding the overlying slide deposits (Fig. 3). Based on seismic correlations of Ericson's Zone X the accumulation rate could be as high as 563 cm/1000 yr. Post cruise geophysical

studies, especially of the recent data collected by the University of Texas, may enable us to place this site in its proper prospective.

Important Shipboard Observations and Conclusions, Mississippi Fan

1. Seismic analyses indicate that the Mississippi Fan is built by a number of elongate fan lobes that are not stacked vertically, but switch laterally and prograde basinward.

2. Each fan lobe is basically a channel-levee-overbank system.

3. Each fan lobe can be divided into a canyon, an upper fan lobe, a middle fan lobe, and an outer fan lobe.

4. Canyon: Mississippi Canyon is an erosional feature formed at or near the shelf break as a result of slope failure followed by retrogressive slumping.

5. The upper fan lobe is characterized by a large erosive channel that is nearly filled. The northern part is confined between diapirs. The southern part is slightly sinuous, has massive levees, and has a central channel incised in its fill.

6. The middle fan lobe is convex upward in cross section, is about 400 m thick, 150 km wide, and has a 3-4 km wide sinuous channel at its apex. This channel is nearly filled. The dimensions and sinuosity of the channel decrease down fan.

7. The lower fan lobe is an aggradational area where the channel becomes small and shallow, has levees, and may bifurcate before it terminates. Several, slightly parallel, abandoned channels are

located nearby, suggesting a short active life followed by abandonment. Channel terminations not only jump laterally but likely also back and forth with an overall progradation. At the end of a channel, one (or more?) lenticular or oblong depositional lobes are deposited.

8. A first estimate on amounts of clay, silt, sand, and gravel in the Mississippi Fan suggests that the source of this material was very high in clay content.

9. The channel on the upper and mid-fans has acted as a conduit for transport of sand and finer sediment to the lower fan. Volume calculations of how much was left in the channel versus how much was deposited outside the channel and on the lower fan will show if this is really a sand-efficient system.

10. The upper and middle fan channel is filled with coarse-grained material retained during transport. The channel fill accumulates by lateral migration and vertical aggradation. This coarse-grained sediment is overlain by a more passive fill consisting mainly of fine-grained sediments.

11. The channel on the mid-fan must have been of sufficient depth to prevent turbidity currents from carrying much coarse material at levels higher than its levees. However, most of the turbidity currents must have been thicker than the channel depth to allow large quantities of fine-grained material to flow over the levees and to build the overbank deposits. Based on seismic, coring, and faunal determinations, the minimum depth of the channel may have been 110 to 160 m.

12. The gravel found in the mid-fan channel must be time equivalent to sands in the lower fan.

13. The channel in the mid-fan is migratory. Each time it moves upward and lateral it builds levees. Several rows of levees support the migratory nature.

14. The channel on the lower fan seems to have shifted its position frequently rather than being stable or migratory. The sediments in that area show alternations of indistict fining-upward (channel deposits), coarsening-upward (overbank deposits), and saw-tooth patterns (levee deposits).

15. Nearly all the sections cored fall in the Ericson Zone Y (late Wisconsin glacial). Tentative average accumulation rates on non-decompacted sediments show rates ranging from about 2 m/1000 yr. (middle fan) to 6 to 7 m/1000 yr. (lower fan). This necessitates nearly continuous sedimentation in a geologic sense.

16. Fauna is very sparse. Displaced Cretaceous foraminifera and nannofossils are not uncommon. Planktonic foraminifers are rare in the Y zone. The displaced benthic species indicate a neritic origin. Mid-fan Site 620 (overbank) is the exception, containing bathyal benthics, many radiolarians and few planktonics. Consequently displaced benthic species are mainly transported inside the channel (similar to silt and sand grains), and only a few spill over onto the overbank areas.

17. During Ericson's Y zone two fan lobes have been deposited that are separated by a weak seismic reflector but sedimentologically

could be separated into two major vertical sequences.

18. Local and maybe long distance mass movements are not uncommon.

19. All cored sediments (clays) are underconsolidated. At Site 620, overpressuring starts at a depth of 390 m where a pressure equal to lithostatic pressure is present.

20. Although organic matter is present, the amount seems to be low. This may explain why biogenic methane was scarce at all the sites drilled.

INTRASLOPE BASINS

The continental slope off Louisiana and east Texas is characterized by a large-scale hummocky topography that is caused by underlying diapirs. Most of these diapirs are assumed to consist of salt of Louann age (Middle and Late Jurassic) and to be overlain by Tertiary shales (Martin and Bouma, 1978; Martin, 1978). Locally the salt may outcrop or be very near the water/sediment interface. Typically, no two adjacent diapirs are of the same size or shape (Martin, 1980) or effect the overlying sediments in the same way (Bouma, 1983).

The depressions between the diapirs--called intraslope basins--also vary in size, depth, and shape. The utilization of seismic stratigraphy, aided by the collection of piston and gravity cores,

has provided a tentative classification of these intraslope basins into three major types: (1) blocked-canyon intraslope basins, (2) interdomal basins, and (3) collapse basins.

A blocked-canyon intraslope basin is formed either by blockage of the thalweg of a submarine canyon or upper fan valley caused by upward-moving diapirs or is part of a series of intraslope basins that were subjected to bottom transport of sediment that originated from the same shallow-water source. The sediments in the axis of such a basin contain coarse material that gradually changes laterally into clays where the layer onlaps onto the sides of the diapirs. The bottom contact of the coarse material often forms a low-angle unconformity with the underlying sediments. The coarse material or "sands" likely are overlain by muds of shallow-water origin; these can be topped by hemipelagic and pelagic deposits. The coarser material can be deposited either by turbidity currents or by debris flows, or the interval can be partly or completely composed of slump material. Acoustically, the coarse-grained interval appears either transparent, semitransparent, or a combination of both with scattered hyperbolics. The overlying muds likely are of turbidity current origin; acoustically they form discontinuous, more or less parallel, reflectors. The upper part of the sequence, the pelagic and hemipelagic sediments, is represented acoustically as thin, parallel, continuous reflectors.

This vertical acoustical sequence is also visible in a lateral direction, suggesting a lateral fining of the sediment. The seismic sequence can be incomplete, and no pattern has been detected in

relative thicknesses of the three intervals. Present data suggest that each complete sequence does not exceed 0.25 s in thickness; often they are much thinner.

Some similarity in seismic sequence can be seen between this type of intraslope basin and the Mississippi Fan, specifically in the upper fan (Bouma and Garrison, 1979; Bouma, 1981, 1983; Bouma, et al., 1981). Well-published examples are Gyre Basin and Pigmy Basin; both show the acoustical sequences well.

The second type of intraslope basin--an interdomal basin--forms when a group of upward-moving diapirs coalesce, thereby surrounding a depression with a wall and eliminating any possibility of coarser-grained sediments entering that depression by means of bottom transport. As a result only hemipelagic and pelagic sediment can accumulate.

Orca Basin is the only known example of this second category of intraslope basins. This basin is exceptional in that it contains a hypersaline, anoxic layer of bottom water about 200 m thick (Trabant and Presley, 1978). Seismically one observes salt outcropping on multichannel records on the northeast side of the basin (Bouma, 1983). Mini sparker and air gun records do not show sub-bottom reflectors that may indicate either the thickness of the anoxic bottom sediments or the contact with underlying, older deposits.

The third type of intraslope basin--collapse basins--are small, irregularly shaped depressions commonly found on diapiric tops. A graben structure can often be observed. Collapse basins are the

smallest of the three types of intraslope basins. They are either formed by tensional collapse of the overburden or result from vertical collapse because of solution of salt from the top of the diapir (Martin and Bouma, 1978; Bouma, 1983). The normally flat or slightly upward bulging bottom is located above the surrounding seafloor and separated from it by a surrounding rim. The sediments are typically hemipelagic and pelagic. Acoustic profiles over these basins show thin, parallel reflectors, often disturbed by growth faults and normal faults. Studied examples are Carancahua and East Breaks Basins (Bouma, et al., 1981).

The main objective of drilling one site in each of the two most important types of intraslope basins was to obtain a complete upper Pleistocene stratigraphic record. Because of the unique anoxic conditions in Orca Basin, we wanted to establish the organic and inorganic characteristics of the anoxic and the underlying oxic sediments, and to establish the source of the brine. It was expected that biostratigraphic resolution might be good enough to provide insight into the timing of slope diapiric activities. A final objective at Pigmy Basin was to correlate the observed acoustic sequence with lithological types, sea level variations, climatic zones, and sediment processes.

Site 618 was located near the center of the northern subbasin in Orca Basin (Fig. 1). Drilling was terminated at 92.5 m because of the poor faunal content in the primarily displaced sediment. Core recovery was excellent to a depth of 62.5 m; below that, average recovery dropped less than 50%. The near-surface sediments were gray

rather than black as had been predicted. From 0 to 16 m the sediments were a very uniform clay, displayed an abundance of gas-escape structures, and contained an abundance of reworked benthic foraminifera. This unit was interpreted as a local Holocene slide.

Underneath this slide we cored a 1.5 m zone of dark black anoxic sediments. Downhole the sediments again became a gray clay, and contained occasional thin interbedded dark black clays. The deepest black layer encountered occurred at a sub-bottom depth of 41 m; the remainder of the cored sequence consisted predominantly of gray clays (Fig. 2).

Because of the abundance of gas expansion cracks, few sedimentary structures could be observed and sampling for paleomagnetic determinations could not be done. The sediments contained mixed planktonic, dominantly displaced, foraminiferal assemblages. Interstitial water analyses showed a rapid decrease in salinity from about 270 ppt at the surface to about 45 ppt at a depth of 30 m below which it stayed about constant. Very small, white, crystalline gas hydrates were found in the upper cores.

The Holocene sediment accumulation at Site 618 is computed to be 158.3 cm/1000 yr. (Ericson Zone Z); a minimum accumulation rate of 83.6 cm/1000 yr. was computed for the underlying drilled section belonging to the Ericson Zone Y (Fig. 3).

Site 619 (penetration 208.7 m) is located in Pigmy Basin (Fig. 1). The basin is northeast-southwest trending, has a flat floor at a water depth of about 2260 m and steep sloping walls formed by the

adjacent diapirs. The walls rise to about 700 m above the basin floor.

The continuously cored section consists of muds and clays containing an abundant benthic and planktonic fauna (Fig. 2). The hemipelagic muds contain only a minor amount of thin (coarse) sandy-silty turbidites and do not show any significant influence of mass movement. The absence of gas and the abundance of foraminifera made this site ideal for a detailed upper Pleistocene stratigraphy; closely-spaced samples for shore-based biostratigraphic, paleomagnetic, and oxygen isotope stratigraphic studies were collected.

A well-preserved and rather complete stratigraphic section of the Wisconsin was cored at Site 619. Ericson's Zones Z, Y, X, and W were penetrated. Computed sedimentation rates were 83.3 cm/1000 yr. for the Holocene (Zone Z, 10 m thick), 186.3 cm/1000 yr. for the late Wisconsin glacial (Zone Y, 136 m thick), 23.8 cm/1000 yr. for the Wisconsin interstadial (Zone X, 10 m thick), and a minimum of 76.5 cm/1000 yr. for the early Wisconsin glacial (Zone W, 52 m cored) (Fig. 3).

The predominantly clay section contains an abundance of bathyal benthic foraminifers in the lower part of the cored Zone W (early Wisconsin glacial), in addition to displaced shallow neritic benthic species. A prominent ash layer was cored at a sub-bottom depth of 141.5 m, coinciding with the top of Ericson's Zone X. This ash may be the Y-8 ash of Kennett and Huddlestun (1972) deposited 84,000 yr. B.P.

Diapiric movement forming this basin must have been minor during

the late Pleistocene because a minimum of mass-movement deposits were observed in the cored section. In spite of the fine-grained nature of the sediments, we were able to detect compositional changes at depths predicted by seismic reflectors; differences in sediment composition are small, but are apparently sufficient to provide the necessary impedance contrast.

REFERENCES

Bouma, A. H., 1981. Depositional sequences in clastic continental slope deposits, Gulf of Mexico. Geo-Marine Letters, 1:105-110.

Bouma, A. H., 1983. Intraslope basins in northwest Gulf of Mexico: A key to ancient submarine canyons and fans. AAPG Spec. Publ., 34:567-581.

Bouma, A. H., and Garrison, L. E., 1979. Intraslope basins, Gulf of Mexico. Geol. Soc. America Bull., Abstracts with Programs, 1979 Ann. Meeting, San Diego: 329.

Bouma, A. H. et al., 1981. Seismic stratigraphic characteristics of upper Louisiana continental slope: an area east of Green Canyon. Proceed. Offshore Technology Conf., Paper 4098:283-292.

Coleman, J. M., Bouma, A. H., Adams, C., and Prior, D., in press. Mississippi Canyon and Deep Sea Fan: Seismic Facies and Depositional Processes. Amer. Assoc. Petroleum Geol.

Ericson, D. B., and Wollin, G., 1968. Pleistocene climates and chronology in deep-sea sediments. Science, 162:1227-1234.

Garrison, L. E., Kenyon, N. H., and Bouma, A. H., 1982. Channel Systems and Lobe Construction of the Eastern Mississippi Fan Lobe. Geo Marine Letters, 2:31-39.

Kennett, J. P. and Huddlestun, P., 1972. Late Pleistocene Paleoclimatology, Foraminiferal Biostratigraphy and Tephrochronology, Western Gulf of Mexico. Quaternary Research, 2:38-69.

Martin, R. G., 1978. Northern and eastern Gulf of Mexico continental margin: stratigraphic and structural framework. In Bouma, A. H., Moore, G. T., and Coleman, J. M. (Eds.), Framework, facies, and oil-trapping characteristics of the upper continental margin. AAPG Studies in Geology, 7:21-42.

Martin, R. G., 1980. Distribution of salt structures in Gulf of Mexico region: map and descriptive text. U.S. Geological Survey Miscellaneous Field Studies Map MF-1213, 8 p., 2 sheets.

Martin, R. G., and Bouma, A. H., 1978. Physiography of the Gulf of Mexico. In Bouma, A. H., Moore, G. T., and Coleman, J. M. (Eds.), Framework, facies, and oil-trapping characteristics of the upper continental margin. AAPG Studies in Geology, 7:3-19.

Trabant, P. K., and Presley, B. J., 1978. Orca Basin, anoxic depression on the continental slope, northwest Gulf of Mexico. In Bouma, A. H., Moore, G. T., and Coleman, J. M. (Eds.), Framework, facies, and oil-trapping characteristics of the upper continental margin. AAPG Studies in Geology, 7:3-19.

Walker, J. R., and Massingill, J. V., 1970. Slump features on the Mississippi Fan, northeastern Gulf of Mexico. Geol. Soc. Am. Bull., 81:3101-3108.

LEG 96 CORING SUMMARY

HOLE	DATES (1983)	LATITUDE	LONGITUDE	WATER DEPTH*	PENETRATION (m)	NO OF. CORES	METERS CORED	METERS RECOVERED	PERCENT OF RECOVERY
614	1-2 October 1983	25°04.08'N	86°08.21'W	3310 m	37.0	5	37.0	37.07	100
614A	2-4 October 1983	25°04.08'N	86°08.21'W	3310 m	150.3	13	75.0	56.06	75
615	4-9 October 1983	25°13.34'N	85°59.53'W	3268 m	523.2	52	419.3	175.29	42
615A	9-10 October 1983	25°13.35'N	85°59.55'W	3268 m	208.5	17	74.5	51.93	70
616	11-14 October 1983	26°48.67'N	86°52.83'W	2983 m	371.0	34	307.8	143.38	47
616A	14-15 October 1983	26°48.65'N	86°52.86'W	2983 m	132.4	4	38.4	24.21	63
616B	15-16 October 1983	26°48.66'N	86°52.85'W	2983 m	204.3	22	143.2	113.74	79
617	17-18 October 1983	26°41.93'N	88°31.67'W	2467 m	191.2	21	130.1	111.58	86
617A	18-19 October 1983	26°41.93'N	88.31.67'W	2467 m	73.0	8	73.9	56.94	77
618	19-21 October 1983	27°00.68'N	91°15.73'W	2412 m	92.5	11	78.0	67.47	87
618A	21 October 1983	27°00.68'N	91°15.73'W	2412 m	47.6	3	28.7	18.52	65
619	21-22 October 1983	27°11.61'N	91°24.54'W	2259 m	208.7	25	134.4	111.88	83
619A	22-23 October 1983	27°11.61'N	91°24.54'W	2259 m	5.3	1	5.3	5.30	100
620	23-26 October 1983	26°50.12'N	88°22.25'W	2608 m	422.7	45	421.3	197.95	47
621	26-29 October 1983	26°43.86'N	88°29.76'W	2481 m	214.8	34	157.3	136.83	87
622	29-30 October 1983	26°41.41'N	88°28.82'W	2491 m	208.0	26	132.7	100.17	75
622A	31 October 1983	26°41.41'N	88°28.82'W	2491 m	5.6	1	5.6	5.55	99
623	1-2 November 1983	25°46.09'N	86°13.84'W	3177 m	202.2	20	110.2	89.24	81

LEG 96 CORING SUMMARY

HOLE	DATES (1983)	LATITUDE	LONGITUDE	WATER DEPTH*	PENETRATION (m)	NO OF. CORES	METERS CORED	METERS RECOVERED	PERCENT OF RECOVERY
624	3-4 November 1983	25°45.24'N	86°16.63'W	3183 m	199.9	23	109.8	75.32	69
624A	5-6 November 1983	25°45.24'N	86°16.63'W	3183 m	207.6	22	103.7	86.76	84
						387	2586.2	1665.19	64

* water depth from sea level

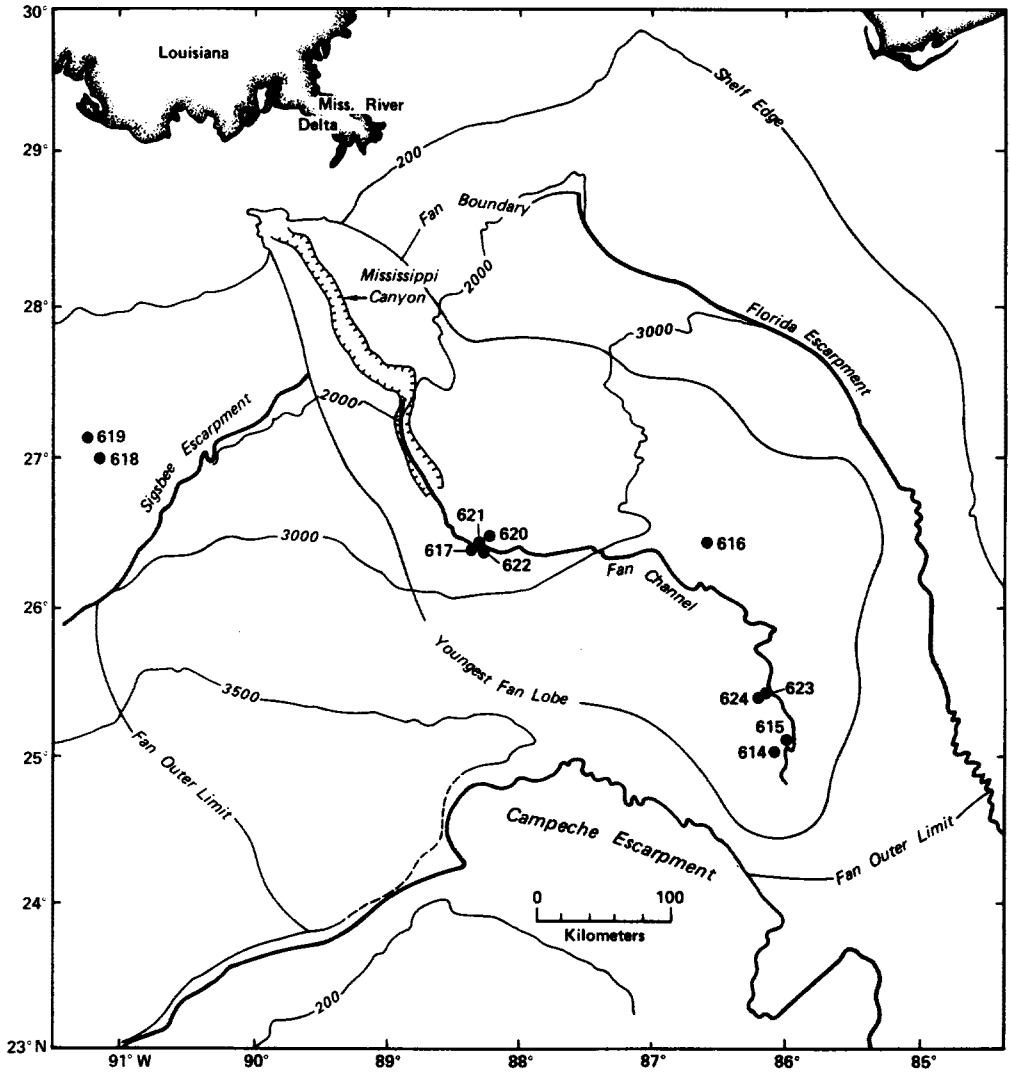


Figure 1. Location map showing sites drilled on DSDP Leg 96.

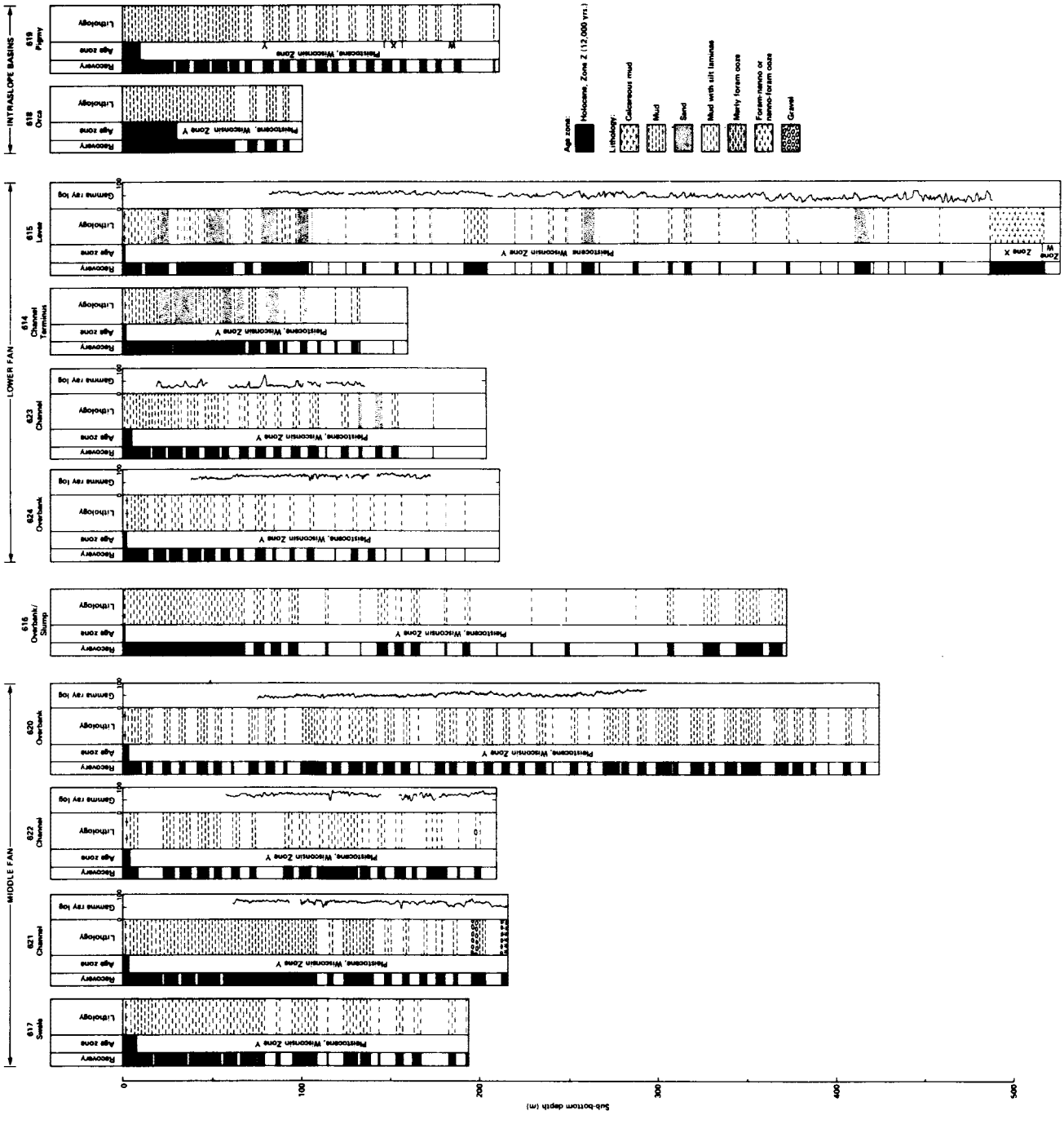


Figure 2. Stratigraphic summary of sites dri d on DSDP Leg 96, showing age, core recovery, general lithology, and well logging results.

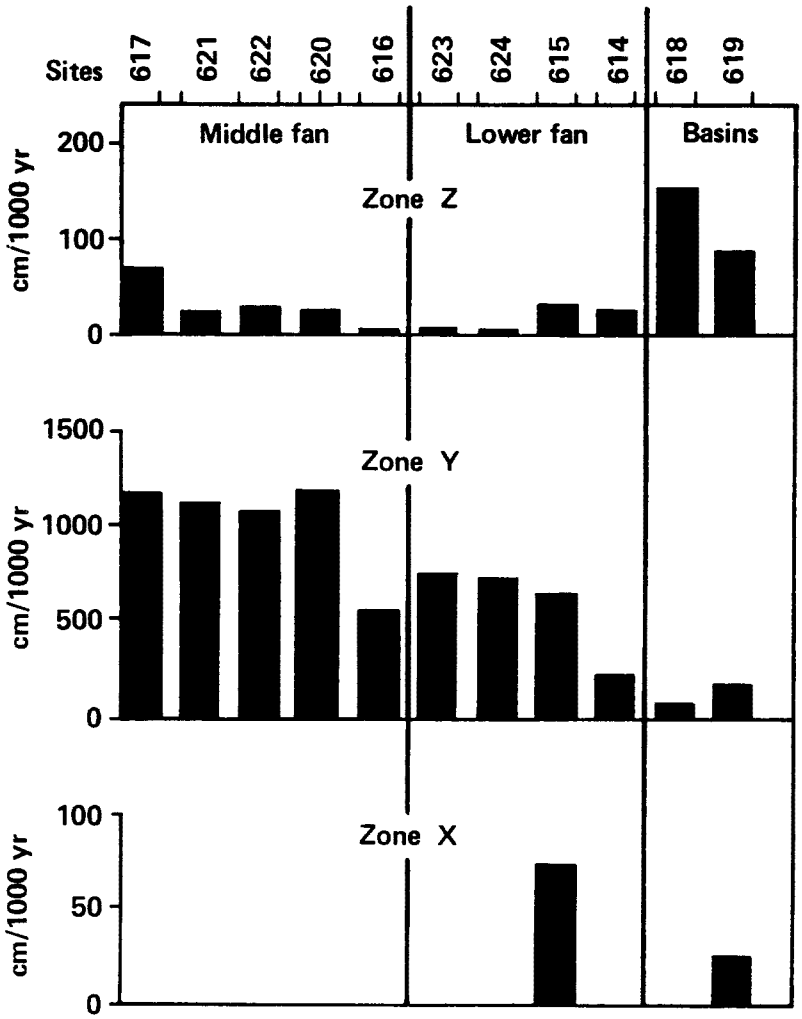


Figure 3. Undecompacted accumulation rates of sediments drilled on DSDP Leg 96.

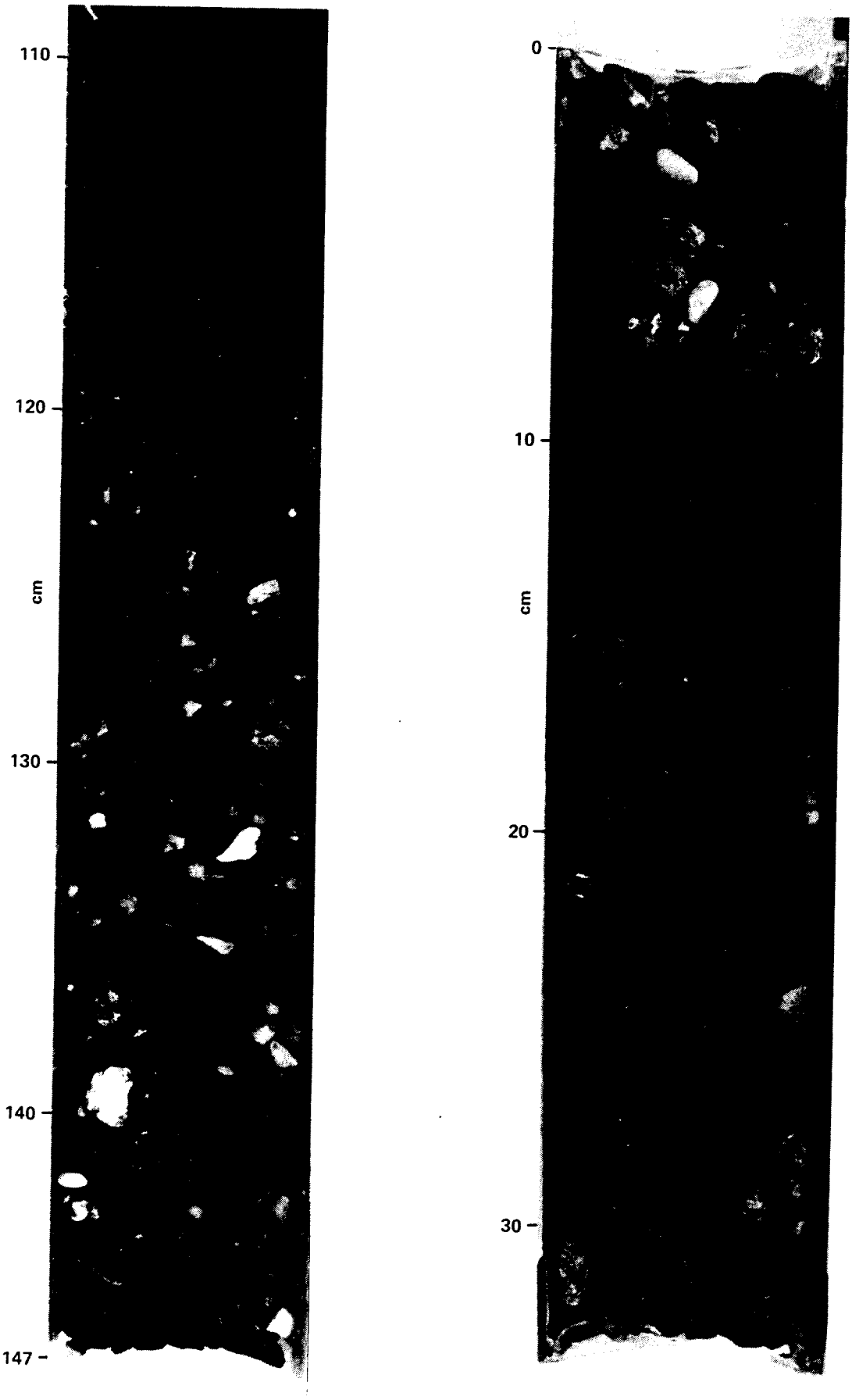


Figure 4. Core photos of 621-33-2, 108-147 cm and 33,CC (0-33 cm), showing sand, pebbly sandy mud, and gravel recovered at base of hole.

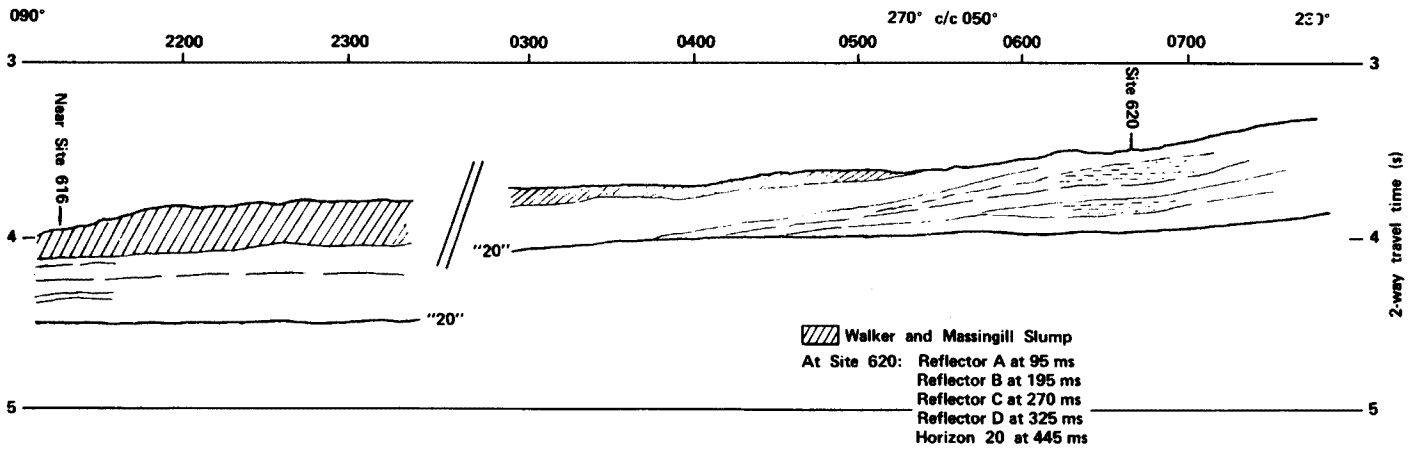


Figure 5. Seismic reflection profile collected on board Glomar Challenger Leg 96 showing offlapping reflectors observed at Site 616.

SITE 614

HOLE 614

Date Occupied: 1 October 1983, 1332 LCT

Date Departed: 2 October 1983, 1140 LCT

Time on Hole: 22 hr.

Position (latitude; longitude): 25°04.08'N; 86°08.21'W

Water depth (sea level; corrected m, echo-sounding): 3310 m

Water depth (rig floor; corrected m, echo-sounding): 3320 m

Bottom felt (m, drill pipe): 3314.1 m

Penetration (m): 37.0

Number of cores: 5

Total length of cored section (m): 37.0

Total core recovered (m): 37.07

Core recovery (%): 100

Oldest sediment cored:

Depth sub-bottom (m): 37.0

Nature: sand

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): 1.580 km/s

Basement: N/A

SITE 614

HOLE 614A

Date Occupied: 2 October 1983, 1140 LCT

Date Departed: 4 October 1983, 0140 LCT

Time on Hole: 1 day, 14 hr.

Position (latitude; longitude): 25°04.08'N; 86°08.21'W

Water depth (sea level; corrected m, echo-sounding): 3310

Water depth (rig floor; corrected m, echo-sounding): 3320

Bottom felt (m, drill pipe): 3314.1

Penetration (m): 150.3

Number of cores: 13

Total length of cored section (m): 75.0

Total core recovered (m): 56.06

Core recovery (%): 75

Oldest sediment cored:

Depth sub-bottom (m): 150.3

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): 1.730 km/s

Basement: N/A

Principal Results:

Hole 614 was drilled in the lower Mississippi Fan (3290 m water depth) near the terminal ends of the lower fan channels and their interfingering depositional lobes. The site was located on R/V Conrad Line 70 (1430Z, 21 December 1982). The youngest fan lobe is approximately 200 m thick in this region.

Hole 614 penetrated to a depth of 37.0 m below the seafloor. The parting of the wire line connection to the corer required abandonment of the hole. Hole 614A, directly adjacent to Hole 614, was washed down to a depth of 37 m from where the coring was continued. Hydraulic piston cores (HPC) were obtained to a depth of 131.4 m below the seafloor. Coring the thick sand units and extremely stiff clays became difficult with the HPC. The extended piston corer was attempted, but the sands tended to wash out, resulting in poor core recovery. A total penetration of 150.3 m was completed in Hole 614A. Total core recovery in Hole 614 was 37.1 m and 56.03 m in Hole 614A. During the entire coring operation, the ship encountered extremely strong currents (estimated at 3 knots) setting from the northeast. This factor caused significant problems in maintaining position on the site.

The coring at the site accomplished the stated objectives. The principal results of the coring were:

1) We discovered a tremendous amount of sand in the lower fan at this site, making up an estimated 70% of the upper 150 m of the sediment column. The nearest source for this sand is the area near the head of the Mississippi Canyon, a distance of approximately 470 km from the site.

2) The fauna in the clays, as well as in the sands, is barren of planktonic foraminifers and contains reworked fauna typical of inner and middle shelf environments.

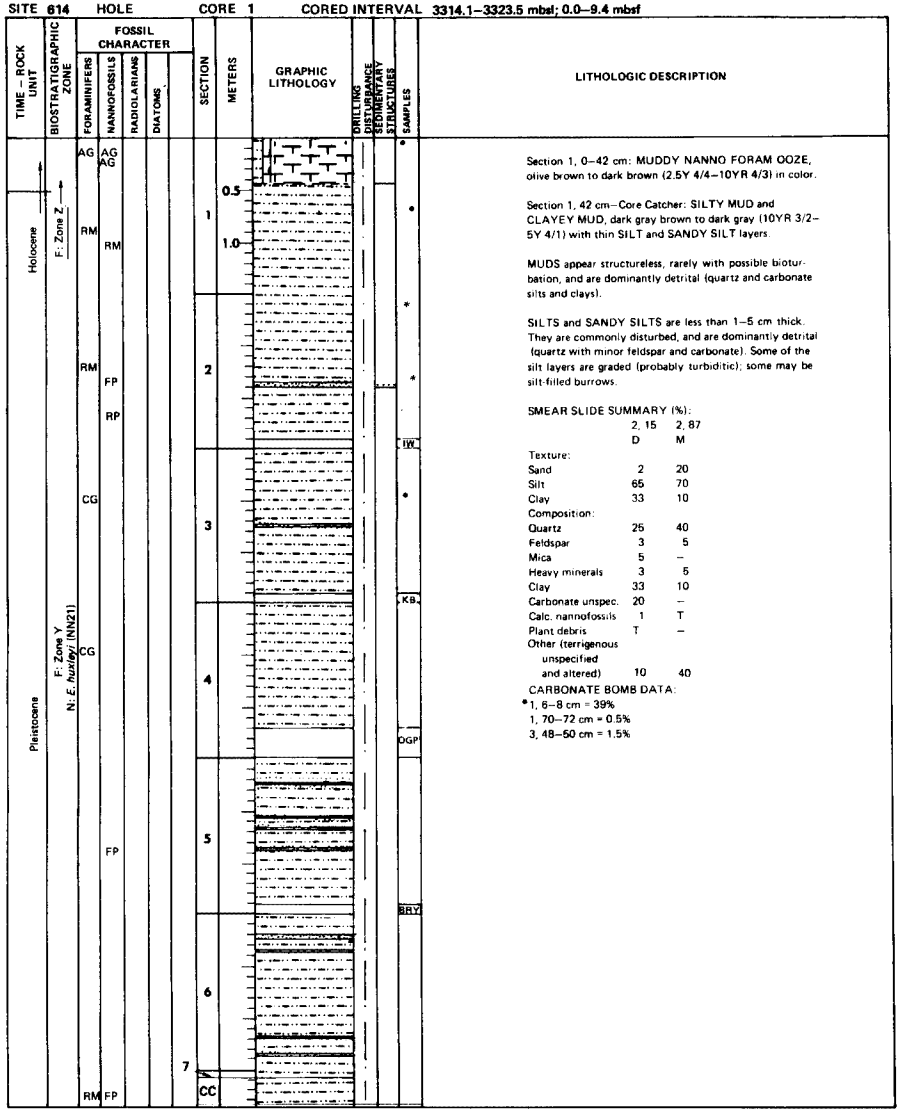
3) The sequence is dominated by turbidite facies.

4) Sedimentation rates in the turbidite sequence are extremely high: about 206 cm/1000 yr. The thin Holocene sequence displays a rate of 1.6 cm/1000 yr.

5) The cored sequence shows an incomplete coarsening-upward sequence from 150 to 115 m, a blocky, thick sand sequence from 115 to 25 m, and a fining-upward sequence over the top 25 m.

6) The Advanced Piston Corer performed rather successfully in coring loose sand series.

SITE 614 HOLE CORE 1 CORED INTERVAL 3314.1–3323.5 mbsl; 0.0–9.4 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–42 cm: MUDDY NANNO FORAM OOZE, olive brown to dark brown (2.5Y 4/4–10YR 4/3) in color.

Section 1, 42 cm–Core Catcher: SILTY MUD and CLAYEY MUD, dark gray brown to dark gray (10YR 3/2–5Y 4/1) with thin SILT and SANDY SILT layers.

MUDS appear structureless, rarely with possible bioturbation, and are dominantly detrital (quartz and carbonate silts and clays).

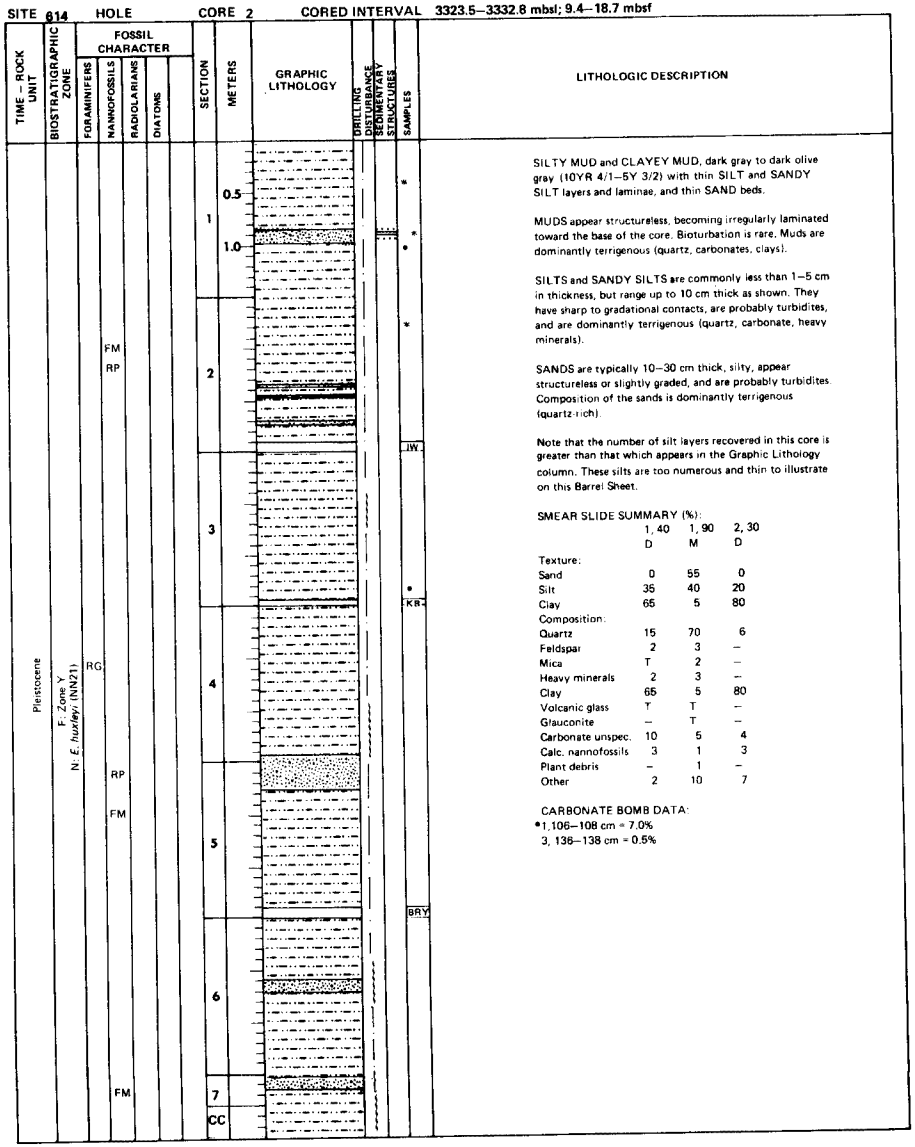
SILTS and SANDY SILTS are less than 1–5 cm thick. They are commonly disturbed, and are dominantly detrital (quartz with minor feldspar and carbonate). Some of the silt layers are graded (probably turbiditic); some may be silt-filled burrows.

SMEAR SLIDE SUMMARY (%):

	2, 15 D	2, 87 M
Texture:		
Sand	2	20
Silt	65	70
Clay	33	10
Composition:		
Quartz	25	40
Feldspar	3	5
Mica	5	–
Heavy minerals	3	5
Clay	33	10
Carbonate unspec.	20	–
Calc. nannofossils	1	T
Plant debris	T	–
Other (terrigenous unspecified and altered)	10	40

CARBONATE BOMB DATA:
*1, 6–8 cm = 39%
1, 70–72 cm = 0.5%
3, 48–50 cm = 1.5%

SITE 614 HOLE CORE 2 CORED INTERVAL 3323.5–3332.8 mbsl; 9.4–18.7 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD and CLAYEY MUD, dark gray to dark olive gray (10YR 4/1–5Y 3/2) with thin SILT and SANDY SILT layers and laminae, and thin SAND beds.

MUDS appear structureless, becoming irregularly laminated toward the base of the core. Bioturbation is rare. Muds are dominantly terrigenous (quartz, carbonates, clays).

SILTS and SANDY SILTS are commonly less than 1–5 cm in thickness, but range up to 10 cm thick as shown. They have sharp to gradational contacts, are probably turbidites, and are dominantly terrigenous (quartz, carbonate, heavy minerals).

SANDS are typically 10–30 cm thick, silty, appear structureless or slightly graded, and are probably turbidites. Composition of the sands is dominantly terrigenous (quartz-rich).

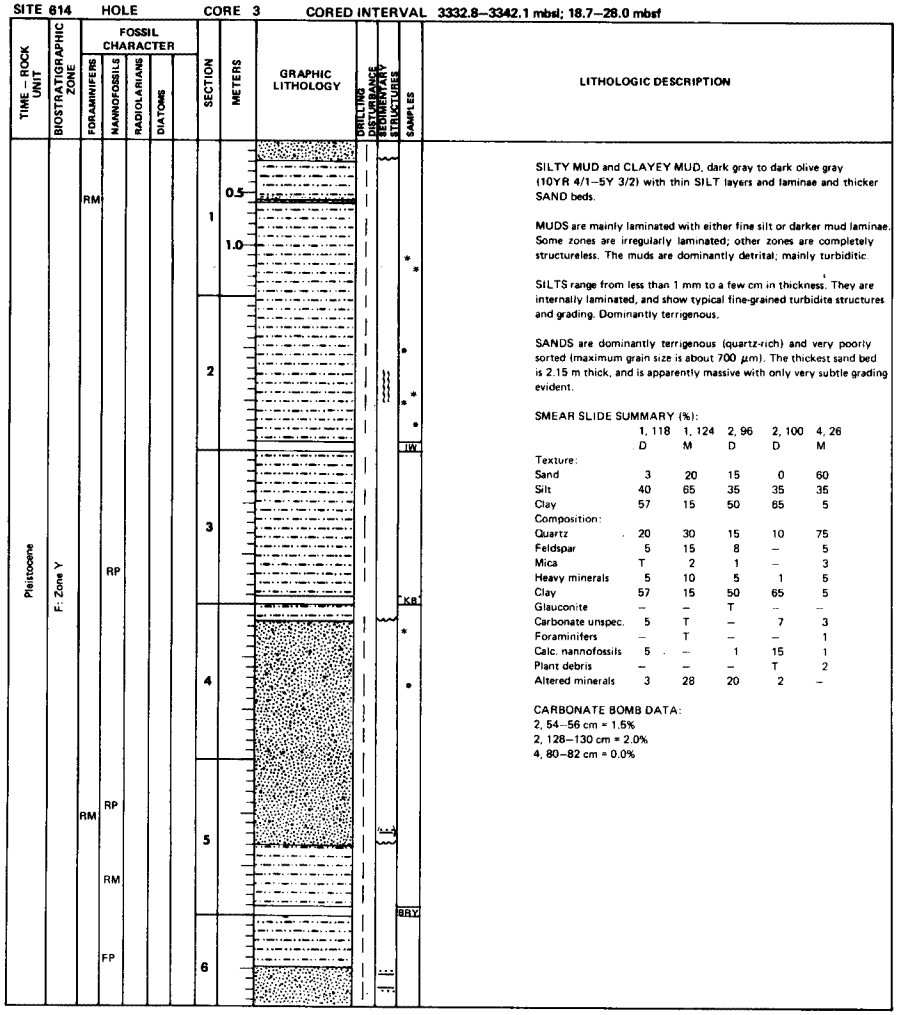
Note that the number of silt layers recovered in this core is greater than that which appears in the Graphic Lithology column. These silts are too numerous and thin to illustrate on this Barrel Sheet.

SMEAR SLIDE SUMMARY (%):

	1, 40 D	1, 90 M	2, 30 D
Texture:			
Sand	0	55	0
Silt	35	40	20
Clay	65	5	80
Composition:			
Quartz	15	70	6
Feldspar	2	3	–
Mica	T	2	–
Heavy minerals	2	3	–
Clay	65	5	80
Volcanic glass	T	T	–
Glauconite	–	T	–
Carbonate unspec.	10	5	4
Calc. nannofossils	3	1	3
Plant debris	–	1	–
Other	2	10	7

CARBONATE BOMB DATA:
*1,106–108 cm = 7.0%
3, 136–138 cm = 0.5%

SITE 614 HOLE CORE 3 CORED INTERVAL 3332.8–3342.1 mbsl; 18.7–28.0 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD and CLAYEY MUD, dark gray to dark olive gray (10YR 4/1–5Y 3/2) with thin SILT layers and laminae and thicker SAND beds.

MUDS are mainly laminated with either fine silt or darker mud laminae. Some zones are irregularly laminated; other zones are completely structureless. The muds are dominantly detrital; mainly turbiditic.

SILTS range from less than 1 mm to a few cm in thickness. They are internally laminated, and show typical fine-grained turbidite structures and grading. Dominantly terrigenous.

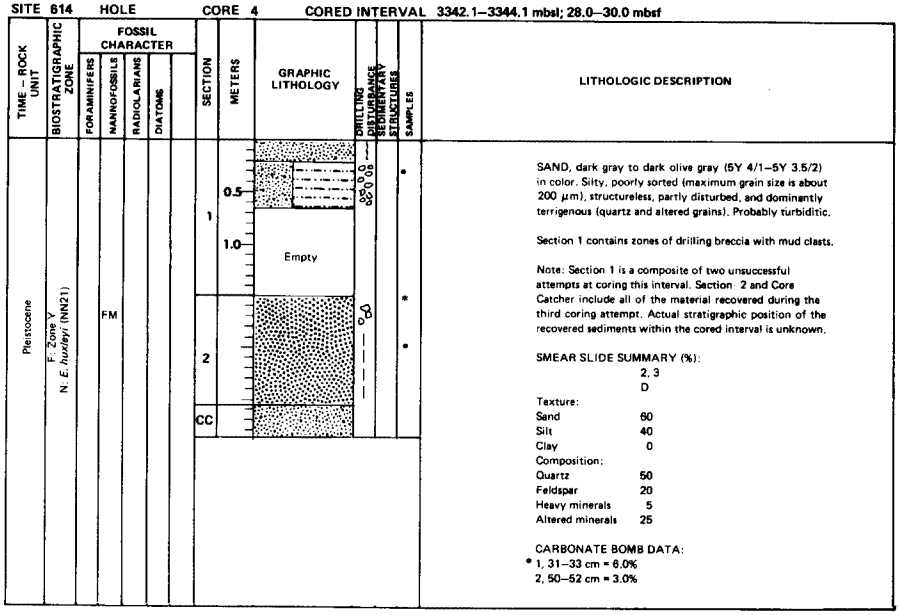
SANDS are dominantly terrigenous (quartz-rich) and very poorly sorted (maximum grain size is about 700 μm). The thickest sand bed is 2.15 m thick, and is apparently massive with only very subtle grading evident.

SMEAR SLIDE SUMMARY (%):

	1, 118 D	1, 124 M	2, 96 D	2, 100 D	4, 26 M
Texture:					
Sand	3	20	15	0	60
Silt	40	65	35	35	35
Clay	57	15	50	65	5
Composition:					
Quartz	20	30	15	10	75
Feldspar	5	15	8	–	5
Mica	T	2	1	–	3
Heavy minerals	5	10	5	1	5
Clay	57	15	50	65	5
Glauconite	–	–	T	–	–
Carbonate unspec.	5	T	–	7	3
Foraminifers	–	T	–	–	1
Calc. nannofossils	5	–	1	15	1
Plant debris	–	–	–	T	2
Altered minerals	3	28	20	2	–

CARBONATE BOMB DATA:
2, 54–56 cm = 1.5%
2, 128–130 cm = 2.0%
4, 80–82 cm = 0.0%

SITE 614 HOLE CORE 4 CORED INTERVAL 3342.1–3344.1 mbsl; 28.0–30.0 mbsf



LITHOLOGIC DESCRIPTION

SAND, dark gray to dark olive gray (5Y 4/1–5Y 3.5/2) in color. Silty, poorly sorted (maximum grain size is about 200 μm), structureless, partly disturbed, and dominantly terrigenous (quartz and altered grains). Probably turbiditic.

Section 1 contains zones of drilling breccia with mud clasts.

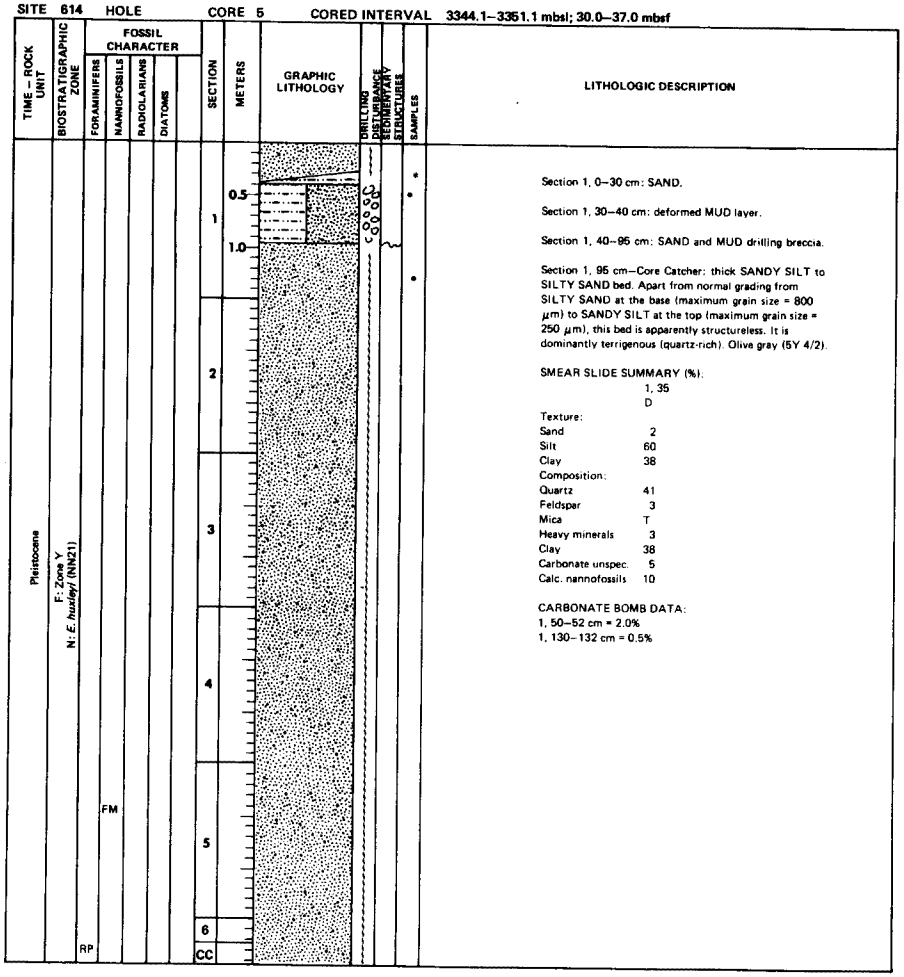
Note: Section 1 is a composite of two unsuccessful attempts at coring this interval. Section 2 and Core Catcher include all of the material recovered during the third coring attempt. Actual stratigraphic position of the recovered sediments within the cored interval is unknown.

SMEAR SLIDE SUMMARY (%):

	2, 3 D
Texture:	
Sand	60
Silt	40
Clay	0
Composition:	
Quartz	50
Feldspar	20
Heavy minerals	5
Altered minerals	25

CARBONATE BOMB DATA:
1, 31–33 cm = 6.0%
2, 50–52 cm = 3.0%

SITE 614 HOLE CORE 5 CORED INTERVAL 3344.1–3351.1 mbsl; 30.0–37.0 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–30 cm: SAND.

Section 1, 30–40 cm: deformed MUD layer.

Section 1, 40–95 cm: SAND and MUD drilling breccia.

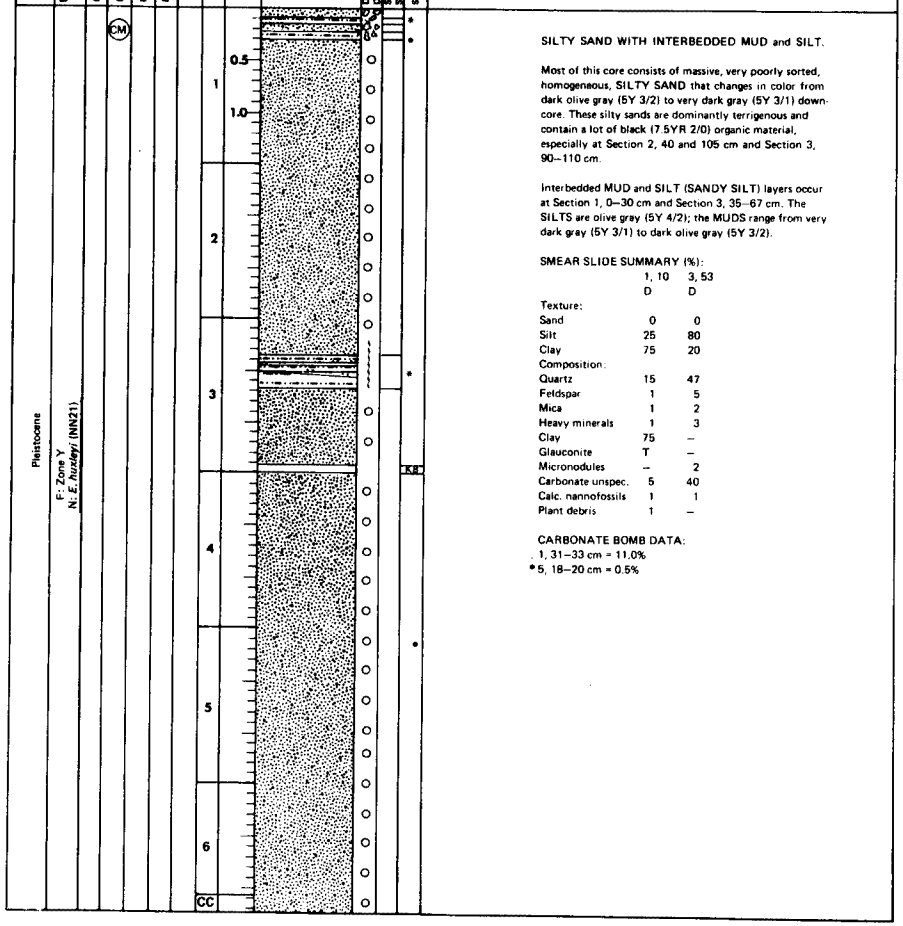
Section 1, 95 cm–Core Catcher: thick SANDY SILT to SILTY SAND bed. Apart from normal grading from SILTY SAND at the base (maximum grain size = 800 μm) to SANDY SILT at the top (maximum grain size = 250 μm), this bed is apparently structureless. It is dominantly terrigenous (quartz-rich). Olive gray (5Y 4/2).

SMEAR SLIDE SUMMARY (%):

	1, 35 D
Texture:	
Sand	2
Silt	60
Clay	38
Composition:	
Quartz	41
Feldspar	3
Mica	T
Heavy minerals	3
Clay	38
Carbonate unspec.	5
Calc. nannofossils	10

CARBONATE BOMB DATA:
1, 50–52 cm = 2.0%
1, 130–132 cm = 0.5%

SITE 614 HOLE A CORE 1 CORED INTERVAL 3361.1–3359.1 mbsl; 37.0–45.0 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND WITH INTERBEDDED MUD and SILT.

Most of this core consists of massive, very poorly sorted, homogeneous, SILTY SAND that changes in color from dark olive gray (5Y 3/2) to very dark gray (5Y 3/1) downcore. These silty sands are dominantly terrigenous and contain a lot of black (7.5YR 2/0) organic material, especially at Section 2, 40 and 105 cm and Section 3, 90–110 cm.

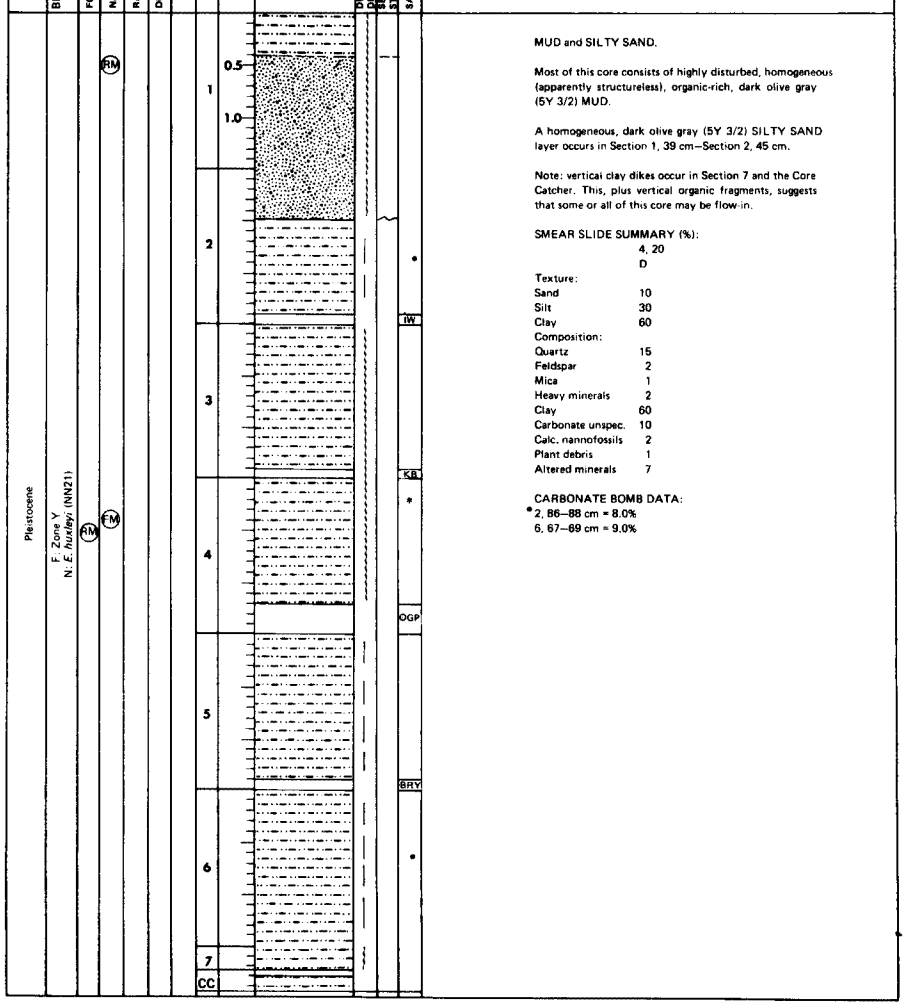
Interbedded MUD and SILT (SANDY SILT) layers occur at Section 1, 0–30 cm and Section 3, 35–67 cm. The SILTS are olive gray (5Y 4/2); the MUDS range from very dark gray (5Y 3/1) to dark olive gray (5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	1, 10 D	3, 53 D
Texture:		
Sand	0	0
Silt	25	80
Clay	75	20
Composition:		
Quartz	15	47
Feldspar	1	5
Mica	1	2
Heavy minerals	1	3
Clay	75	–
Glauconite	T	–
Micronodules	–	2
Carbonate unspec.	5	40
Calc. nannofossils	1	1
Plant debris	1	–

CARBONATE BOMB DATA:
1, 31–33 cm = 11.0%
*5, 18–20 cm = 0.5%

SITE 614 HOLE A CORE 2 CORED INTERVAL 3359.1–3368.4 mbsl; 45.0–54.3 mbsf



LITHOLOGIC DESCRIPTION

MUD and SILTY SAND.

Most of this core consists of highly disturbed, homogeneous (apparently structureless), organic-rich, dark olive gray (5Y 3/2) MUD.

A homogeneous, dark olive gray (5Y 3/2) SILTY SAND layer occurs in Section 1, 39 cm–Section 2, 45 cm.

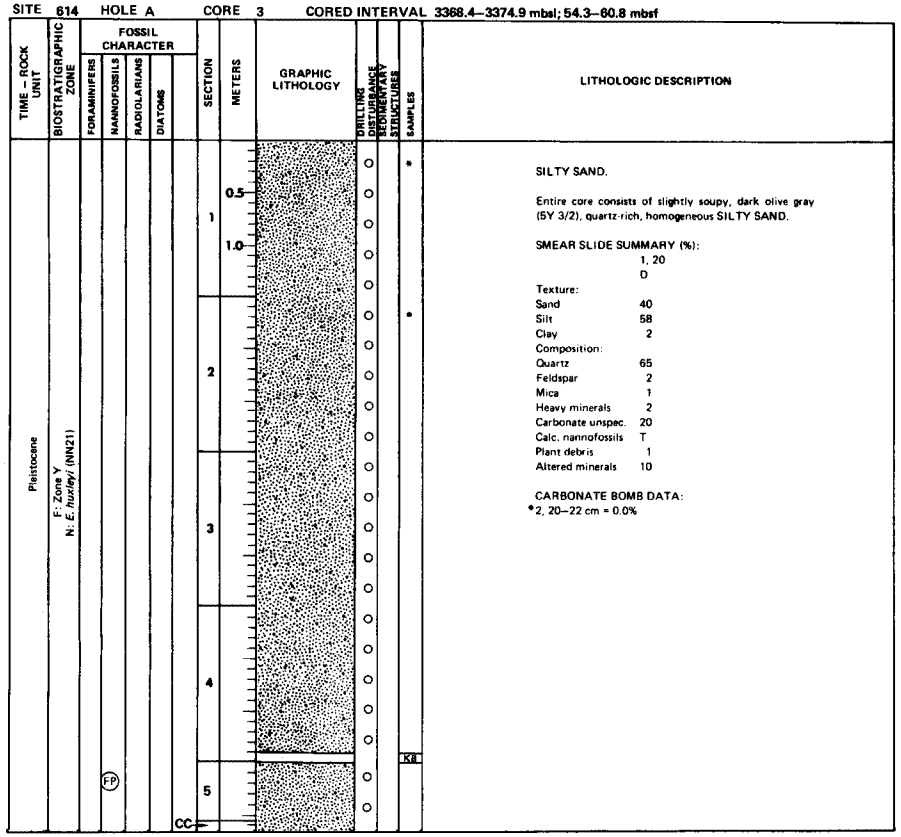
Note: vertical clay dikes occur in Section 7 and the Core Catcher. This, plus vertical organic fragments, suggests that some or all of this core may be flow-in.

SMEAR SLIDE SUMMARY (%):

	4, 20 D
Texture:	
Sand	10
Silt	30
Clay	60
Composition:	
Quartz	15
Feldspar	2
Mica	1
Heavy minerals	2
Clay	60
Carbonate unspec.	10
Calc. nannofossils	2
Plant debris	1
Altered minerals	7

CARBONATE BOMB DATA:
*2, 86–88 cm = 8.0%
6, 67–69 cm = 9.0%

SITE 614 HOLE A CORE 3 CORED INTERVAL 3368.4–3374.9 mbsl; 54.3–60.8 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND.

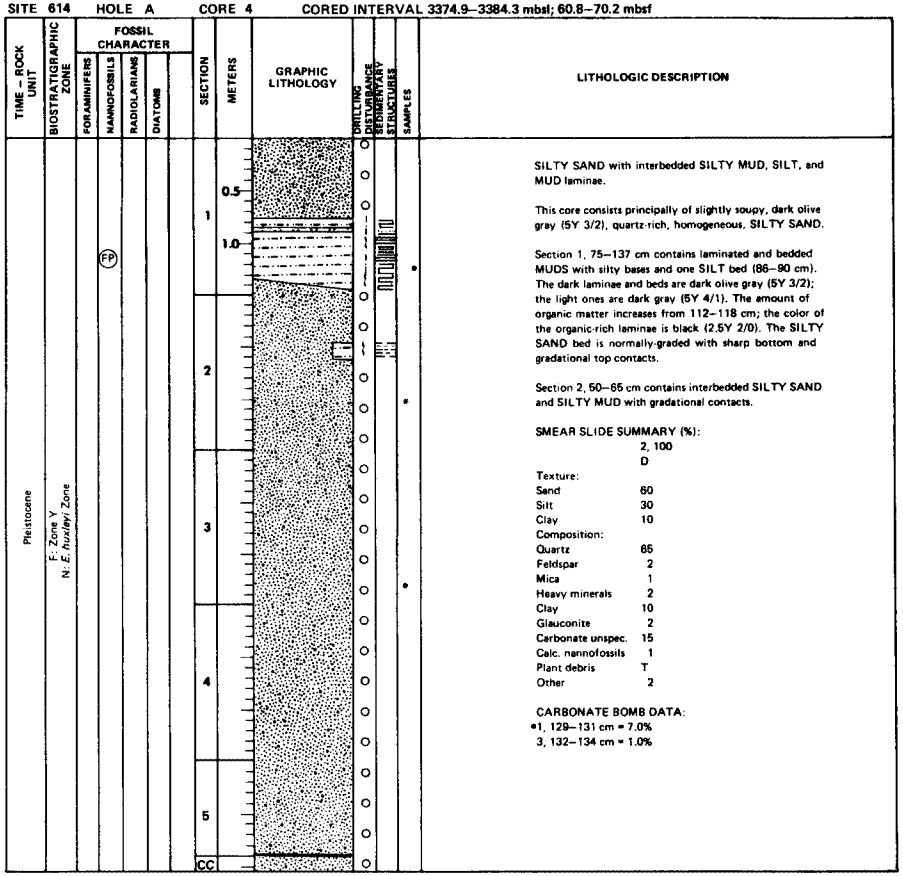
Entire core consists of slightly soupy, dark olive gray (5Y 3/2), quartz-rich, homogeneous SILTY SAND.

SMEAR SLIDE SUMMARY (%):

	1, 20 D
Texture:	
Sand	40
Silt	58
Clay	2
Composition:	
Quartz	65
Feldspar	2
Mica	1
Heavy minerals	2
Carbonate unspec.	20
Calc. nannofossils	T
Plant debris	1
Altered minerals	10

CARBONATE BOMB DATA:
*2, 20–22 cm = 0.0%

SITE 614 HOLE A CORE 4 CORED INTERVAL 3374.9–3384.3 mbsl; 60.8–70.2 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND with interbedded SILTY MUD, SILT, and MUD laminae.

This core consists principally of slightly soupy, dark olive gray (5Y 3/2), quartz-rich, homogeneous, SILTY SAND.

Section 1, 75–137 cm contains laminated and bedded MUDS with silty bases and one SILT bed (86–90 cm). The dark laminae and beds are dark olive gray (5Y 3/2); the light ones are dark gray (5Y 4/1). The amount of organic matter increases from 112–118 cm; the color of the organic-rich laminae is black (2.5Y 2/0). The SILTY SAND bed is normally-graded with sharp bottom and gradational top contacts.

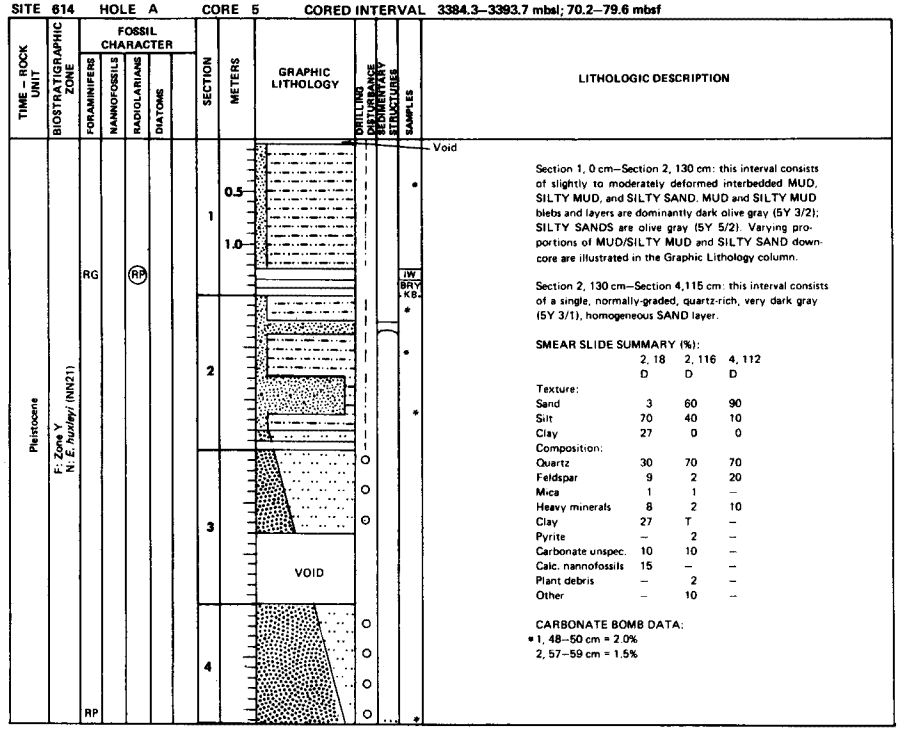
Section 2, 60–65 cm contains interbedded SILTY SAND and SILTY MUD with gradational contacts.

SMEAR SLIDE SUMMARY (%):

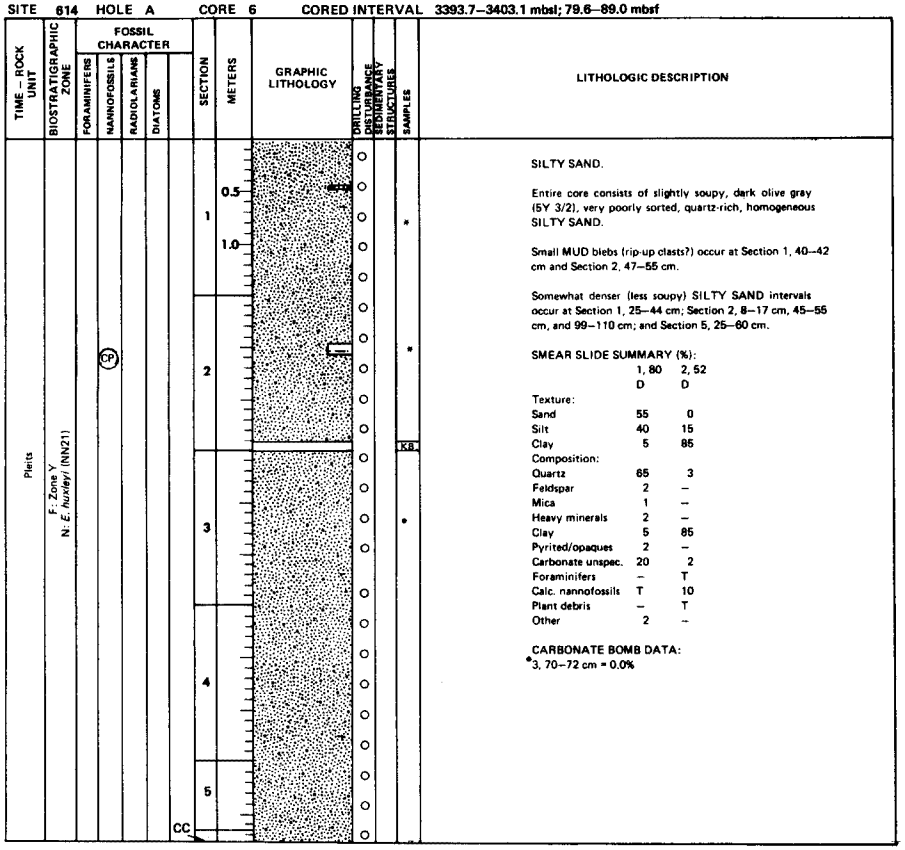
	2, 100 D
Texture:	
Sand	60
Silt	30
Clay	10
Composition:	
Quartz	65
Feldspar	2
Mica	1
Heavy minerals	2
Clay	10
Glauconite	2
Carbonate unspec.	15
Calc. nannofossils	1
Plant debris	T
Other	2

CARBONATE BOMB DATA:
*1, 129–131 cm = 7.0%
3, 132–134 cm = 1.0%

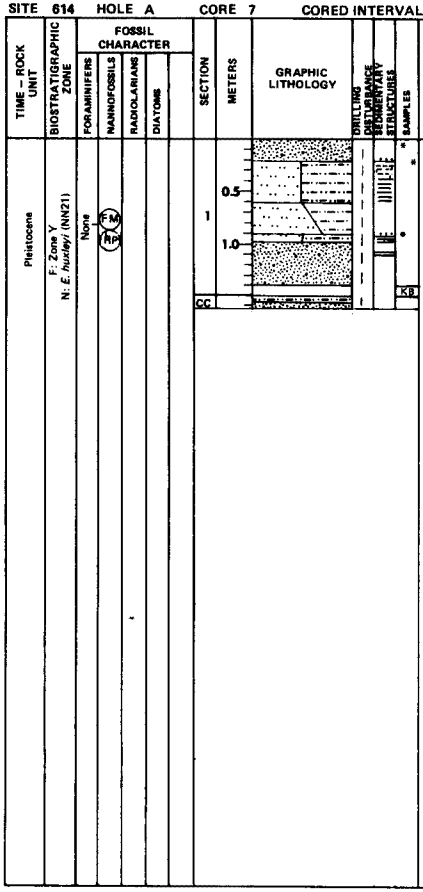
SITE 614 HOLE A CORE 5 CORED INTERVAL 3384.3–3393.7 mbsl; 70.2–79.6 mbsf



SITE 614 HOLE A CORE 6 CORED INTERVAL 3393.7–3403.1 mbsl; 79.6–89.0 mbsf



SITE 614 HOLE A CORE 7 CORED INTERVAL 3403.1–3412.6 mbsl; 88.0–98.5 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–20 cm: SILTY SAND. Slightly deformed, olive gray (5Y 4/2), very poorly sorted, quartz-rich, normally-graded, and homogeneous.

Section 1, 20–62 cm: organic-rich, laminated SILT (SILTY MUD) and MUD. Light-colored laminations are dark olive gray (5Y 3/2); dark colored laminations are black (5Y 2/1). These laminations range from 0.1–1.0 cm thick, and are somewhat indistinct at Section 1, 20–30 cm.

Section 1, 62–90 cm: MUD with discontinuous layers and blebs of SILT. MUD is dark olive gray (5Y 3/2); SILT is dark gray (5Y 4/1). Number of discontinuous silt layers increases downcore. Base may be graded.

Section 1, 90–95 cm: SILTY MUD. Well-laminated, and organic-rich.

Section 1, 95–140 cm: SILTY SAND. Slightly deformed, dark olive gray (5Y 3.5/2), very poorly sorted, quartz-rich, and homogeneous. Two thin organic-rich layers occur at 104 and 105 cm.

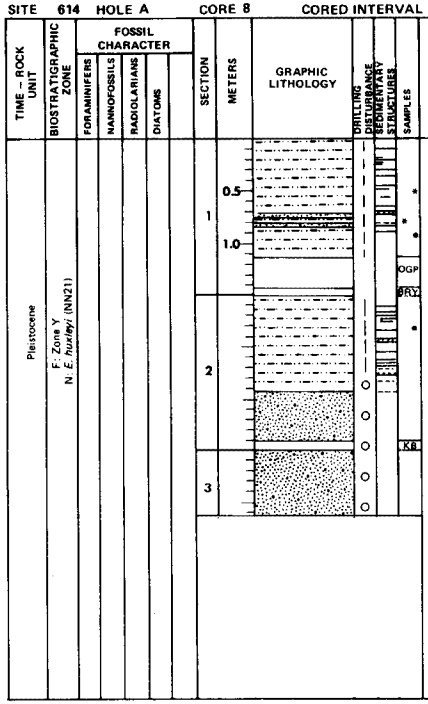
Core Catcher: well laminated MUD (Core Catcher, 0–3 cm) and SILTY SAND (Core Catcher, 3 cm–base). Laminations are 1 mm thick.

SMEAR SLIDE SUMMARY (%):

	1, 1 D	1, 26 D
Texture:		
Sand	60	1
Silt	35	70
Clay	5	29
Composition:		
Quartz	80	50
Feldspar	3	2
Mica	1	1
Heavy minerals	3	2
Clay	5	29
Pyrite/opaques	–	2
Carbonate unspec.	3	5
Foraminifers	1	1
Calc. nannofossils	1	1
Plant debris	2	2
Altered minerals	1	5

CARBONATE BOMB DATA:
* Section 1, 92–94 cm = 2.0%

SITE 614 HOLE A CORE 8 CORED INTERVAL 3412.6–3422.1 mbsl; 98.5–108.0 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0 cm–Section 2, 91 cm: MUD interbedded with numerous SILTY MUD, MUDDY SILT, and SANDY SILT layers. The MUD is dark olive gray (5Y 3.5/2). Interbedded SILTS are thin (less than 1 to 3 cm thick); some are graded and cross-laminated.

Section 2, 91 cm–Section 3, 63 cm: homogeneous dark gray/olive gray (5Y 4/1.5), quartz-rich SILTY SAND.

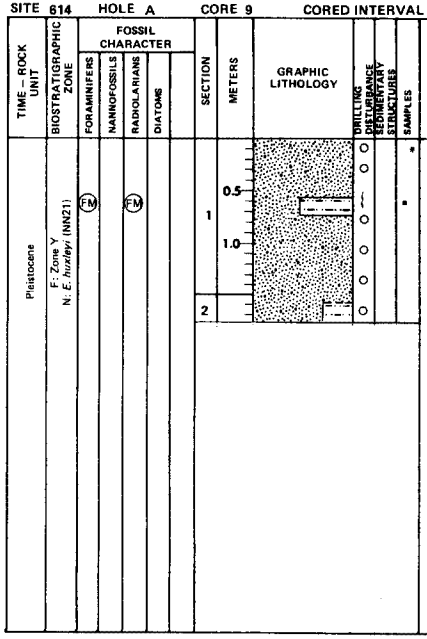
Note: locations of interbedded SILTS are schematically shown by solid lines in the Sedimentary Structures column.

SMEAR SLIDE SUMMARY (%):

	1, 57 M	1, 80 D
Texture:		
Sand	0	55
Silt	80	40
Clay	20	5
Composition:		
Quartz	38	60
Feldspar	T	5
Mica	T	2
Heavy minerals	T	2
Clay	20	5
Palagonite	15	–
Pyrite/opaques	T	2
Carbonate unspec.	25	15
Foraminifers	–	T
Calc. nannofossils	2	1
Plant debris	–	T
Altered minerals	–	8

CARBONATE BOMB DATA:
•1, 99–101 cm = 8.0%
2, 36–38 cm = 6.0%

SITE 614 HOLE A CORE 9 CORED INTERVAL 3422.1–3431.6 mbsl; 108.0–117.5 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND.

This core consists dominantly of dark olive gray (5Y 3.5/2), slightly soupy, poorly sorted, quartz-rich, homogeneous SILTY SAND.

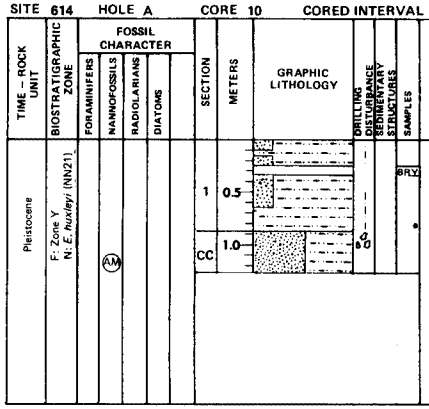
The SILTY SAND in Section 1, 55–72 cm and Section 2 contains dark olive gray (5Y 3/2) MUD clasts and blebs. The MUD clast at Section 1, 55–60 cm is laminated.

SMEAR SLIDE SUMMARY (%):

	1, 10 D
Texture:	
Sand	74
Silt	25
Clay	1
Composition:	
Quartz	70
Feldspar	5
Mica	2
Heavy minerals	3
Clay	1
Pyrite/opaques	3
Carbonate unspec.	16
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	5

CARBONATE BOMB DATA:
*Section 1, 62–64 cm = 0.0%

SITE 614 HOLE A CORE 10 CORED INTERVAL 3431.6–3441.1 mbsl; 117.5–127.0 mbsf



LITHOLOGIC DESCRIPTION

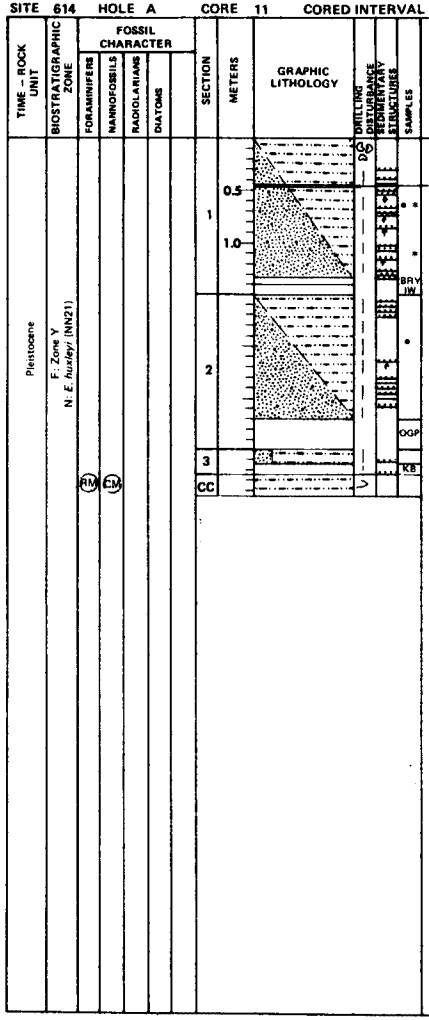
Section 1 is only 98 cm long and consists primarily of very dark gray (5Y 3/1) MUD. This MUD contains blebs and thin, discontinuous layers of SILTY MUD from 0–10 cm, 14–22 cm, and 32–64 cm.

The Core Catcher was badly disturbed during coring and deck handling and consists of intermixed dark olive gray MUD (5Y 3/2) and SILTY SAND (5Y 3.5/2).

Note: This liner was deformed, and some of the core was lost because liner sections could not be removed from the barrel.

CARBONATE BOMB DATA:
*Section 1, 86–88 cm = 4.5%

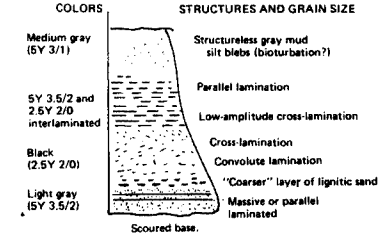
SITE 614 HOLE A CORE 11 CORED INTERVAL 3441.1–3446.3 mbsl; 127.0–131.2 mbsf



LITHOLOGIC DESCRIPTION

Whole core consists of repeated fine grained turbidites of variable thickness (ranging from less than 1 to more than 20 cm). These turbidites are typically graded from FINE SILT or SANDY SILT at the base to MUD at the top, with the standard vertical sequences of colors and structures detailed in the diagram below.

Variations: some of the turbidites grade from muddy silt at the base to mud upsection and are of a darker grayish color. Some of the turbiditic silts are whiter in color (5Y 6/1) and very fine grained with sharp contact and flame structures between silt and the overlying mud. The mud intervals may be slightly burrowed.



SMEAR SLIDE SUMMARY (%):

	1, 62 D	1, 112 D
Texture:		
Sand	10	10
Silt	80	60
Clay	10	30
Composition:		
Quartz	52	37
Feldspar	4	T
Mica	2	T
Heavy minerals	3	2
Clay	10	30
Palagonite	–	T
Pyrite/opaques	3	2
Micronodules	T	–
Carbonate unspec.	20	18
Foraminifers	–	2
Calc. nannofossils	T	10
Plant debris	1	3
Altered minerals, etc.	5	2

CARBONATE BOMB DATA:
1, 63–65 cm = 7.0%
2, 48–50 cm = 2.0%

SITE 614 HOLE A CORE 12 CORED INTERVAL 3445.3–3454.8 mbsl; 131.2–140.7 mbsf

TIME–ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* (NN21)					1						Section 1, 0–9 cm: MUD with tiny SILTY MUD blebs and one discontinuous SILTY MUD layer at 5 cm. MUD is dark olive gray (5Y 3/2). Section 1, 9–20 cm: a composite of the MUD chunks found in the Core Catcher. This mud is identical to that recovered in Section 1, 0–9 cm.

SITE 614 HOLE A CORE 13 CORED INTERVAL 3454.8–3464.4 mbsl; 140.7–150.3 mbsf

TIME–ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* (NN21)	FG	CM			CC						SILTY SAND with one ball of MUD. SILTY SAND is dark olive gray (5Y 3/2) and poorly sorted. MUD is black (5Y 2/2). Note: Recovered sediment in the Core Catcher only. Rest of the core barrel was empty.

SITE 615

HOLE 615

Date Occupied: 4 October 1983, 1037 LCT

Date Departed: 9 October 1983, 1155 LCT

Time on Hole: 5 days, 1 hr.

Position (latitude; longitude): 25°13.3N; 85°59.5'W

Water depth (sea level; corrected m, echo-sounding): 3268

Water depth (rig floor; corrected m, echo-sounding): 3278

Bottom felt (m, drill pipe): 3283.9

Penetration (m): 523.2

Number of cores: 52

Total length of cored section (m): 419.3

Total core recovered (m): 175.29

Core recovery (%): 42

Oldest sediment cored:

Depth sub-bottom (m): 515.4

Nature: clay with silt

Age: Pleistocene (Ericson Zone W)

Measured velocity (km/s):

Basement: N/A

SITE 615

HOLE 615A

Date Occupied: 9 October 1983, 1150 LCT

Date Departed: 10 October 1983, 2035 LCT

Time on Hole: 1 day, 9 hr.

Position (latitude; longitude): 25°13.35'N; 85°59.55'W

Water depth (sea level; corrected m, echo-sounding): 3268

Water depth (rig floor; corrected m, echo-sounding): 3278

Bottom felt (m, drill pipe): 3285.9

Penetration (m): 208.5

Number of cores: 17

Total length of cored section (m): 74.5

Total core recovered (m): 51.93

Core recovery (%): 70

Oldest sediment cored: N/A

Principal Results:

Hole 615 was drilled in the lower Mississippi Fan on the western levee of the small central channel. The water depth at the site was 3278 m. The location of this site is 21 km northeast of Site 614.

The original location of this site was on R/V Conrad Line 73 at 2124Z. However, beacon failures forced us to move about 4 km away. The final Site 615 was positioned to the north and slightly to the west of 2138Z on R/V Conrad Line 75. A water-gun reflection record was acquired across the site by the D/V Glomar Challenger.

The total depth of penetration was 523.2 m. The Advanced Piston Corer was used to a depth of 136.0 m, showing a diminishing core recovery with depth. The remainder of the section was cored with the Extended Piston Corer, except for the interval 418.7-428.2 m in which the APC was used.

Core recovery varied widely and unpredictably. Down to a depth of 105 m recovery was extremely high, after which it varied between 0 and 30% with a few scattered very high percentages. The lowermost section (485-523 m) again gave excellent recovery. Below a sub-bottom depth of about 100 m the clays become very stiff and the sand content generally increases. Both tend to decrease penetration as well as retention of sand. The Extended Piston Corer normally prohibits entering of sand into the corer or does not retain it. A marked, but general, relationship exists between core recovery and amount of sand present in the section.

During the entire coring operation, the vessel encountered similar strong currents as at Site 614. The calm sea state certainly helped to maintain position.

At the end of the coring operation, during preparation for well logging, the pipe stuck for several hours. After freeing the pipe, two very successful logging runs were made: DIT-GR-caliper-sonic, dual induction-conductivity-GR and FDC/CNL/NGT-Porosity. The logs amazed the drilling crew by showing considerable less cave-in than was expected, and the scientific crew by indicating the high amount of sand in the cored interval.

The coring at Site 615 basically accomplished the stated objectives with the exception of a study on sedimentary structures, particularly in the sands, and on Mutti's compensation cycles. The complete unconsolidated nature of the sand caused fluidization during coring, eliminating the ability to observe sedimentary structures. The principal results obtained at this site are:

1) Although a large amount of sand was cored at this site and on the previous one, the well logs showed that sand content was significantly higher, by a factor of 2, than estimated from recovered core.

2) The lower 40 m of the cored section consists of an upward-fining carbonate sequence, starting with a breccia, overlain by a foraminiferal-nannofossil ooze and ending with a nannofossil-foraminiferal (juvenile species) ooze. This series is underlain by muds similar to those encountered above the calcareous series. Foraminifers indicate a shallow-water carbonate platform

origin, likely coming from the north rather than from the Campeche.

3) Ericson faunal Zones Z, Y, X and W (partial) were cored.

4) Two megacycles occur in the cored series, one per individual fan lobe. Each starts with a coarsening-upward series from mud to sand, following by bedded sands, and topped by a fining-upward sequence. The upper one has a Holocene pelagic ooze interval on top of the fining-upward sequence.

5) Turbidite deposition seems to be the major agent in sediment transport, including the muds. The source of the sediment is the middle and upper shelf environments.

6) Seismic Horizon 20 is difficult to establish in the cores but seems to coincide with the base of a clay interval (15 m thick) and the end of the presence of reworked Cretaceous foraminifers.

7) Seismic Horizon 30 coincides with the top of the calcareous series.

8) The calcareous series probably was emplaced by debris flow deposition rather than by turbidity currents.

9) Near the bottom of Ericson's Zone Y the first planktonic foraminifers show up, increasing in number downward. The mud underneath the calcareous series likely is the top of the Ericson Zone W, the carbonates may be the only representative of Ericson Zone X.

10) The clays below 100 m show a higher stiffness than anticipated. Their overconsolidated nature can be ascribed to removal of overburden in an engineering sense. However, such is not

acceptable for this area. Another explanation deals with diagenetic changes.

11) It has been clearly demonstrated that when core recovery is poor, interpretations about the assumed lithologies for the section are possibly erroneous. Well logs proved to be essential for providing a more realistic lithologic picture.

12) The well logs clearly demonstrated that the nonrecovered core intervals were sandier than the obtained cores which often were slightly to medium muddy fine sands. This means that many beds likely show an upward grading and upward increase in clay-sized material.

13) Analyses of the well logs and cored section indicated a net sand thickness of 265.9 m or a 50.8% sand content in the cored interval. The upper lobe had a net sand thickness of 81.7 m or a 41.1% sand content whereas the lower lobe had a net sand thickness of 183.0 m or a 65.1% sand content.

14) Computation of sediment accumulation rates are as follows: (a) Zone Z--33.5 cm/1000 yr.; (b) Zone Y--645.9 cm/1000 yr; and (c) Zone X--75.0 cm/1000 yr.

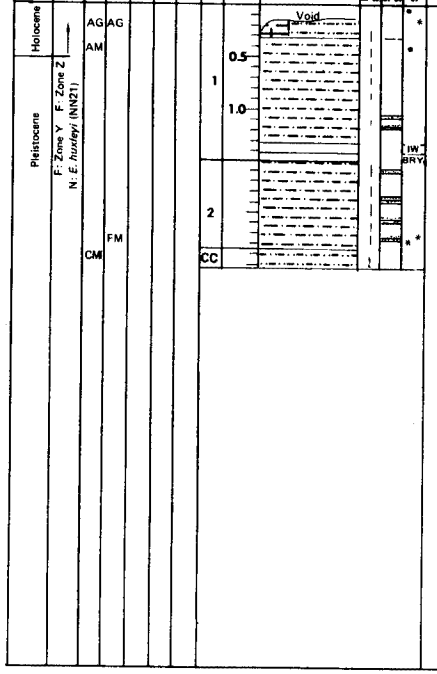
15) The upper cores through the levee show that these deposits are made up of thin-bedded (1-5 cm) fine-grained turbidites.

16) The absence of detectable gas, except the traces in the carbonates, likely is a function of low organic content and low bacterial activity.

17) Initial shrinkage studies on the clays show a change in the direction of anisotropy of the clays; the oblong pores being more

vertical in the upper part of the section and more horizontal in the lower part.

SITE 615 HOLE CORE 1 CORED INTERVAL 3283.9–3286.5 mbsl; 0.0–2.6 mbsl



LITHOLOGIC DESCRIPTION

Section 1, 0–15 cm: void.

Section 1, 15–32 cm: MARLY NANNOFOSSIL-FORAMINIFERAL OOZE. Yellowish brown (10YR 5/4) and thoroughly bioturbated. Separated from the underlying unit by a bioturbated, gradational contact.

Section 1, 32 cm–Core Catcher: SILTY MUD, dark grayish brown (10YR 4/2) grading to dark gray (5Y 4/1) at base of Section 1. The SILTY MUD in Section 2 is color-banded dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2). The color banding may be related to variation in redox conditions(?). The SILTY MUD contains very thin silt laminae that become more frequent downcore. Some of these laminae have clear turbiditic structures, indicating that they are fine-grained turbidites.

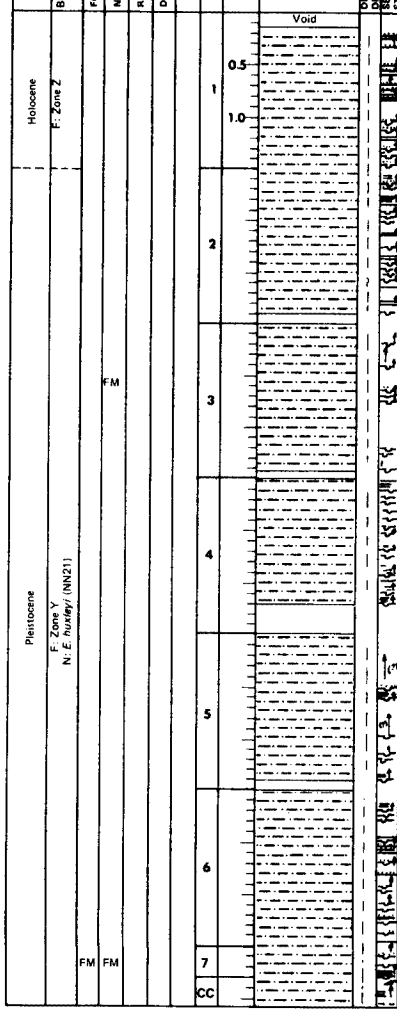
SMEAR SLIDE SUMMARY (%):

	1, 19 D	2, 75 D	2, 80 M
Texture:			
Sand	50	6	–
Silt	30	30	70
Clay	20	70	30
Composition:			
Quartz		–	–
Feldspar		–	–
Mica		–	–
Heavy minerals		–	–
Clay		–	–
Volcanic glass		–	–
Palagonite	50	–	–
Glauconite		–	–
Pyrite		–	–
Micronodules		–	–
Zeolite		–	–
Carbonate unspec.		–	–
Foraminifers	40	–	–
Calc. nannofossils	10	1	1

(Total detrital)

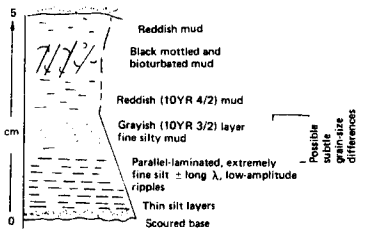
CARBONATE BOMB DATA:
*1, 0–2 cm = 23.0%
1, 44–46 cm = 0.0%

SITE 615 HOLE CORE 2 CORED INTERVAL 3286.5–3296.0 mbsl; 2.6–12.1 mbsl



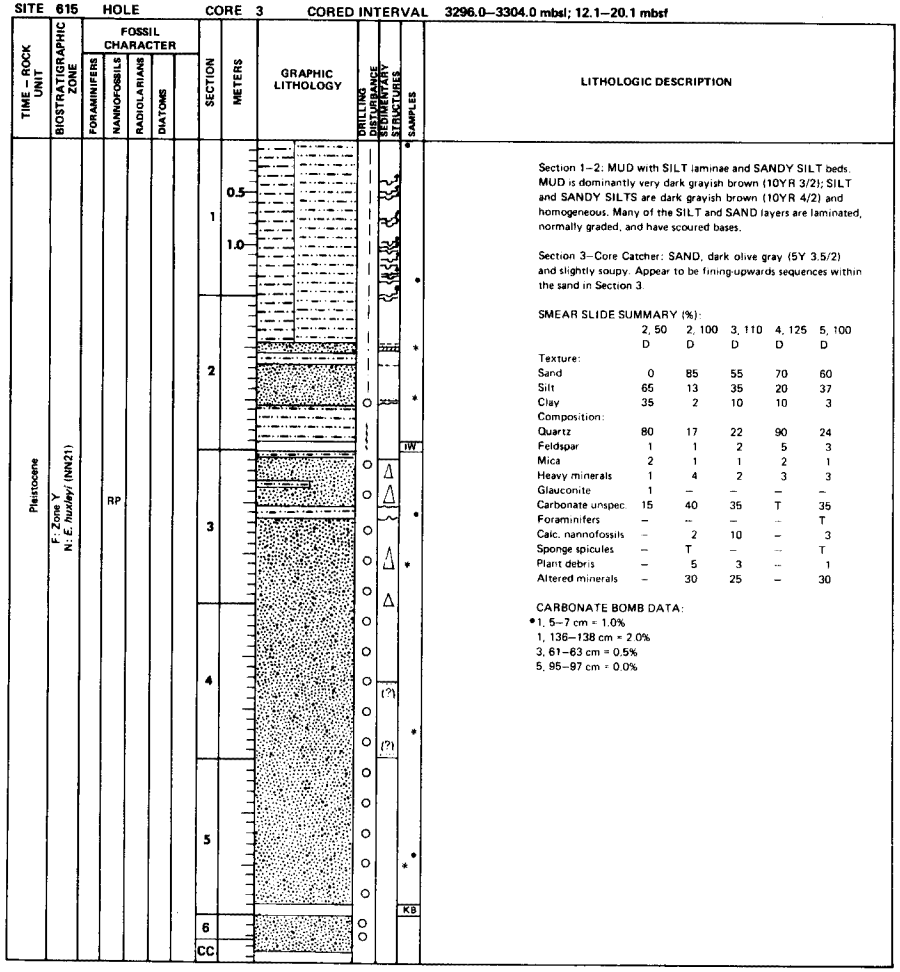
LITHOLOGIC DESCRIPTION

SILTY MUD with thin SILT laminae throughout the core. Dark olive gray to olive gray (10YR 3/2–10YR 4/2) in color. These layers are thin fine-grained turbidites of variable thickness, grain size, and completeness. A typical section through one turbidite is shown below.



CARBONATE BOMB DATA:
*1, 121–123 cm = 0.5%
2, 132–134 cm = 0.5%

SITE 615 HOLE CORE 3 CORED INTERVAL 3296.0–3304.0 mbsl; 12.1–20.1 mbsf



LITHOLOGIC DESCRIPTION

Section 1–2: MUD with SILT laminae and SANDY SILT beds. MUD is dominantly very dark grayish brown (10YR 3/2); SILT and SANDY SILTS are dark grayish brown (10YR 4/2) and homogeneous. Many of the SILT and SAND layers are laminated, normally graded, and have scoured bases.

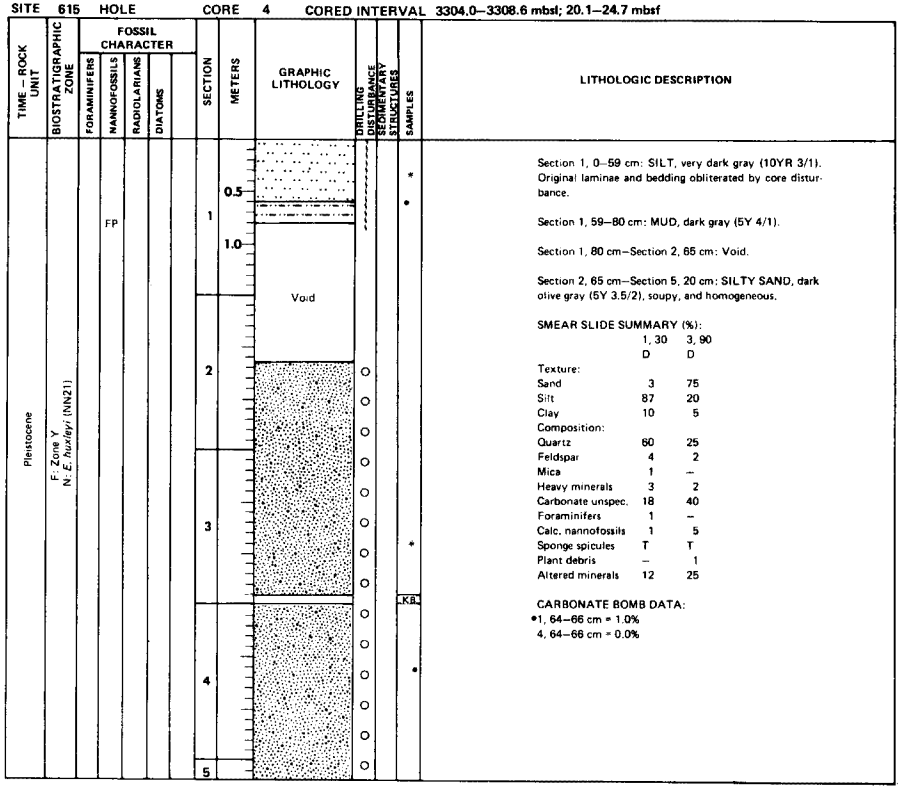
Section 3–Core Catcher: SAND, dark olive gray (5Y 3.5/2) and slightly soupy. Appear to be fining-upwards sequences within the sand in Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 50 D	2, 100 D	3, 110 D	4, 125 D	5, 100 D
Texture:					
Sand	0	85	55	70	60
Silt	65	13	35	20	37
Clay	35	2	10	10	3
Composition:					
Quartz	80	17	22	90	24
Feldspar	1	1	2	5	3
Mica	2	1	1	2	1
Heavy minerals	1	4	2	3	3
Glauconite	1	–	–	–	–
Carbonate unspec.	15	40	35	T	35
Foraminifers	–	–	–	–	T
Calc. nannofossils	–	2	10	–	3
Sponge spicules	–	T	–	–	T
Plant debris	–	5	3	–	1
Altered minerals	–	30	25	–	30

CARBONATE BOMB DATA:
•1, 5–7 cm = 1.0%
1, 136–138 cm = 2.0%
3, 61–63 cm = 0.5%
5, 95–97 cm = 0.0%

SITE 615 HOLE CORE 4 CORED INTERVAL 3304.0–3308.6 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–59 cm: SILT, very dark gray (10YR 3/1). Original laminae and bedding obliterated by core disturbance.

Section 1, 59–80 cm: MUD, dark gray (5Y 4/1).

Section 1, 80 cm–Section 2, 65 cm: Void.

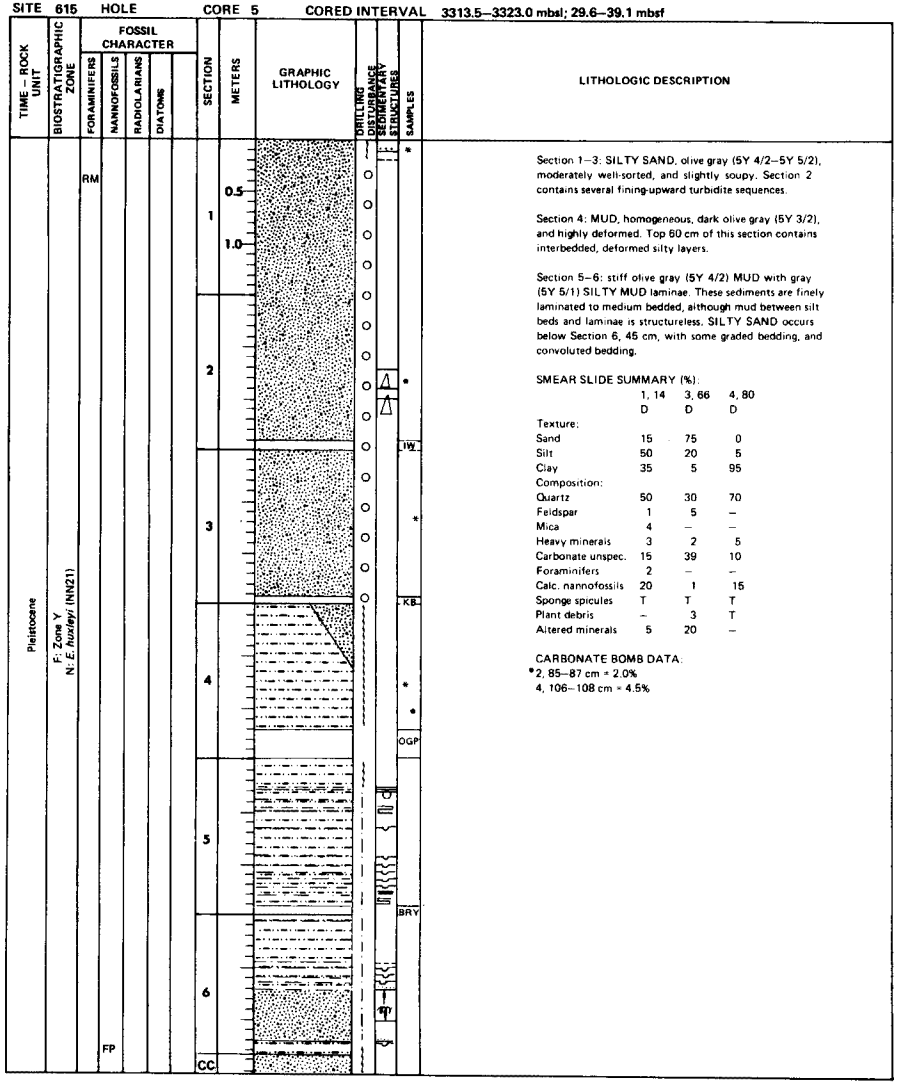
Section 2, 65 cm–Section 5, 20 cm: SILTY SAND, dark olive gray (5Y 3.5/2), soupy, and homogeneous.

SMEAR SLIDE SUMMARY (%):

	1, 30 D	3, 90 D
Texture:		
Sand	3	75
Silt	87	20
Clay	10	5
Composition:		
Quartz	60	25
Feldspar	4	2
Mica	1	–
Heavy minerals	3	2
Carbonate unspec.	18	40
Foraminifers	1	–
Calc. nannofossils	1	5
Sponge spicules	T	T
Plant debris	–	1
Altered minerals	12	25

CARBONATE BOMB DATA:
•1, 64–66 cm = 1.0%
4, 64–66 cm = 0.0%

SITE 615 HOLE CORE 5 CORED INTERVAL 3313.5–3323.0 mbsl; 29.6–39.1 mbsf



Section 1–3: SILTY SAND, olive gray (5Y 4/2–5Y 5/2), moderately well-sorted, and slightly soupy. Section 2 contains several fining-upward turbidite sequences.

Section 4: MUD, homogeneous, dark olive gray (5Y 3/2), and highly deformed. Top 60 cm of this section contains interbedded, deformed silty layers.

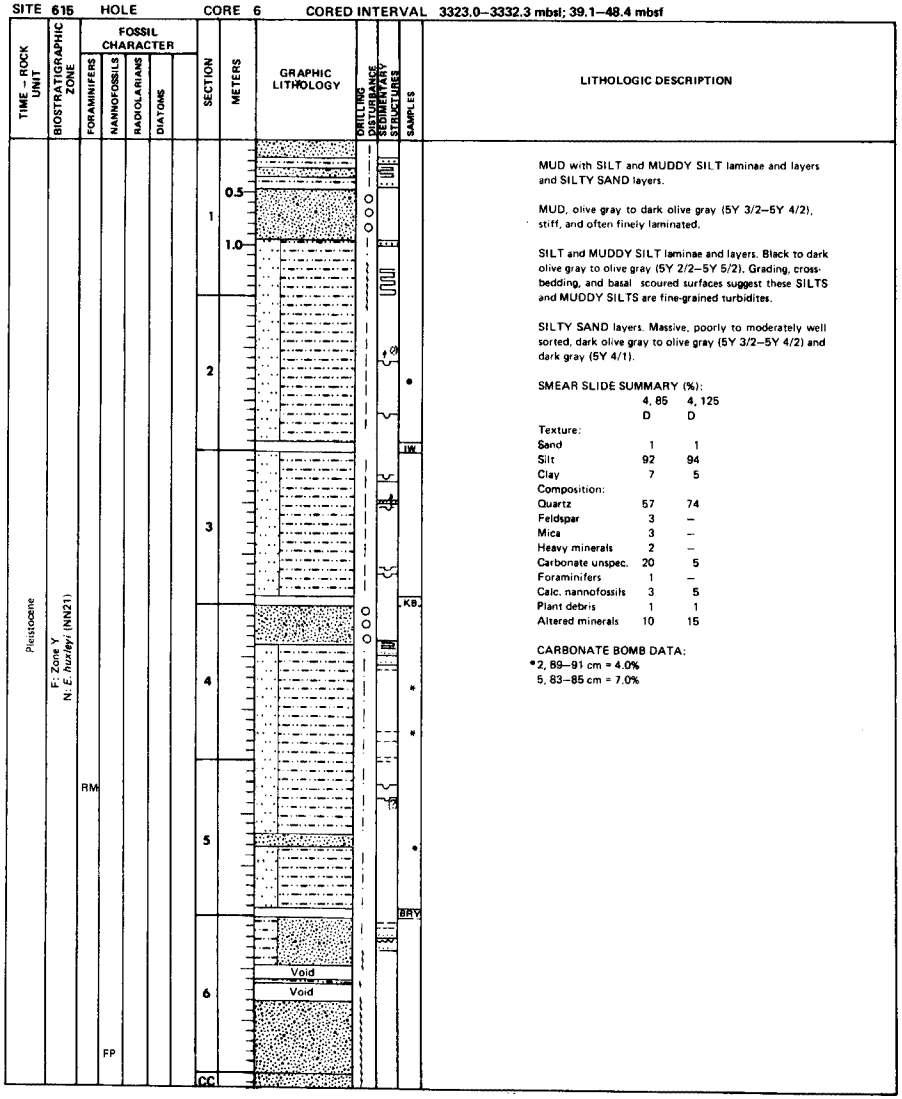
Section 5–6: stiff olive gray (5Y 4/2) MUD with gray (5Y 5/1) SILTY MUD laminae. These sediments are finely laminated to medium bedded, although mud between silt beds and laminae is structureless. SILTY SAND occurs below Section 6, 45 cm, with some graded bedding, and convoluted bedding.

SMEAR SLIDE SUMMARY (%):

	1, 14 D	3, 66 D	4, 80 D
Texture:			
Sand	15	75	0
Silt	50	20	5
Clay	35	5	95
Composition:			
Quartz	50	30	70
Feldspar	1	5	–
Mica	4	–	–
Heavy minerals	3	2	5
Carbonate unspec.	15	39	10
Foraminifers	2	–	–
Calc. nannofossils	20	1	15
Sponge spicules	T	T	T
Plant debris	–	3	T
Altered minerals	5	20	–

CARBONATE BOMB DATA:
*2, 85–87 cm = 2.0%
4, 106–108 cm = 4.5%

SITE 615 HOLE CORE 6 CORED INTERVAL 3323.0–3332.3 mbsl; 39.1–48.4 mbsf



MUD with SILT and MUDDY SILT laminae and layers and SILTY SAND layers.

MUD, olive gray to dark olive gray (5Y 3/2–5Y 4/2), stiff, and often finely laminated.

SILT and MUDDY SILT laminae and layers. Black to dark olive gray to olive gray (5Y 2/2–5Y 5/2). Grading, cross-bedding, and basal scoured surfaces suggest these SILTS and MUDDY SILTS are fine-grained turbidites.

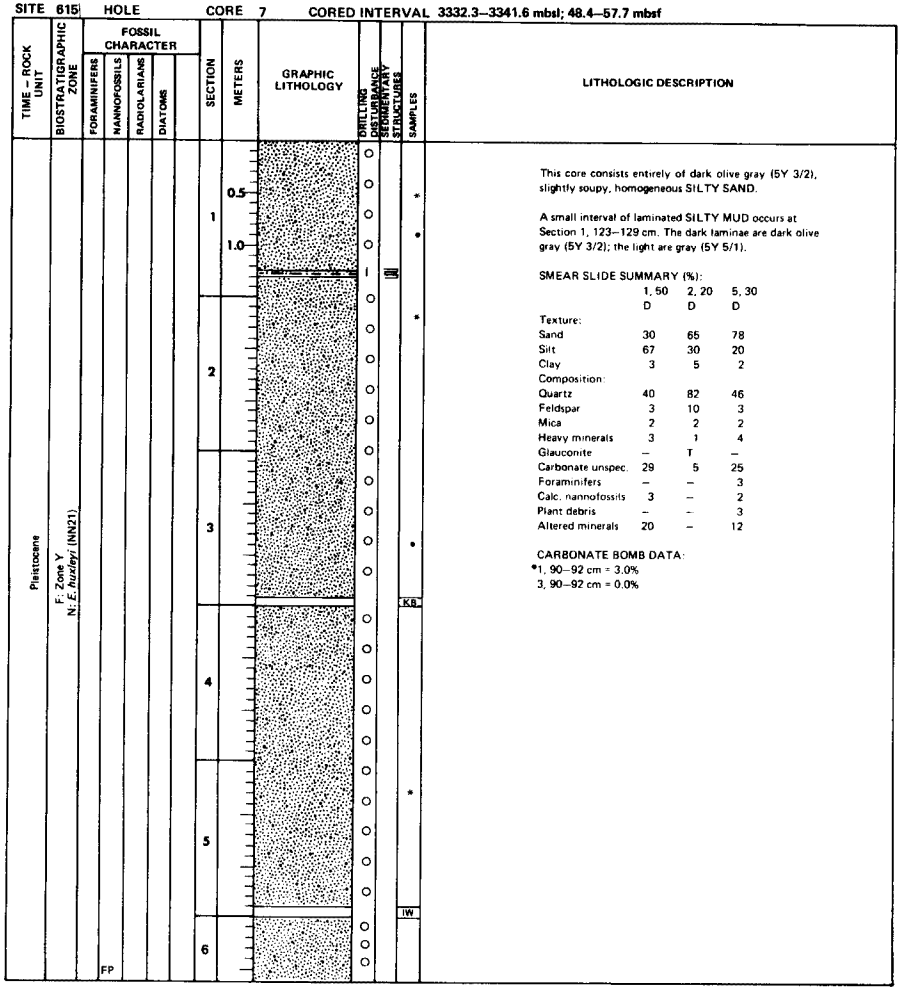
SILTY SAND layers. Massive, poorly to moderately well sorted, dark olive gray to olive gray (5Y 3/2–5Y 4/2) and dark gray (5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	4, 85 D	4, 125 D
Texture:		
Sand	1	1
Silt	92	94
Clay	7	5
Composition:		
Quartz	57	74
Feldspar	3	–
Mica	3	–
Heavy minerals	2	–
Carbonate unspec.	20	5
Foraminifers	1	–
Calc. nannofossils	3	5
Plant debris	1	1
Altered minerals	10	15

CARBONATE BOMB DATA:
*2, 89–91 cm = 4.0%
5, 83–85 cm = 7.0%

SITE 615 HOLE CORE 7 CORED INTERVAL 3332.3–3341.6 mbsl; 48.4–57.7 mbsf



LITHOLOGIC DESCRIPTION

This core consists entirely of dark olive gray (5Y 3/2), slightly soupy, homogeneous SILTY SAND.

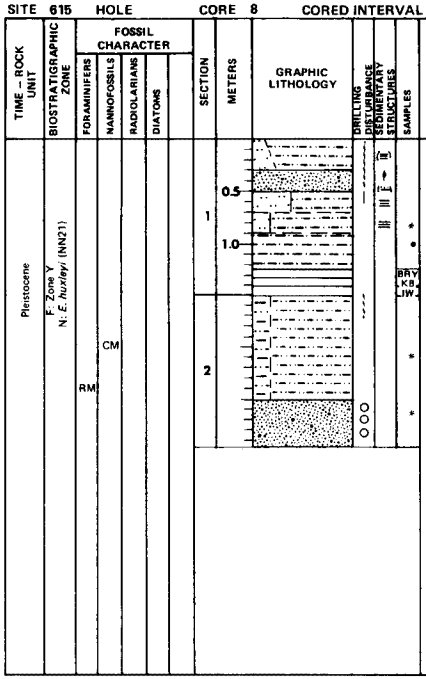
A small interval of laminated SILTY MUD occurs at Section 1, 123–129 cm. The dark laminae are dark olive gray (5Y 3/2); the light are gray (5Y 5/1).

SMEAR SLIDE SUMMARY (%):

	1, 50 D	2, 20 D	5, 30 D
Texture:			
Sand	30	65	78
Silt	67	30	20
Clay	3	5	2
Composition:			
Quartz	40	82	46
Feldspar	3	10	3
Mica	2	2	2
Heavy minerals	3	1	4
Glauconite	–	T	–
Carbonate unspec.	29	5	25
Foraminifers	–	–	3
Calc. nannofossils	3	–	2
Plant debris	–	–	3
Altered minerals	20	–	12

CARBONATE BOMB DATA:
*1, 90–92 cm = 3.0%
3, 90–92 cm = 0.0%

SITE 615 HOLE CORE 8 CORED INTERVAL 3341.6–3344.6 mbsl; 57.7–60.7 mbsf



LITHOLOGIC DESCRIPTION

Interbedded SILTY SAND (5Y 3/2), SILT-LAMINATED MUD (5Y 3/1, 5Y 5.5/2), and SILTY or SANDY MUD (5Y 4/2–5Y 2/2).

SILTY SAND: homogeneous, lower part completely disturbed.

SILT-LAMINATED MUD: variable frequency of very fine silt laminae, commonly scoured bases and sharp tops.

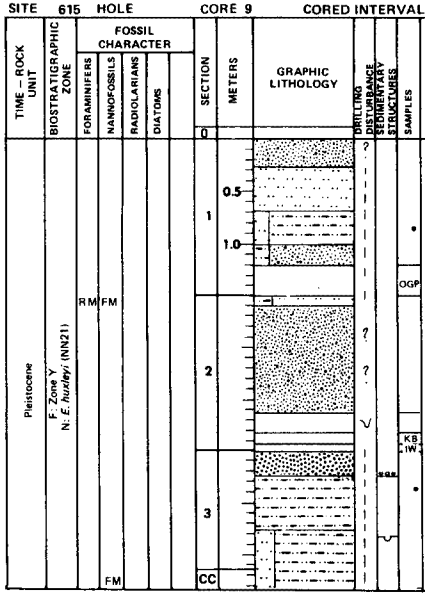
SILTY-SANDY MUD: very poorly sorted, homogeneous, sometimes disturbed structures, positive grading evident in one bed.

SMEAR SLIDE SUMMARY (%):

	1, 86 D	2, 61 D	2, 116 D
Texture:			
Sand	0	20	60
Silt	95	70	35
Clay	5	10	5
Composition:			
Quartz	66	50	39
Feldspar	1	2	5
Mica	1	2	2
Heavy minerals	1	1	3
Carbonate unspec.	25	30	25
Foraminifers	–	10	15
Calc. nannofossils	3	5	5
Plant debris	1	T	1
Altered minerals	2	–	5

CARBONATE BOMB DATA:
*1, 105–107 cm = 0.0%

SITE 615 HOLE CORE 9 CORED INTERVAL 3351.1–3355.6 mbsl; 67.2–71.7 mbsf

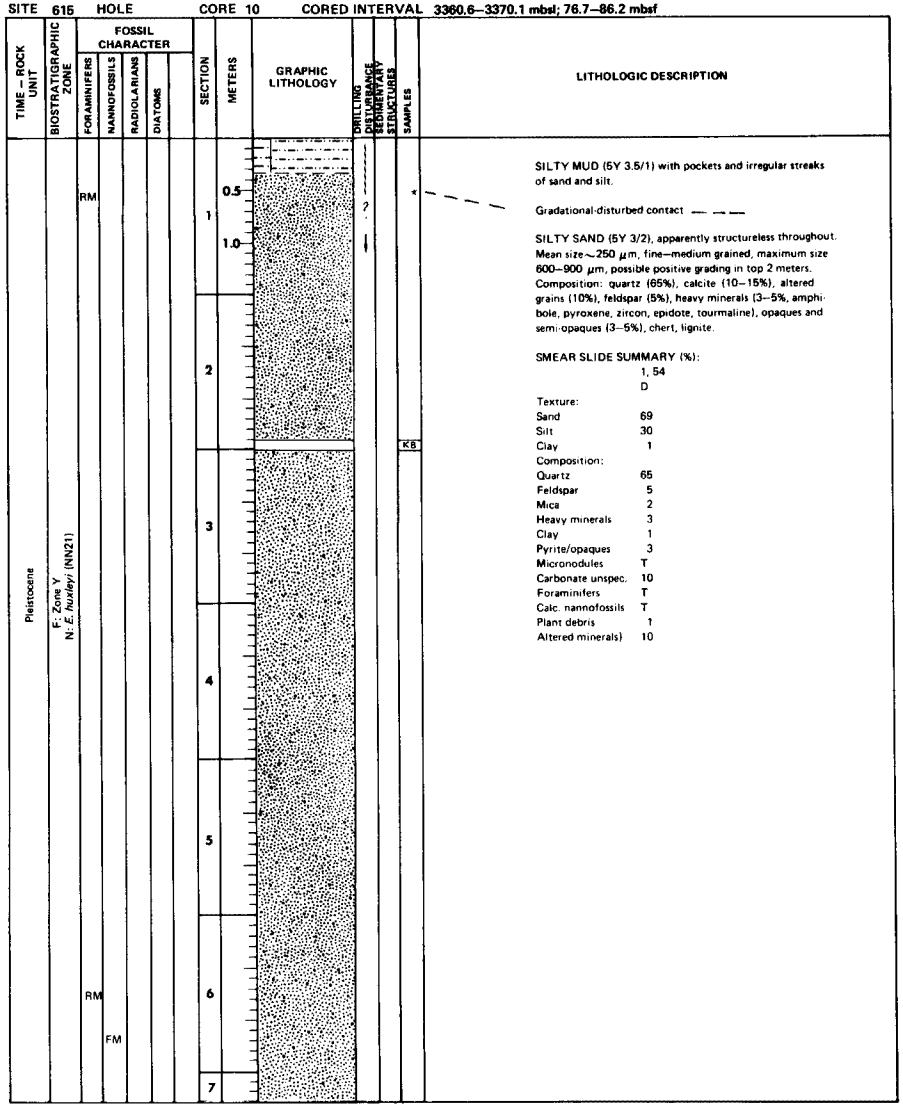


LITHOLOGIC DESCRIPTION

INTERBEDDED SILTY SAND (5Y 3.5/2), SILTY MUD (5Y 3/2) and SILT-LAMINATED MUD (5Y 3/2–5Y 5/2) – same as Core 615-8.

CARBONATE BOMB DATA:
*1, 89–91 cm = 1.5%
3, 40–42 cm = 1.5%

SITE 615 HOLE CORE 10 CORED INTERVAL 3360.6–3370.1 mbsl; 76.7–86.2 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD (5Y 3.5/1) with pockets and irregular streaks of sand and silt.

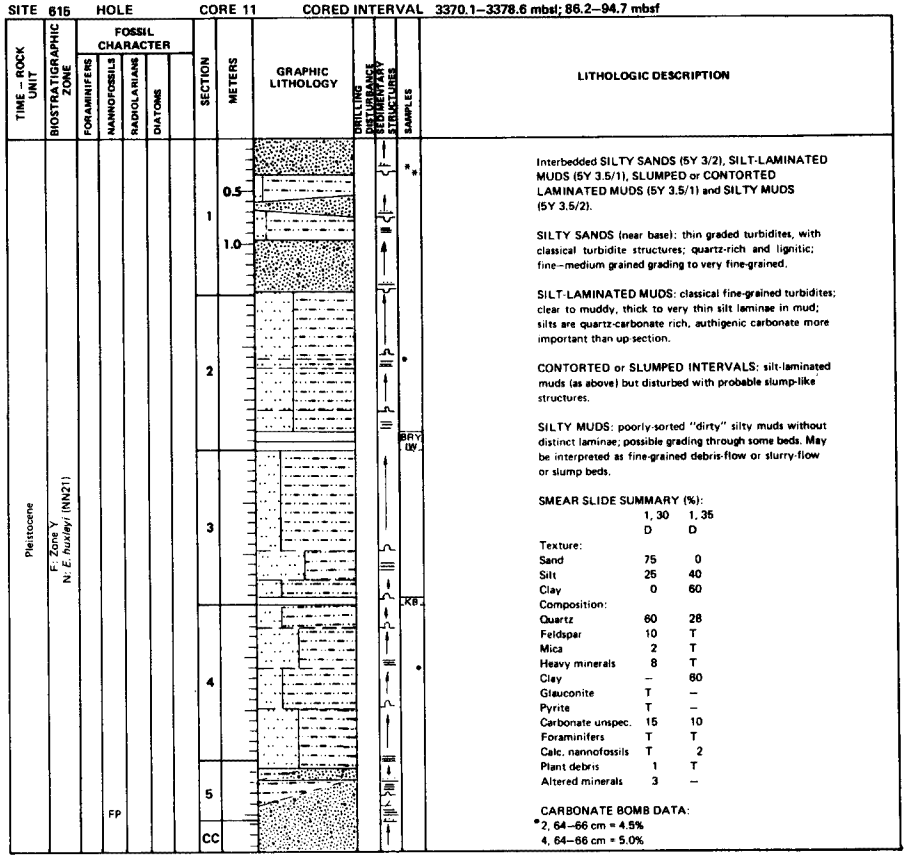
Gradational-disturbed contact

SILTY SAND (5Y 3/2), apparently structureless throughout. Mean size ~250 μm, fine–medium grained, maximum size 600–900 μm, possible positive grading in top 2 meters. Composition: quartz (65%), calcite (10–15%), altered grains (10%), feldspar (5%), heavy minerals (3–5%, amphibole, pyroxene, zircon, epidote, tourmaline), opaques and semi-opaques (3–5%), chert, lignite.

SMEAR SLIDE SUMMARY (%):

	1, 54 D
Texture:	
Sand	69
Silt	30
Clay	1
Composition:	
Quartz	65
Feldspar	5
Mica	2
Heavy minerals	3
Clay	1
Pyrite/opaques	3
Micronodules	T
Carbonate unspec.	10
Foraminifers	T
Calc. nannofossils	T
Plant debris	1
Altered minerals)	10

SITE 615 HOLE CORE 11 CORED INTERVAL 3370.1–3378.6 mbsl; 86.2–94.7 mbsf



LITHOLOGIC DESCRIPTION

Interbedded SILTY SANDS (5Y 3/2), SILT-LAMINATED MUDS (5Y 3.5/1), SLUMPED or CONTORTED LAMINATED MUDS (5Y 3.5/1) and SILTY MUDS (5Y 3.5/2).

SILTY SANDS (near base): thin graded turbidites, with classical turbidite structures; quartz-rich and lignitic; fine–medium grained grading to very fine-grained.

SILT-LAMINATED MUDS: classical fine-grained turbidites; clear to muddy, thick to very thin silt laminae in mud; silts are quartz-carbonate rich, authigenic carbonate more important than up-section.

CONTORTED or SLUMPED INTERVALS: silt-laminated muds (as above) but disturbed with probable slump-like structures.

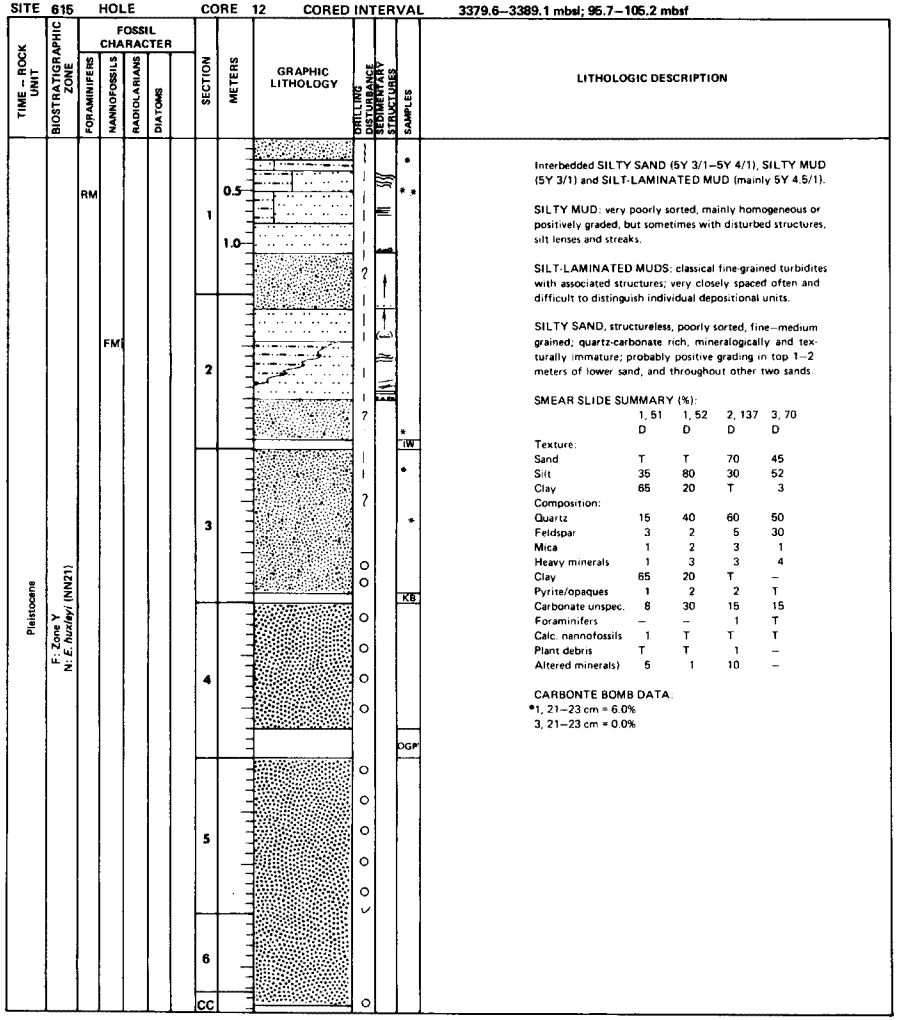
SILTY MUDS: poorly-sorted "dirty" silty muds without distinct laminae; possible grading through some beds. May be interpreted as fine-grained debris-flow or slurry-flow or slump beds.

SMEAR SLIDE SUMMARY (%):

	1, 30 D	1, 35 D
Texture:		
Sand	75	0
Silt	25	40
Clay	0	60
Composition:		
Quartz	60	28
Feldspar	10	T
Mica	2	T
Heavy minerals	8	T
Clay	–	60
Glauconite	T	–
Pyrite	T	–
Carbonate unspec.	15	10
Foraminifers	T	T
Calc. nannofossils	T	2
Plant debris	1	T
Altered minerals	3	–

CARBONATE BOMB DATA:
*2, 64–66 cm = 4.5%
4, 64–66 cm = 5.0%

SITE 615 HOLE CORE 12 CORED INTERVAL 3379.6–3389.1 mbsl; 95.7–105.2 mbsf



LITHOLOGIC DESCRIPTION

Interbedded SILTY SAND (5Y 3/1–5Y 4/1), SILTY MUD (5Y 3/1) and SILT-LAMINATED MUD (mainly 5Y 4.5/1).

SILTY MUD: very poorly sorted, mainly homogeneous or positively graded, but sometimes with disturbed structures, silt lenses and streaks.

SILT-LAMINATED MUDS: classical fine-grained turbidites with associated structures; very closely spaced often and difficult to distinguish individual depositional units.

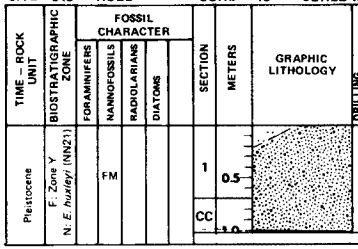
SILTY SAND, structureless, poorly sorted, fine–medium grained; quartz-carbonate rich, mineralogically and texturally immature; probably positive grading in top 1–2 meters of lower sand, and throughout other two sands.

SMEAR SLIDE SUMMARY (%):

	1, 51 D	1, 52 D	2, 137 D	3, 70 D
Texture:				
Sand	T	T	70	45
Silt	35	80	30	52
Clay	65	20	T	3
Composition:				
Quartz	15	40	60	50
Feldspar	3	2	5	30
Mica	1	2	3	1
Heavy minerals	1	3	3	4
Clay	65	20	T	–
Pyrite/opaques	1	2	2	T
Carbonate unspec.	8	30	15	15
Foraminifers	–	–	1	T
Calc. nannofossils	1	T	T	T
Plant debris	T	T	1	–
Altered minerals)	5	1	10	–

CARBONTE BOMB DATA:
*1, 21–23 cm = 6.0%
3, 21–23 cm = 0.0%

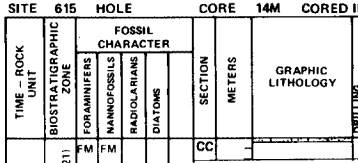
SITE 615 HOLE CORE 13 CORED INTERVAL 3389.1–3393.9 mbsl; 105.2–110.0 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND, 5Y 3/2, structureless apart from disturbed laminated silt towards the top; fine–medium grained; quartz-rich, lignitic.

SITE 615 HOLE CORE 14M CORED INTERVAL 3398.6 mbsl; 114.7 mbsf



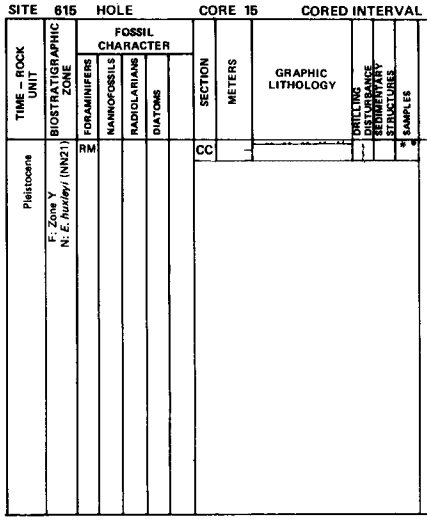
LITHOLOGIC DESCRIPTION

Two cm Core Catcher sample of gravelly muddy silty SAND. Very poorly sorted. Mixed immature composition including rock fragments, biogenics, rounded/polished quartz grains, feldspars, carbonates, micas, heavies, opaques, mica, etc. (from sieved sample).

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	50
Silt	30
Clay	20
Composition:	
Quartz	48
Feldspar	5
Mica	2
Heavy minerals	5
Clay	20
Glauconite	T
Pyrite	T
Carbonate unspec.	15
Foraminifers	1
Plant debris	2
Shell debris	2

SITE 615 HOLE CORE 15 CORED INTERVAL 3408.1–3410.0 mbsl; 124.2–126.1 mbsf



LITHOLOGIC DESCRIPTION

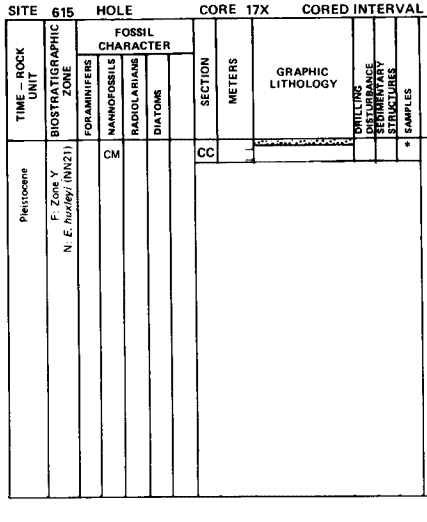
Two cm Core Catcher sample of very firm silty mud–muddy silt; quartz-carbonate rich silt.

SMEAR SLIDE SUMMARY (%):

	CC
Texture:	
Sand	0
Silt	90
Clay	10
Composition:	
Quartz	54
Feldspar	2
Mica	T
Heavy minerals	3
Clay	10
Glauconite	1
Pyrite	T
Carbonate unspec.	30
Calc. nannofossils	T
Plant debris	T

CARBONATE BOMB DATA:
*CC, 0–2 cm = 11.5%

SITE 615 HOLE CORE 17X CORED INTERVAL 3427.1–3436.6 mbsl; 143.2–152.7 mbsf



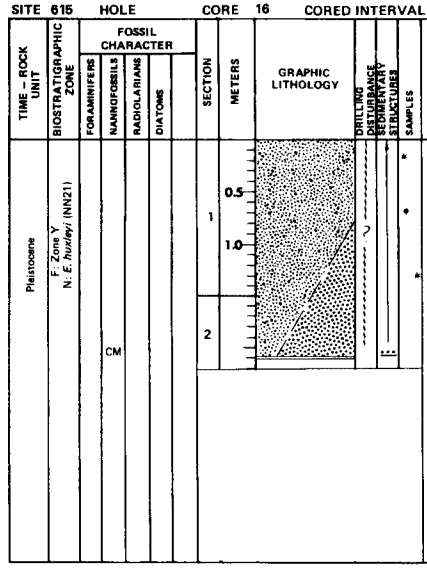
LITHOLOGIC DESCRIPTION

Core consisted of only 4 cm of medium-grained SAND in the Core Catcher. Maximum grain size ~ 1000 μm; mean μ300 μm. The SAND is poorly sorted and consists of quartz and authigenic calcite (replaces forams) + minor shell fragments. Overall color is dark olive gray (5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	87
Silt	10
Clay	3
Composition:	
Quartz	25
Feldspar	2
Mica	2
Heavy minerals	3
Carbonate unspec.	60
Calc. nannofossils	1
Sponge spicules	T
Plant debris	2
Altered minerals	5

SITE 615 HOLE CORE 16 CORED INTERVAL 3417.6–3419.9 mbsl; 133.7–136.0 mbsf



LITHOLOGIC DESCRIPTION

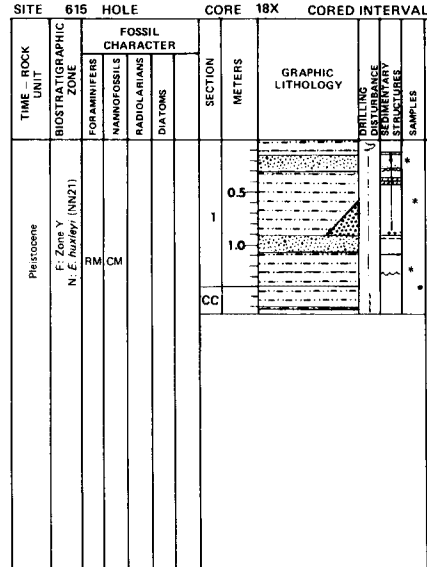
SAND grading to SILTY SAND (5Y 3.5/2) (problems with coring, possibly disturbed) coarse sand at base → very fine sand at top; otherwise structureless; composition: quartz, feldspar, calcite, heavy minerals, opaques, forams, lignite; clay ball and clasts near base.

SMEAR SLIDE SUMMARY (%):

	1, 20 D	1, 130 D
Texture:		
Sand	85	85
Silt	15	15
Clay	T	T
Composition:		
Quartz	65	63
Feldspar	6	5
Mica	2	T
Heavy minerals	5	5
Glauconite	T	T
Pyrite/opaques	5	5
Carbonate unspec.	5	10
Foraminifers	1	T
Plant debris	1	2
Altered minerals	10	10

CARBONATE BOMB DATA:
*1, 70–72 cm = 1.0%

SITE 615 HOLE CORE 18X CORED INTERVAL 3436.6–3446.1 mbsl; 152.7–162.2 mbsf



LITHOLOGIC DESCRIPTION

MUD and SILTY MUD with 2 SILTY SAND beds.

MUD and SILTY MUD is dominantly dark olive black (5Y 2/2) and commonly includes silty sand blebs. SILTY MUD at 25–90 cm has indistinct very thin beds grading to MUD above 70 cm. These very thin beds – thick laminae are absent in the MUD section. There are two crossbedded silt laminae at 32–33 cm and 37 cm.

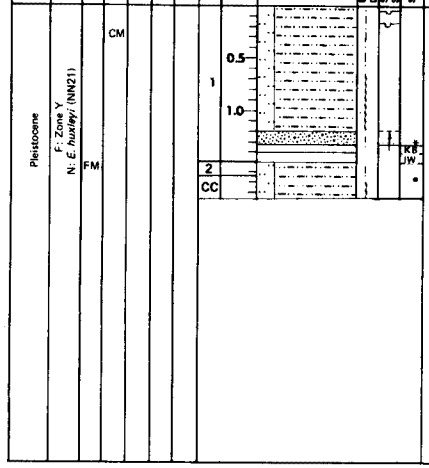
SILTY SAND beds are very dark gray (5Y 3/1), poorly sorted, quartz-carbonate rich, and probably graded.

SMEAR SLIDE SUMMARY (%):

	1, 20 D	1, 60 D	1, 125 D
Texture:			
Sand	70	0	T
Silt	20	5	15
Clay	10	95	85
Composition:			
Quartz	18	2	9
Feldspar	5	1	T
Mica	1	T	1
Heavy minerals	1	1	1
Clay	–	85	75
Carbonate unspec.	40	–	8
Calc. nannofossils	10	10	5
Plant debris	3	1	1
Altered minerals	25	–	–

CARBONATE BOMB DATA:
*CC, 7–9 cm = 0.5%

SITE 615 HOLE CORE 19X CORED INTERVAL 3446.1–3455.6 mbsl; 162.2–171.7 mbsf



LITHOLOGIC DESCRIPTION

SILT-LAMINATED MUD (mainly dark olive gray (5Y 3/2)) and SILTY SAND (also 5Y 3/2).

SILT-LAMINATED MUDS include a few thin organic-rich layers and blebs (black (2.5Y 2/N2)). Interval from 68–120 cm is very deformed by drilling.

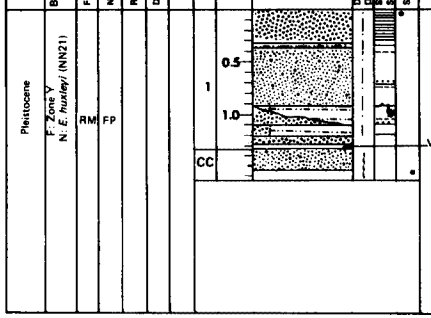
SILTY SAND at Section 1, 120–130 cm is graded from fine sand to very fine sand.

SMEAR SLIDE SUMMARY (%):

	1, 130 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	3
Feldspar	3
Mica	1
Heavy minerals	2
Clay	80
Foraminifers	T
Calc. nannofossils	10
Plant debris	1

CARBONATE BOMB DATA:
*CC, 6–8 cm = 1.5%

SITE 615 HOLE CORE 21X CORED INTERVAL 3465.1–3474.6 mbsl; 181.2–190.7 mbsf



LITHOLOGIC DESCRIPTION

Interbedded SAND, SILT-LAMINATED MUD, and SILTY MUD.

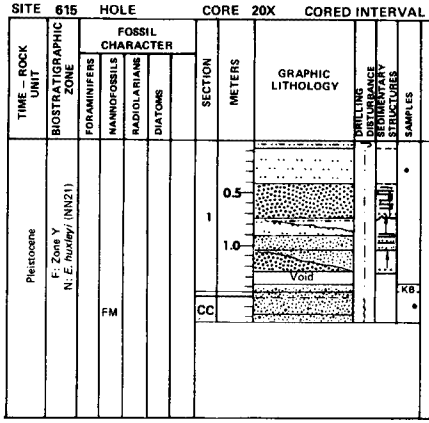
SAND: Fine- to medium-grained, very thin bedded or homogeneous, very dark gray to olive gray (5Y 3/1–5Y 3/2). One sand depositional unit from 35–90 cm with a scoured base; sand appears massive, but may be thinnly laminated about 62 cm and graded above 41 cm.

SILT-LAMINATED MUD at 32–35 cm, dark olive gray (5Y 3/2). Six thin laminae.

SILTY MUD, dark olive gray (5Y 3/2). Much of this seems to be remolded, deformed, and incorporated with MUD and SAND.

CARBONATE BOMB DATA:
*1, 5–7 cm = 0.0%
CC, 25–27 cm = 5.0%

SITE 615 HOLE CORE 20X CORED INTERVAL 3455.6–3465.1 mbsl; 171.7–181.2 mbsf



LITHOLOGIC DESCRIPTION

Interbedded MUD, SILT, and SILTY SAND.

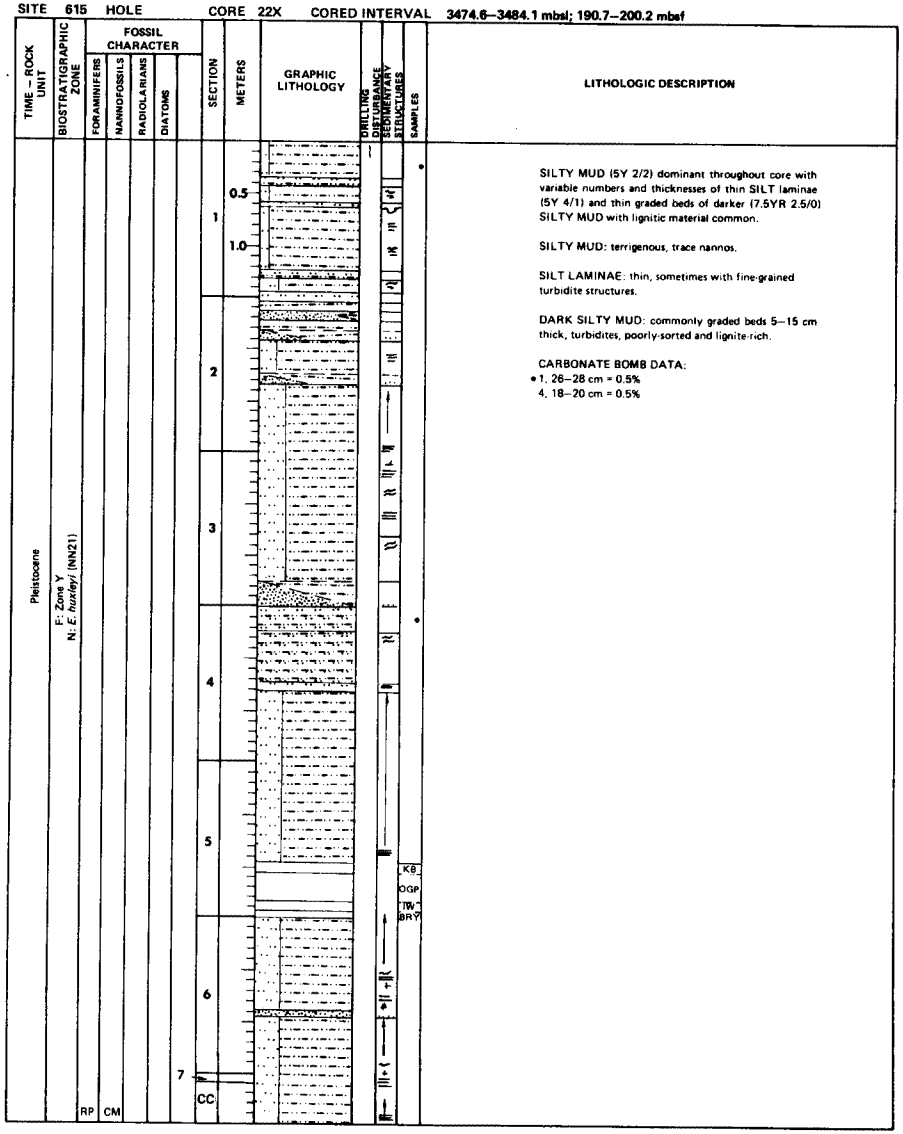
MUDS are olive gray to black (5Y 4/2–5Y 2/2) and homogeneous.

SILTS are dark olive gray to black (5Y 3/2–5Y 2/2) and organic-rich. The organic-rich SILT at Section 1, 77–90 cm grades up section to MUD.

SILTY SANDS are dark olive gray (5Y 3/2–5Y 3.5/2), fine- to medium-graded, thickly-laminated to thinnly-bedded, and normally-graded.

CARBONATE BOMB DATA:
*1, 30–32 cm = 0.5%
CC, 18–20 cm = 0.0%

SITE 615 HOLE CORE 22X CORED INTERVAL 3474.6–3484.1 mbsl; 190.7–200.2 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD (5Y 2/2) dominant throughout core with variable numbers and thicknesses of thin SILT laminae (5Y 4/1) and thin graded beds of darker (7.5YR 2.5/0) SILTY MUD with lignitic material common.

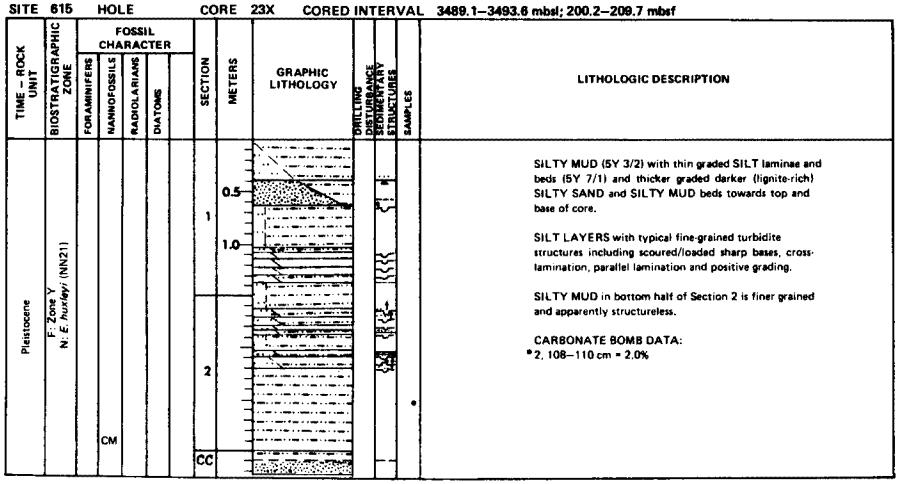
SILTY MUD: terrigenous, trace nannos.

SILT LAMINAE: thin, sometimes with fine-grained turbidite structures.

DARK SILTY MUD: commonly graded beds 5–15 cm thick, turbidites, poorly-sorted and lignite-rich.

CARBONATE BOMB DATA:
• 1, 26–28 cm = 0.5%
4, 18–20 cm = 0.5%

SITE 615 HOLE CORE 23X CORED INTERVAL 3489.1–3493.6 mbsl; 200.2–209.7 mbsf



LITHOLOGIC DESCRIPTION

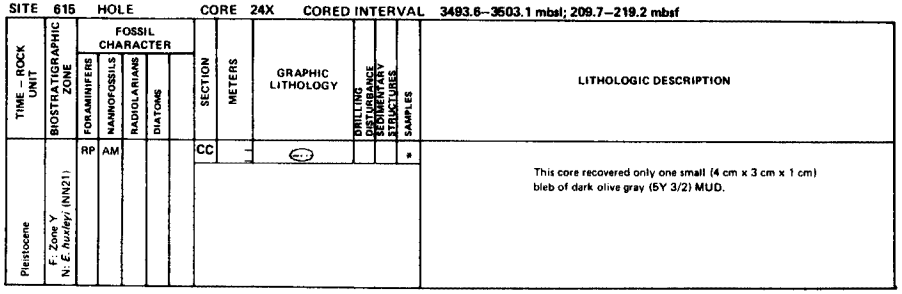
SILTY MUD (5Y 3/2) with thin graded SILT laminae and beds (5Y 7/1) and thicker graded darker (lignite-rich) SILTY SAND and SILTY MUD beds towards top and base of core.

SILT LAYERS with typical fine-grained turbidite structures including scoured/loaded sharp bases, cross-lamination, parallel lamination and positive grading.

SILTY MUD in bottom half of Section 2 is finer grained and apparently structureless.

CARBONATE BOMB DATA:
• 2, 108–110 cm = 2.0%

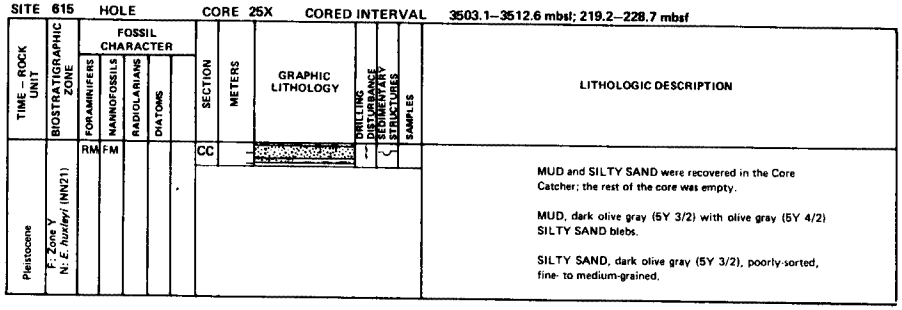
SITE 615 HOLE CORE 24X CORED INTERVAL 3493.6–3503.1 mbsl; 209.7–219.2 mbsf



LITHOLOGIC DESCRIPTION

This core recovered only one small (4 cm x 3 cm x 1 cm) bleb of dark olive gray (5Y 3/2) MUD.

SITE 615 HOLE CORE 25X CORED INTERVAL 3503.1–3512.6 mbsl; 219.2–228.7 mbsf



LITHOLOGIC DESCRIPTION

MUD and SILTY SAND were recovered in the Core Catcher; the rest of the core was empty.

MUD, dark olive gray (5Y 3/2) with olive gray (5Y 4/2) SILTY SAND blebs.

SILTY SAND, dark olive gray (5Y 3/2), poorly-sorted, fine- to medium-grained.

SITE 615 HOLE CORE 26X CORED INTERVAL 3512.6–3522.1 mbsl; 228.7–238.2 mbsf

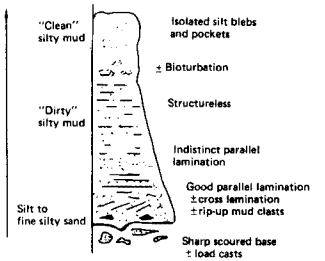
TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F; Zone Y N; *E. huxleyi* (NN21)	FM	CM			CC			○		•	About 4 cm disturbed soupy sediment in Core Catcher: SILTY MUD, quartz/carbonate-rich silt fraction; and some nannos and calcareous needles.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	–
Silt	35
Clay	65
Composition:	
Quartz	20
Feldspar	T
Mica	T
Heavy minerals	T
Clay	65
Pyrite	T
Carbonate unspec.	10
Foraminifers	T
Plant debris	T

SITE 615 HOLE CORE 27X CORED INTERVAL 3522.1–3531.6 mbsl; 238.2–247.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F; Zone Y N; *E. huxleyi* (NN21)	RM	CM			1 2 CC	0.5 1.0				KB IW *	Interbedded MUDS, SILTY MUDS, and SILTY SANDS (5Y 5/2 ⟶ 5Y 3.5/2) arranged in FOUR organized turbidites as below:



Some thin SILT turbidites between thicker beds.

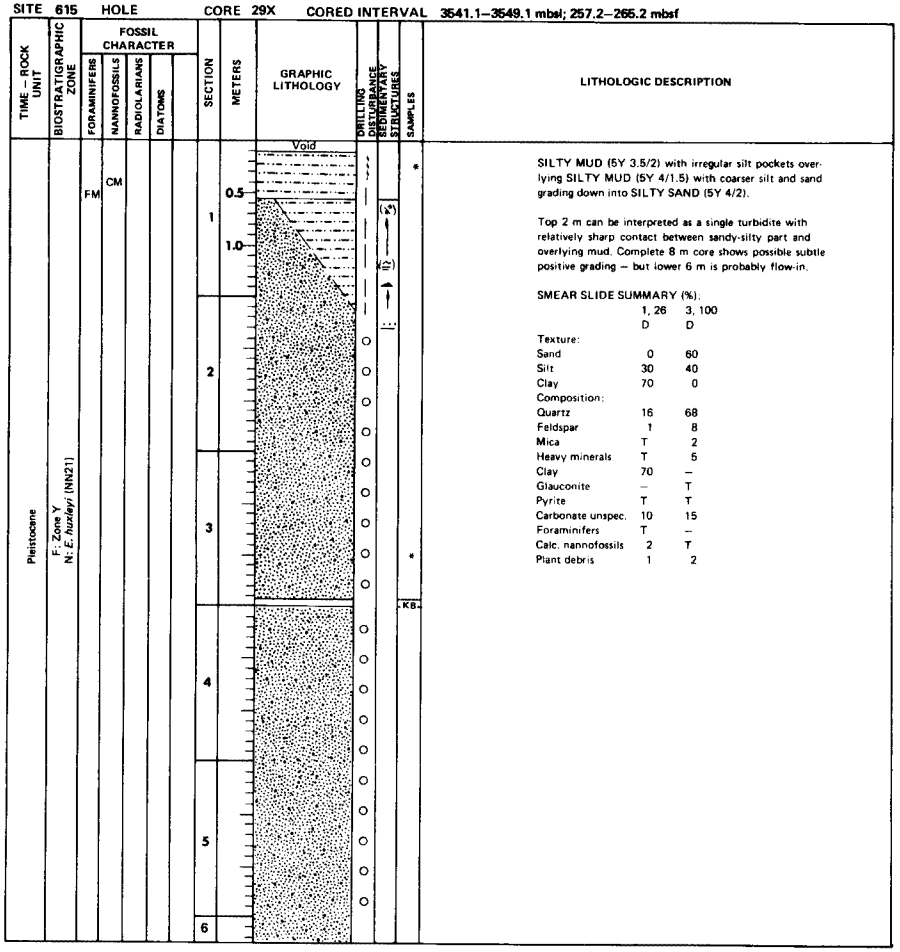
SMEAR SLIDE SUMMARY (%):

	2, 44 D
Texture:	
Sand	40
Silt	55
Clay	5
Composition:	
Quartz	50
Feldspar	5
Mica	3
Heavy minerals	5
Clay	5
Glauconite	T
Pyrite	T
Carbonate unspec.	30
Foraminifers	T
Calc. nannofossils	1
Plant debris	1

SITE 615 HOLE CORE 28X CORED INTERVAL 3531.6–3541.1 mbsl; 247.7–257.2 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F; Zone Y N; *E. huxleyi* (NN21)	FM	FM			1 CC	0.5 1.0	Void				Interbedded MUD (5Y 3.5/2), SILTY SAND (5Y 4/2–5Y 5/2) and SILTY MUD (5Y 3.5/2) with indication of turbidite structures – but whole of first section disturbed. Core Catcher has clear 15 cm thick turbidite.

SITE 615 HOLE CORE 29X CORED INTERVAL 3541.1–3549.1 mbsl; 257.2–265.2 mbsf



LITHOLOGIC DESCRIPTION

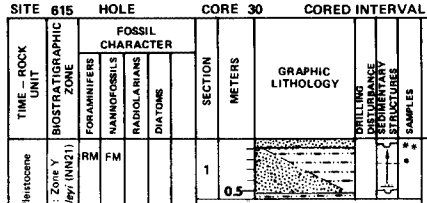
SILTY MUD (5Y 3.5/2) with irregular silt pockets overlying SILTY MUD (5Y 4/1.5) with coarser silt and sand grading down into SILTY SAND (5Y 4/2).

Top 2 m can be interpreted as a single turbidite with relatively sharp contact between sandy-silty part and overlying mud. Complete 8 m core shows possible subtle positive grading – but lower 6 m is probably flow-in.

SMEAR SLIDE SUMMARY (%):

	1, 26 D	3, 100 D
Texture:		
Sand	0	60
Silt	30	40
Clay	70	0
Composition:		
Quartz	16	68
Feldspar	1	8
Mica	T	2
Heavy minerals	T	5
Clay	70	–
Glauconite	–	T
Pyrite	T	T
Carbonate unspec.	10	15
Foraminifers	T	–
Calc. nannofossils	2	T
Plant debris	1	2

SITE 615 HOLE CORE 30 CORED INTERVAL 3550.6–3551.6 mbsl; 266.7–267.7 mbsf



LITHOLOGIC DESCRIPTION

SILTY SAND (5Y 3/2) representing base of turbidite overlying SILTY MUD (5Y 2.5/2) grading down into SILTY SAND (5Y 3/2). Thin SILTY MUD at base.

Middle part of core is probably a 40 cm thick turbidite with clear positive grading.

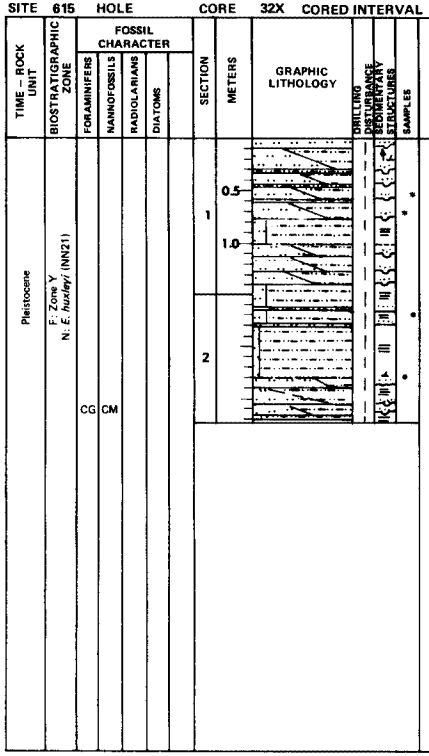
SMEAR SLIDE SUMMARY (%):

	1, 7 D	1, 9 D
Texture:		
Sand	15	1
Silt	60	40
Clay	25	59
Composition:		
Quartz	55	20
Feldspar	5	3
Mica	1	2
Heavy minerals	2	3
Clay	25	59
Glauconite	–	T
Pyrite	T	T
Micronodules	–	T
Carbonate unspec.	10	12
Foraminifers	T	T
Calc. nannofossils	T	T
Plant debris	1	1
Altered minerals	1	–

CARBONATE BOMB DATA:
*1, 29–31 cm = 4.5%

Note: Core 31X, 3560.1–3569.6 mbsl; 276.2–285.7 mbsf: no recovery.

SITE 615 HOLE CORE 32X CORED INTERVAL 3569.6–3579.1 mbsl; 285.7–295.2 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD (5Y 3.5/1) with variable frequency and thickness of thin SILT laminae (5Y 4.5/2) and thicker SILT and darker SILTY MUD beds (5Y 4/2).

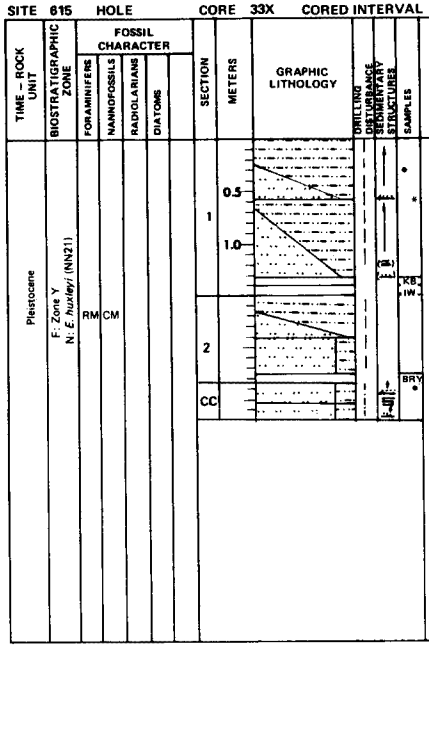
- Silt laminae can be very thin and structures barely distinguishable.
- Silt beds and dark silty-mud beds are positively graded and with a range of turbidite structures. At least two types of turbidites apparent:
  (a) fine, clean, well-sorted and well laminated silt turbidites; and
  (b) "dirty" coarser, poorly sorted, less well structured and commonly lignitic silty mud turbidites.

SMEAR SLIDE SUMMARY (%):

	1, 56 D	1, 72 D
Texture:		
Sand	0	60
Silt	35	35
Clay	65	5
Composition:		
Quartz	10	53
Feldspar	2	12
Mica	T	3
Heavy minerals	2	5
Clay	65	5
Glauconite	–	T
Pyrite	T	T
Micronodules	T	–
Carbonate unspec.	8	10
Foraminifers	T	T
Calc. nannofossils	1	T
Plant debris	2	2
Altered minerals	10	10

CARBONATE BOMB DATA:
- 2, 22–24 cm = 6.5%
  2, 80–82 cm = 4.0%

SITE 615 HOLE CORE 33X CORED INTERVAL 3588.6–3598.1 mbsl; 304.7–314.2 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD, dark olive gray (5Y 3/2–5Y 3.5/2) and subtle color variations.

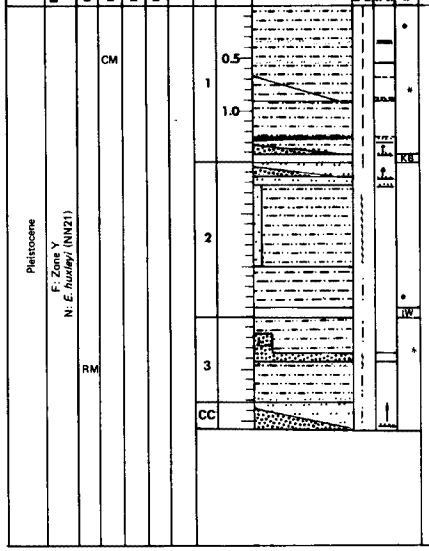
- Core consists of several thick "dirty" disorganized silty MUD turbidite-like layers as shown. These layers are rich in dispersed lignite, regularly layered with slight compositional variations, and positively graded from more-silty SILTY MUD to MUD. Lower turbidite in Section 1 looks somewhat like a debrite.

SMEAR SLIDE SUMMARY (%):

	1, 64 D
Texture:	
Sand	0
Silt	26
Clay	74
Composition:	
Quartz	13
Feldspar	1
Mica	1
Heavy minerals	T
Clay	74
Pyrite	T
Micronodules	T
Carbonate unspec.	10
Calc. nannofossils	1
Plant debris	T

CARBONATE BOMB DATA:
- 1, 33–35 cm = 8.0%
  CC, 1–3 cm = 5.0%

SITE 615 HOLE CORE 34X CORED INTERVAL 3598.1–3607.6 mbsl; 314.2–323.7 mbsf



LITHOLOGIC DESCRIPTION

Interbedded MUDS, SILTY MUDS, and SANDS.

SANDS are olive gray to olive (5Y 4/2–5Y 4/3), fine- to coarse-grained, and graded (except for sand in Section 3, which is homogeneous).

SILTY MUDS are very dark grayish brown (10YR 3/2) and organic-rich.

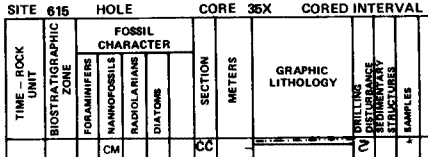
MUDS are dark olive gray to black (5Y 3/2–5Y 2/2). Homogeneous with occasional medium laminae of gray (5Y 5/1) silt and silt and sand blebs and occasional wood fragments. Silt and sand blebs may be due to drilling disturbance; regularly spaced "laminae" in muds may be drilling shear planes.

SMEAR SLIDE SUMMARY (%):

	1, 82 D	3, 35 D
Texture:		
Sand	25	55
Silt	45	35
Clay	30	10
Composition:		
Quartz	55	74
Feldspar	T	T
Heavy minerals	T	1
Glauconite	–	T
Carbonate unspec.	45	25
Calc. nannofossils	T	–

CARBONATE BOMB DATA:
*1, 20–22 cm = 5.5%
2, 134–136 cm = 0.5%

SITE 615 HOLE CORE 35X CORED INTERVAL 3602.6–3617.1 mbsl; 323.7–333.2 mbsf



LITHOLOGIC DESCRIPTION

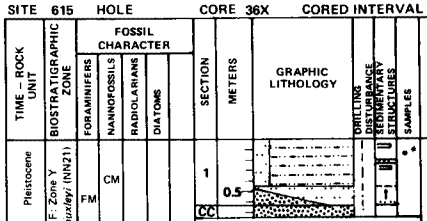
MUD, dark olive gray (5Y 3/2), homogeneous, and very deformed.

Recovered MUD in Core Catcher only; rest of core is empty.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	1
Silt	35
Clay	64
Composition:	
Quartz	14
Feldspar	T
Mica	1
Heavy minerals	2
Clay	64
Volcanic glass	5
Pyrite	T
Micronodules	T
Zeolite	T
Carbonate unspec.	14
Calc. nannofossils	T
Plant debris	T

SITE 615 HOLE CORE 36X CORED INTERVAL 3617.1–3626.6 mbsl; 333.2–342.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT layers. SAND.

MUD is dark olive gray (5Y 2.5/2). Includes SILT layers and blebs: dark gray (5Y 4/1) with structures preserved in coarser-grained/thicker beds.

SAND is dark olive gray (5Y 3/2) and medium-fine grained. SAND in Section 1 is normally-graded.

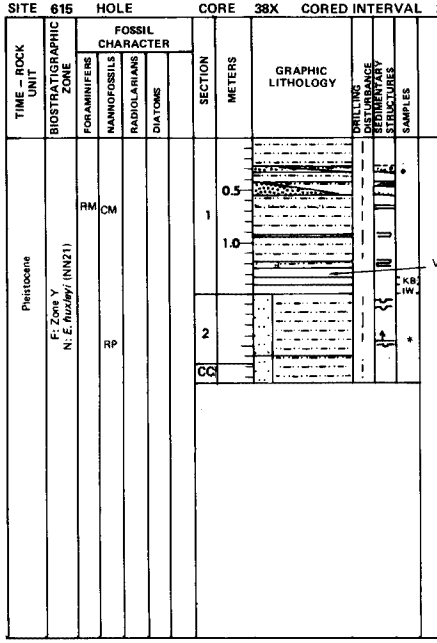
SMEAR SLIDE SUMMARY (%):

	1, 12 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	9
Feldspar	1
Mica	T
Heavy minerals	T
Clay	75
Palagonite	T
Pyrite	T
Micronodules	T
Zeolite	T
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Other	5

CARBONATE BOMB DATA:
*1, 15–17 cm = 6.5%

Note: Core 37X, 3626.6–3636.1 mbsl; 342.7–352.2 mbsf: no recovery.

SITE 615 HOLE CORE 38X CORED INTERVAL 3636.1–3645.6 mbsl; 352.2–361.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT and SAND laminae.

MUD is dark olive gray (5Y 3/2); SILTS are olive gray (5Y 5/2) and SANDS are gray (5Y 5/1). Some of the thicker sand beds are graded and contain intercalated organic-rich laminations.

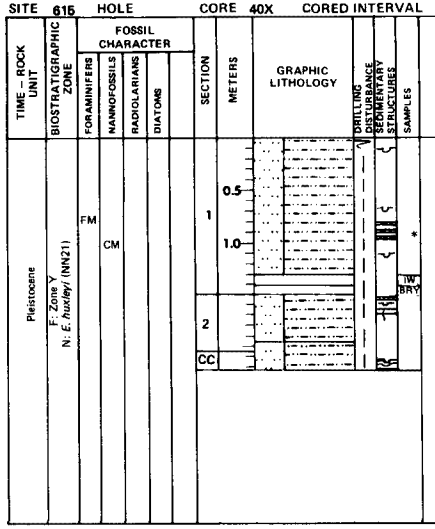
SMEAR SLIDE SUMMARY (%):

	2, 47
	D
Texture:	
Sand	15
Silt	50
Clay	35
Composition:	
Quartz	32
Feldspar	5
Mica	2
Heavy minerals	3
Clay	35
Pyrite	T
Micronodules	T
Carbonate unspec.	15
Calc. nannofossils	T
Plant debris	1
Altered minerals	7

CARBONATE BOMB DATA:
* 1, 36–38 cm = 5.0%

Note: Core 39X, 3645.6–3655.1 mbsl; 361.7–371.2 mbsf: no recovery.

SITE 615 HOLE CORE 40X CORED INTERVAL 3655.1–3664.6 mbsl; 371.2–380.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT layers and blebs.

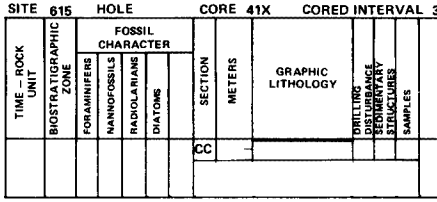
MUD is dark olive gray (5Y 3/2), organic-rich, and slightly silty.

SILT layers and blebs range from black to light olive gray (5Y 2/2–5Y 7/2). The thicker silt layers have scoured lower surfaces and cross-laminations.

SMEAR SLIDE SUMMARY (%):

	1, 94
Texture:	
Sand	0
Silt	99
Clay	1
Composition:	
Quartz	62
Mica	1
Heavy minerals	1
Carbonate unspec.	30
Foraminifers	5
Calc. nannofossils	1
Sponge spicules	T

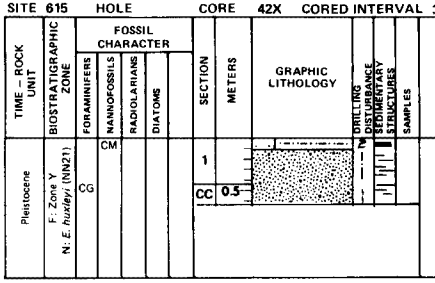
SITE 615 HOLE CORE 41X CORED INTERVAL 3664.6–3674.1 mbsl; 380.7–390.2 mbsf



LITHOLOGIC DESCRIPTION

Core Catcher contained one handful of medium-grained SAND. Rest of core was EMPTY.

SITE 615 HOLE CORE 42X CORED INTERVAL 3683.6–3693.1 mbsl; 399.7–409.2 mbsf



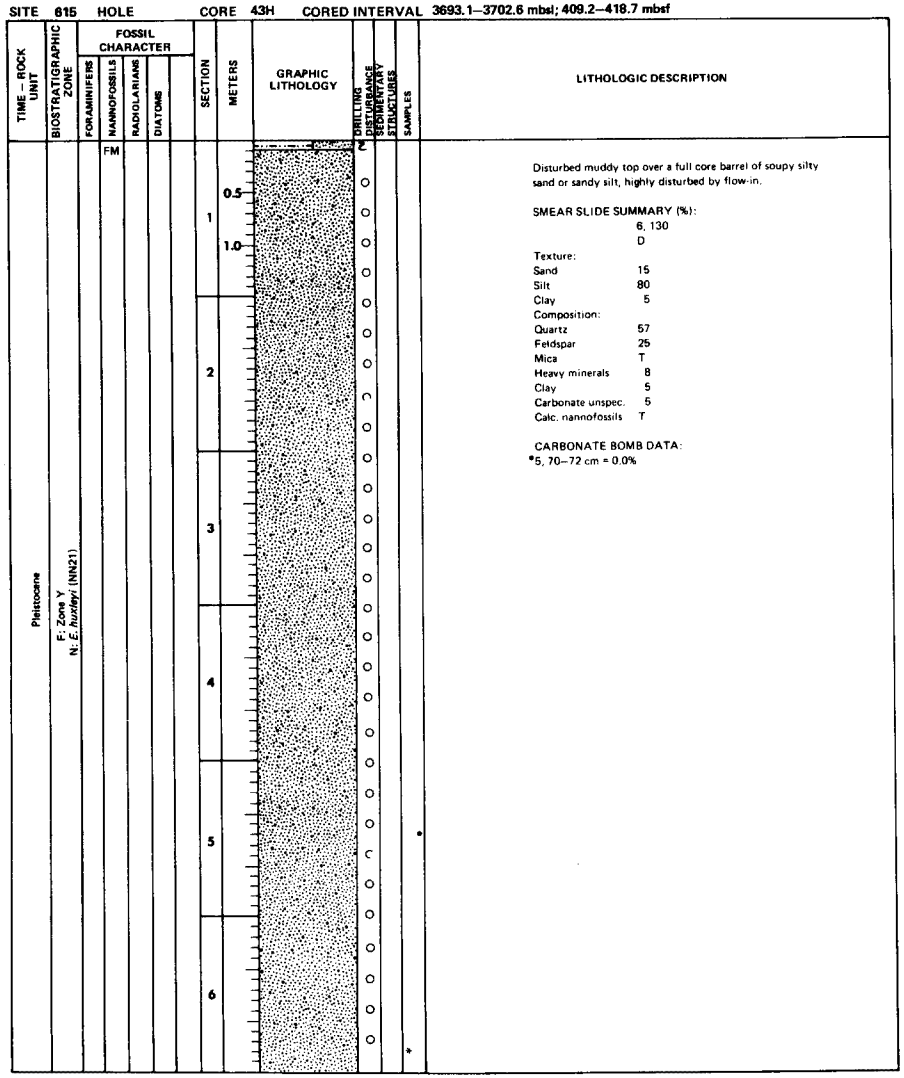
LITHOLOGIC DESCRIPTION

SANDY SILT and MUD with sand-laminae.

SANDY SILT is dark gray to olive gray (5Y 4/1–5Y 4/2.5) and indistinctly laminated.

MUD (Section 1, 0–8 cm) is dark olive gray (5Y 3/2) and contains thin silt layers 1–4 mm thick.

SITE 615 HOLE CORE 43H CORED INTERVAL 3693.1–3702.6 mbsl; 409.2–418.7 mbsf



LITHOLOGIC DESCRIPTION

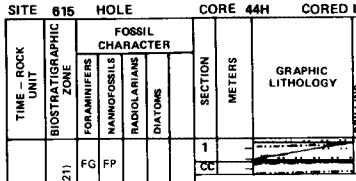
Disturbed muddy top over a full core barrel of soupy silty sand or sandy silt, highly disturbed by flow-in.

SMEAR SLIDE SUMMARY (%):

	6, 130 D
Texture:	
Sand	15
Silt	80
Clay	5
Composition:	
Quartz	57
Feldspar	25
Mica	T
Heavy minerals	8
Clay	5
Carbonate unspec.	5
Calc. nannofossils	T

CARBONATE BOMB DATA:
*5, 70–72 cm = 0.0%

SITE 615 HOLE CORE 44H CORED INTERVAL 3702.6–3704.6 mbsl; 418.7–420.7 mbsf



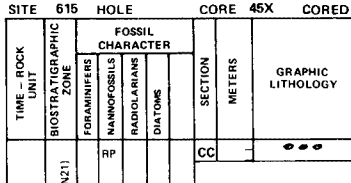
LITHOLOGIC DESCRIPTION

MUD, dark olive gray (5Y 3.5/1–5Y 3/2) with silt blebs and laminae. Section 1, 6–20 cm is a graded, "dirty" silty mud turbidite.

SMEAR SLIDE SUMMARY (%):

	1, 17 D
Texture:	
Sand	5
Silt	50
Clay	45
Composition:	
Quartz	25
Feldspar	6
Mica	T
Heavy minerals	T
Clay	45
Pyrite	T
Carbonate unspec.	20
Calc. nannofossils	T
Plant debris (lignite)	1
Altered minerals	3

SITE 615 HOLE CORE 45X CORED INTERVAL 3704.6–3712.1 mbsl; 420.7–428.2 mbsf



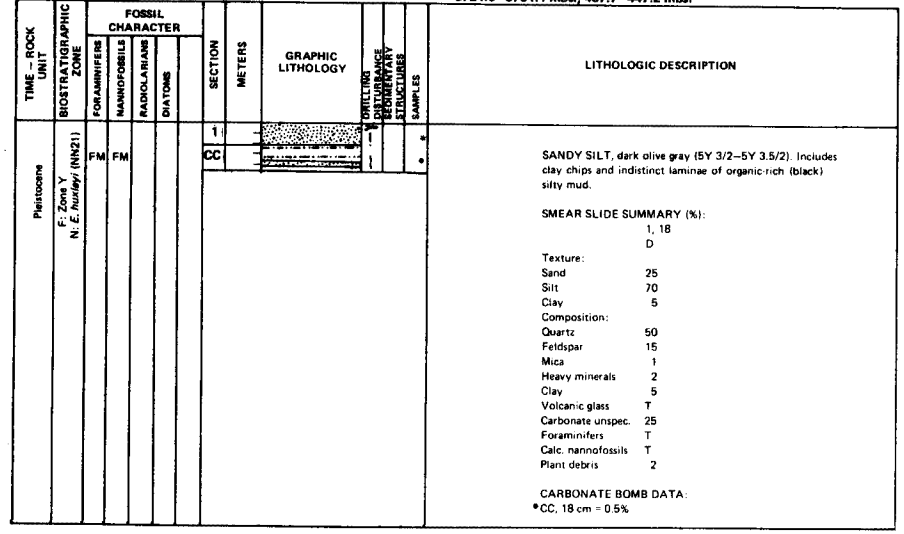
LITHOLOGIC DESCRIPTION

Recovered a couple balls of MUD from the Core Catcher. Rest of core is empty.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	25
Silt	45
Clay	30
Composition:	
Quartz	42
Feldspar	14
Mica	T
Heavy minerals	3
Clay	30
Carbonate unspec.	20
Plant debris	1

SITE 615 HOLE CORE 46X CORED INTERVAL 3721.6–3731.1 mbsl; 437.7–447.2 mbsl



LITHOLOGIC DESCRIPTION

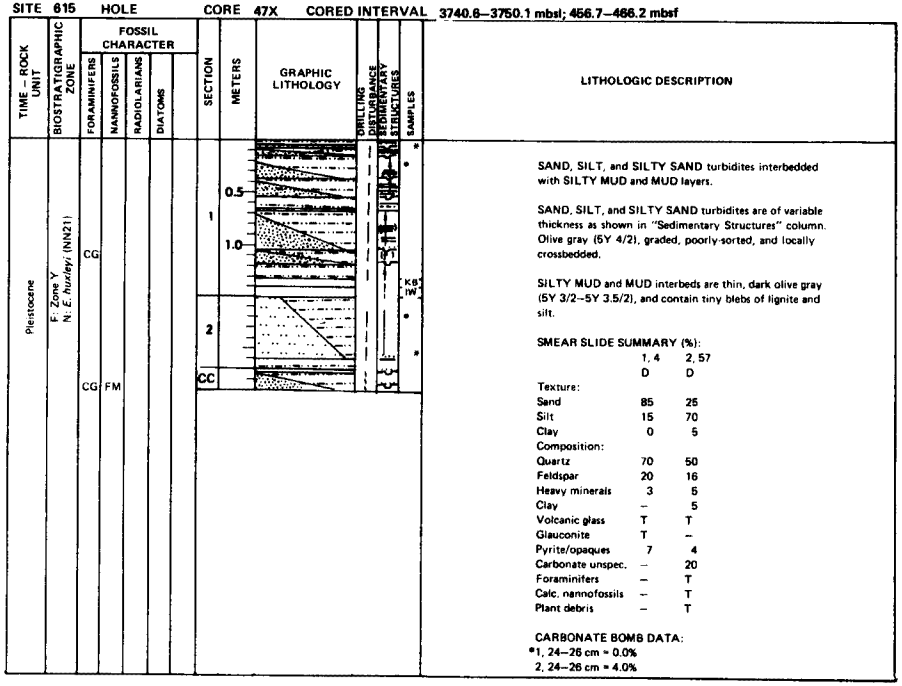
SANDY SILT, dark olive gray (5Y 3/2–5Y 3.5/2). Includes clay chips and indistinct laminae of organic-rich (black) silty mud.

SMEAR SLIDE SUMMARY (%):

	1, 18 D
Texture:	
Sand	25
Silt	70
Clay	5
Composition:	
Quartz	50
Feldspar	15
Mica	1
Heavy minerals	2
Clay	5
Volcanic glass	T
Carbonate unspec.	25
Foraminifers	T
Calc. nannofossils	T
Plant debris	2

CARBONATE BOMB DATA:
*CC, 18 cm = 0.5%

SITE 615 HOLE CORE 47X CORED INTERVAL 3740.6–3750.1 mbsl; 456.7–466.2 mbsl



LITHOLOGIC DESCRIPTION

SAND, SILT, and SILTY SAND turbidites interbedded with SILTY MUD and MUD layers.

SAND, SILT, and SILTY SAND turbidites are of variable thickness as shown in "Sedimentary Structures" column. Olive gray (5Y 4/2), graded, poorly-sorted, and locally crossbedded.

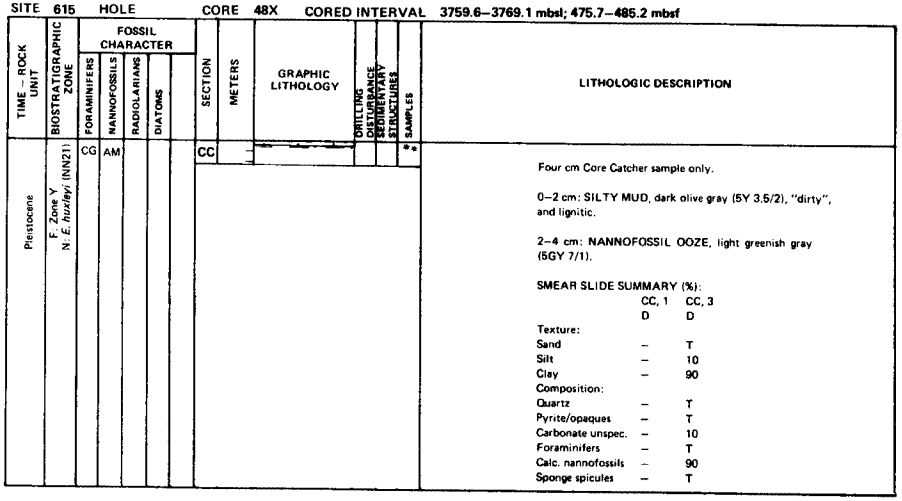
SILTY MUD and MUD interbeds are thin, dark olive gray (5Y 3/2–5Y 3.5/2), and contain tiny blebs of lignite and silt.

SMEAR SLIDE SUMMARY (%):

	1, 4 D	2, 57 D
Texture:		
Sand	85	25
Silt	15	70
Clay	0	5
Composition:		
Quartz	70	50
Feldspar	20	16
Heavy minerals	3	5
Clay	–	5
Volcanic glass	T	T
Glauconite	T	–
Pyrite/opaques	7	4
Carbonate unspec.	–	20
Foraminifers	–	T
Calc. nannofossils	–	T
Plant debris	–	T

CARBONATE BOMB DATA:
*1, 24–26 cm = 0.0%
2, 24–26 cm = 4.0%

SITE 615 HOLE CORE 48X CORED INTERVAL 3759.6–3769.1 mbsl; 475.7–485.2 mbsl



LITHOLOGIC DESCRIPTION

Four cm Core Catcher sample only.

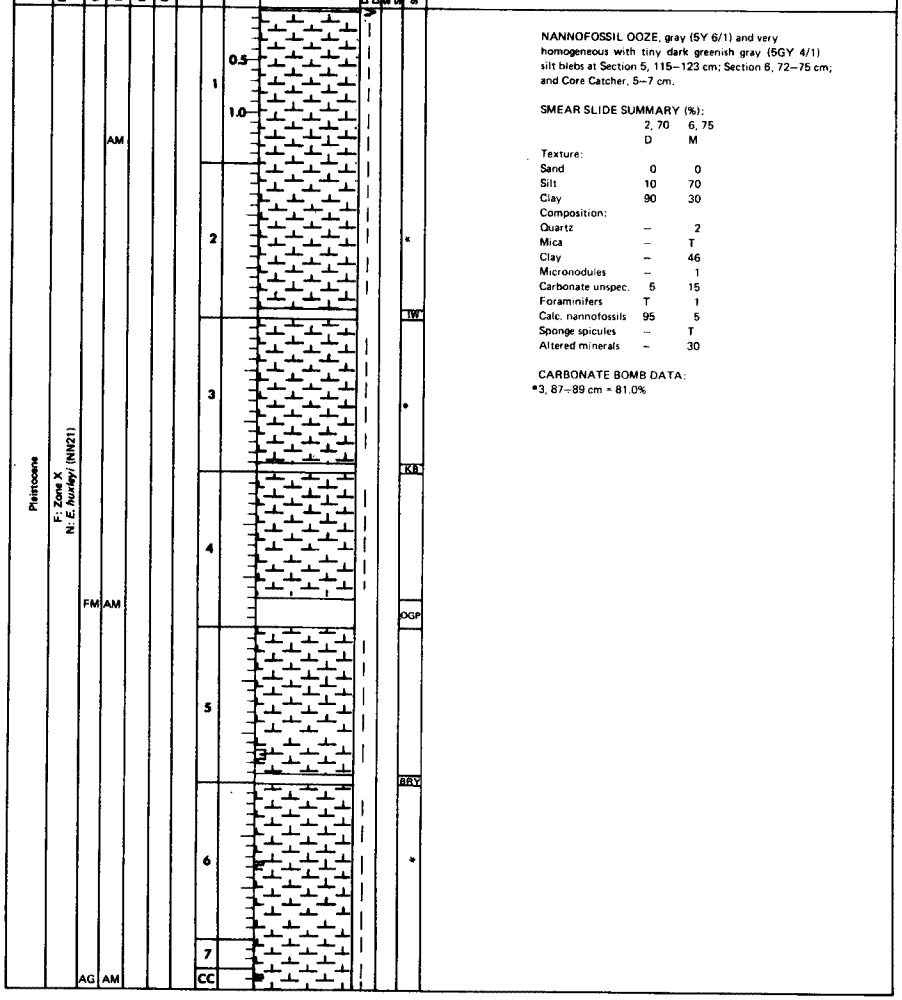
0–2 cm: SILTY MUD, dark olive gray (5Y 3.5/2), "dirty", and lignitic.

2–4 cm: NANNOFOSSIL OOZE, light greenish gray (5GY 7/1).

SMEAR SLIDE SUMMARY (%):

	CC, 1 D	CC, 3 D
Texture:		
Sand	–	T
Silt	–	10
Clay	–	90
Composition:		
Quartz	–	T
Pyrite/opaques	–	T
Carbonate unspec.	–	10
Foraminifers	–	T
Calc. nannofossils	–	90
Sponge spicules	–	T

SITE 615 HOLE CORE 49X CORED INTERVAL 3769.1–3778.6 mbsl; 485.2–494.7 mbsf



LITHOLOGIC DESCRIPTION

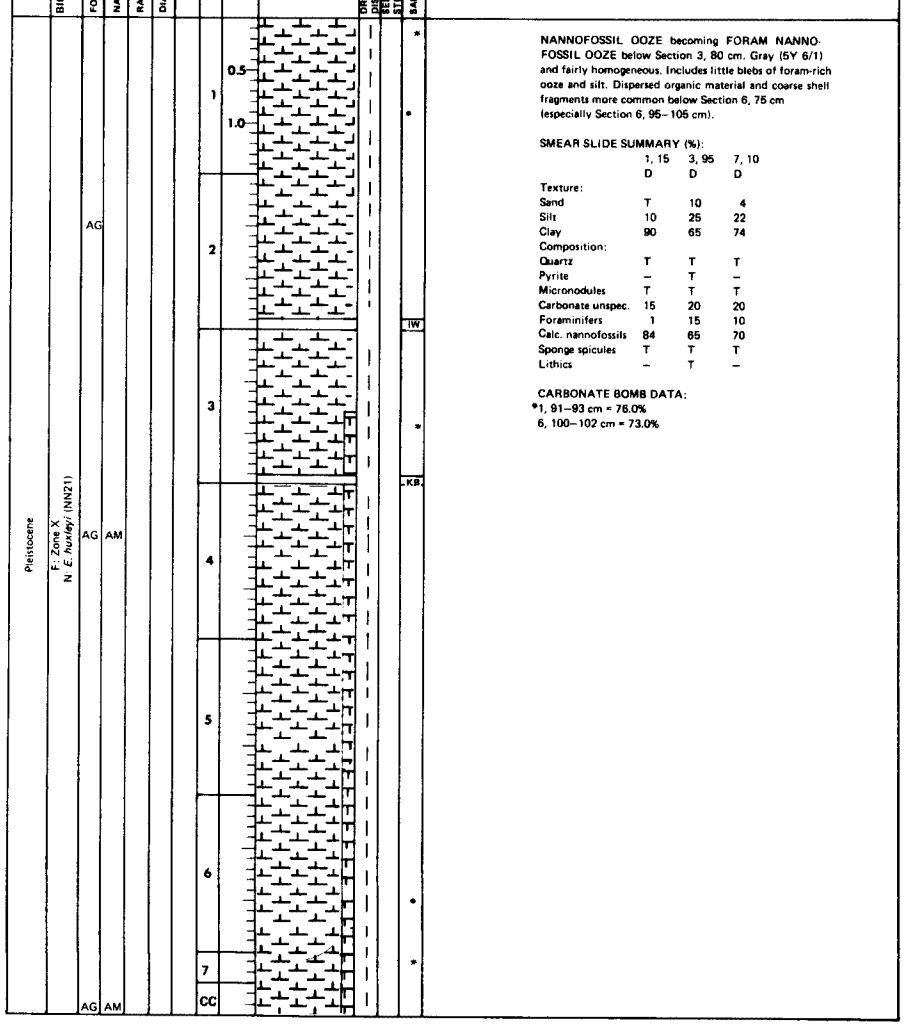
NANNOFOSSIL OOZE, gray (5Y 6/1) and very homogeneous with tiny dark greenish gray (5GY 4/1) silt blebs at Section 5, 115–123 cm; Section 6, 72–75 cm; and Core Catcher, 5–7 cm.

SMEAR SLIDE SUMMARY (%):

	2, 70 D	6, 75 M
Texture:		
Sand	0	0
Silt	10	70
Clay	90	30
Composition:		
Quartz	–	2
Mica	–	T
Clay	–	46
Micronodules	–	1
Carbonate unspec.	5	15
Foraminifers	T	1
Calc. nannofossils	95	5
Sponge spicules	–	T
Altered minerals	–	30

CARBONATE BOMB DATA:
*3, 87–89 cm = 81.0%

SITE 615 HOLE CORE 50X CORED INTERVAL 3778.6–3788.1 mbsl; 494.7–504.2 mbsf



LITHOLOGIC DESCRIPTION

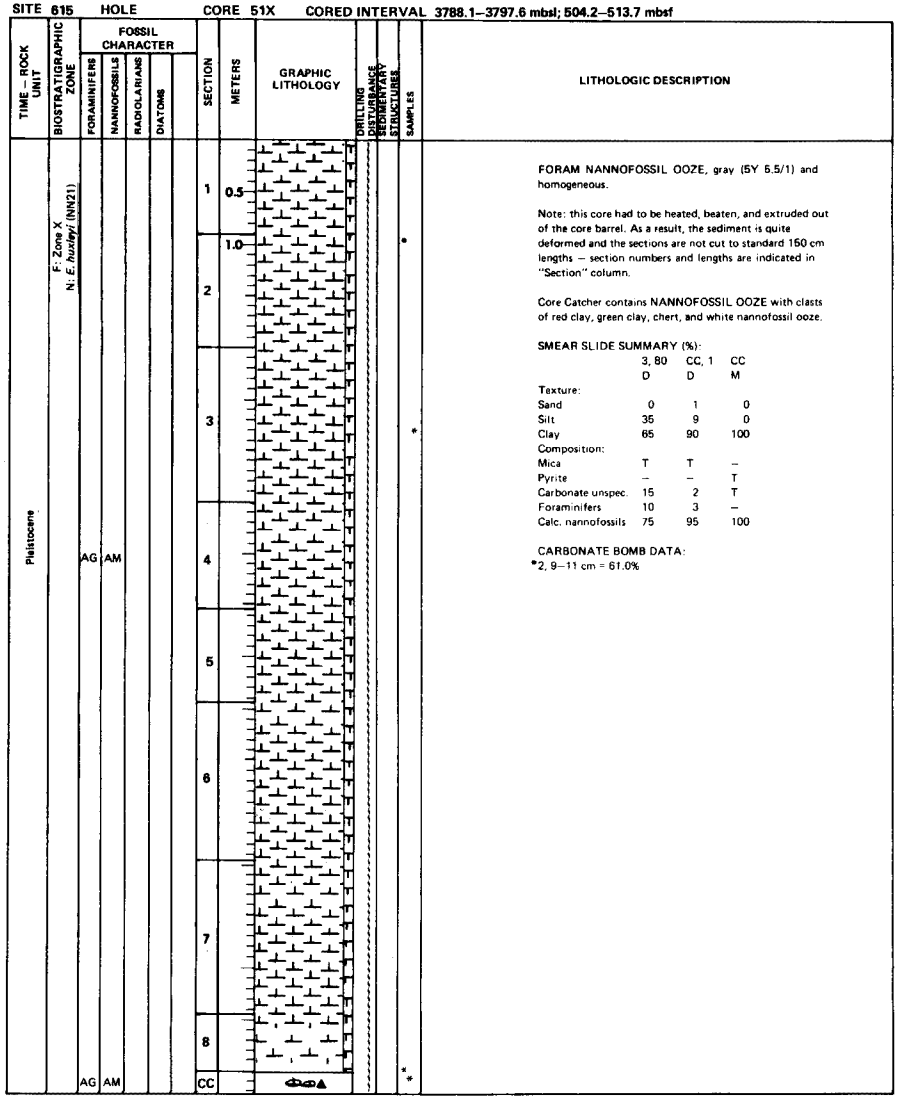
NANNOFOSSIL OOZE becoming FORAM NANNOFOSSIL OOZE below Section 3, 80 cm. Gray (5Y 6/1) and fairly homogeneous. Includes little blebs of foram-rich ooze and silt. Dispersed organic material and coarse shell fragments more common below Section 6, 75 cm (especially Section 6, 95–105 cm).

SMEAR SLIDE SUMMARY (%):

	1, 15 D	3, 95 D	7, 10 D
Texture:			
Sand	T	10	4
Silt	10	25	22
Clay	90	65	74
Composition:			
Quartz	T	T	T
Pyrite	–	T	–
Micronodules	T	T	T
Carbonate unspec.	15	20	20
Foraminifers	1	15	10
Calc. nannofossils	84	65	70
Sponge spicules	T	T	T
Lithics	–	T	–

CARBONATE BOMB DATA:
*1, 91–93 cm = 76.0%
6, 100–102 cm = 73.0%

SITE 615 HOLE CORE 51X CORED INTERVAL 3788.1–3797.6 mbsl; 504.2–513.7 mbsf



LITHOLOGIC DESCRIPTION

FORAM NANNOFOSSIL OOZE, gray (5Y 6.5/1) and homogeneous.

Note: this core had to be heated, beaten, and extruded out of the core barrel. As a result, the sediment is quite deformed and the sections are not cut to standard 150 cm lengths – section numbers and lengths are indicated in "Section" column.

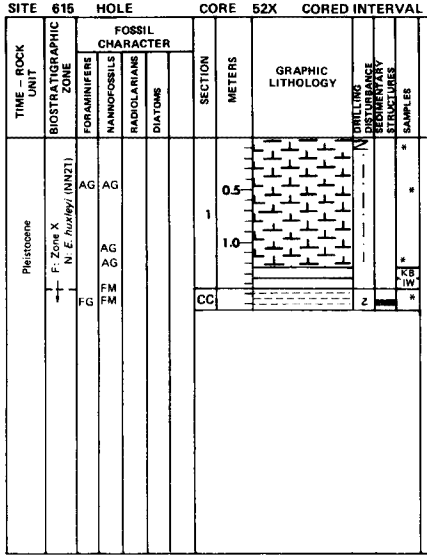
Core Catcher contains NANNOFOSSIL OOZE with clasts of red clay, green clay, chert, and white nannofossil ooze.

SMEAR SLIDE SUMMARY (%):

	3, 80 D	CC, 1 D	CC M
Texture:			
Sand	0	1	0
Silt	35	9	0
Clay	65	90	100
Composition:			
Mica	T	T	–
Pyrite	–	–	T
Carbonate unspec.	15	2	T
Foraminifers	10	3	–
Calc. nannofossils	75	95	100

CARBONATE BOMB DATA:
*2, 9–11 cm = 61.0%

SITE 615 HOLE CORE 52X CORED INTERVAL 3797.6–3807.1 mbsl; 513.7–523.2 mbsf



LITHOLOGIC DESCRIPTION

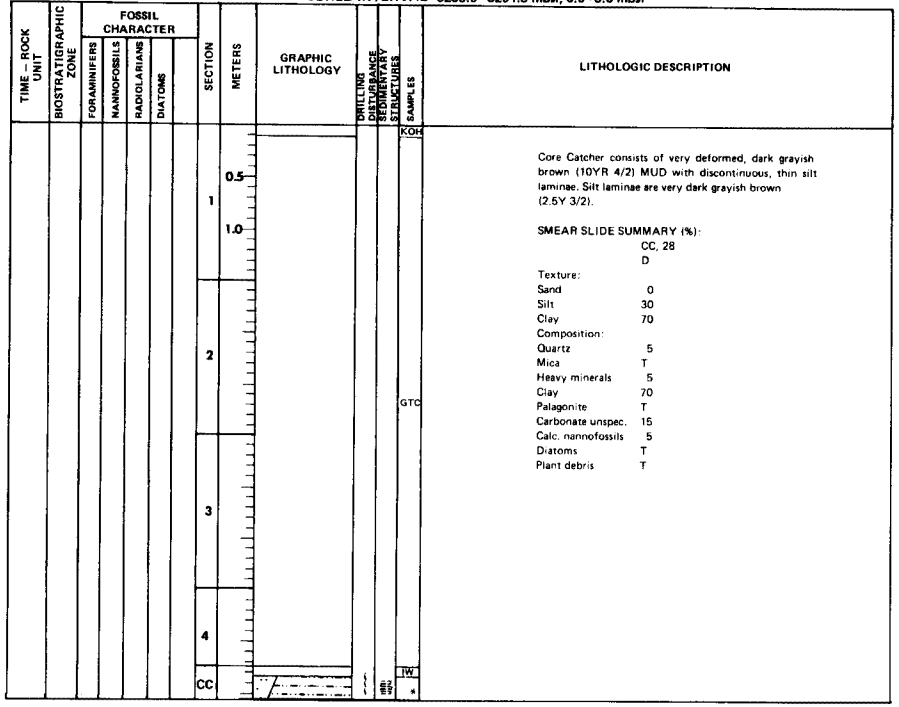
Section 1: NANNOFOSSIL OOZE, color grades downsection from light gray (10YR 7/1; 0–30 cm) to light brownish gray (2.5Y 6/2–10YR 6/2; 30–115 cm) to dark grayish brown (10YR 4/2; 115–124 cm).

Core Catcher: CLAY. Dark olive gray (10YR 3/2) with faint, wavy, discontinuous laminae.

SMEAR SLIDE SUMMARY (%):

	1, 10 D	1, 50 D	1, 123 D	CC, 10 D
Texture:				
Sand	T	1	0	0
Silt	20	10	10	5
Clay	80	89	90	95
Composition:				
Quartz	T	–	–	–
Mica	T	T	T	–
Heavy minerals	–	–	T	–
Clay	–	–	–	90
Pyrite	T	–	–	–
Carbonate unspec.	–	–	2	10
Foraminifers	2	5	2	–
Calc. nannofossils	98	95	96	–
Sponge spicules	–	T	–	–
Bryozoan	–	T	–	–

SITE 615 HOLE A CORE 1H CORED INTERVAL 3285.9–3291.5 mbsl; 0.0–5.6 mbsf

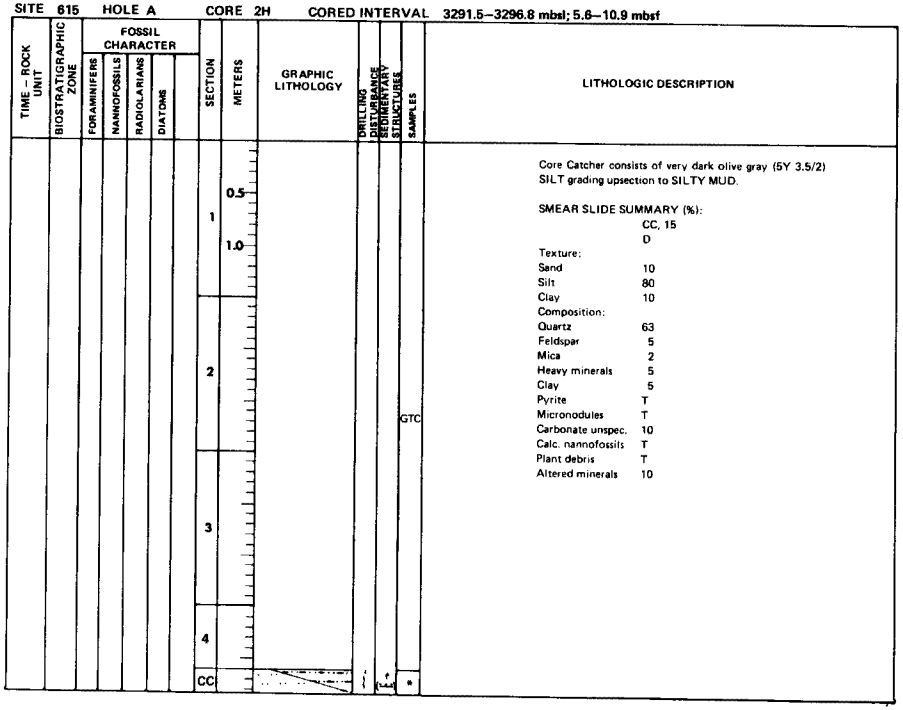


Core Catcher consists of very deformed, dark grayish brown (10YR 4/2) MUD with discontinuous, thin silt laminae. Silt laminae are very dark grayish brown (2.5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	CC, 28 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	5
Mica	T
Heavy minerals	5
Clay	70
Palagonite	T
Carbonate unspec.	15
Calc. nannofossils	5
Diatoms	T
Plant debris	T

SITE 615 HOLE A CORE 2H CORED INTERVAL 3291.5–3296.8 mbsf; 5.6–10.9 mbsf

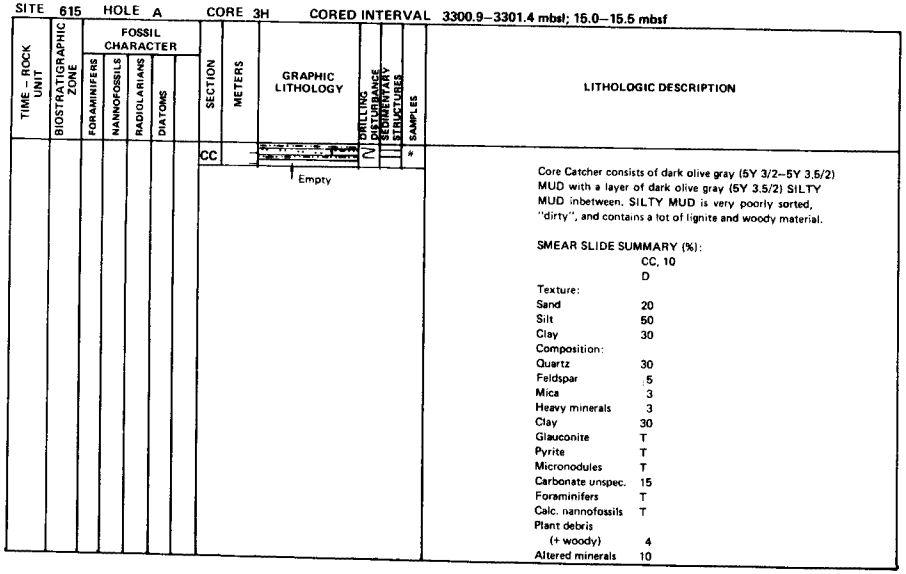


Core Catcher consists of very dark olive gray (5Y 3.5/2) SILT grading upsection to SILTY MUD.

SMEAR SLIDE SUMMARY (%):

	CC, 15 D
Texture:	
Sand	10
Silt	80
Clay	10
Composition:	
Quartz	63
Feldspar	5
Mica	2
Heavy minerals	5
Clay	5
Pyrite	T
Micronodules	T
Carbonate unspec.	10
Calc. nannofossils	T
Plant debris	T
Altered minerals	10

SITE 615 HOLE A CORE 3H CORED INTERVAL 3300.9–3301.4 mbsl; 15.0–15.5 mbsf

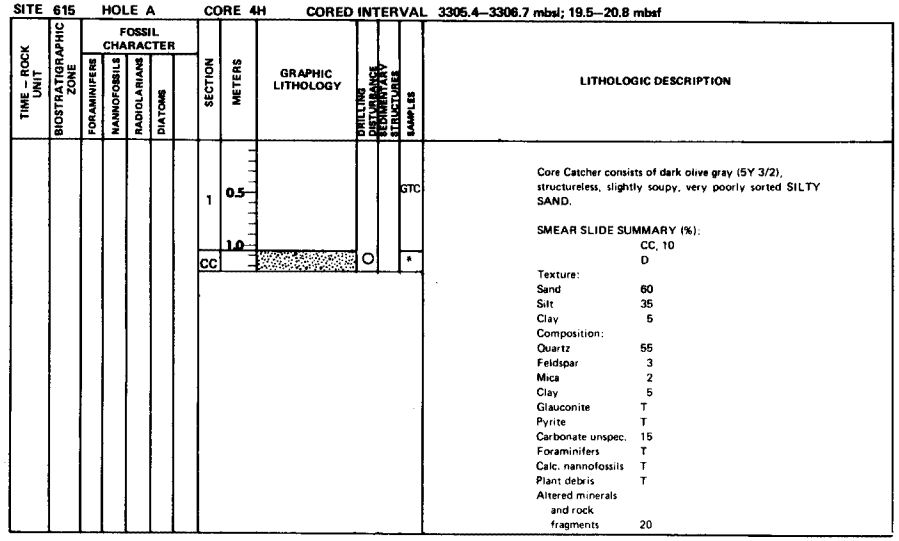


Core Catcher consists of dark olive gray (5Y 3/2–5Y 3.5/2) MUD with a layer of dark olive gray (5Y 3.5/2) SILTY MUD inbetween. SILTY MUD is very poorly sorted, "dirty", and contains a lot of lignite and woody material.

SMEAR SLIDE SUMMARY (%):

	CC, 10 D
Texture:	
Sand	20
Silt	50
Clay	30
Composition:	
Quartz	30
Feldspar	5
Mica	3
Heavy minerals	3
Clay	30
Glauconite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	15
Foraminifers	T
Calc. nannofossils	T
Plant debris (+ woody)	4
Altered minerals	10

SITE 615 HOLE A CORE 4H CORED INTERVAL 3305.4–3306.7 mbsl; 19.5–20.8 mbsf



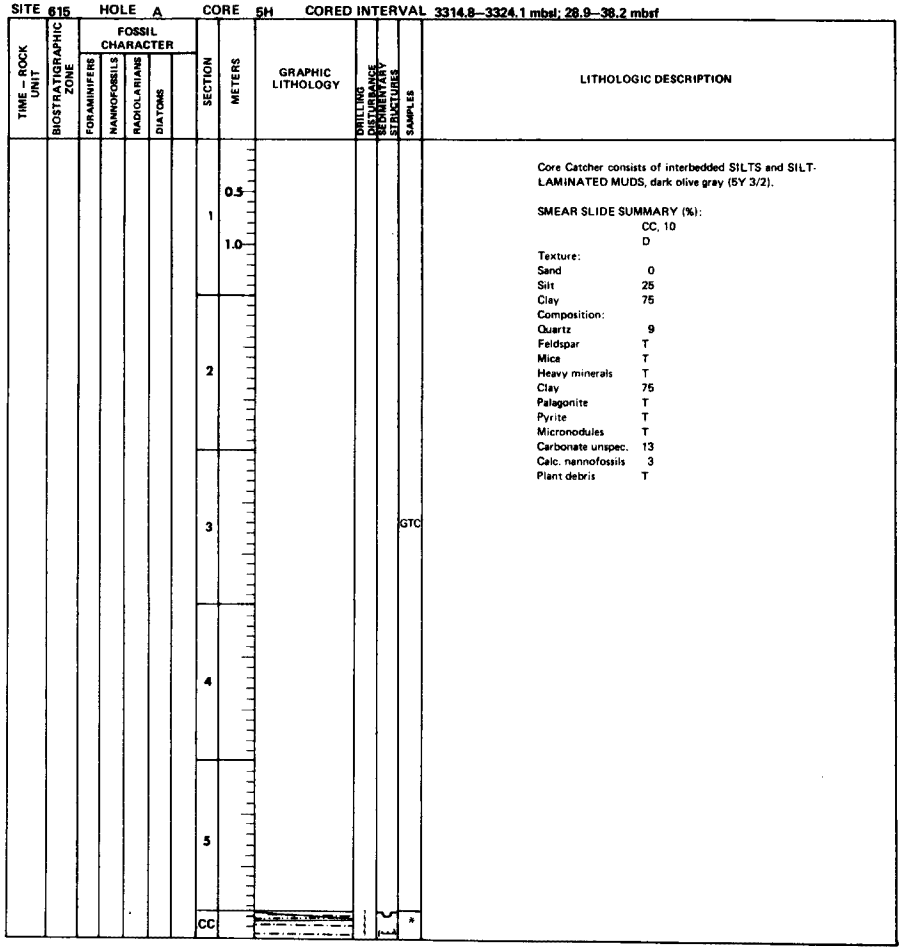
LITHOLOGIC DESCRIPTION

Core Catcher consists of dark olive gray (5Y 3/2), structureless, slightly soupy, very poorly sorted SILTY SAND.

SMEAR SLIDE SUMMARY (%):

	CC, 10 D
Texture:	
Sand	60
Silt	35
Clay	5
Composition:	
Quartz	55
Feldspar	3
Mica	2
Clay	5
Glauconite	T
Pyrite	T
Carbonate unspec.	15
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals and rock fragments	20

SITE 615 HOLE A CORE 5H CORED INTERVAL 3314.8–3324.1 mbsl; 28.9–38.2 mbsf



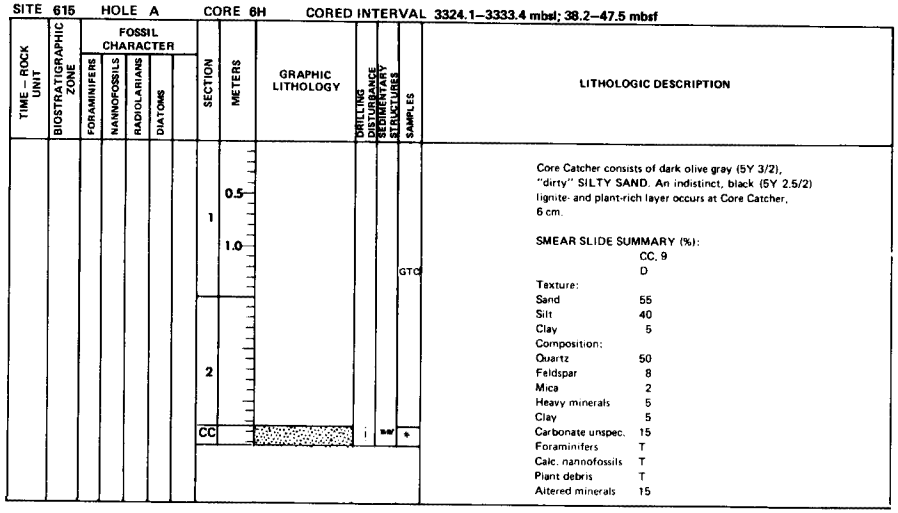
LITHOLOGIC DESCRIPTION

Core Catcher consists of interbedded SILTS and SILT-LAMINATED MUDS, dark olive gray (5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	CC, 10 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	9
Feldspar	T
Mica	T
Heavy minerals	T
Clay	75
Palagonite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	13
Calc. nannofossils	3
Plant debris	T

SITE 615 HOLE A CORE 6H CORED INTERVAL 3324.1–3333.4 mbsl; 38.2–47.5 mbsf

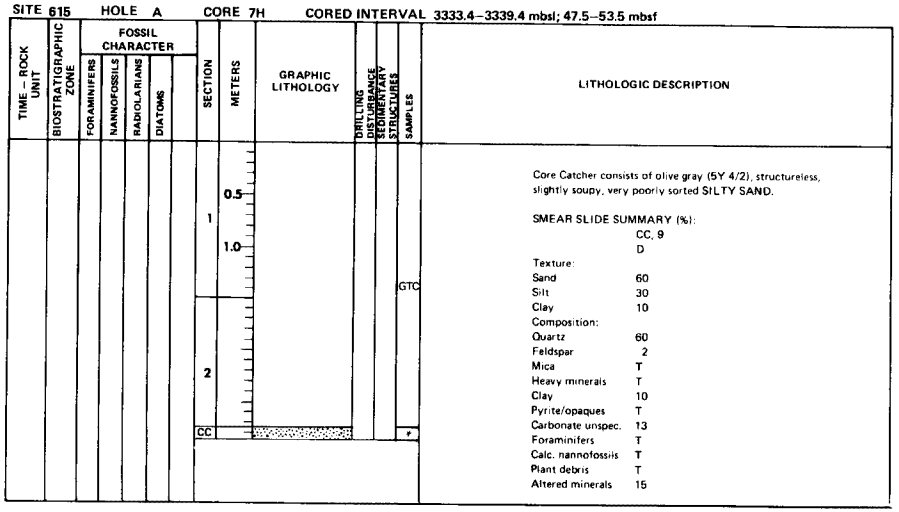


Core Catcher consists of dark olive gray (5Y 3/2), "dirty" SILTY SAND. An indistinct, black (5Y 2.5/2) lignite- and plant-rich layer occurs at Core Catcher, 6 cm.

SMEAR SLIDE SUMMARY (%):

	CC, 9 D
Texture:	
Sand	55
Silt	40
Clay	5
Composition:	
Quartz	50
Feldspar	8
Mica	2
Heavy minerals	5
Clay	5
Carbonate unspec.	15
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	15

SITE 615 HOLE A CORE 7H CORED INTERVAL 3333.4–3339.4 mbsl; 47.5–53.5 mbsf

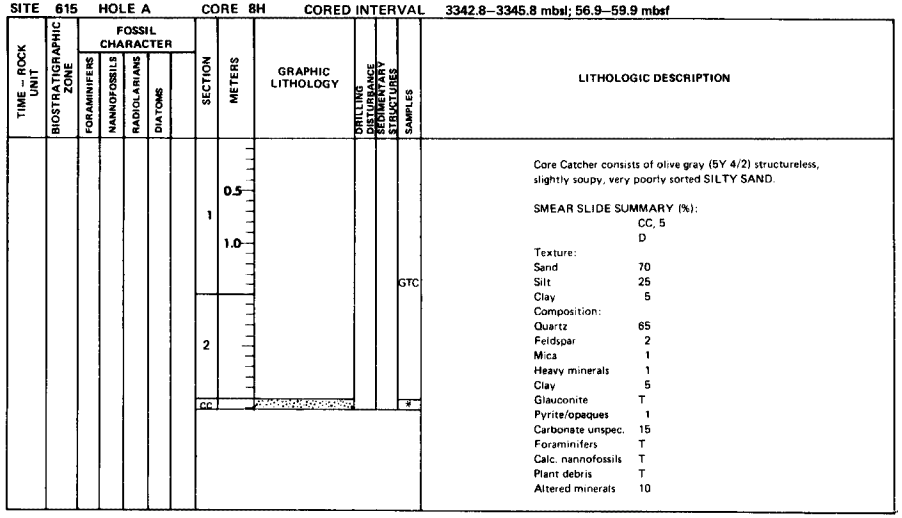


Core Catcher consists of olive gray (5Y 4/2), structureless, slightly soupy, very poorly sorted SILTY SAND.

SMEAR SLIDE SUMMARY (%):

	CC, 9 D
Texture:	
Sand	60
Silt	30
Clay	10
Composition:	
Quartz	60
Feldspar	2
Mica	T
Heavy minerals	T
Clay	10
Pyrite/opaques	T
Carbonate unspec.	13
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	15

SITE 615 HOLE A CORE 8H CORED INTERVAL 3342.8–3345.8 mbsl; 56.9–59.9 mbsf

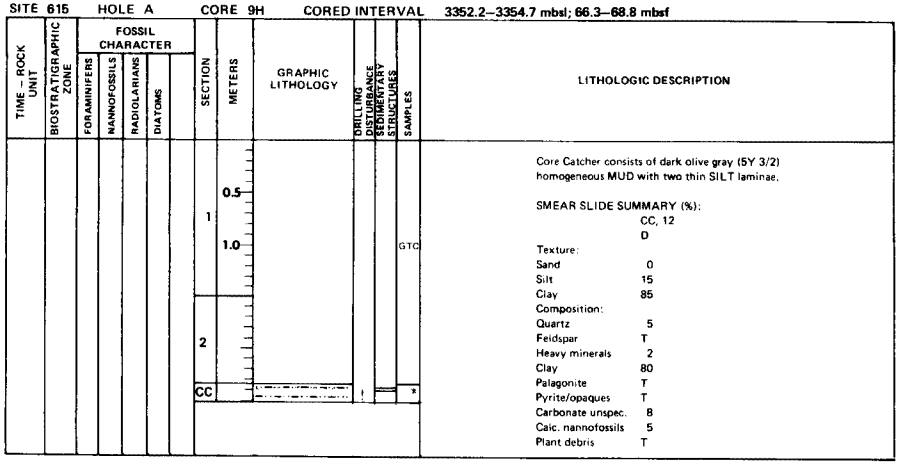


Core Catcher consists of olive gray (5Y 4/2) structureless, slightly soupy, very poorly sorted SILTY SAND.

SMEAR SLIDE SUMMARY (%):

	CC, 5 D
Texture:	
Sand	70
Silt	25
Clay	5
Composition:	
Quartz	65
Feldspar	2
Mica	1
Heavy minerals	1
Clay	5
Glauconite	T
Pyrite/opaques	1
Carbonate unspec.	15
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	10

SITE 615 HOLE A CORE 9H CORED INTERVAL 3352.2–3354.7 mbsl; 66.3–68.8 mbsf

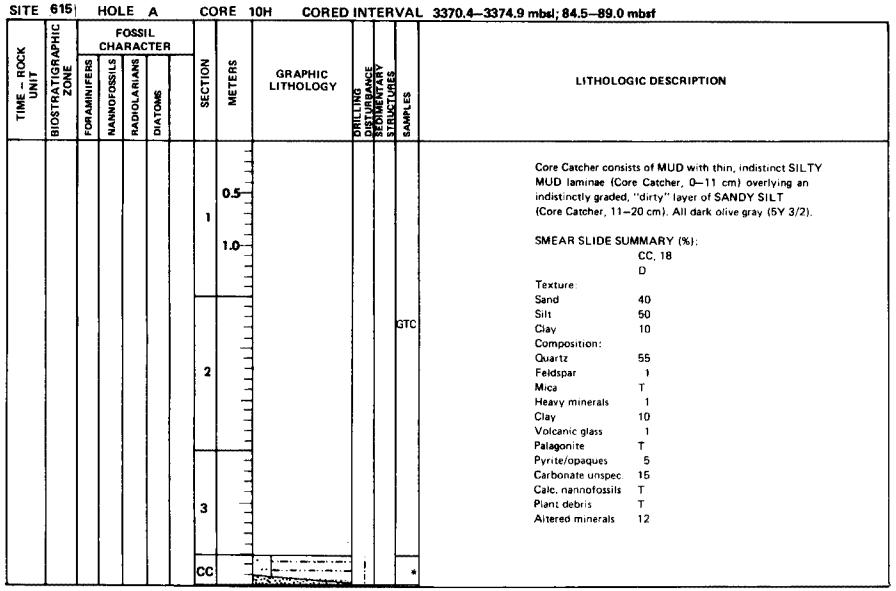


Core Catcher consists of dark olive gray (5Y 3/2) homogeneous MUD with two thin SILT laminae.

SMEAR SLIDE SUMMARY (%):

	CC, 12 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	5
Feldspar	T
Heavy minerals	2
Clay	80
Palagonite	T
Pyrite/opaques	T
Carbonate unspec.	8
Calc. nannofossils	5
Plant debris	T

SITE 615 HOLE A CORE 10H CORED INTERVAL 3370.4–3374.9 mbsl; 84.5–89.0 mbsf



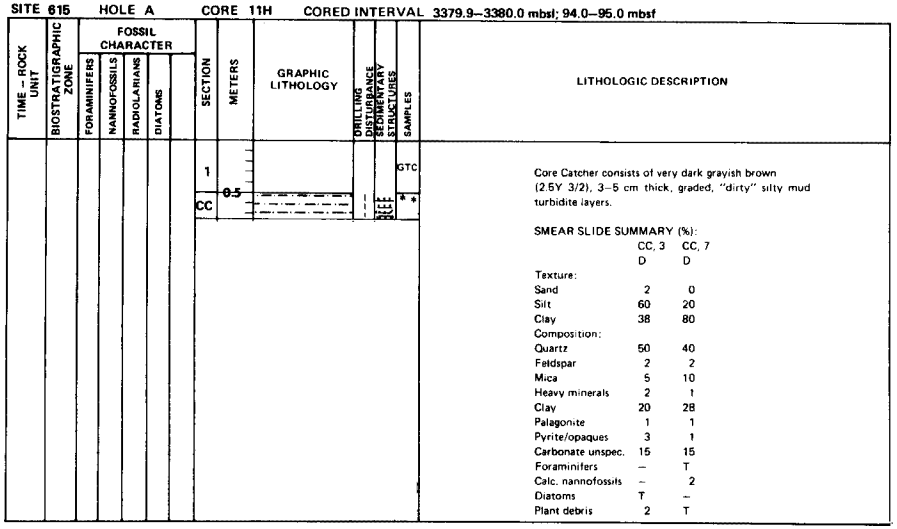
LITHOLOGIC DESCRIPTION

Core Catcher consists of MUD with thin, indistinct SILTY MUD laminae (Core Catcher, 0–11 cm) overlying an indistinctly graded, "dirty" layer of SANDY SILT (Core Catcher, 11–20 cm). All dark olive gray (5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	CC, 18 D
Texture:	
Sand	40
Silt	50
Clay	10
Composition:	
Quartz	55
Feldspar	1
Mica	T
Heavy minerals	1
Clay	10
Volcanic glass	1
Palagonite	T
Pyrite/opaques	5
Carbonate unspec.	15
Calc. nannofossils	T
Plant debris	T
Altered minerals	12

SITE 615 HOLE A CORE 11H CORED INTERVAL 3379.9–3380.0 mbsl; 94.0–95.0 mbsf



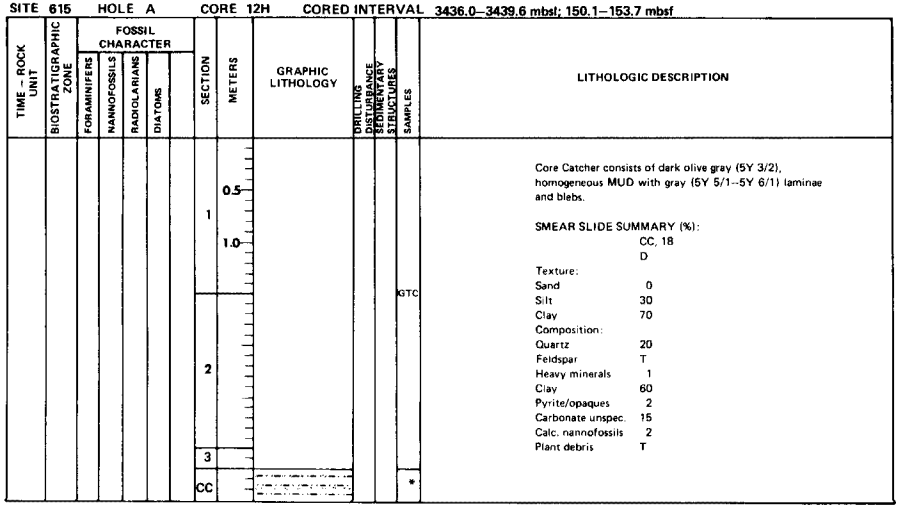
LITHOLOGIC DESCRIPTION

Core Catcher consists of very dark grayish brown (2.5Y 3/2), 3–5 cm thick, graded, "dirty" silty mud turbidite layers.

SMEAR SLIDE SUMMARY (%):

	CC, 3 D	CC, 7 D
Texture:		
Sand	2	0
Silt	60	20
Clay	38	80
Composition:		
Quartz	50	40
Feldspar	2	2
Mica	5	10
Heavy minerals	2	1
Clay	20	28
Palagonite	1	1
Pyrite/opaques	3	1
Carbonate unspec.	15	15
Foraminifers	–	T
Calc. nannofossils	–	2
Diatoms	T	–
Plant debris	2	T

SITE 615 HOLE A CORE 12H CORED INTERVAL 3436.0–3439.6 mbsl; 150.1–153.7 mbsf



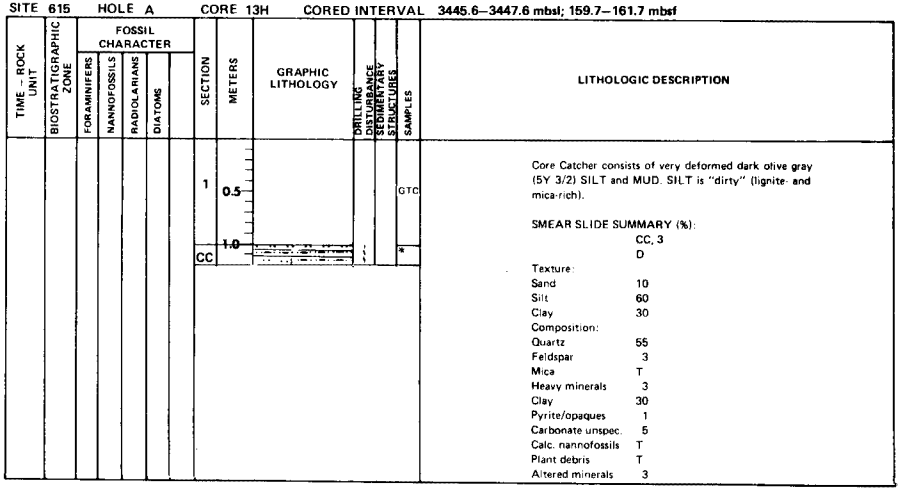
LITHOLOGIC DESCRIPTION

Core Catcher consists of dark olive gray (5Y 3/2), homogeneous MUD with gray (5Y 5/1–5Y 6/1) laminae and blebs.

SMEAR SLIDE SUMMARY (%):

	CC, 18 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	20
Feldspar	T
Heavy minerals	1
Clay	60
Pyrite/opaques	2
Carbonate unspec.	15
Calc. nannofossils	2
Plant debris	T

SITE 615 HOLE A CORE 13H CORED INTERVAL 3445.6–3447.6 mbsl; 159.7–161.7 mbsf



LITHOLOGIC DESCRIPTION

Core Catcher consists of very deformed dark olive gray (5Y 3/2) SILT and MUD. SILT is "dirty" (lignite- and mica-rich).

SMEAR SLIDE SUMMARY (%):

	CC, 3 D
Texture:	
Sand	10
Silt	60
Clay	30
Composition:	
Quartz	55
Feldspar	3
Mica	T
Heavy minerals	3
Clay	30
Pyrite/opaques	1
Carbonate unspec.	5
Calc. nannofossils	T
Plant debris	T
Altered minerals	3

SITE 615 HOLE A CORE 14H CORED INTERVAL 3455.2–3455.7 mbsl; 169.3–169.8 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1					GTC	No Core Catcher. All of Section 1 given to Geotechnical Consortium (GTC) for shorebased studies.

SITE 615 HOLE A CORE 15H CORED INTERVAL 3455.7–3456.7 mbsl; 169.8–170.8 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				GTC	Core Catcher consists of dark olive gray (5Y 3/2) MUD with thin-bedded SILT/SANDY SILT graded layers and discontinuous laminae and SILTY MUD. SILT/SANDY SILT layers and SILTY MUDS are lignite-rich.
						CC					*	

SMEAR SLIDE SUMMARY (%):

	CC, 12 D
Texture:	
Sand	5
Silt	85
Clay	10
Composition:	
Quartz	70
Feldspar	2
Heavy minerals	1
Clay	10
Volcanic glass	T
Pyrite/opaques	T
Carbonate unspec.	7
Calc. nannofossils	T
Plant debris	T
Altered minerals	10

SITE 615 HOLE A CORE 16X CORED INTERVAL 3475.3–3484.9 mbsl; 189.4–199.0 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				GTC	Core Catcher consists of SILT-LAMINATED MUD and thin layers of graded, laminated SANDY SILT. Dark olive gray (5Y 3/2).
							1.0					
						2						
						3						
						4						
						CC					*	

SMEAR SLIDE SUMMARY (%):

	CC, 31 D
Texture:	
Sand	10
Silt	65
Clay	25
Composition:	
Quartz	35
Feldspar	3
Mica	5
Heavy minerals	4
Clay	25
Pyrite/opaques	2
Carbonate unspec.	11
Calc. nannofossils	T
Plant debris	5
Altered minerals	10

Note: Core 17X, 3484.9–3494.4 mbsl; 199.0–208.5 mbsf: no recovery.

SITE 616

HOLE 616

Date Occupied: 11 October 1983, 0745 LCT

Date Departed: 14 October 1983, 0930 LCT

Time on Hole: 3 days, 2 hr.

Position (latitude; longitude): 26°48.67'N; 86°52.83'W

Water depth (sea level; corrected m, echo-sounding): 2983

Water depth (rig floor; corrected m, echo-sounding): 2993

Bottom felt (m, drill pipe): 2998.9

Penetration (m): 371.0

Number of cores: 34

Total length of cored section (m): 307.8

Total core recovered (m): 143.38

Core recovery (%): 47

Oldest sediment cored:

Depth sub-bottom (m): 371

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): 1.70

Basement: N/A

SITE 616

HOLE 616A

Date Occupied: 14 October 1983, 1917 LCT

Date Departed: 15 October 1983, 0726 LCT

Time on Hole: 0 days, 12 hr.

Position (latitude; longitude): 26°48.65'N; 86°52.86'W

Water depth (sea level; corrected m, echo-sounding): 2983

Water depth (rig floor; corrected m, echo-sounding): 2993

Bottom felt (m, drill pipe): 2998.9

Penetration (m): 132.4

Number of cores: 4

Total length of cored section (m): 38.4

Total core recovered (m): 24.21

Core recovery (%): 63

Oldest sediment cored:

Depth sub-bottom (m): 132.4

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): 1.78

Basement: N/A

SITE 616

HOLE 616B

Date Occupied: 15 October 1983, 0825 LCT

Date Departed: 16 October 1983, 1445 LCT

Time on Hole: 1 day, 6 hr., 20 min.

Position (latitude; longitude): 26°48.66'N; 86°52.85'W

Water depth (sea level; corrected m, echo-sounding): 2983

Water depth (rig floor; corrected m, echo-sounding): 2993

Bottom felt (m, drill pipe): 2998.8

Penetration (m): 204.3

Number of cores: 22

Total length of cored section (m): 143.2

Total core recovered (m): 113.74

Core recovery (%): 79

Oldest sediment cored:

Depth sub-bottom (m): 204.3

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Hole 616 was drilled on the eastern lateral margin of the youngest fan lobe. The site was located on U.S.G.S. Line 22 (S.P. 225) in 2983 m of water. A water gun and sub-bottom record was acquired across the site by the D/V Glomar Challenger.

Total penetration at the site was 371.0 m. Core recovery to a depth of 102 m was excellent utilizing the Advanced Piston Corer. From that depth down the Extended Piston Corer was used and recovery was marginally successful to a depth of 320 m. Good recovery was again obtained with the XCB in the interval 320 m to TD at 371 m. A malfunctioning check valve in one of the XCB's contributed to the poor core recovery. At a depth of 371 m, the pipe became stuck and the decision was made to run a well log through the stuck pipe to allow interpretation of the missing cored sections, especially in the lower part of the hole. An extremely successful log run was completed and the gamma log response correlates very well with the cored intervals. The pipe was severed at the lowermost joint of the 5½ drilling pipe.

Hole 616A was offset slightly and cored at selected intervals to a depth of 132.4 m to obtain some of the cored sections missed in Hole 616. In the upper section of 616A, at a depth of 34.6 m, the downhole orientation system on the APC was attempted in a sequence of steeply dipping beds. Upon retrieval, it was found that the sensor wires in the orientation tool had been severed and that the plastic liner was buckled; no core was recovered.

Hole 616B was for geotechnical purposes and a series of successful cores were obtained to a depth of 204.3 m.

Drilling at Site 616 was considered successful and the major scientific objectives were achieved. The principal results were:

1) The entire sequence cored was much finer grained than at the previous sites in the lower fan. This is in agreement with the location of the site being on the lateral margin of the fan lobe.

2) The upper 100 m of cored section consists of an overall coarsening-upward fine-grained mud and silty sequence displaying extremely steep dips (ranging up to 65°). Numerous small zones of disturbance separate sequences displaying variable dips. The sequence obviously represents emplacement by mass-movement processes, but the source of the sediment is unknown as the entire section was virtually devoid of foraminifers. A high radiolarian content was present, but the depth ranges of the forms present have not been established.

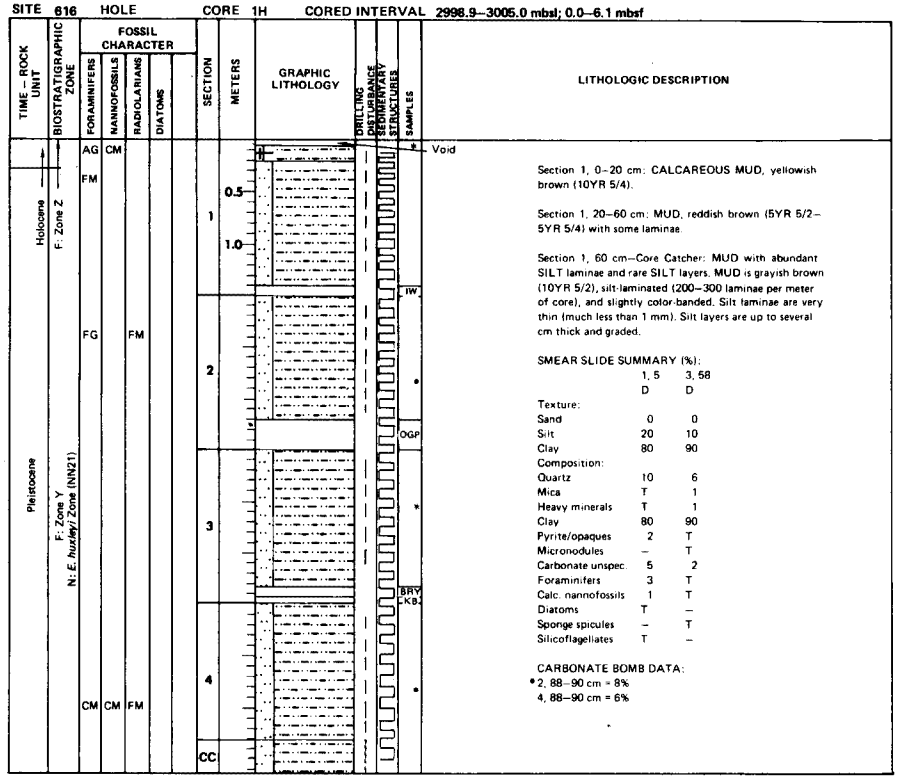
3) A successful gamma log run was acquired through the drill string to a depth of 249 m, the top of the drill collars. The presence of thick high-gamma radiating clays alternating with relatively clean sands resulted in a highly discriminating log response. The log significantly aided in the interpretation of the missing cored sections.

4) In addition to the mass-movement interval, two fan lobes were cored. The youngest fan lobe is approximately 88 m thick with a total of 33.8 m net sand (38.5%) and is a fining-upward sequence. The lower fan lobe was only partially cored, but appears to display a coarsening-upward trend with a minimum of 7% sand. The sand sequences

in the older lobe tend to show graded base sands while in the upper, younger lobe, the sands display both graded and sharp bases.

5) The entire section contained sparse planktonic foraminifers indicating a rapid accumulation rate. One interval, from 65 to 150 m contained a relatively high faunal content, possibly representing slower accumulation rates. Ericson's Zone Z (Holocene) was less than a meter thick and the cored section basically stayed in Ericson's Zone Y. Although Ericson's Zone X was not penetrated, a minimum accumulation rate for the cored section can be calculated to give approximately 3.78 m/1000 yr., excluding the overlying slide deposits. Based on seismic correlations of Zone X, the accumulation rate could be as high as 5.63 m/1000 yr. The site clearly demonstrates that thick series of fine-grained sediments can be deposited rapidly in deep water settings and that low- or nondepositional periods are too short to accumulate planktonic foraminifers provided the upper water is sufficiently clear to have a photic zone.

SITE 616 HOLE CORE 1H CORED INTERVAL 2998.9–3005.0 mbsl; 0.0–6.1 mbsl



LITHOLOGIC DESCRIPTION

Section 1, 0–20 cm: CALCAREOUS MUD, yellowish brown (10YR 5/4).

Section 1, 20–60 cm: MUD, reddish brown (5YR 5/2–5YR 5/4) with some laminae.

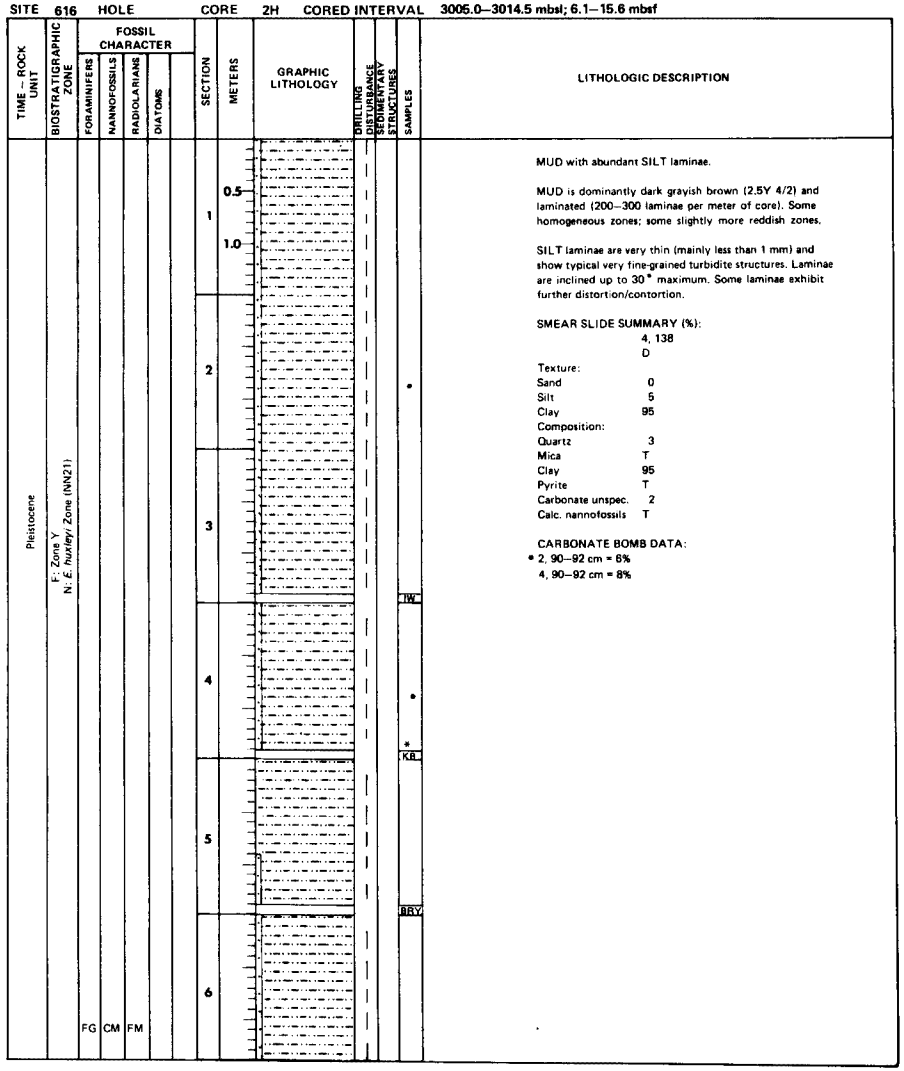
Section 1, 60 cm–Core Catcher: MUD with abundant SILT laminae and rare SILT layers. MUD is grayish brown (10YR 5/2), silt-laminated (200–300 laminae per meter of core), and slightly color-banded. Silt laminae are very thin (much less than 1 mm). Silt layers are up to several cm thick and graded.

SMEAR SLIDE SUMMARY (%):

	1, 5 D	3, 58 D
Texture:		
Sand	0	0
Silt	20	10
Clay	80	90
Composition:		
Quartz	10	6
Mica	T	1
Heavy minerals	T	1
Clay	80	90
Pyrite/opaques	2	T
Micronodules	–	T
Carbonate unspec.	5	2
Foraminifers	3	T
Calc. nannofossils	1	T
Diatoms	T	–
Sponge spicules	–	T
Silicoflagellates	T	–

CARBONATE BOMB DATA:
• 2, 88–90 cm = 8%
4, 88–90 cm = 6%

SITE 616 HOLE CORE 2H CORED INTERVAL 3005.0–3014.5 mbsl; 6.1–15.6 mbsl



LITHOLOGIC DESCRIPTION

MUD with abundant SILT laminae.

MUD is dominantly dark grayish brown (2.5Y 4/2) and laminated (200–300 laminae per meter of core). Some homogeneous zones; some slightly more reddish zones.

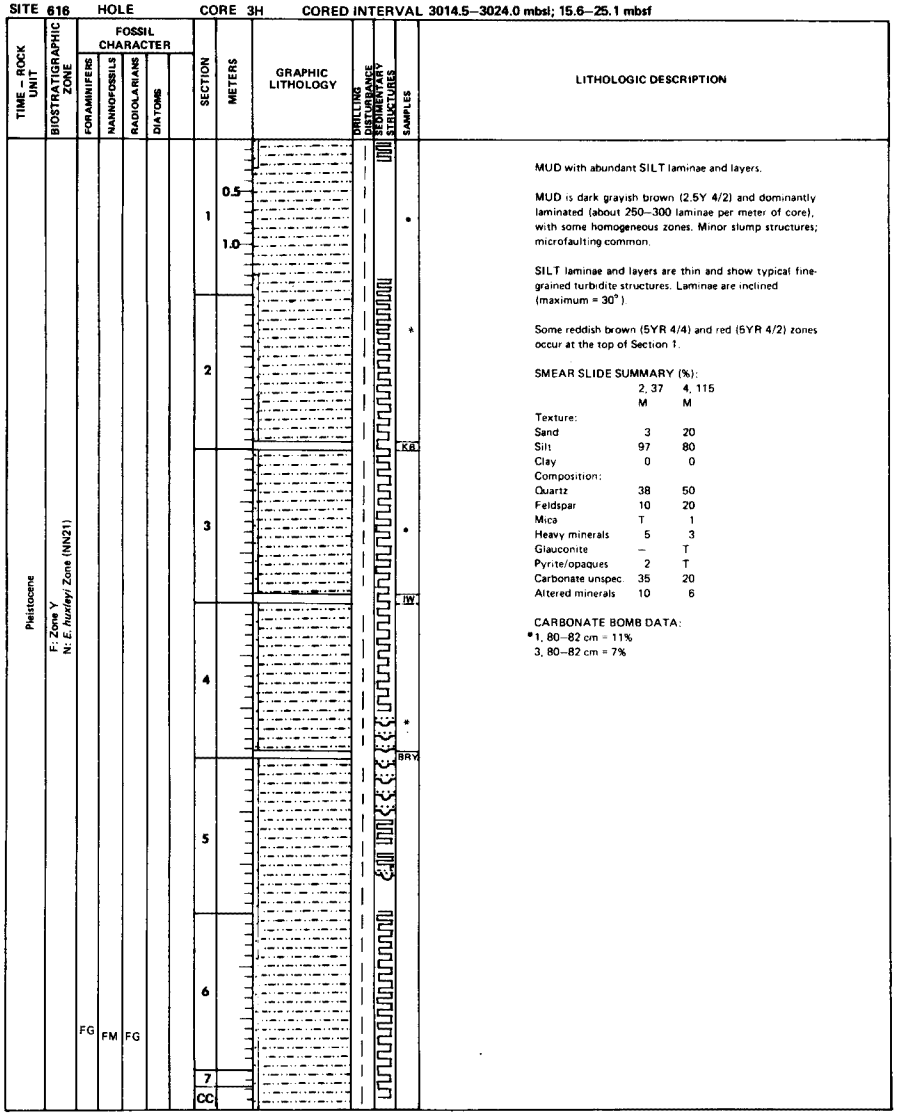
SILT laminae are very thin (mainly less than 1 mm) and show typical very fine-grained turbidite structures. Laminae are inclined up to 30° maximum. Some laminae exhibit further distortion/contortion.

SMEAR SLIDE SUMMARY (%):

	4, 138 D
Texture:	
Sand	0
Silt	5
Clay	95
Composition:	
Quartz	3
Mica	T
Clay	95
Pyrite	T
Carbonate unspec.	2
Calc. nannofossils	T

CARBONATE BOMB DATA:
• 2, 90–92 cm = 6%
4, 90–92 cm = 8%

SITE 616 HOLE CORE 3H CORED INTERVAL 3014.5–3024.0 mbsl; 15.6–25.1 mbsf



LITHOLOGIC DESCRIPTION

MUD with abundant SILT laminae and layers.

MUD is dark grayish brown (2.5Y 4/2) and dominantly laminated (about 250–300 laminae per meter of core), with some homogeneous zones. Minor slump structures; microfaulting common.

SILT laminae and layers are thin and show typical fine-grained turbidite structures. Laminae are inclined (maximum = 30°).

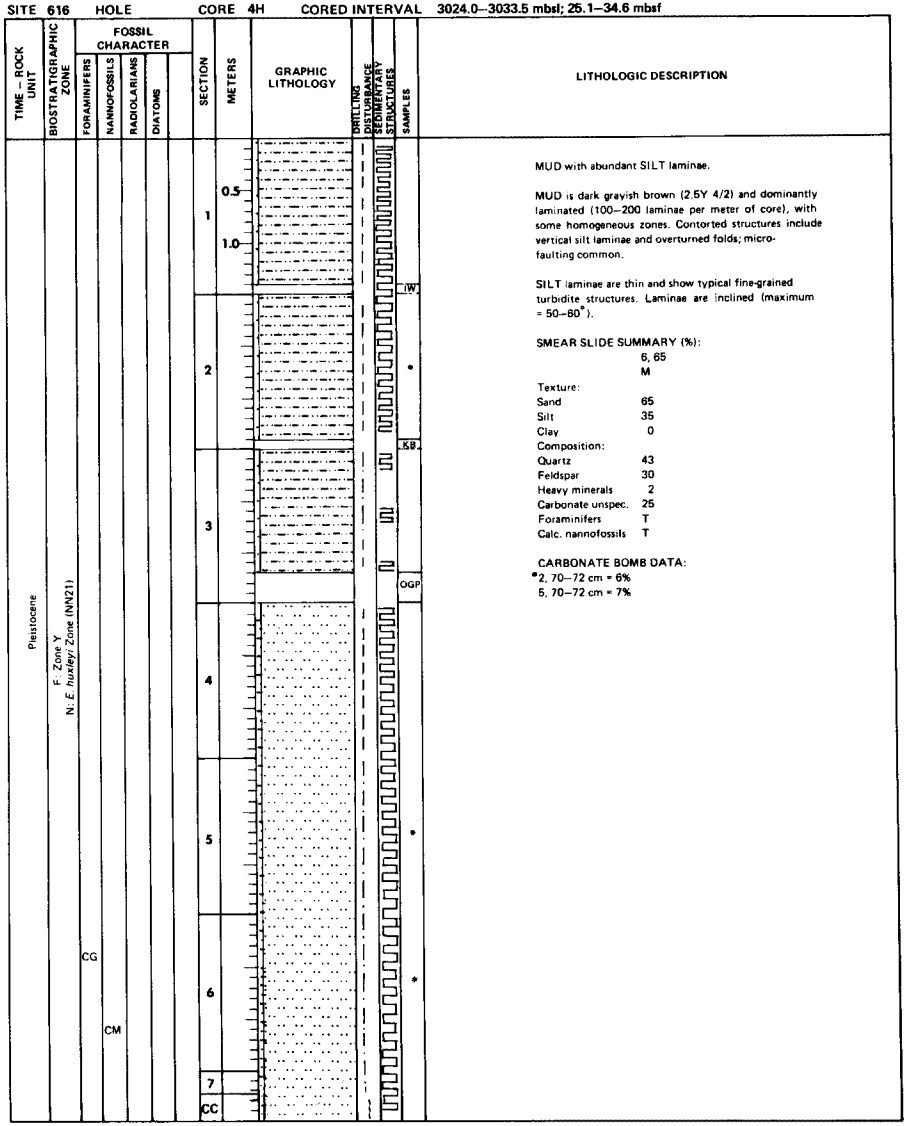
Some reddish brown (5YR 4/4) and red (5YR 4/2) zones occur at the top of Section 1.

SMEAR SLIDE SUMMARY (%):

	2, 37 M	4, 115 M
Texture:		
Sand	3	20
Silt	97	80
Clay	0	0
Composition:		
Quartz	38	50
Feldspar	10	20
Mica	T	1
Heavy minerals	5	3
Glauconite	–	T
Pyrite/opaques	2	T
Carbonate unspec.	35	20
Altered minerals	10	6

CARBONATE BOMB DATA:
*1, 80–82 cm = 11%
3, 80–82 cm = 7%

SITE 616 HOLE CORE 4H CORED INTERVAL 3024.0–3033.5 mbsl; 25.1–34.6 mbsf



LITHOLOGIC DESCRIPTION

MUD with abundant SILT laminae.

MUD is dark grayish brown (2.5Y 4/2) and dominantly laminated (100–200 laminae per meter of core), with some homogeneous zones. Contorted structures include vertical silt laminae and overturned folds; microfaulting common.

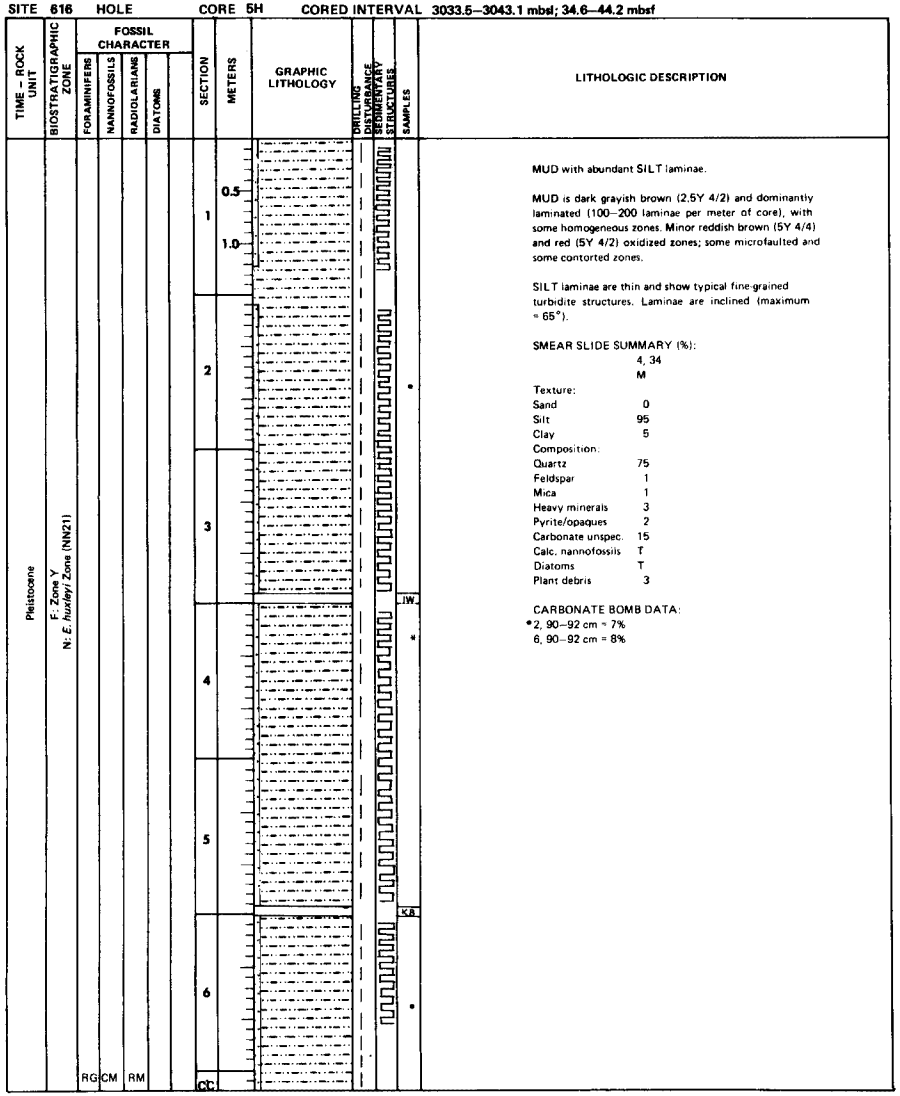
SILT laminae are thin and show typical fine-grained turbidite structures. Laminae are inclined (maximum = 50–80°).

SMEAR SLIDE SUMMARY (%):

	6, 65 M
Texture:	
Sand	65
Silt	35
Clay	0
Composition:	
Quartz	43
Feldspar	30
Heavy minerals	2
Carbonate unspec.	25
Foraminifers	T
Calc. nannofossils	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 6%
5, 70–72 cm = 7%

SITE 616 HOLE CORE 5H CORED INTERVAL 3033.5–3043.1 mbsl; 34.6–44.2 mbsf



LITHOLOGIC DESCRIPTION

MUD with abundant SILT laminae.

MUD is dark grayish brown (2.5Y 4/2) and dominantly laminated (100–200 laminae per meter of core), with some homogeneous zones. Minor reddish brown (5Y 4/4) and red (5Y 4/2) oxidized zones; some microfaulted and some contorted zones.

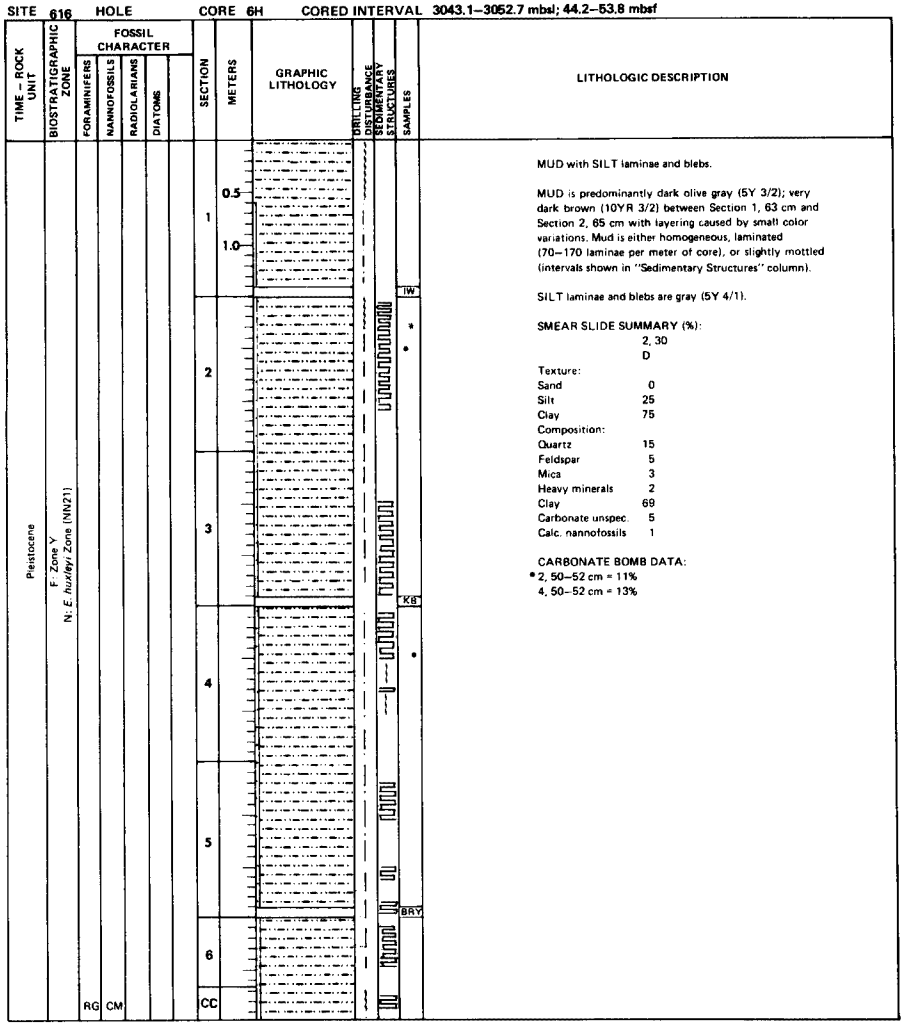
SILT laminae are thin and show typical fine-grained turbidite structures. Laminae are inclined (maximum = 65°).

SMEAR SLIDE SUMMARY (%):

	4, 34 M
Texture:	
Sand	0
Silt	95
Clay	5
Composition:	
Quartz	75
Feldspar	1
Mica	1
Heavy minerals	3
Pyrite/opaques	2
Carbonate unspec.	15
Calc. nannofossils	T
Diatoms	T
Plant debris	3

CARBONATE BOMB DATA:
*2, 90–92 cm = 7%
6, 90–92 cm = 8%

SITE 616 HOLE CORE 6H CORED INTERVAL 3043.1–3052.7 mbsl; 44.2–53.8 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

MUD is predominantly dark olive gray (5Y 3/2); very dark brown (10YR 3/2) between Section 1, 63 cm and Section 2, 65 cm with layering caused by small color variations. Mud is either homogeneous, laminated (70–170 laminae per meter of core), or slightly mottled (intervals shown in "Sedimentary Structures" column).

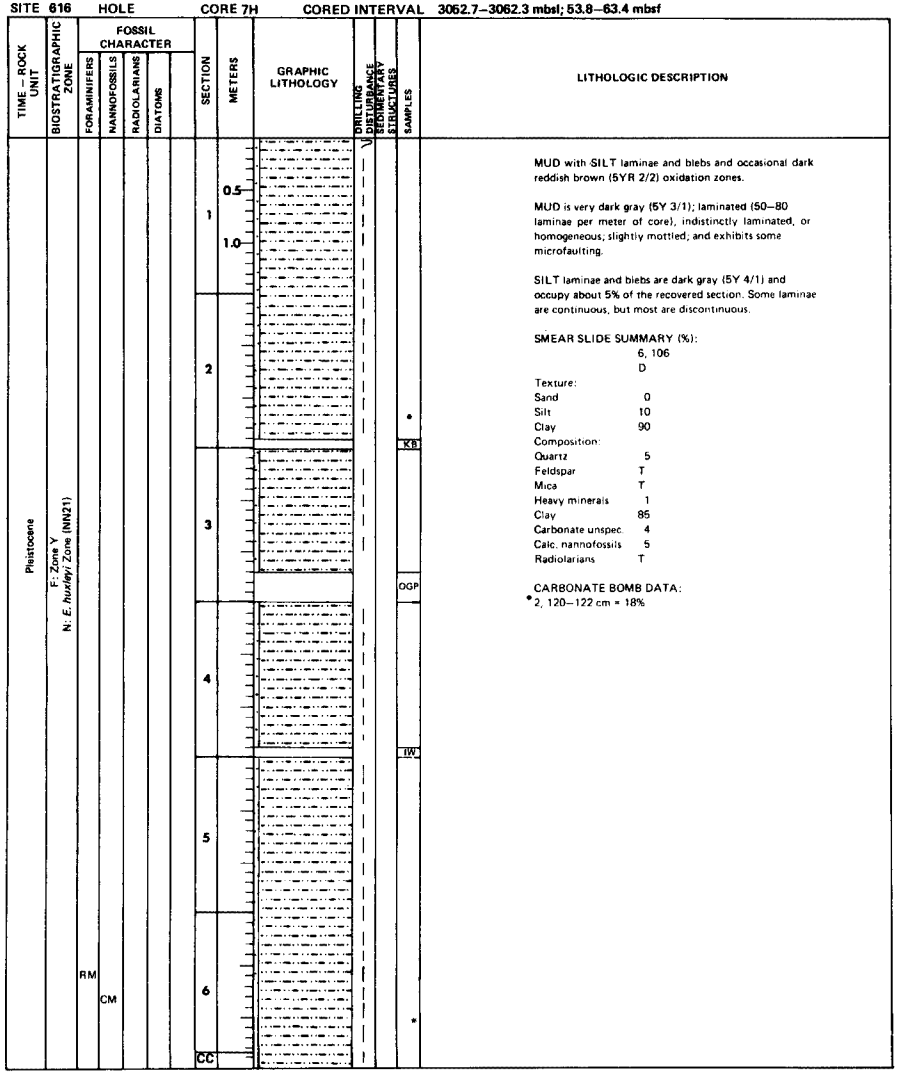
SILT laminae and blebs are gray (5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	2, 30 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	15
Feldspar	5
Mica	3
Heavy minerals	2
Clay	69
Carbonate unspec.	5
Calc. nannofossils	1

CARBONATE BOMB DATA:
*2, 50–52 cm = 11%
4, 50–52 cm = 13%

SITE 616 HOLE CORE 7H CORED INTERVAL 3062.7–3062.3 mbsl; 53.8–63.4 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs and occasional dark reddish brown (5YR 2/2) oxidation zones.

MUD is very dark gray (5Y 3/1); laminated (50–80 laminae per meter of core), indistinctly laminated, or homogeneous; slightly mottled; and exhibits some microfaulting.

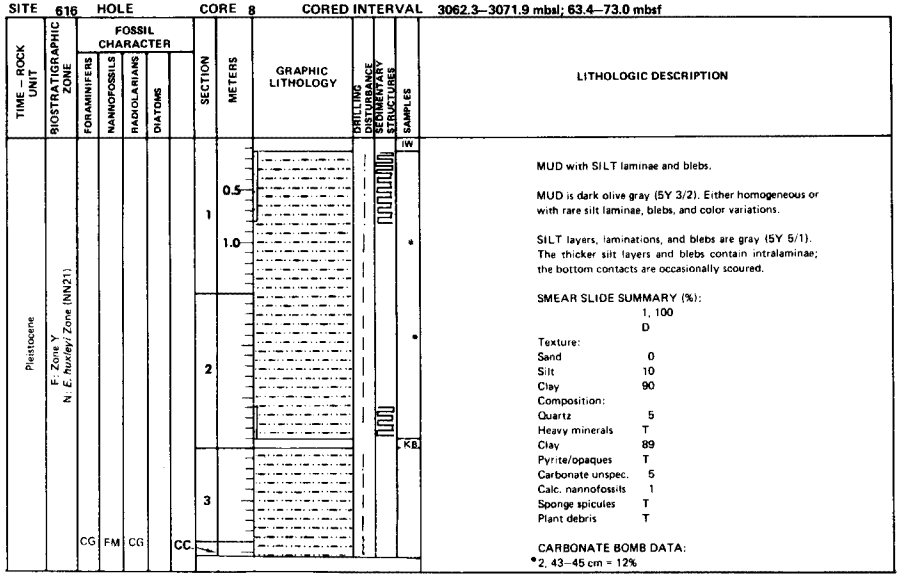
SILT laminae and blebs are dark gray (5Y 4/1) and occupy about 5% of the recovered section. Some laminae are continuous, but most are discontinuous.

SMEAR SLIDE SUMMARY (%):

	6, 106 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	5
Feldspar	T
Mica	T
Heavy minerals	1
Clay	86
Carbonate unspec.	4
Calc. nannofossils	5
Radiolarians	T

CARBONATE BOMB DATA:
*2, 120–122 cm = 18%

SITE 616 HOLE CORE 8 CORED INTERVAL 3062.3–3071.9 mbsl; 63.4–73.0 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

MUD is dark olive gray (5Y 3/2). Either homogeneous or with rare silt laminae, blebs, and color variations.

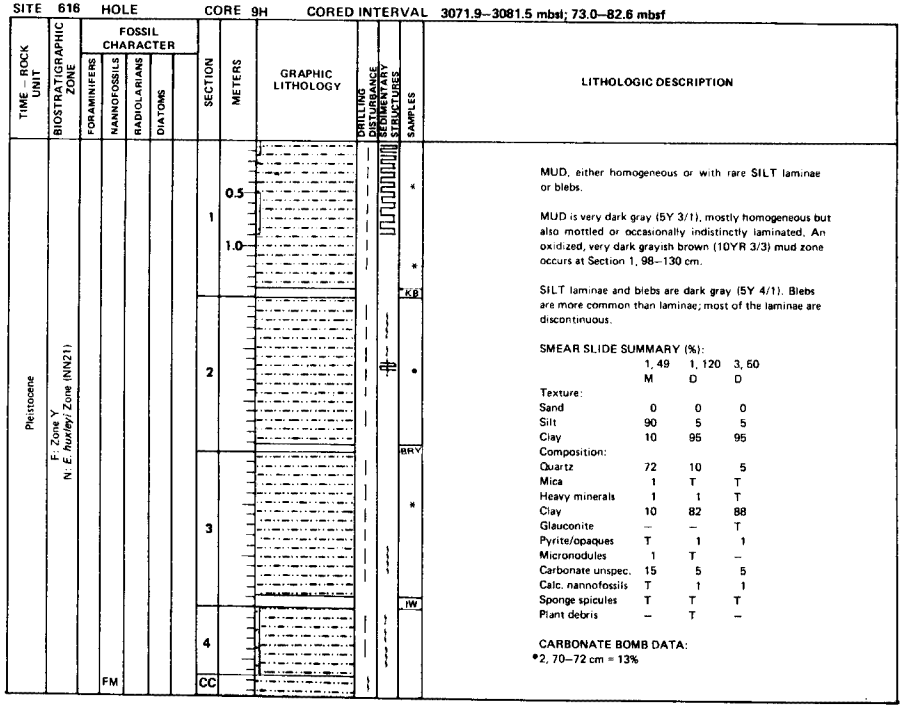
SILT layers, laminations, and blebs are gray (5Y 5/1). The thicker silt layers and blebs contain intralaminae; the bottom contacts are occasionally scoured.

SMEAR SLIDE SUMMARY (%):

	1, 100 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	5
Heavy minerals	T
Clay	89
Pyrite/opaques	T
Carbonate unspec.	5
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
*2, 43–45 cm = 12%

SITE 616 HOLE CORE 9H CORED INTERVAL 3071.9–3081.5 mbsl; 73.0–82.6 mbsf



LITHOLOGIC DESCRIPTION

MUD, either homogeneous or with rare SILT laminae or blebs.

MUD is very dark gray (5Y 3/1), mostly homogeneous but also mottled or occasionally indistinctly laminated. An oxidized, very dark grayish brown (10YR 3/3) mud zone occurs at Section 1, 98–130 cm.

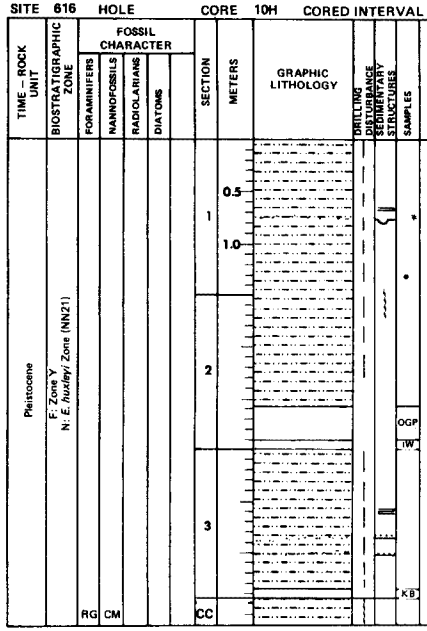
SILT laminae and blebs are dark gray (5Y 4/1). Blebs are more common than laminae; most of the laminae are discontinuous.

SMEAR SLIDE SUMMARY (%):

	1, 49 M	1, 120 D	3, 60 D
Texture:			
Sand	0	0	0
Silt	90	5	5
Clay	10	95	95
Composition:			
Quartz	72	10	5
Mica	1	T	T
Heavy minerals	1	1	T
Clay	10	82	88
Glauconite	—	—	T
Pyrite/opaques	T	1	1
Micronodules	1	T	—
Carbonate unspec.	15	5	5
Calc. nannofossils	T	1	1
Sponge spicules	T	T	T
Plant debris	—	T	—

CARBONATE BOMB DATA:
*2, 70–72 cm = 13%

SITE 616 HOLE CORE 10H CORED INTERVAL 3081.5–3091.1 mbsl; 82.6–92.2 mbsf



LITHOLOGIC DESCRIPTION

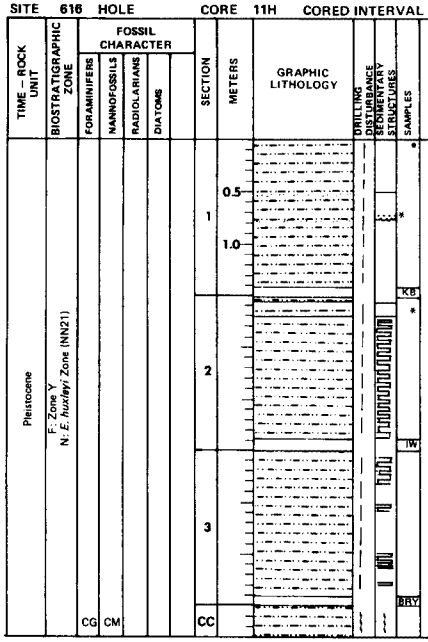
MUD, dark olive gray (5Y 3/2), and dominantly homogeneous with very rare silt blebs. Discrete coarse silt beds (2–3 cm thick and olive gray [5Y 3/2–5Y 4/2]) occur at Section 1, 75–78 cm; Section 3, 87–89 cm; and Section 3, 100–102 cm. The silt layer in Section 1 has a scoured base; silt layers in Section 3 are indistinctly normally-graded.

SMEAR SLIDE SUMMARY (%):

	1, 76 M
Texture:	
Sand	10
Silt	80
Clay	10
Composition:	
Quartz	88
Feldspar	3
Mica	2
Heavy minerals	1
Carbonate unspec.	5
Calc. nannofossils	1
Other (spores)	T

CARBONATE BOMB DATA:
*1, 130–132 cm = 8%

SITE 616 HOLE CORE 11H CORED INTERVAL 3091.1–3100.7 mbsl; 92.2–101.8 mbsf



LITHOLOGIC DESCRIPTION

MUD, very dark gray (5Y 3/1); dominantly homogeneous with somewhat indistinct laminations in Section 2 mainly due to color variations (slight oxidation). MUD includes SILT/SILTY MUD beds and rare dark gray (5Y 4/1) SILT laminae and blebs. SILT/SILTY MUD beds are very dark gray (5Y 3/1).

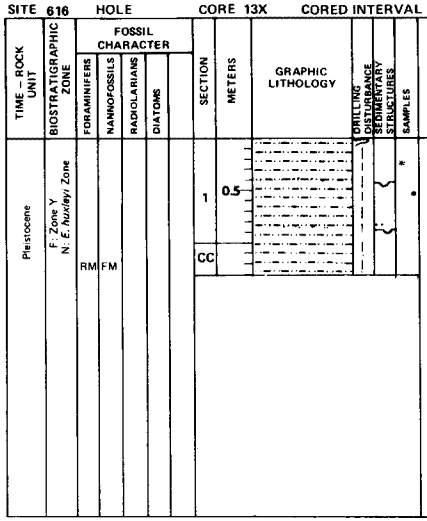
SMEAR SLIDE SUMMARY (%):

	1, 75 M	2, 12 M
Texture:		
Sand	5	5
Silt	90	20
Clay	5	75
Composition:		
Quartz	77	20
Feldspar	7	2
Mica	4	1
Heavy minerals	2	1
Clay	–	70
Pyrite/opaques	–	T
Micronodules	–	1
Carbonate unspec.	10	5
Foraminifers	–	T
Calc. nannofossils	–	T
Sponge spicules	–	T

CARBONATE BOMB DATA:
1, 8–10 cm = 6%

Note: Core 12X, 3102.9–3112.5 mbsl;
*104.0–113.6 mbsf: no recovery.

SITE 616 HOLE CORE 13X CORED INTERVAL 3112.5–3122.1 mbsl; 113.6–123.2 mbsf



LITHOLOGIC DESCRIPTION

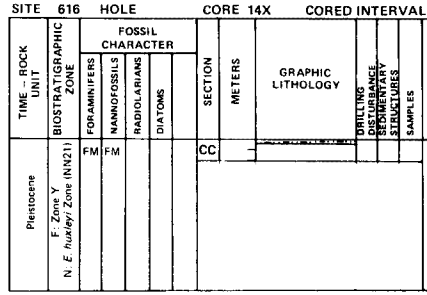
MUD, dark olive gray (5Y 3/2) and homogeneous with rare, thin, discontinuous silt laminae and blebs. Some of the silt blebs are olive gray (5Y 5/2).

SMEAR SLIDE SUMMARY (%):

	1, 28 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	10
Mica	1
Heavy minerals	T
Clay	85
Glauconite	T
Pyrite/opaques	1
Micronodules	T
Carbonate unspec.	3
Calc. nannofossils	T

CARBONATE BOMB DATA:
*1, 57–59 cm = 7%

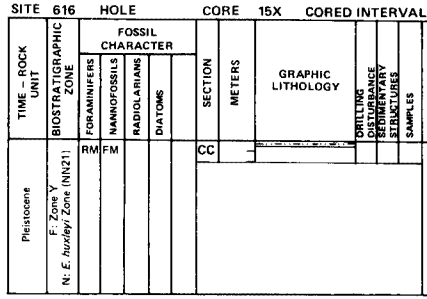
SITE 616 HOLE CORE 14X CORED INTERVAL 3122.1–3131.7 mbsl; 123.2–132.8 mbsf



LITHOLOGIC DESCRIPTION

Core Catcher contained one small handful of homogeneous, dark olive gray (5Y 3/2) MUD. Rest of core was empty.

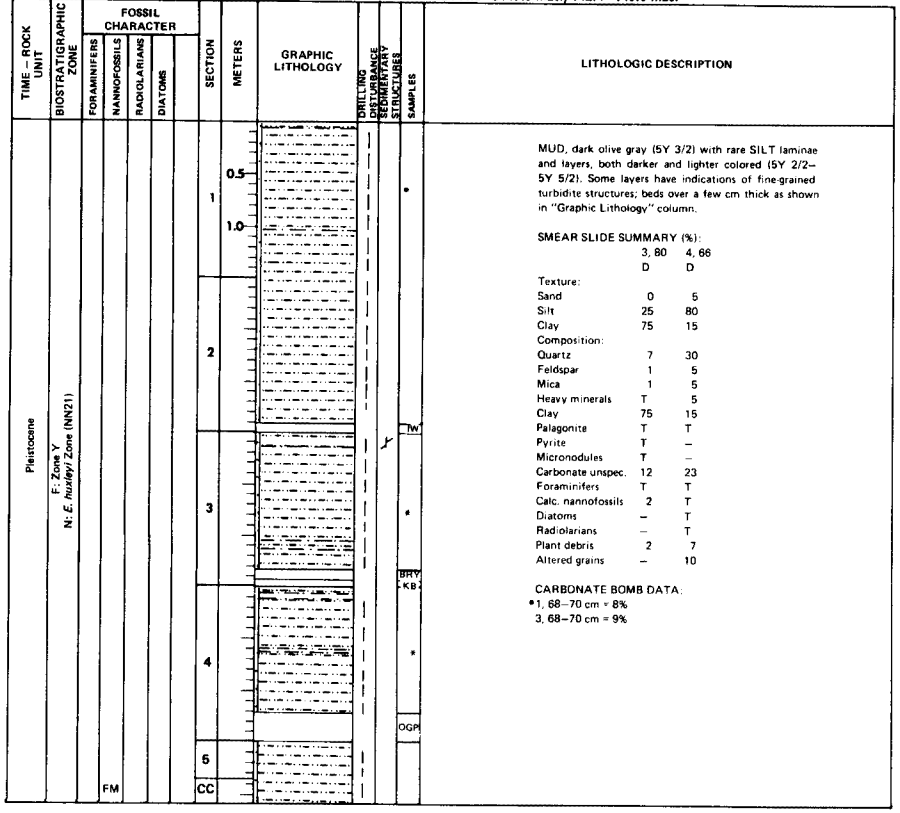
SITE 616 HOLE CORE 15X CORED INTERVAL 3131.7–3141.3 mbsl; 132.8–142.4 mbsf



LITHOLOGIC DESCRIPTION

Core Catcher contained one small handful of homogeneous, dark olive gray (5Y 3/2) MUD. Rest of the core was empty.

SITE 616 HOLE CORE 16H CORED INTERVAL 3141.3–3147.9 mbsl; 142.4–149.0 mbsf



LITHOLOGIC DESCRIPTION

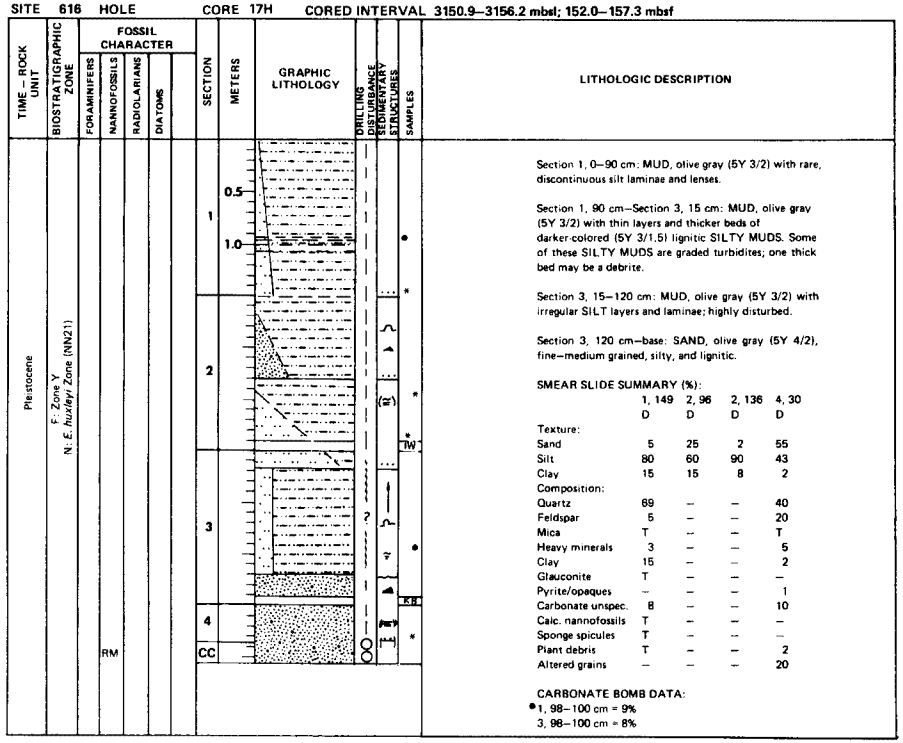
MUD, dark olive gray (5Y 3/2) with rare SILT laminae and layers, both darker and lighter colored (5Y 2/2–5Y 5/2). Some layers have indications of fine-grained turbidite structures; beds over a few cm thick as shown in "Graphic Lithology" column.

SMEAR SLIDE SUMMARY (%):

	3, 80 D	4, 66 D
Texture:		
Sand	0	5
Silt	25	80
Clay	75	15
Composition:		
Quartz	7	30
Feldspar	1	5
Mica	1	5
Heavy minerals	T	5
Clay	75	15
Palagonite	T	T
Pyrite	T	–
Micronodules	T	–
Carbonate unspec.	12	23
Foraminifers	T	T
Calc. nannofossils	2	T
Diatoms	–	T
Radiolarians	–	T
Plant debris	2	7
Altered grains	–	10

CARBONATE BOMB DATA:
•1, 68–70 cm = 8%
3, 68–70 cm = 9%

SITE 616 HOLE CORE 17H CORED INTERVAL 3150.9–3156.2 mbsl; 152.0–157.3 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–90 cm: MUD, olive gray (5Y 3/2) with rare, discontinuous silt laminae and lenses.

Section 1, 90 cm–Section 3, 15 cm: MUD, olive gray (5Y 3/2) with thin layers and thicker beds of darker-colored (5Y 3/1.5) lignitic SILTY MUDS. Some of these SILTY MUDS are graded turbidites; one thick bed may be a debrite.

Section 3, 15–120 cm: MUD, olive gray (5Y 3/2) with irregular SILT layers and laminae; highly disturbed.

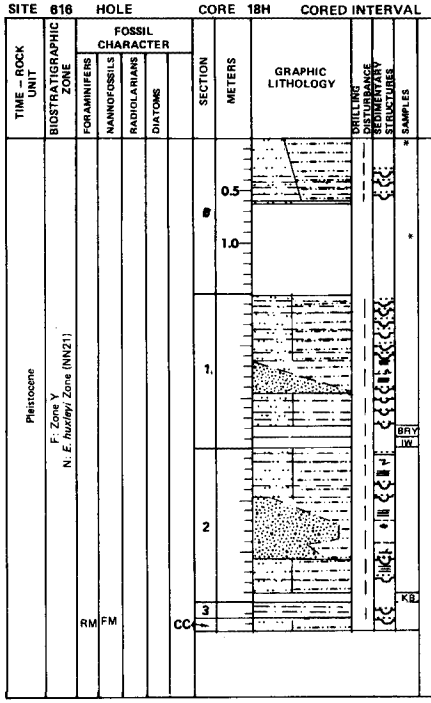
Section 3, 120 cm–base: SAND, olive gray (5Y 4/2), fine–medium grained, silty, and lignitic.

SMEAR SLIDE SUMMARY (%):

	1, 149 D	2, 96 D	2, 136 D	4, 30 D
Texture:				
Sand	5	25	2	55
Silt	80	60	90	43
Clay	15	15	8	2
Composition:				
Quartz	69	–	–	40
Feldspar	5	–	–	20
Mica	T	–	–	T
Heavy minerals	3	–	–	5
Clay	15	–	–	2
Glauconite	T	–	–	–
Pyrite/opaques	–	–	–	1
Carbonate unspec.	8	–	–	10
Calc. nannofossils	T	–	–	–
Sponge spicules	T	–	–	–
Plant debris	T	–	–	2
Altered grains	–	–	–	20

CARBONATE BOMB DATA:
•1, 98–100 cm = 9%
3, 98–100 cm = 8%

SITE 616 HOLE CORE 18H CORED INTERVAL 3160.5–3164.4 mbsl; 161.6–165.5 mbsf



LITHOLOGIC DESCRIPTION

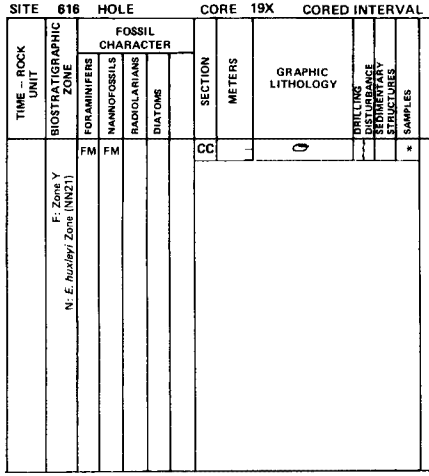
Interbedded MUD, SILT, and FINE SAND. MUD is dark olive gray (5Y 3/2); SILT and FINE SAND are dominantly olive gray (5Y 4/2). SILT laminae range from 1–10 mm thick; thin SILT and very FINE SAND beds range from 1–30 cm thick. Classical turbidite structures are observed throughout the SILT and SAND layers, with some more disturbed/slumped horizons. Structures are delineated most clearly by compositional variations: light-colored beds are mainly quartz and carbonate and dark-colored beds are mainly lignite and mica. Some MUDS are very rich in very fine carbonate silt; some SANDS are very rich in volcanic ash.

Note: numbering of core sections on this barrel sheet. This core has a Section 0.

SMEAR SLIDE SUMMARY (%):

	1, 5 D	1, 91 D
Texture:		
Sand	0	55
Silt	25	45
Clay	75	0
Composition:		
Quartz	10	30
Feldspar	–	17
Mica	–	1
Heavy minerals	–	7
Clay	75	–
Volcanic glass	–	20
Zeolite	–	T
Carbonate unspec.	10	5
Foraminifers	–	T
Calc. nannofossils	5	–
Plant debris	T	–
Altered minerals	–	20

SITE 616 HOLE CORE 19X CORED INTERVAL 3170.1–3179.6 mbsl; 171.2–180.7 mbsf



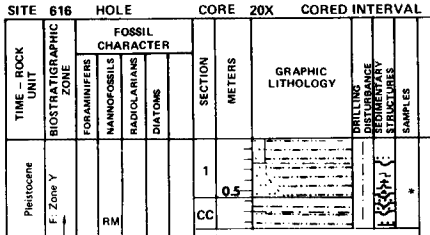
LITHOLOGIC DESCRIPTION

Total core consists of a 4 cm ball of MUD in the Core Catcher. Smear slide data indicate that this MUD is silty and rich in detrital carbonate.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	3
Silt	27
Clay	70
Composition:	
Quartz	8
Feldspar	T
Mica	T
Heavy minerals	T
Clay	74
Carbonate unspec.	15
Calc. nannofossils	2
Sponge spicules	T
Plant debris	1

SITE 616 HOLE CORE 20X CORED INTERVAL 3174.6–3189.1 mbsl; 180.7–190.2 mbsf



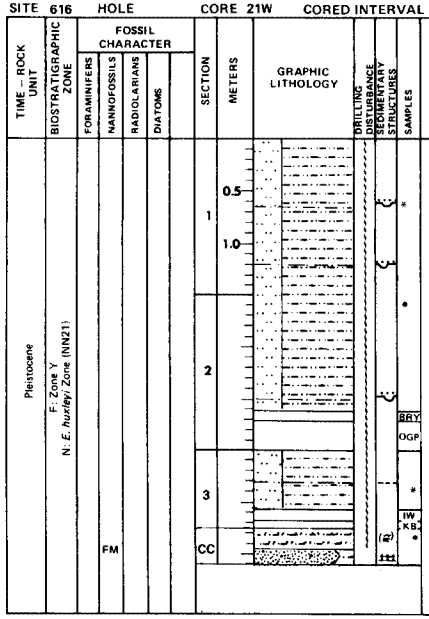
LITHOLOGIC DESCRIPTION

MUD, dark olive gray (5Y 3/1) with SILT laminae, layers, and thin graded turbidite beds. SILTS are olive gray (5Y 3.5/1). Core is somewhat disturbed.

SMEAR SLIDE SUMMARY (%):

	1, 53 D
Texture:	
Sand	65
Silt	35
Clay	T
Composition:	
Quartz	55
Feldspar	6
Mica	3
Heavy minerals	8
Clay	T
Glauconite	T
Carbonate unspec.	15
Foraminifers	T
Plant debris	3
Altered grains	10

SITE 616 HOLE CORE 21W CORED INTERVAL 3189.1–3208.2 mbsl; 190.2–209.3 mbsf



LITHOLOGIC DESCRIPTION

MUD, dark olive gray (5Y 3/2) with SILT laminae and layers. SILTS are olive gray (5Y 4/2). Whole core is thoroughly disturbed, probably as a result of coring.

SMEAR SLIDE SUMMARY (%):

	1, 68 D	3, 40 D
Texture:		
Sand	75	2
Silt	20	35
Clay	5	63
Composition:		
Quartz	54	18
Feldspar	5	T
Mica	2	T
Heavy minerals	5	T
Clay	5	63
Palagonite	–	T
Glauconite	T	–
Pyrite	–	T
Micronodules	–	T
Carbonate unspec.	10	15
Foraminifers	T	–
Calc. nannofossils	T	2
Plant debris	4	2
Altered grains	15	–

CARBONATE BOMB DATA:
*2, 10–12 cm = 4%
CC, 10–12 cm = 6%

SITE 616 HOLE CORE 22W CORED INTERVAL 3208.2–3277.4 mbsl; 209.3–228.5 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone (NN21)		FM			1 2	0.5 1.0				* *	SAND, olive gray (5Y 5/2). Silty; fine- to medium-grained at the top, medium- to coarse-grained at the base; otherwise structureless; mineralogically immature with dominant quartz, plus carbonate, feldspar, micas, heavy minerals, altered/coated grains, lignite, spores, and shell debris; very rounded and polished to subangular grains.

SMEAR SLIDE SUMMARY (%):

	1, 20 D	2, 10 D
Texture:		
Sand	75	75
Silt	25	25
Clay	T	0
Composition:		
Quartz	41	62
Feldspar	6	8
Mica	6	T
Heavy minerals	8	5
Glauconite	1	T
Carbonate unspec.	15	10
Foraminifers	T	–
Plant debris	3	T
Altered grains	20	15

SITE 616 HOLE CORE 23W CORED INTERVAL 3227.4–3246.6 mbsl; 228.5–247.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone (NN21)	RP	FM			1 CC	0.5 1.0				*	MUD, dark olive gray (5Y 3.5/2) with SILT laminae and layers. SILTS are lighter olive gray (5Y 5/2). Whole core is thoroughly disturbed, probably as a result of coring.

CARBONATE BOMB DATA:
*1, 73–75 cm = 11%

SITE 616 HOLE CORE 24W CORED INTERVAL 3246.6–3265.8 mbsl; 247.7–266.9 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone (NN21)		RM			1 2 CC	0.5 1.0	KB BRY IW			* * * * *	MUD with SILT and SILTY SAND laminations and layers. MUD is dark olive gray (5Y 3/2) and either homogeneous or SILT-laminated. SILT and SILTY SAND laminations and layers are dominantly dark olive gray to olive gray (5Y 3/2–5Y 4/2), and usually graded. SILTY SAND at Section 2, 18–35 cm is black (7.5YR 2/0) and very lignite-rich.

Void

SMEAR SLIDE SUMMARY (%):

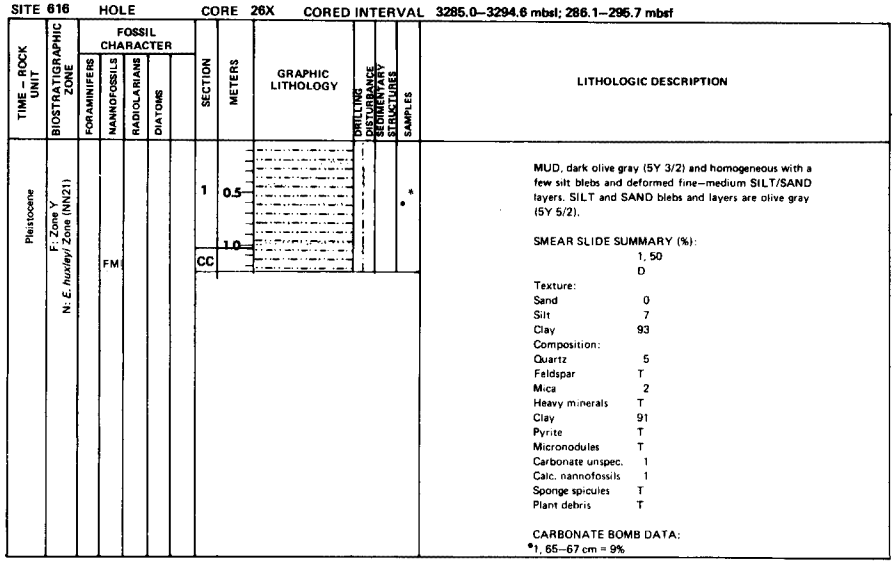
	1, 38 D	1, 42 D	2, 8 D	2, 25 D	2, 33 D	CC, 17 D
Texture:						
Sand	0	1	0	60	65	T
Silt	15	24	75	25	30	50
Clay	85	75	25	15	5	50
Composition:						
Quartz	10	15	66	56	92	30
Feldspar	1	2	10	1	1	3
Mica	1	1	–	5	2	1
Heavy minerals	T	T	4	–	T	T
Clay	83	76	15	5	–	64
Glauconite	–	–	–	T	–	–
Pyrite/opaques	1	–	–	–	–	T
Micronodules	1	–	–	–	–	T
Carbonate unspec.	1	5	5	3	2	2
Foraminifers	–	–	T	10	3	–
Calc. nannofossils	2	T	–	T	T	–
Sponge spicules	T	–	–	–	–	–
Plant debris	T	1	–	20	T	T

CARBONATE BOMB DATA:
*1, 25–27 cm = 8%

SITE 616 HOLE CORE 25W CORED INTERVAL 3265.8–3285.0 mbsl; 266.9–286.1 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone (NN21)	FM	FM			CC	–					Core was empty except for a couple specks of dark olive gray (5Y 3/2) MUD. Entire sample given to paleontologists.

SITE 616 HOLE CORE 26X CORED INTERVAL 3285.0–3294.6 mbsl; 286.1–295.7 mbsf



LITHOLOGIC DESCRIPTION

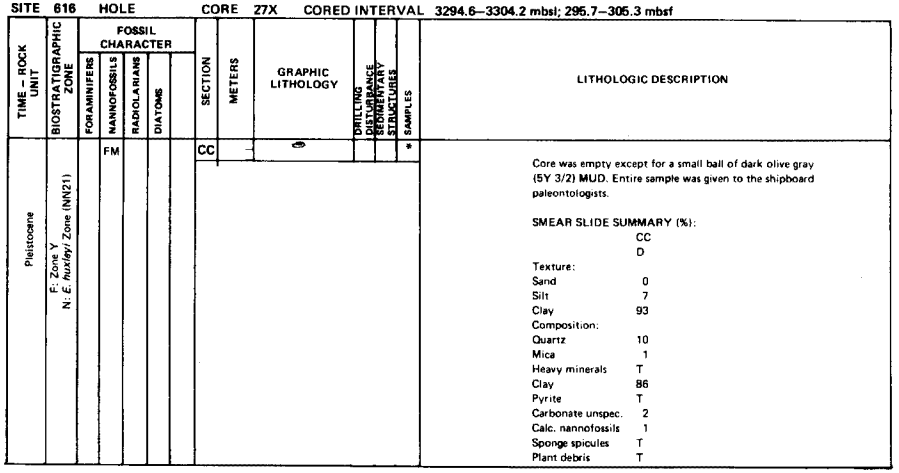
MUD, dark olive gray (5Y 3/2) and homogeneous with a few silt blebs and deformed fine–medium SILT/SAND layers. SILT and SAND blebs and layers are olive gray (5Y 5/2).

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	0
Silt	7
Clay	93
Composition:	
Quartz	5
Feldspar	T
Mica	2
Heavy minerals	T
Clay	91
Pyrite	T
Micronodules	T
Carbonate unspec.	1
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
*1, 65–67 cm = 9%

SITE 616 HOLE CORE 27X CORED INTERVAL 3294.6–3304.2 mbsl; 295.7–305.3 mbsf



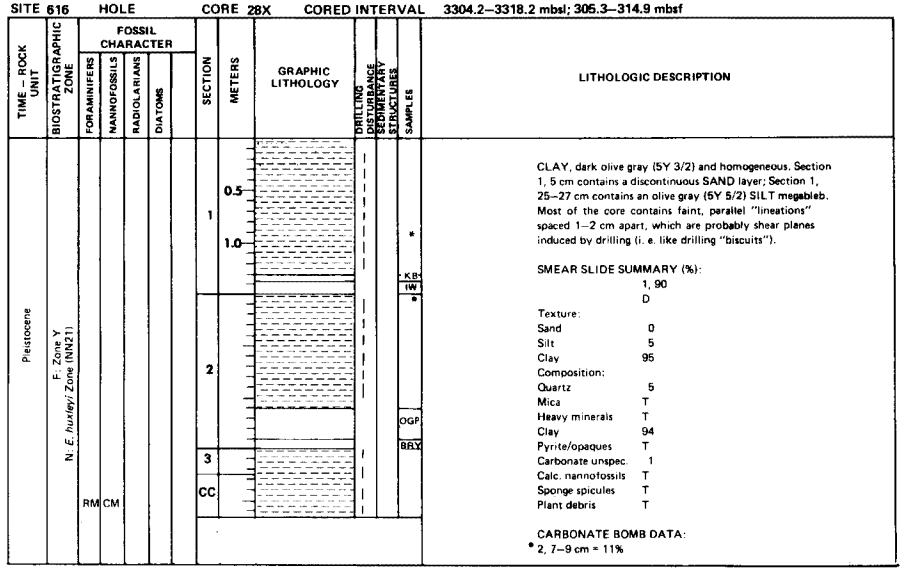
LITHOLOGIC DESCRIPTION

Core was empty except for a small ball of dark olive gray (5Y 3/2) MUD. Entire sample was given to the shipboard paleontologists.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	0
Silt	7
Clay	93
Composition:	
Quartz	10
Mica	1
Heavy minerals	T
Clay	86
Pyrite	T
Carbonate unspec.	2
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

SITE 616 HOLE CORE 28X CORED INTERVAL 3304.2–3318.2 mbsl; 305.3–314.9 mbsf



LITHOLOGIC DESCRIPTION

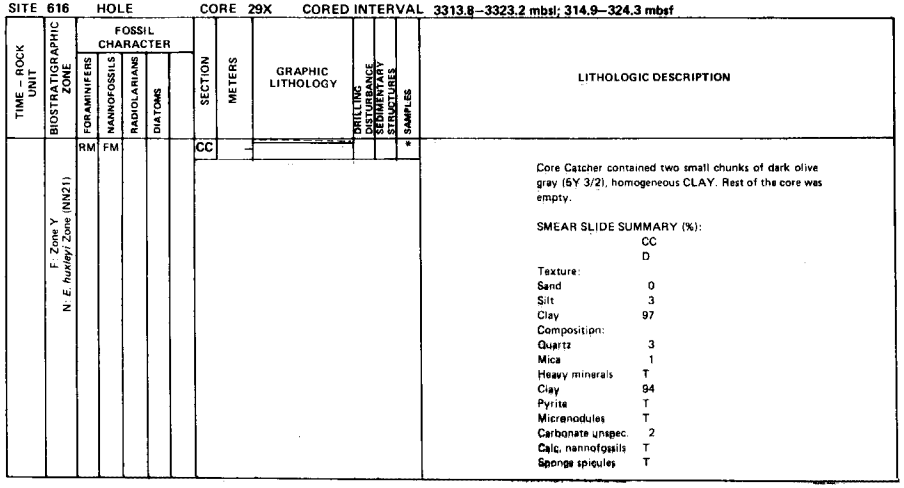
CLAY, dark olive gray (5Y 3/2) and homogeneous. Section 1, 5 cm contains a discontinuous SAND layer; Section 1, 25–27 cm contains an olive gray (5Y 5/2) SILT megableb. Most of the core contains faint, parallel "lineations" spaced 1–2 cm apart, which are probably shear planes induced by drilling (i. e. like drilling "biscuits").

SMEAR SLIDE SUMMARY (%):

	1, 90 D
Texture:	
Sand	0
Silt	5
Clay	95
Composition:	
Quartz	5
Mica	T
Heavy minerals	T
Clay	94
Pyrite/opaques	T
Carbonate unspec.	1
Calc. nannofossils	T
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
*2, 7–9 cm = 11%

SITE 616 HOLE CORE 29X CORED INTERVAL 3313.8–3323.2 mbsl; 314.9–324.3 mbsf



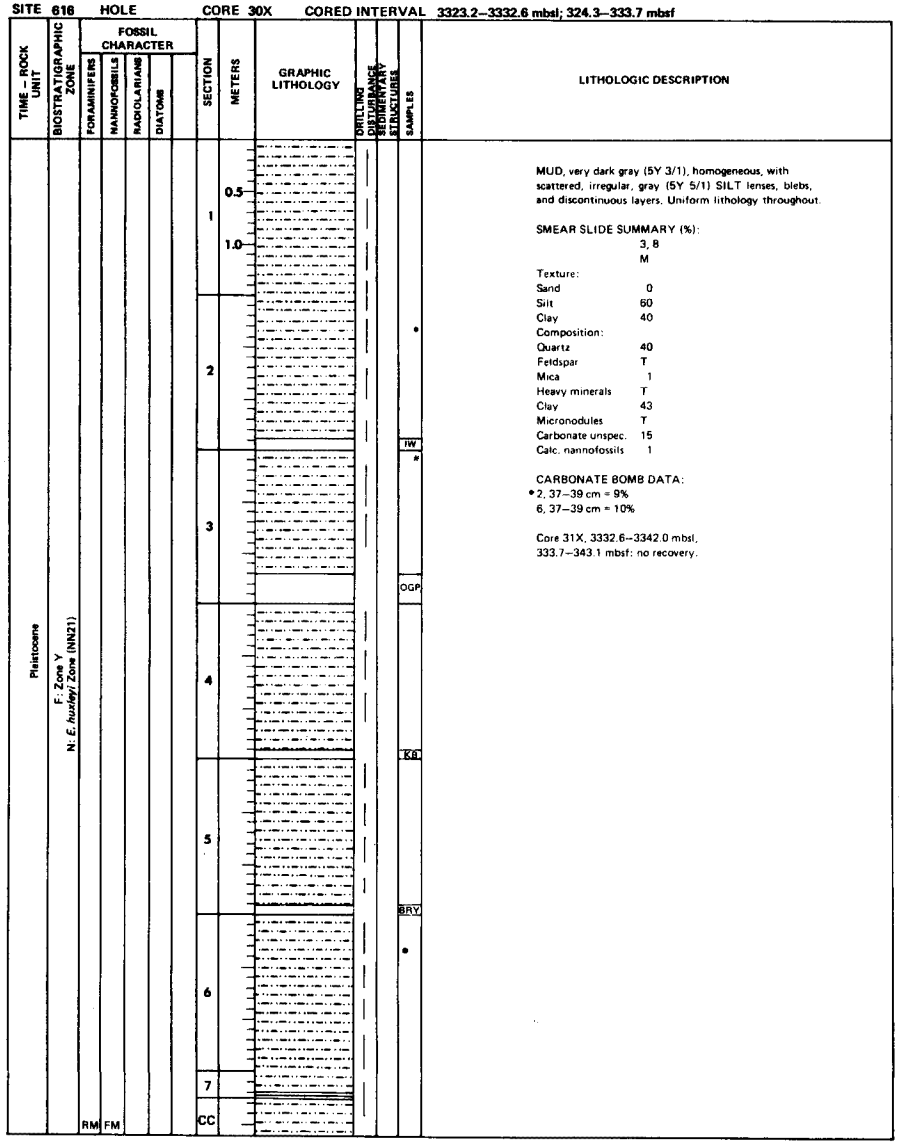
LITHOLOGIC DESCRIPTION

Core Catcher contained two small chunks of dark olive gray (5Y 3/2), homogeneous CLAY. Rest of the core was empty.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	0
Silt	3
Clay	97
Composition:	
Quartz	3
Mica	1
Heavy minerals	T
Clay	94
Pyrite	T
Micronodules	T
Carbonate unspec.	2
Calc. nannofossils	T
Sponge spicules	T

SITE 616 HOLE CORE 30X CORED INTERVAL 3323.2–3332.6 mbsl; 324.3–333.7 mbsf



LITHOLOGIC DESCRIPTION

MUD, very dark gray (5Y 3/1), homogeneous, with scattered, irregular, gray (5Y 5/1) SILT lenses, blebs, and discontinuous layers. Uniform lithology throughout.

SMEAR SLIDE SUMMARY (%):

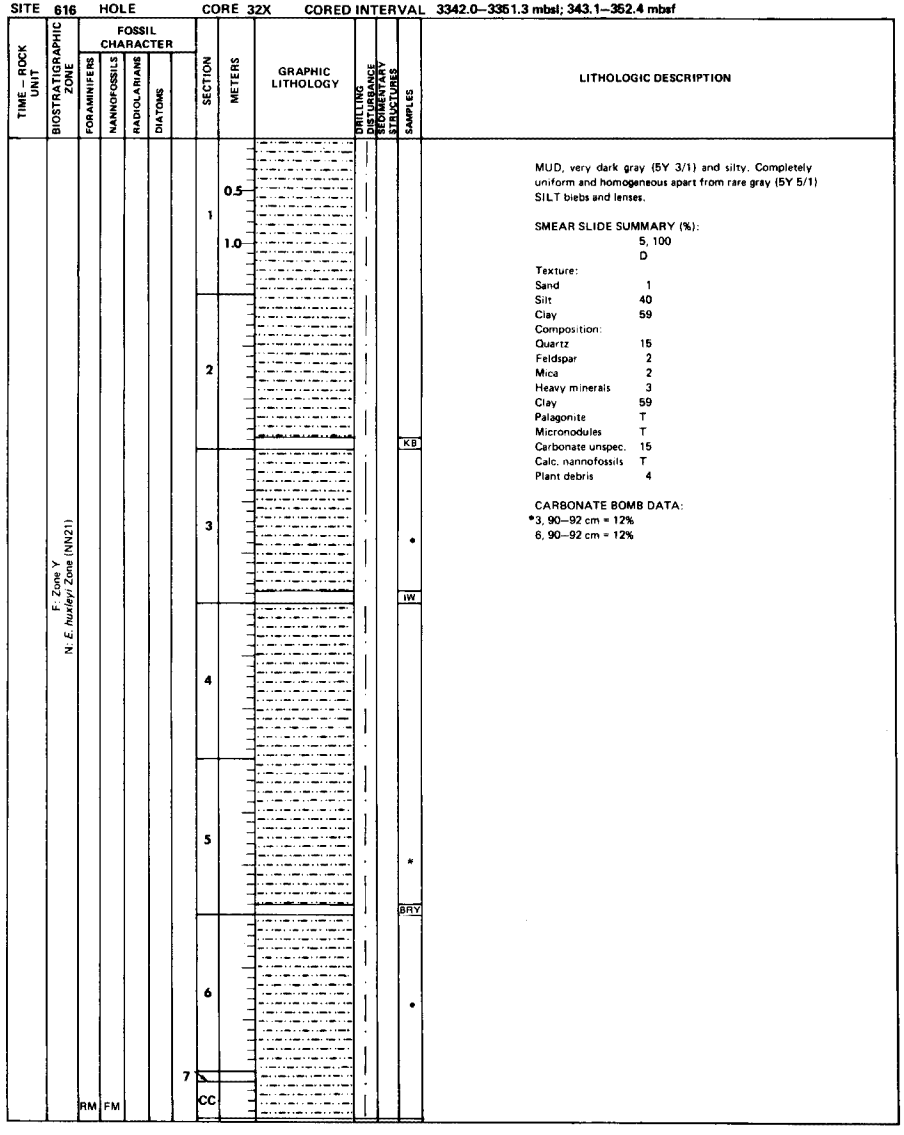
	3, 8 M
Texture:	
Sand	0
Silt	60
Clay	40
Composition:	
Quartz	40
Feldspar	T
Mica	1
Heavy minerals	T
Clay	43
Micronodules	T
Carbonate unspec.	15
Calc. nannofossils	1

CARBONATE BOMB DATA:

*2, 37–39 cm = 9%
6, 37–39 cm = 10%

Core 31X, 3332.6–3342.0 mbsl, 333.7–343.1 mbsf: no recovery.

SITE 616 HOLE CORE 32X CORED INTERVAL 3342.0–3351.3 mbsl; 343.1–352.4 mbsf



LITHOLOGIC DESCRIPTION

MUD, very dark gray (5Y 3/1) and silty. Completely uniform and homogeneous apart from rare gray (5Y 5/1) SILT blebs and lenses.

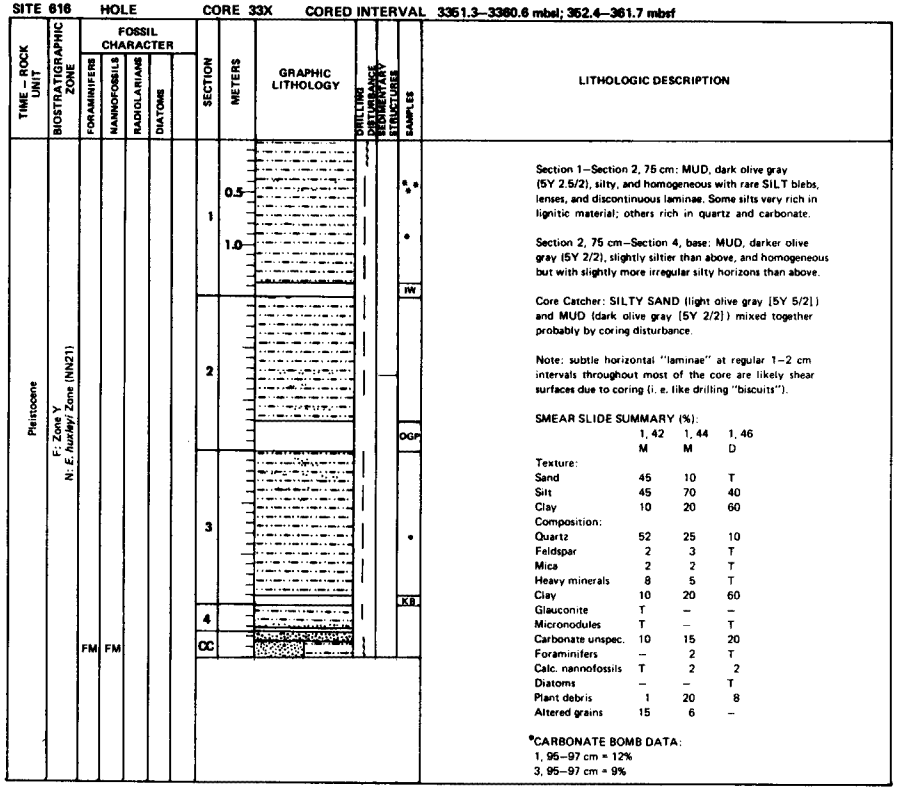
SMEAR SLIDE SUMMARY (%):

	5, 100 D
Texture:	
Sand	1
Silt	40
Clay	59
Composition:	
Quartz	15
Feldspar	2
Mica	2
Heavy minerals	3
Clay	59
Palagonite	T
Micronodules	T
Carbonate unspec.	15
Calc. nannofossils	T
Plant debris	4

CARBONATE BOMB DATA:

*3, 90–92 cm = 12%
6, 90–92 cm = 12%

SITE 616 HOLE CORE 33X CORED INTERVAL 3351.3–3360.6 mbsl; 352.4–361.7 mbsf



LITHOLOGIC DESCRIPTION

Section 1–Section 2, 75 cm: MUD, dark olive gray (5Y 2.5/2), silty, and homogeneous with rare SILT blebs, lenses, and discontinuous laminae. Some silts very rich in lignitic material; others rich in quartz and carbonate.

Section 2, 75 cm–Section 4, base: MUD, darker olive gray (5Y 2/2), slightly siltier than above, and homogeneous but with slightly more irregular silty horizons than above.

Core Catcher: SILTY SAND (light olive gray [5Y 5/2]) and MUD (dark olive gray [5Y 2/2]) mixed together probably by coring disturbance.

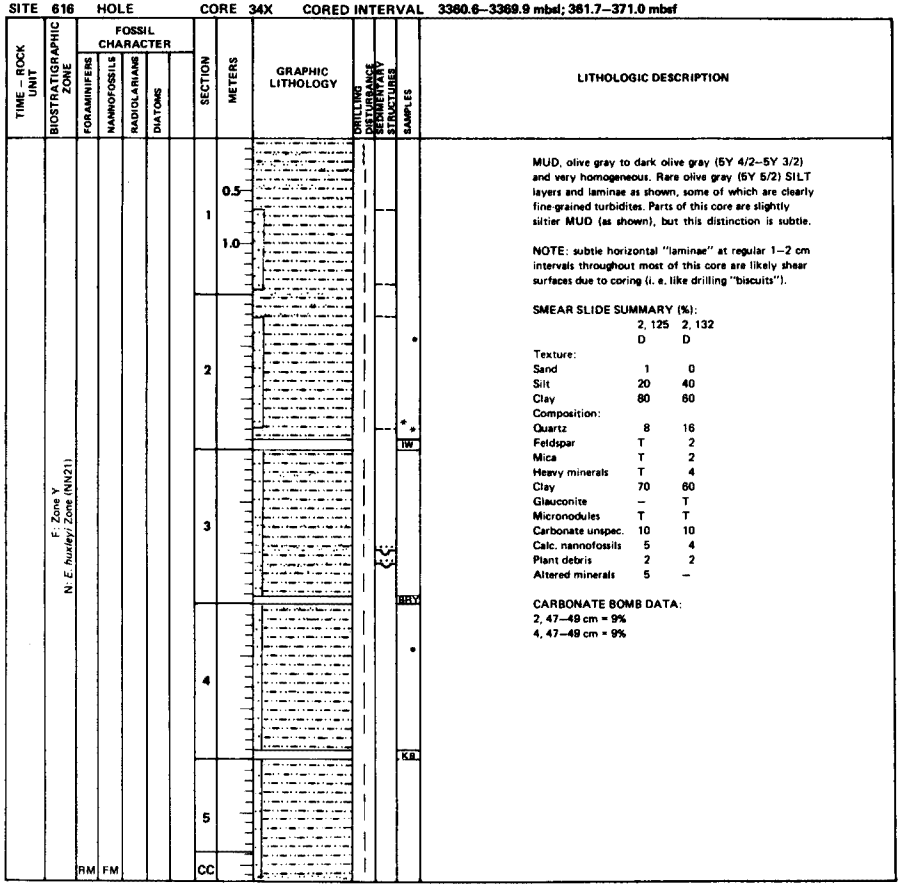
Note: subtle horizontal "laminae" at regular 1–2 cm intervals throughout most of the core are likely shear surfaces due to coring (i. e. like drilling "biscuits").

SMEAR SLIDE SUMMARY (%):

	1, 42 M	1, 44 M	1, 46 D
Texture:			
Sand	45	10	T
Silt	45	70	40
Clay	10	20	60
Composition:			
Quartz	52	25	10
Feldspar	2	3	T
Mica	2	2	T
Heavy minerals	8	5	T
Clay	10	20	60
Glauconite	T	–	–
Micronodules	T	–	T
Carbonate unspec.	10	15	20
Foraminifers	–	2	T
Calc. nannofossils	T	2	2
Diatoms	–	–	T
Plant debris	1	20	8
Altered grains	15	6	–

*CARBONATE BOMB DATA:
1, 95–97 cm = 12%
3, 95–97 cm = 9%

SITE 616 HOLE CORE 34X CORED INTERVAL 3360.6–3369.9 mbsl; 361.7–371.0 mbsf



LITHOLOGIC DESCRIPTION

MUD, olive gray to dark olive gray (5Y 4/2–5Y 3/2) and very homogeneous. Rare olive gray (5Y 5/2) SILT layers and laminae as shown, some of which are clearly fine-grained turbidites. Parts of this core are slightly siltier MUD (as shown), but this distinction is subtle.

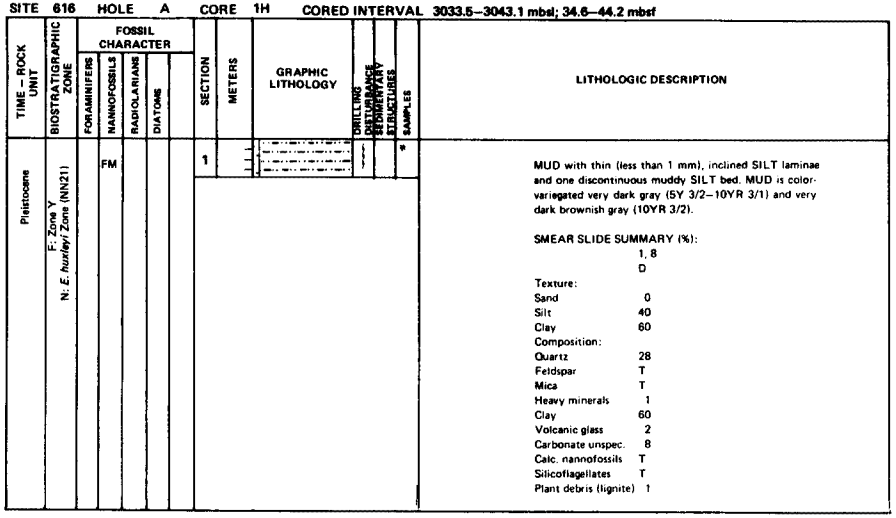
NOTE: subtle horizontal "laminae" at regular 1–2 cm intervals throughout most of this core are likely shear surfaces due to coring (i. e. like drilling "biscuits").

SMEAR SLIDE SUMMARY (%):

	2, 125 D	2, 132 D
Texture:		
Sand	1	0
Silt	20	40
Clay	80	60
Composition:		
Quartz	8	16
Feldspar	T	2
Mica	T	2
Heavy minerals	T	4
Clay	70	60
Glauconite	–	T
Micronodules	T	T
Carbonate unspec.	10	10
Calc. nannofossils	5	4
Plant debris	2	2
Altered minerals	5	–

CARBONATE BOMB DATA:
2, 47–49 cm = 9%
4, 47–49 cm = 9%

SITE 616 HOLE A CORE 1H CORED INTERVAL 3033.5–3043.1 mbsl; 34.6–44.2 mbsf



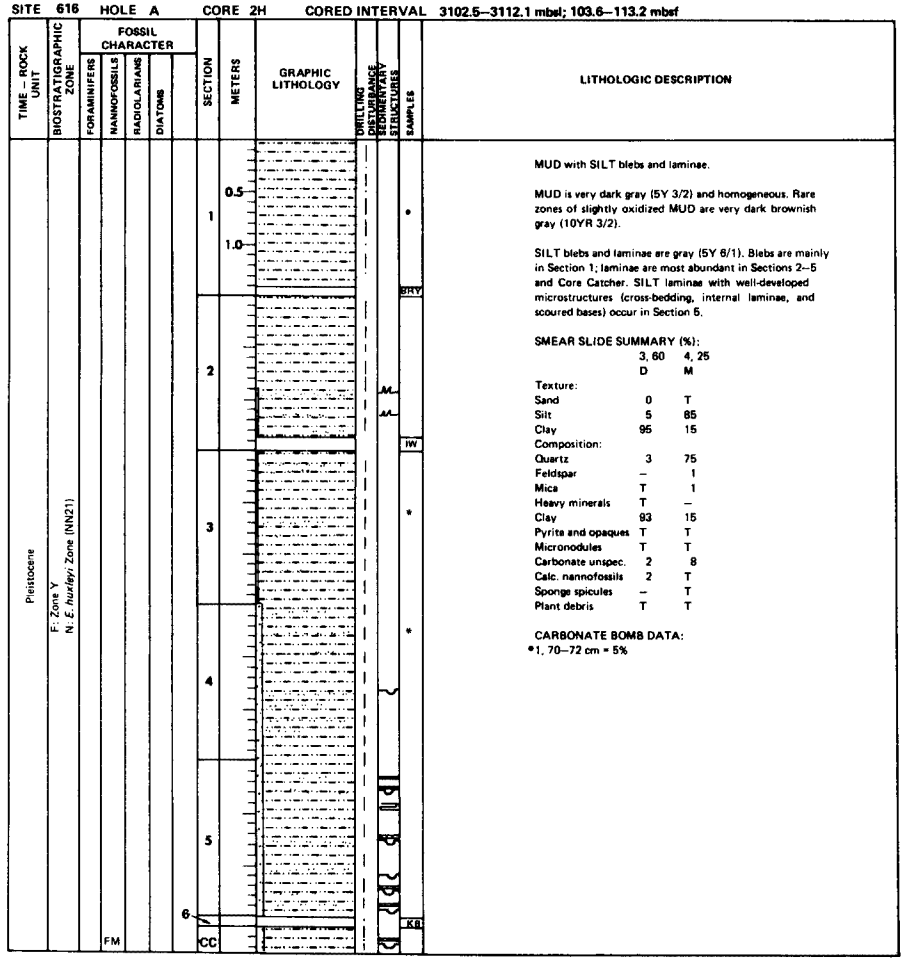
LITHOLOGIC DESCRIPTION

MUD with thin (less than 1 mm), inclined SILT laminae and one discontinuous muddy SILT bed. MUD is color-variegated very dark gray (5Y 3/2–10YR 3/1) and very dark brownish gray (10YR 3/2).

SMEAR SLIDE SUMMARY (%):

	1, 8 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	28
Feldspar	T
Mica	T
Heavy minerals	1
Clay	60
Volcanic glass	2
Carbonate unspec.	8
Calc. nannofossils	T
Silicoflagellates	T
Plant debris (lignite)	1

SITE 616 HOLE A CORE 2H CORED INTERVAL 3102.5–3112.1 mbsl; 103.6–113.2 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT blebs and laminae.

MUD is very dark gray (5Y 3/2) and homogeneous. Rare zones of slightly oxidized MUD are very dark brownish gray (10YR 3/2).

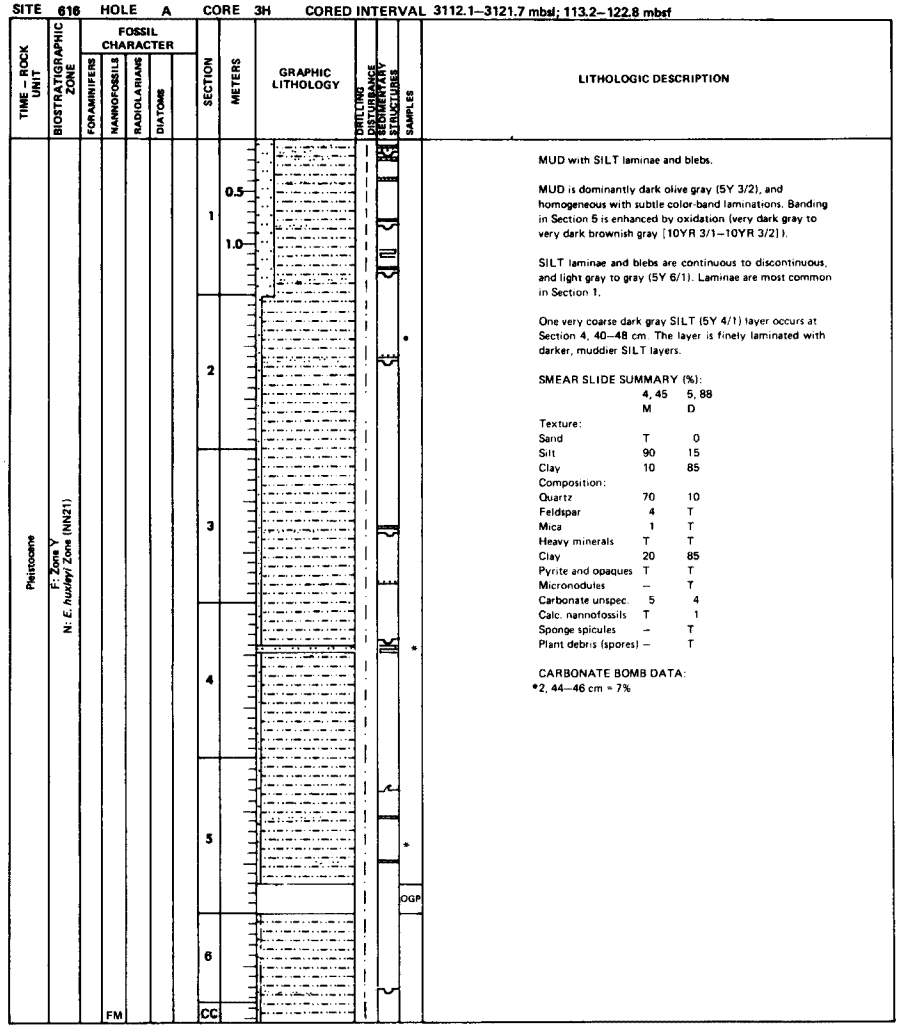
SILT blebs and laminae are gray (5Y 6/1). Blebs are mainly in Section 1; laminae are most abundant in Sections 2–5 and Core Catcher. SILT laminae with well-developed microstructures (cross-bedding, internal laminae, and scoured bases) occur in Section 5.

SMEAR SLIDE SUMMARY (%):

	3, 60 D	4, 25 M
Texture:		
Sand	0	T
Silt	5	85
Clay	95	15
Composition:		
Quartz	3	75
Feldspar	–	1
Mica	T	1
Heavy minerals	T	–
Clay	93	15
Pyrite and opaques	T	T
Micronodules	T	T
Carbonate unspec.	2	8
Calc. nannofossils	2	T
Sponge spicules	–	T
Plant debris	T	T

CARBONATE BOMB DATA:
*1, 70–72 cm = 5%

SITE 616 HOLE A CORE 3H CORED INTERVAL 3112.1–3121.7 mbsl; 113.2–122.8 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

MUD is dominantly dark olive gray (5Y 3/2), and homogeneous with subtle color-band laminations. Banding in Section 6 is enhanced by oxidation (very dark gray to very dark brownish gray [10YR 3/1–10YR 3/2]).

SILT laminae and blebs are continuous to discontinuous, and light gray to gray (5Y 6/1). Laminae are most common in Section 1.

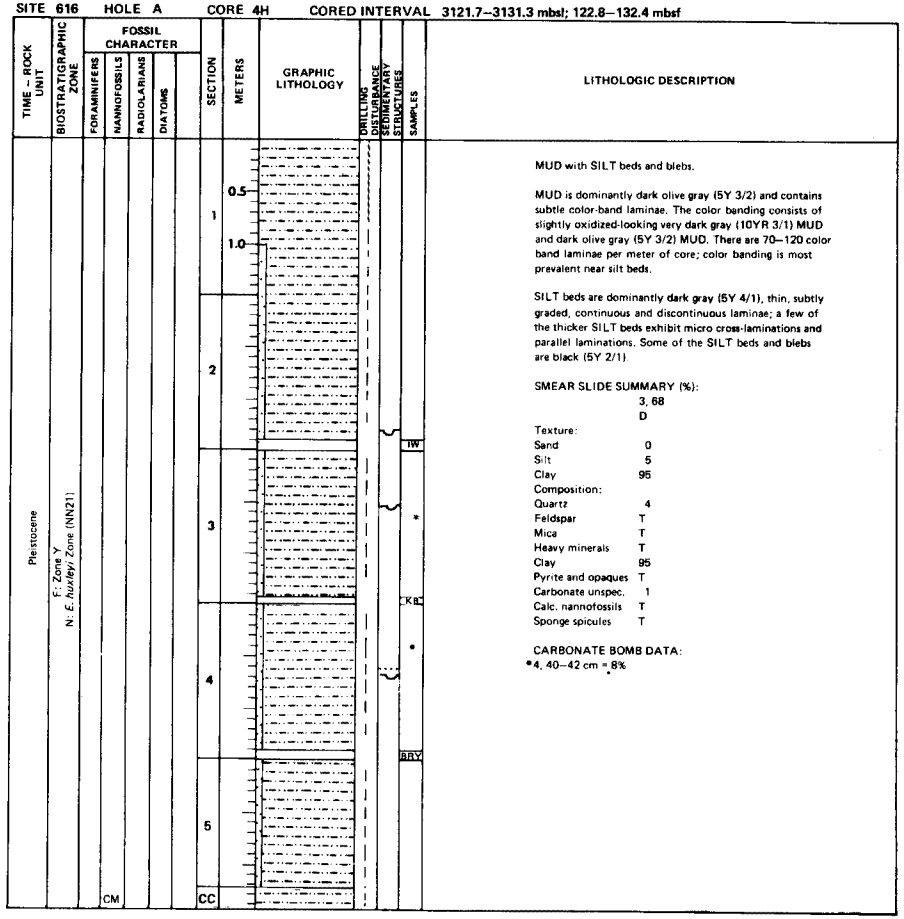
One very coarse dark gray SILT (5Y 4/1) layer occurs at Section 4, 40–48 cm. The layer is finely laminated with darker, muddier SILT layers.

SMEAR SLIDE SUMMARY (%):

	4, 45 M	5, 88 D
Texture:		
Sand	T	0
Silt	90	15
Clay	10	85
Composition:		
Quartz	70	10
Feldspar	4	T
Mica	1	T
Heavy minerals	T	T
Clay	20	85
Pyrite and opaques	T	T
Micronodules	–	T
Carbonate unspec.	5	4
Calc. nannofossils	T	1
Sponge spicules	–	T
Plant debris (spores)	–	T

CARBONATE BOMB DATA:
*2, 44–46 cm = 7%

SITE 616 HOLE A CORE 4H CORED INTERVAL 3121.7–3131.3 mbsl; 122.8–132.4 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT beds and blebs.

MUD is dominantly dark olive gray (5Y 3/2) and contains subtle color-band laminae. The color banding consists of slightly oxidized-looking very dark gray (10YR 3/1) MUD and dark olive gray (5Y 3/2) MUD. There are 70–120 color band laminae per meter of core; color banding is most prevalent near silt beds.

SILT beds are dominantly dark gray (5Y 4/1), thin, subtly graded, continuous and discontinuous laminae; a few of the thicker SILT beds exhibit micro cross-laminations and parallel laminations. Some of the SILT beds and blebs are black (5Y 2/1).

SMEAR SLIDE SUMMARY (%):

	3, 68 D
Texture:	
Sand	0
Silt	5
Clay	95
Composition:	
Quartz	4
Feldspar	T
Mica	T
Heavy minerals	T
Clay	95
Pyrite and opaques	T
Carbonate unspec.	1
Calc. nannofossils	T
Sponge spicules	T

CARBONATE BOMB DATA:
*4, 40–42 cm = 8%

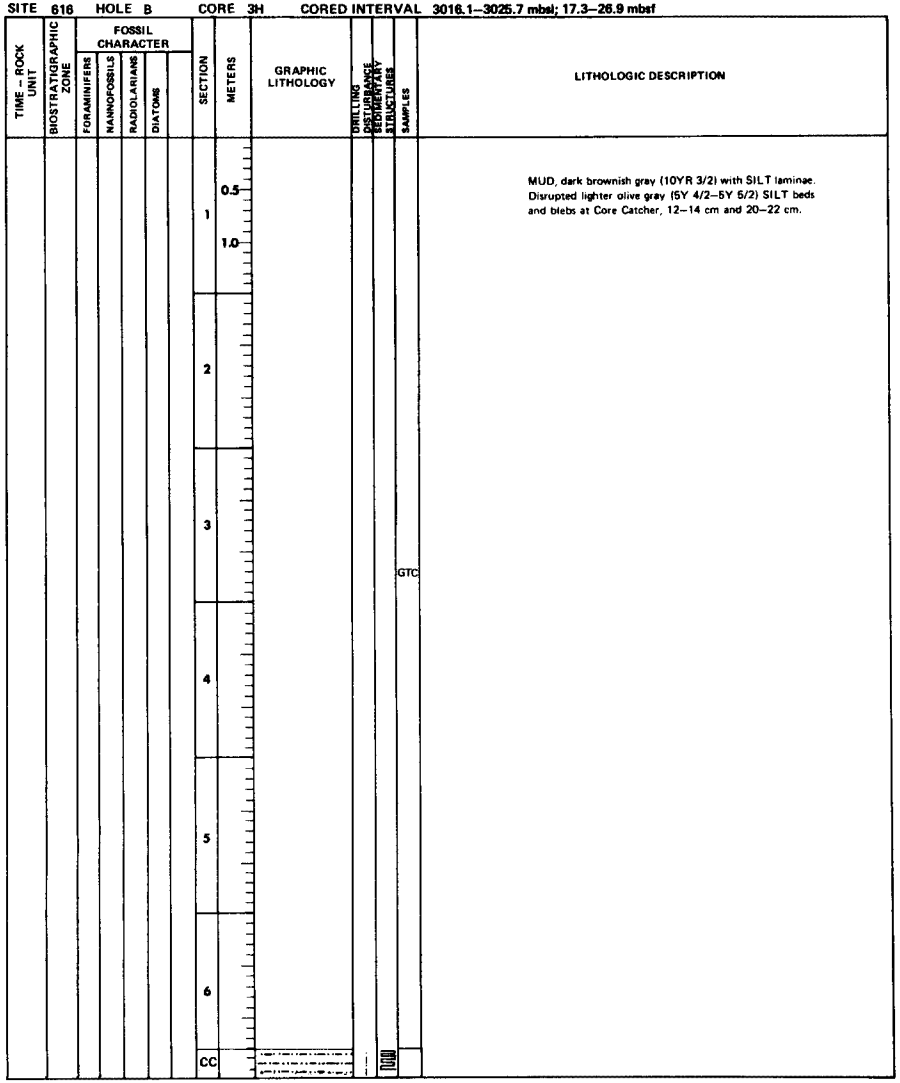
SITE 616 HOLE B CORE 1H CORED INTERVAL 2998.8–3006.5 mbsl; 0.0–7.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					MUD, dark olive gray (5Y 3/2) and laminated. One discontinuous SILT layer at Core Catcher, 3 cm.
						1	1.0					
						2						
						3					GTC	
						4						
						5						
						CC						

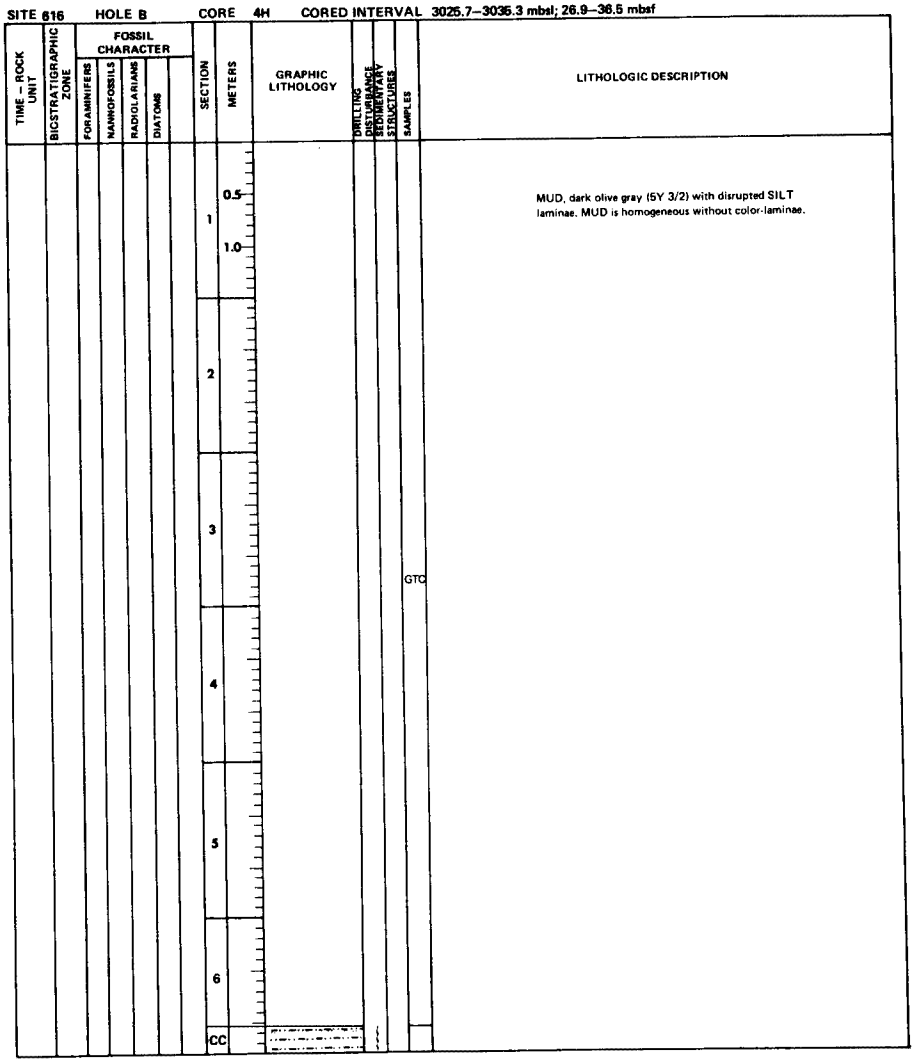
SITE 616 HOLE B CORE 2H CORED INTERVAL 3006.5–3016.1 mbsl; 7.7–17.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					MUD, dark olive gray (5Y 3/2) with thin SILT laminae and subtle 1 mm color laminations.
						1	1.0					
						2						
						3					GTC	
						4						
						5						
						6						
						7						
						CC						

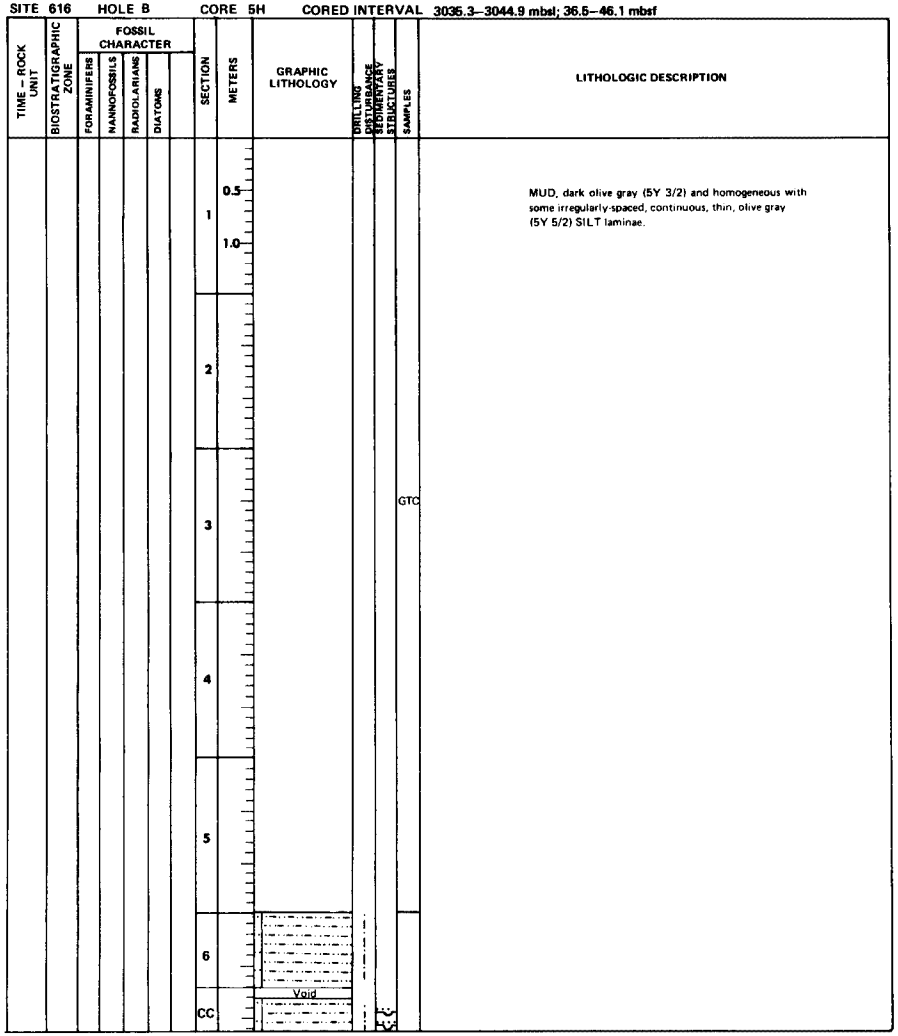
SITE 616 HOLE B CORE 3H CORED INTERVAL 3016.1–3025.7 mbsl; 17.3–26.9 mbsf



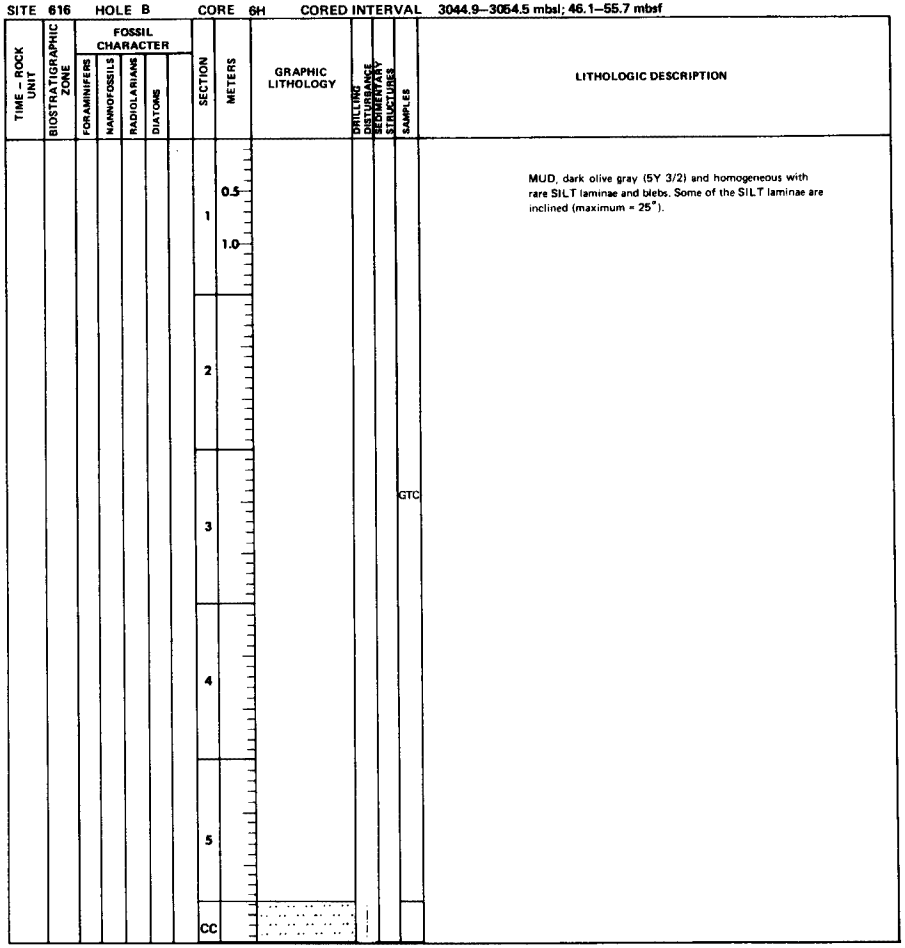
SITE 616 HOLE B CORE 4H CORED INTERVAL 3025.7–3035.3 mbsl; 26.9–36.5 mbsf



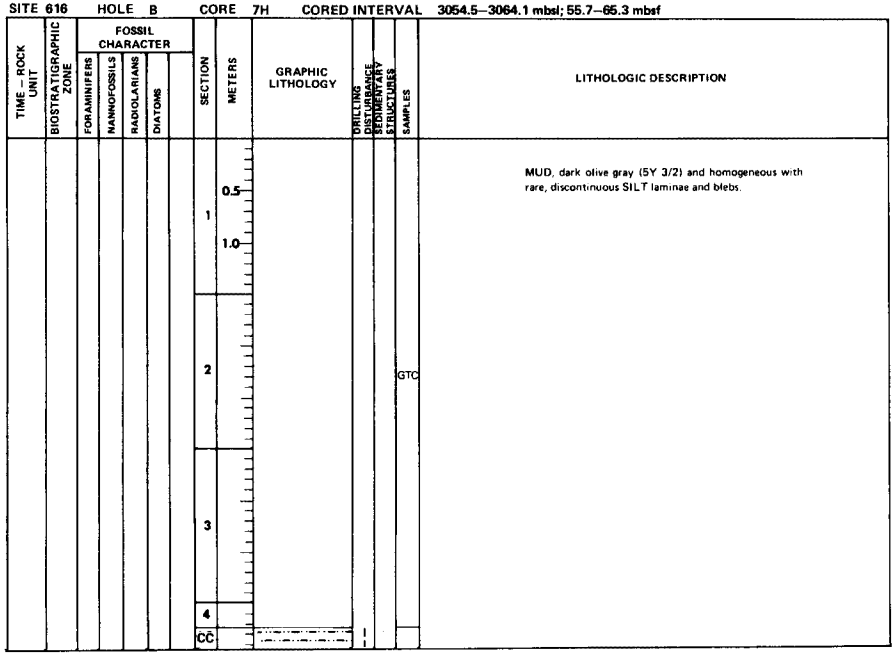
SITE 616 HOLE B CORE 5H CORED INTERVAL 3035.3–3044.9 mbsl; 36.5–46.1 mbsf



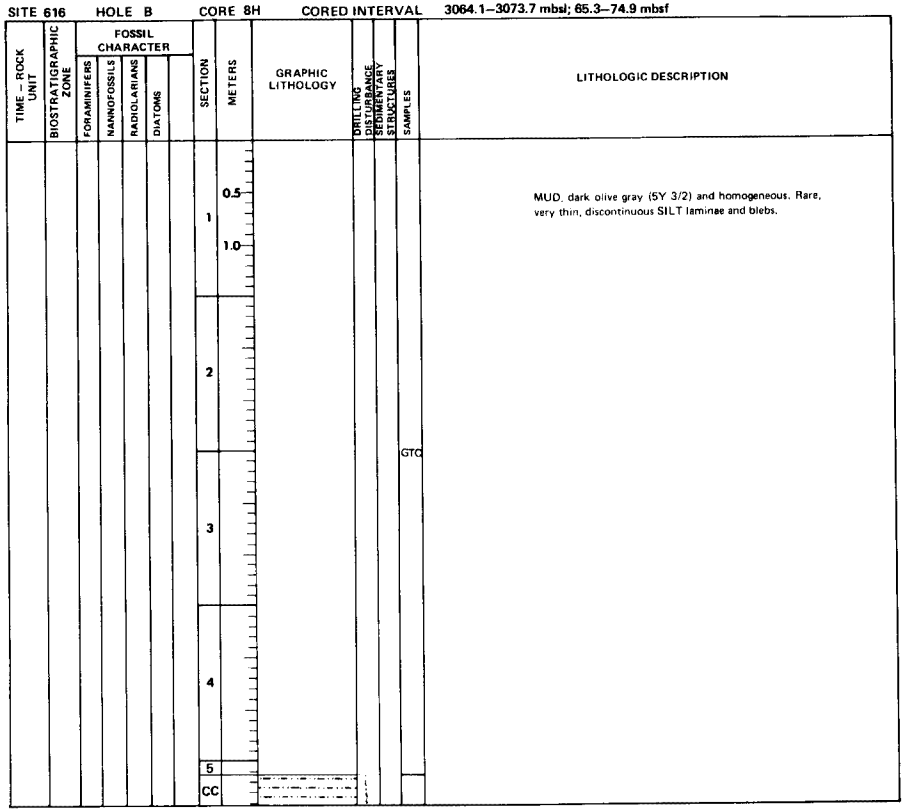
SITE 616 HOLE B CORE 6H CORED INTERVAL 3044.9–3054.5 mbsl; 46.1–55.7 mbsf



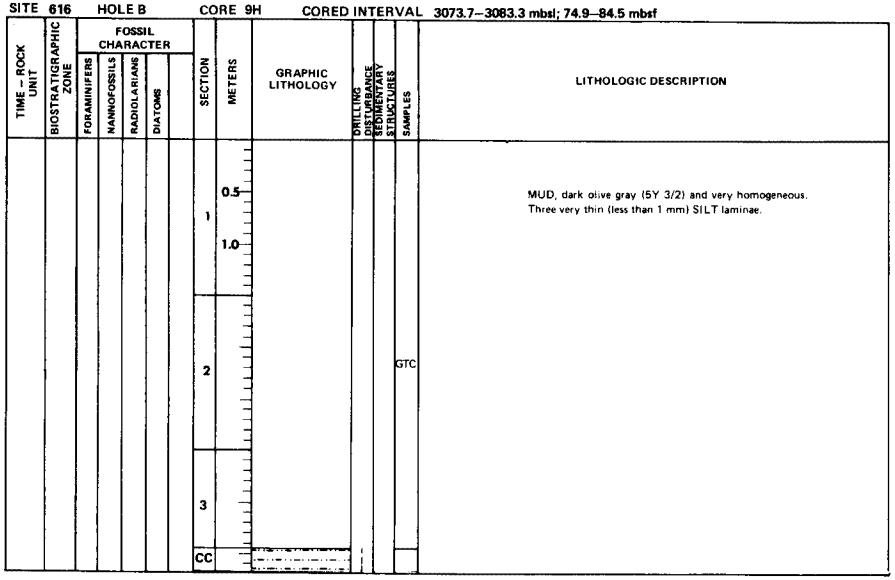
SITE 616 HOLE B CORE 7H CORED INTERVAL 3054.5–3064.1 mbsl; 55.7–65.3 mbsf



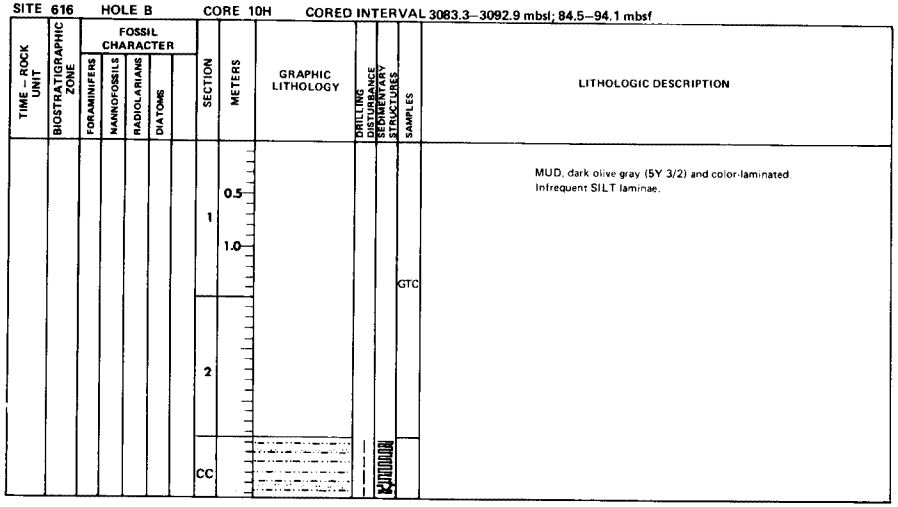
SITE 616 HOLE B CORE 8H CORED INTERVAL 3064.1–3073.7 mbsl; 65.3–74.9 mbsf



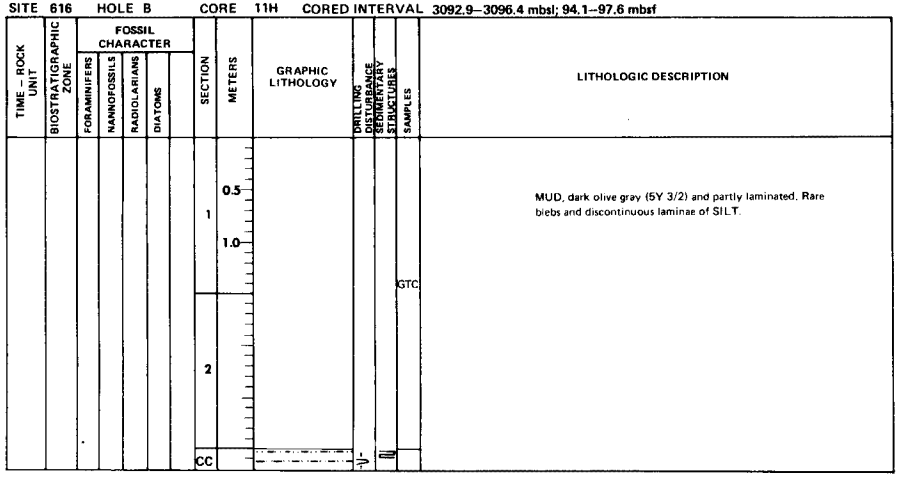
SITE 616 HOLE B CORE 9H CORED INTERVAL 3073.7–3083.3 mbsl; 74.9–84.5 mbsf



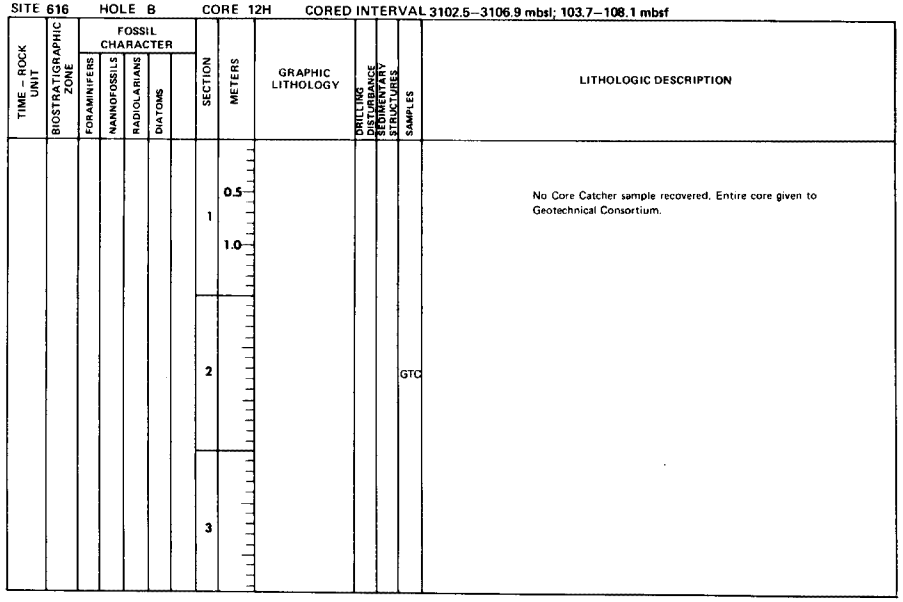
SITE 616 HOLE B CORE 10H CORED INTERVAL 3083.3–3092.9 mbsl; 84.5–94.1 mbsf



SITE 616 HOLE B CORE 11H CORED INTERVAL 3092.9–3096.4 mbsl; 94.1–97.6 mbsf



SITE 616 HOLE B CORE 12H CORED INTERVAL 3102.5–3106.9 mbsl; 103.7–108.1 mbsf



SITE 616 HOLE B CORE 13H CORED INTERVAL 3112.1–3119.1 mbsl; 113.3–120.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					MUD, dark olive gray (5Y 3/2). Dominantly homogeneous, with sets of very thin SILT laminations at Core Catcher, 12 and 18 cm. Silt laminae are dark olive gray to olive gray (5Y 3/2–5Y 4/2).
						1	1.0					
						2						
						3					GTC	
						4						
						5						
						CC						

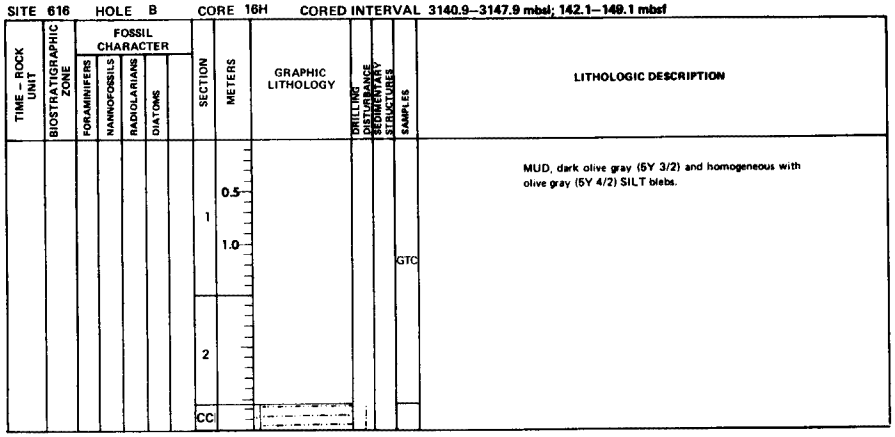
SITE 616 HOLE B CORE 14H CORED INTERVAL 3121.7–3126.1 mbsl; 122.9–127.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					MUD, dark olive gray (5Y 3/2) and finely (1–7 mm) laminated with numerous SILT blebs and several discontinuous SILT laminae. One 3 cm thick, continuous, dark olive gray (5Y 3/2), coarse SILT lamina occurs at the base of the Core Catcher. The rest of the silt laminae and blebs are olive gray (5Y 4/2).
						1	1.0					
						2					GTC	
						3						
						CC						

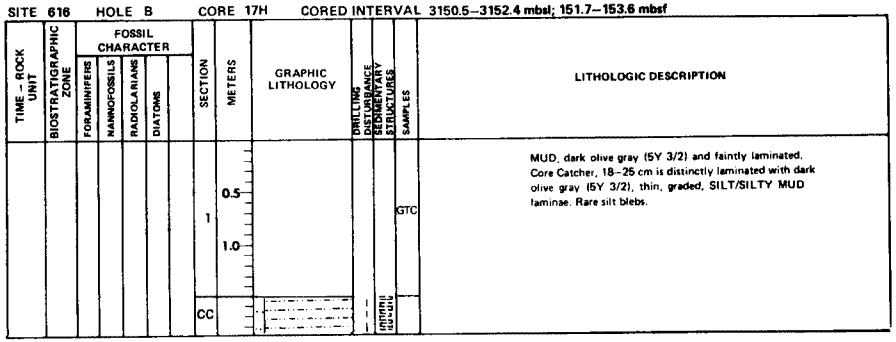
SITE 616 HOLE B CORE 15H CORED INTERVAL 3131.3–3134.4 mbsl; 132.5–135.6 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					MUD, dark olive gray (5Y 3/2) and finely laminated. Common, very thin, discontinuous SILT laminae and blebs.
						1	1.0					
						2					GTC	
						CC						

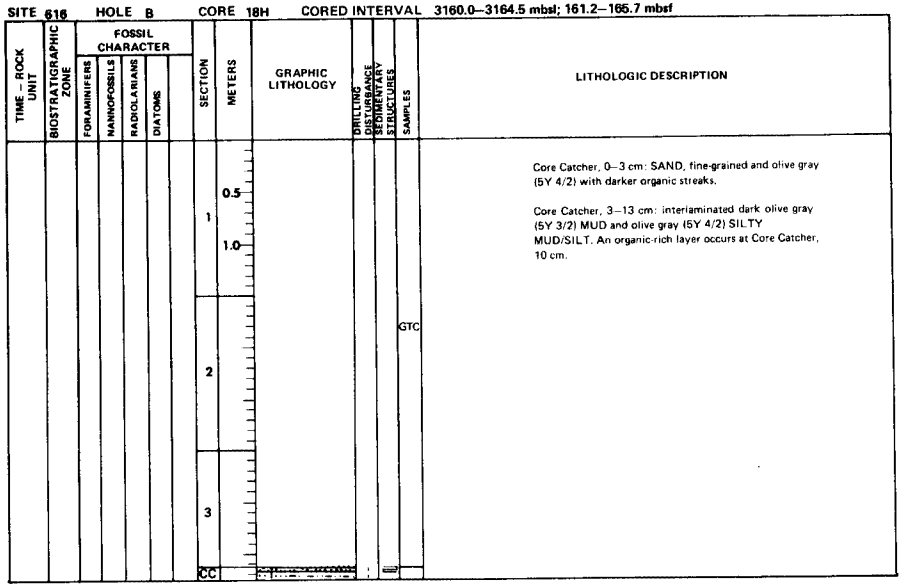
SITE 616 HOLE B CORE 16H CORED INTERVAL 3140.9–3147.9 mbsl; 142.1–149.1 mbsf



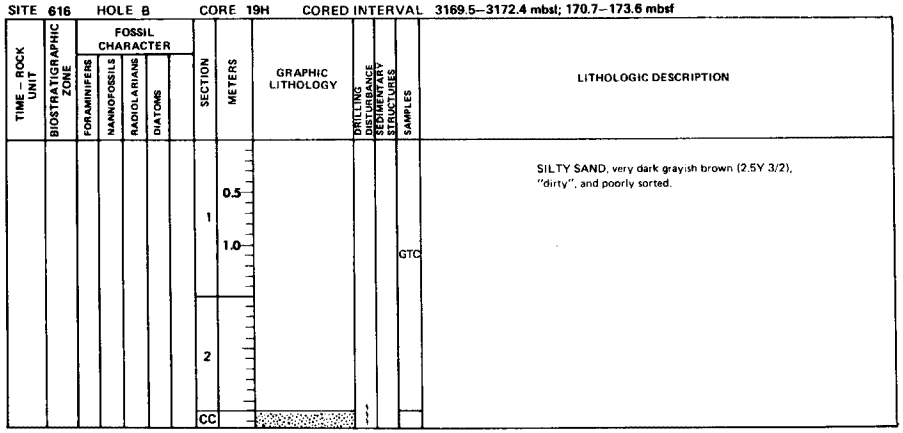
SITE 616 HOLE B CORE 17H CORED INTERVAL 3150.5–3152.4 mbsl; 151.7–153.6 mbsf



SITE 616 HOLE B CORE 18H CORED INTERVAL 3160.0–3164.5 mbsl; 161.2–165.7 mbsf



SITE 616 HOLE B CORE 19H CORED INTERVAL 3169.5–3172.4 mbsl; 170.7–173.6 mbsf



SITE 616 HOLE B CORE 20H CORED INTERVAL 3179.0–3179.5 mbsl; 180.2–180.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1					GTC	No Core Catcher. Entire core dedicated for shorebased Geotechnical Consortium studies.

SITE 616 HOLE B CORE 21H CORED INTERVAL 3188.6–3193.6 mbsl; 189.8–194.8 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5 1.0					MUD, dark olive gray (5Y 3/2) and homogeneous. A thin, gray (5Y 5/1) lamina occurs at Core Catcher, 12 cm; several very thin SILT laminae occur at Core Catcher, 29–31 cm.
						2					GTC	
						3						
						CC						

SITE 616 HOLE B CORE 22H CORED INTERVAL 3198.2–3203.1 mbsl; 199.4–204.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5 1.0					SILT, dark olive gray (5Y 3/2), coarse-grained, structureless, and disorganized with muddy matrix, clay chips, and lignite.
						2					GTC	
						3						
						CC						

SITE 617

HOLE 617

Date Occupied: 17 October 1983, 0608 LCT

Date Departed: 18 October 1983, 1227 LCT

Time on Hole: 1 day, 6 hr.

Position (latitude; longitude): 26°41.93'N; 88°31.67'W

Water depth (sea level; corrected m, echo-sounding): 2467

Water depth (rig floor; corrected m, echo-sounding): 2477

Bottom felt (m, drill pipe): 2478.5

Penetration (m): 191.2

Number of cores: 21

Total length of cored section (m): 130.1

Total core recovered (m): 111.58

Core recovery (%): 86

Oldest sediment cored:

Depth sub-bottom (m): 191.2

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

SITE 617

HOLE 617A

Date Occupied: 18 October 1983, 1227 LCT

Date Departed: 19 October 1983, 0555 LCT

Time on Hole: 0 day, 17 hr.

Position (latitude; longitude): 26°41.93'N; 88°31.67'W

Water depth (sea level; corrected m, echo-sounding): 2467

Water depth (rig floor; corrected m, echo-sounding): 2477

Bottom felt (m, drill pipe): 2477.5

Penetration (m): 73.9

Number of cores: 8

Total length of cored section (m): 73.9

Total core recovered (m): 56.94

Core recovery (%): 77

Oldest sediment cored: N/A (cores unsplit)

Basement: N/A

Principal results:

Site 617 was drilled in the Middle Mississippi Fan on the western levee of the youngest fan lobe's major channel. The water depth at the site is 2467 m; it is located about 159 km west of Site 616. The original site was located on R/V Conrad Line 1017 (1850Z). A water gun seismic line was run by the D/V Glomar Challenger from Site 616 to the proposed Site 617. Strong currents resulted in the seismic line being slightly offset from the original coordinates and the new site lies between R/V Conrad Lines 1017 and 1018.

The total depth of penetration at Hole 617 was 191.2 m and the entire coring program was completed using the Advanced Piston Corer. Recovery was exceptionally good, averaging 86% (111.6 m of core were recovered). The entire sedimentary sequence is composed of fine-grained clays and silty clays and a decision was made to obtain a geotechnical hole (Hole 617A) at the site because of the thick clay sequence. Hole 617A was successfully cored to 73.9 m sub-bottom before strong currents and winds resulted in drifting off station, bending the bumper subs and causing loss of the bottom-hole assembly. Due to time constraints, the geotechnical hole was abandoned.

The entire cored section consists of overbank levee deposits that are characterized by thin, fine-grained turbidite sequences. The upper most Holocene unit (Ericson's Zone Z) consists of a foraminiferal ooze approximately 25 cm thick (617A-1-1, 0-25 cm) which grades downward into a finely laminated turbidite-deposited clay. The base of the Holocene is at 9 m sub-bottom (617-1-6, 55 cm). The

remainder of the hole was drilled in Ericson's Zone Y (late Wisconsin glacial stage).

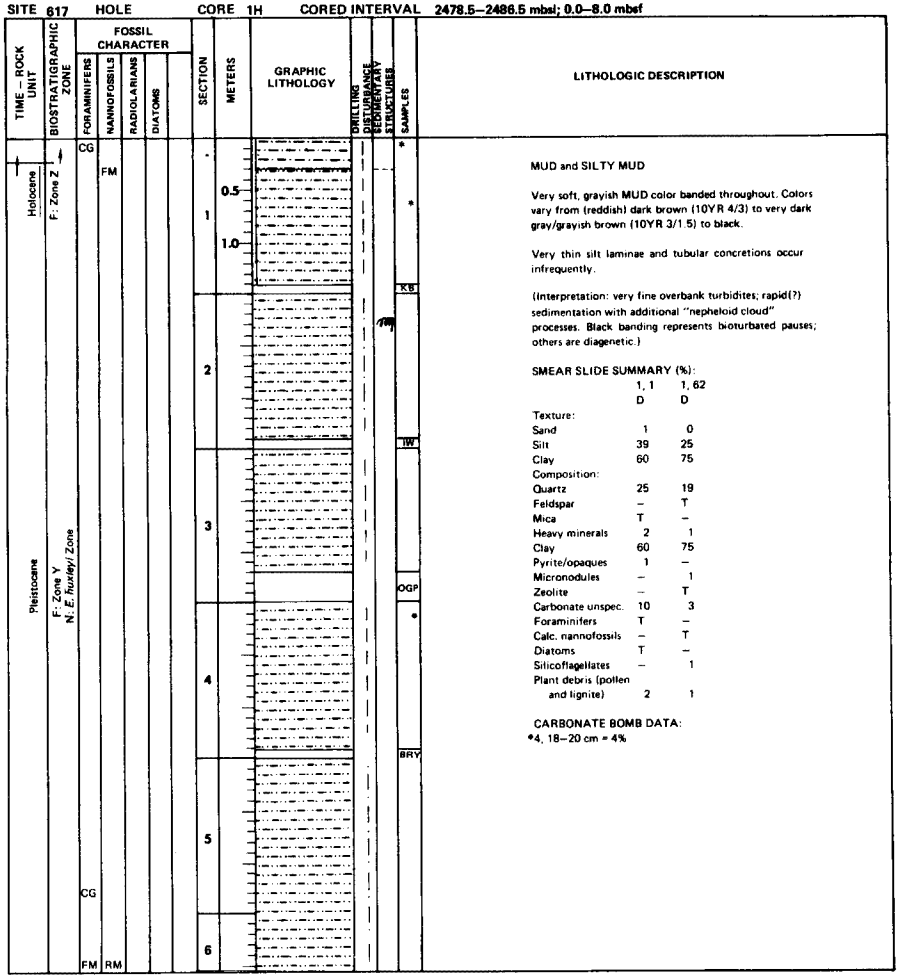
Most of the scientific objectives were achieved at Site 617. Since sands were not encountered, it was difficult to assess whether channel migration is an active process associated with the channel sinuosity. The young age of the cored sediments means that only the processes active during the waning stage of sea level rise were evaluated. It appears that during this period only fine-grained overbank levee deposition took place at the site. The principal results are:

1) With the exception of the foraminiferal ooze at the top, the entire cored interval consists of thin-bedded, fine-grained turbidites deposited as overbank sediments on the levee. The turbidite units increase in grain size from the base of the cored section upward; this probably represents increasing channel activity. At approximately 37 m sub-bottom, the turbidite sequence begins to fine upward in response to the waning stage of fan lobe channel growth. This process culminates with the foraminiferal ooze at the top of the section.

2) Accumulation rates for the levee deposits are exceptionally high, with a minimum rate of 2.5 m/1000 yr. being computed for these levee deposits. Based on seismic correlation of Ericson's Zone X from Site 616 to 617, an accumulation rate of 11.9 m/1000 yr. for Zone X was computed. It appears that turbidite deposition has been nearly continuous throughout deposition of the levee deposits, as evidenced by the high accumulation rates and by the nearly total lack of

planktonic and benthic fauna in the recovered section. The Holocene accumulation rate was computed as 67 cm/1000 yr.

SITE 617 HOLE CORE 1H CORED INTERVAL 2478.5–2486.5 mbsl; 0.0–8.0 mbsf



LITHOLOGIC DESCRIPTION

MUD and SILTY MUD

Very soft, grayish MUD color banded throughout. Colors vary from (reddish) dark brown (10YR 4/3) to very dark gray/grayish brown (10YR 3/1.5) to black.

Very thin silt laminae and tubular concretions occur infrequently.

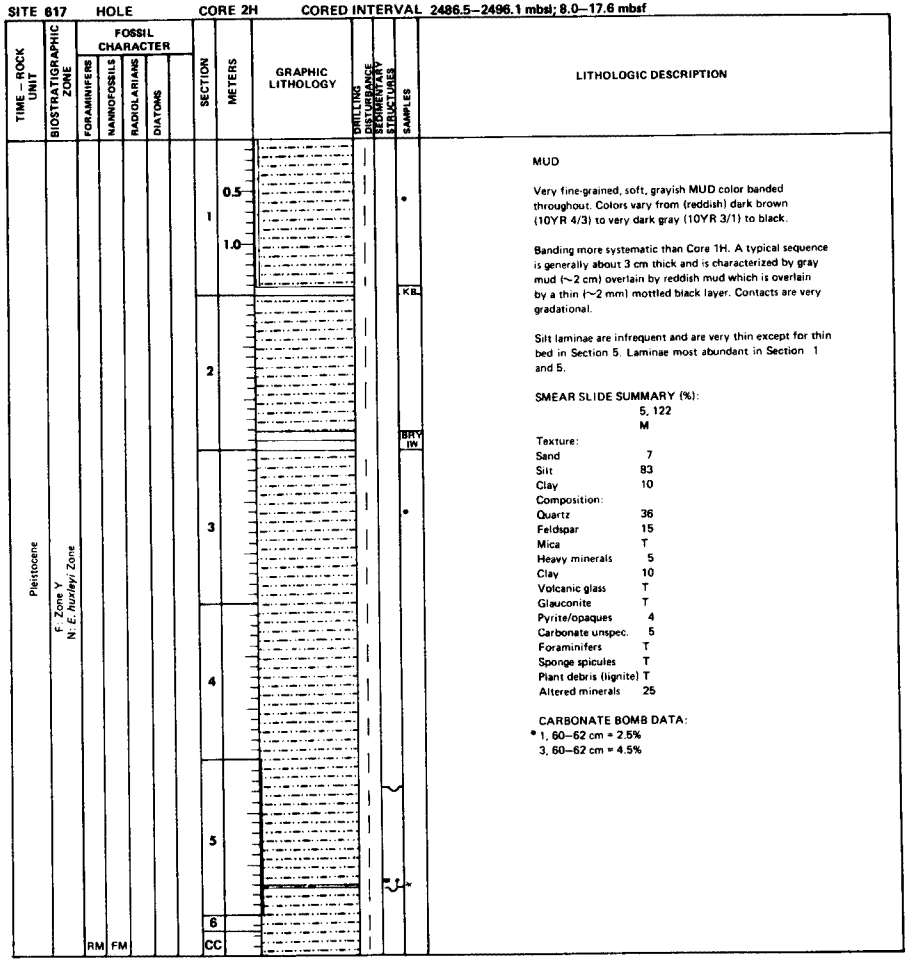
(Interpretation: very fine overbank turbidites; rapid(?) sedimentation with additional "nepheloid cloud" processes. Black banding represents bioturbated pauses; others are diagenetic.)

SMEAR SLIDE SUMMARY (%):

	1, 1 D	1, 62 D
Texture:		
Sand	1	0
Silt	39	25
Clay	60	75
Composition:		
Quartz	25	19
Feldspar	–	T
Mica	T	–
Heavy minerals	2	1
Clay	60	75
Pyrite/opaques	1	–
Micronodules	–	1
Zeolite	–	T
Carbonate unspec.	10	3
Foraminifers	T	–
Calc. nannofossils	–	T
Diatoms	T	–
Silicoflagellates	–	1
Plant debris (pollen and lignite)	2	1

CARBONATE BOMB DATA:
*4, 18–20 cm = 4%

SITE 617 HOLE CORE 2H CORED INTERVAL 2486.5–2496.1 mbsl; 8.0–17.6 mbsf



LITHOLOGIC DESCRIPTION

MUD

Very fine-grained, soft, grayish MUD color banded throughout. Colors vary from (reddish) dark brown (10YR 4/3) to very dark gray (10YR 3/1) to black.

Banding more systematic than Core 1H. A typical sequence is generally about 3 cm thick and is characterized by gray mud (~2 cm) overlain by reddish mud which is overlain by a thin (~2 mm) mottled black layer. Contacts are very gradational.

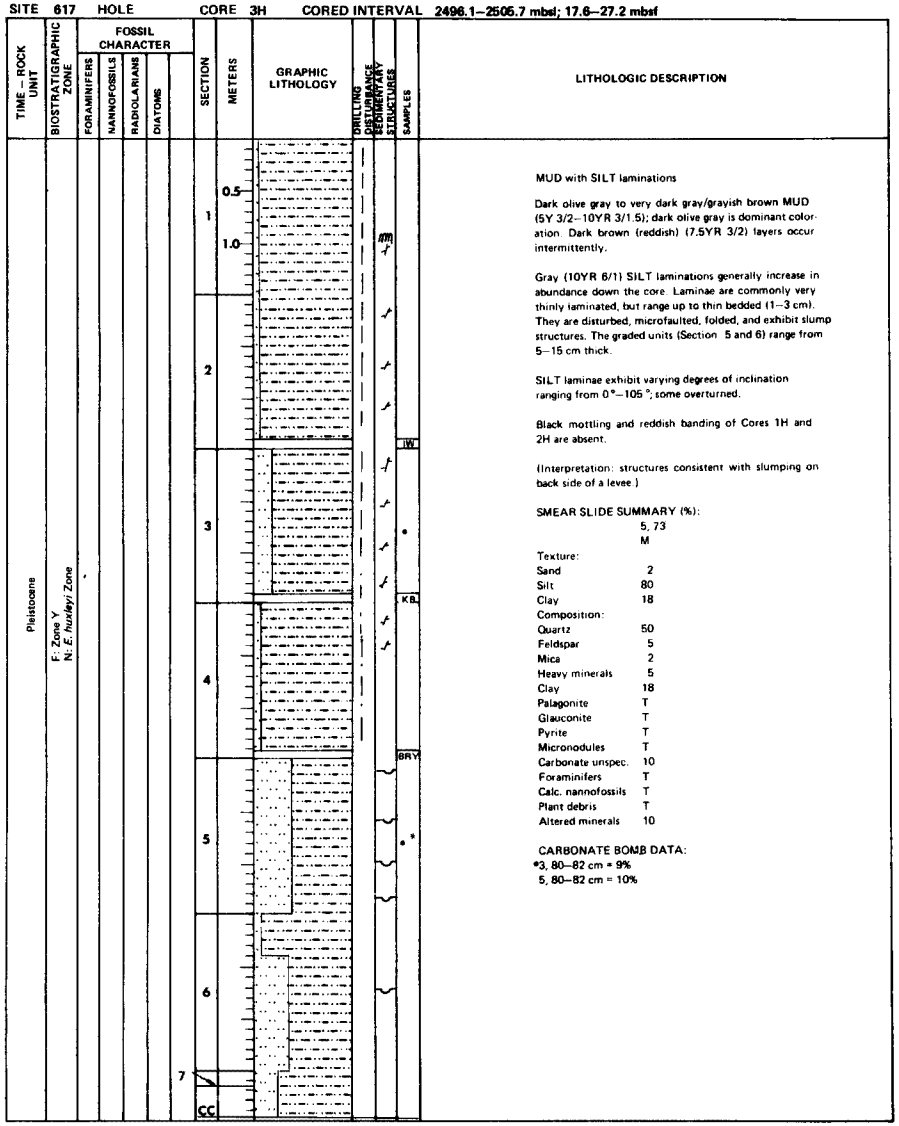
Silt laminae are infrequent and are very thin except for thin bed in Section 5. Laminae most abundant in Section 1 and 5.

SMEAR SLIDE SUMMARY (%):

	5, 122 M
Texture:	
Sand	7
Silt	83
Clay	10
Composition:	
Quartz	36
Feldspar	15
Mica	T
Heavy minerals	5
Clay	10
Volcanic glass	T
Glauconite	T
Pyrite/opaques	4
Carbonate unspec.	5
Foraminifers	T
Sponge spicules	T
Plant debris (lignite)	T
Altered minerals	25

CARBONATE BOMB DATA:
*1, 60–62 cm = 2.5%
3, 60–62 cm = 4.5%

SITE 617 HOLE CORE 3H CORED INTERVAL 2496.1–2505.7 mbsl; 17.6–27.2 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminations

Dark olive gray to very dark gray/grayish brown MUD (5Y 3/2–10YR 3/1.5); dark olive gray is dominant coloration. Dark brown (reddish) (7.5YR 3/2) layers occur intermittently.

Gray (10YR 6/1) SILT laminations generally increase in abundance down the core. Laminae are commonly very thinly laminated, but range up to thin bedded (1–3 cm). They are disturbed, microfaulted, folded, and exhibit slump structures. The graded units (Section 5 and 6) range from 5–15 cm thick.

SILT laminae exhibit varying degrees of inclination ranging from 0°–105°; some overturned.

Black mottling and reddish banding of Cores 1H and 2H are absent.

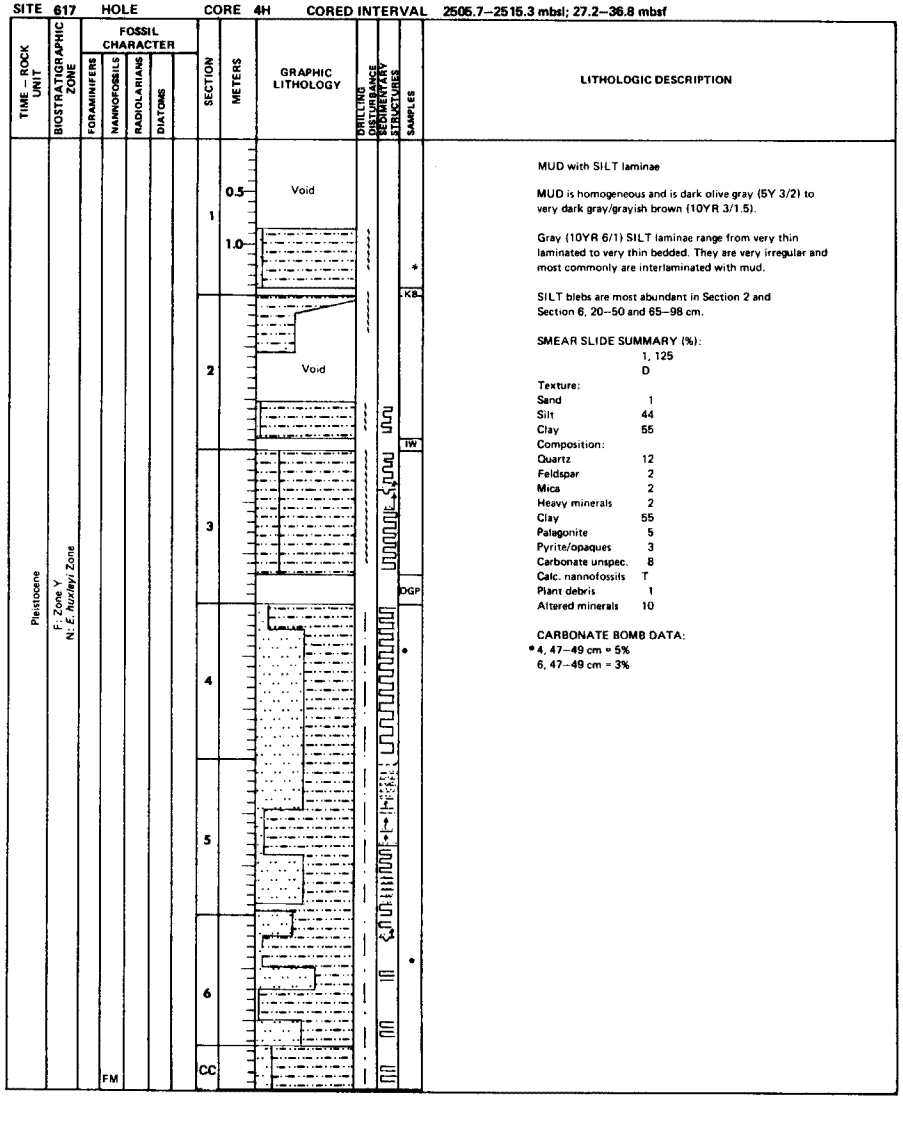
(Interpretation: structures consistent with slumping on back side of a levee.)

SMEAR SLIDE SUMMARY (%):

	5, 73 M
Texture:	
Sand	2
Silt	80
Clay	18
Composition:	
Quartz	50
Feldspar	5
Mica	2
Heavy minerals	5
Clay	18
Palagonite	T
Glauconite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	10
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	10

CARBONATE BOMB DATA:
*3, 80–82 cm = 9%
5, 80–82 cm = 10%

SITE 617 HOLE CORE 4H CORED INTERVAL 2505.7–2515.3 mbsl; 27.2–36.8 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae

MUD is homogeneous and is dark olive gray (5Y 3/2) to very dark gray/grayish brown (10YR 3/1.5).

Gray (10YR 6/1) SILT laminae range from very thin laminated to very thin bedded. They are very irregular and most commonly are interlaminated with mud.

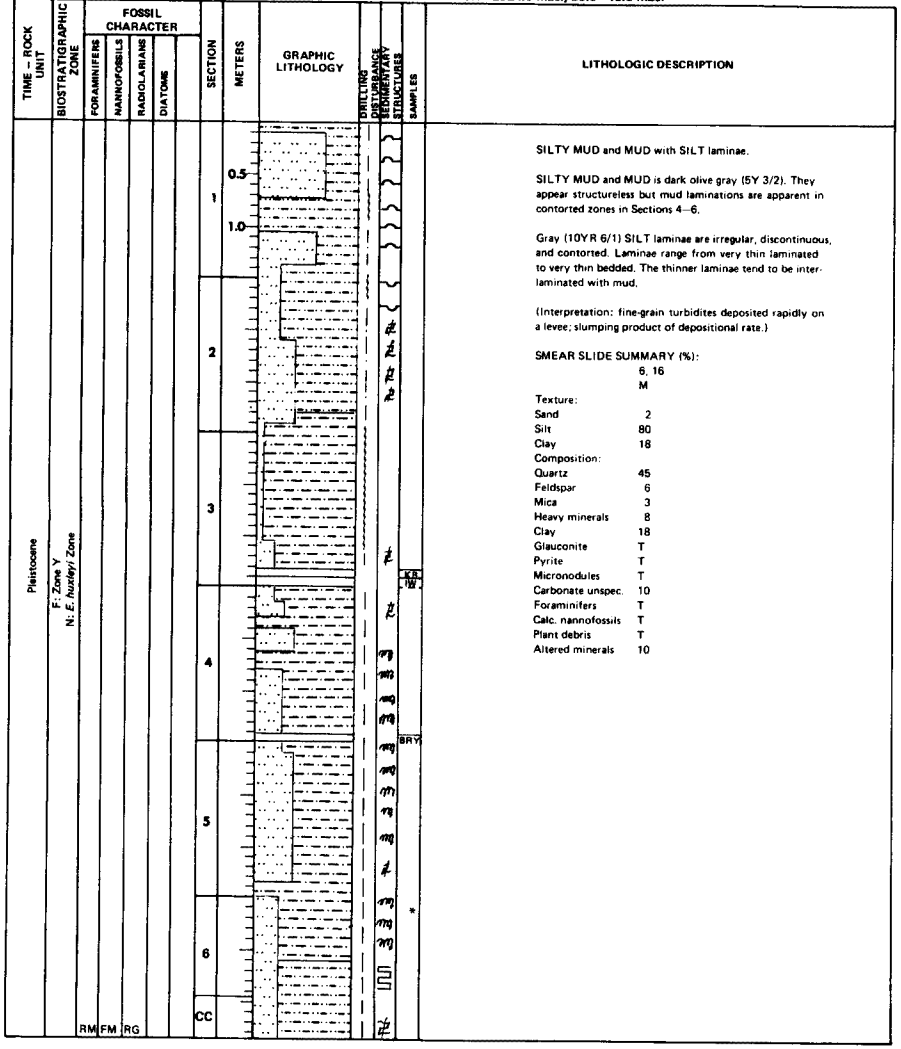
SILT blebs are most abundant in Section 2 and Section 6, 20–50 and 65–98 cm.

SMEAR SLIDE SUMMARY (%):

	1, 125 D
Texture:	
Sand	1
Silt	44
Clay	55
Composition:	
Quartz	12
Feldspar	2
Mica	2
Heavy minerals	2
Clay	55
Palagonite	5
Pyrite/opaques	3
Carbonate unspec.	8
Calc. nannofossils	T
Plant debris	1
Altered minerals	10

CARBONATE BOMB DATA:
*4, 47–49 cm = 5%
6, 47–49 cm = 3%

SITE 617 HOLE CORE 5H CORED INTERVAL 2515.3–2524.8 mbsl; 36.8–46.3 mbsf



SILTY MUD and MUD with SILT laminae.

SILTY MUD and MUD is dark olive gray (5Y 3/2). They appear structureless but mud laminations are apparent in contorted zones in Sections 4–6.

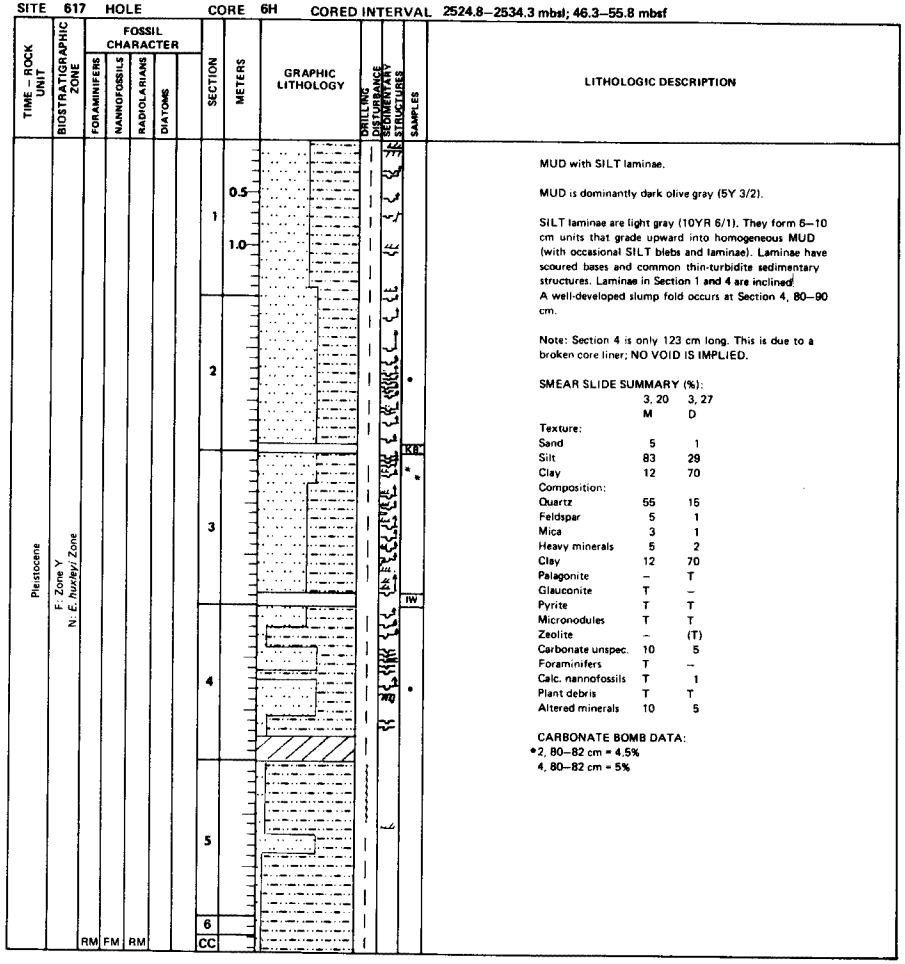
Gray (10YR 6/1) SILT laminae are irregular, discontinuous, and contorted. Laminae range from very thin laminated to very thin bedded. The thinner laminae tend to be interlaminated with mud.

(Interpretation: fine-grain turbidites deposited rapidly on a levee; slumping product of depositional rate.)

SMEAR SLIDE SUMMARY (%):

	6, 16 M
Texture:	
Sand	2
Silt	80
Clay	18
Composition:	
Quartz	45
Feldspar	6
Mica	3
Heavy minerals	8
Clay	18
Glauconite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	10
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	10

SITE 617 HOLE CORE 6H CORED INTERVAL 2524.8–2534.3 mbsl; 46.3–55.8 mbsf



MUD with SILT laminae.

MUD is dominantly dark olive gray (5Y 3/2).

SILT laminae are light gray (10YR 6/1). They form 6–10 cm units that grade upward into homogeneous MUD (with occasional SILT blebs and laminae). Laminae have scoured bases and common thin-turbidite sedimentary structures. Laminae in Section 1 and 4 are inclined. A well-developed slump fold occurs at Section 4, 80–90 cm.

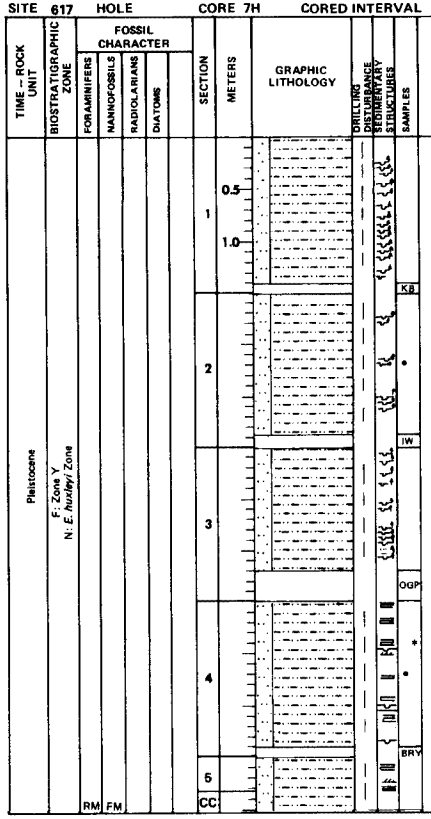
Note: Section 4 is only 123 cm long. This is due to a broken core liner; NO VOID IS IMPLIED.

SMEAR SLIDE SUMMARY (%):

	3, 20 M	3, 27 D
Texture:		
Sand	5	1
Silt	83	29
Clay	12	70
Composition:		
Quartz	55	15
Feldspar	5	1
Mica	3	1
Heavy minerals	5	2
Clay	12	70
Palagonite	–	T
Glauconite	T	–
Pyrite	T	T
Micronodules	T	T
Zeolite	–	(T)
Carbonate unspec.	10	5
Foraminifers	T	–
Calc. nannofossils	T	1
Plant debris	T	T
Altered minerals	10	5

CARBONATE BOMB DATA:
*2, 80–82 cm = 4.5%
4, 80–82 cm = 5%

SITE 617 HOLE CORE 7H CORED INTERVAL 2534.3–2543.8 mbsl; 55.8–65.3 mbsf



MUD with SILT laminae.

MUD is dominantly dark olive gray (5Y 3/2), with some intervals of reddish-brown (7.5Y 3/2) MUD.

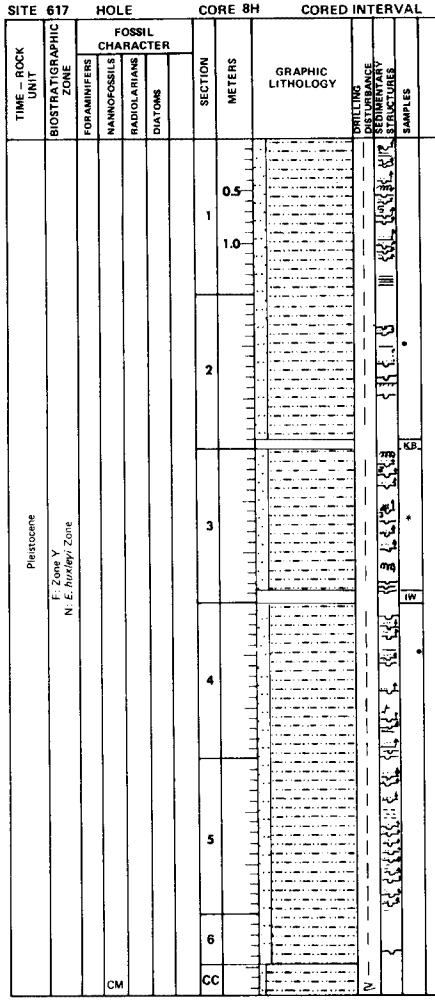
SILT laminae are light gray (10YR 6/1), irregular, graded, and often laminated. Ultra-loading of these SILT laminae into the MUD below has resulted in isolated SILT pseudonodules.

SMEAR SLIDE SUMMARY (%):

	4, 44 M
Texture:	
Sand	8
Silt	77
Clay	15
Composition:	
Quartz	47
Feldspar	5
Mica	2
Heavy minerals	8
Clay	15
Glauconite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	T
Altered minerals	15

CARBONATE BOMB DATA:
*2, 70–72 cm = 6%
4, 70–72 cm = 6.5%

SITE 617 HOLE CORE 8H CORED INTERVAL 2543.8–2553.4 mbsl; 65.3–74.9 mbsf



MUD with SILT laminae.

MUD is dark olive gray (5Y 3/2) with minor "reddish" zones.

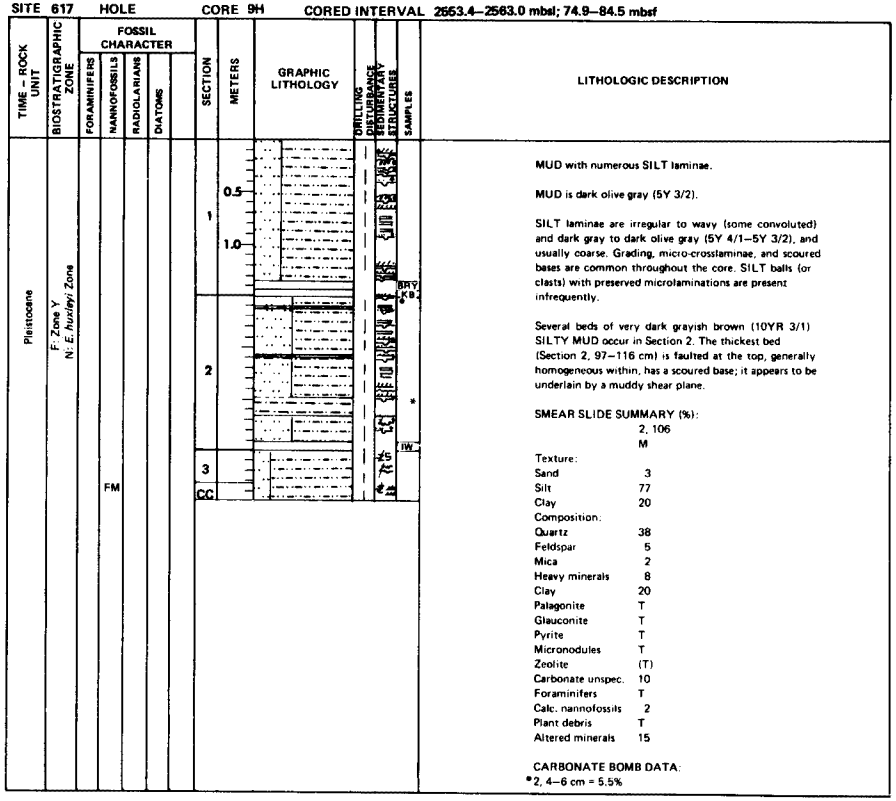
SILT laminae are light gray (10YR 6/1) and occur as irregular, graded, laminated units with scoured bases. Some laminae are contorted, and are probably minor slumped zones.

SMEAR SLIDE SUMMARY (%):

	3, 69 D
Texture:	
Sand	2
Silt	25
Clay	73
Composition:	
Quartz	15
Feldspar	2
Mica	1
Heavy minerals	2
Clay	73
Palagonite	T
Pyrite	T
Micronodules	T
Zeolite	(T)
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	2
Plant debris	T

CARBONATE BOMB DATA:
*2, 50–52 cm = 2.5%
4, 50–52 cm = 6%

SITE 617 HOLE CORE 9H CORED INTERVAL 2563.4–2563.0 mbsl; 74.9–84.5 mbsf



LITHOLOGIC DESCRIPTION

MUD with numerous SILT laminae.

MUD is dark olive gray (5Y 3/2).

SILT laminae are irregular to wavy (some convoluted) and dark gray to dark olive gray (5Y 4/1–5Y 3/2), and usually coarse. Grading, micro-crosslaminae, and scoured bases are common throughout the core. SILT balls (or clasts) with preserved microlaminations are present infrequently.

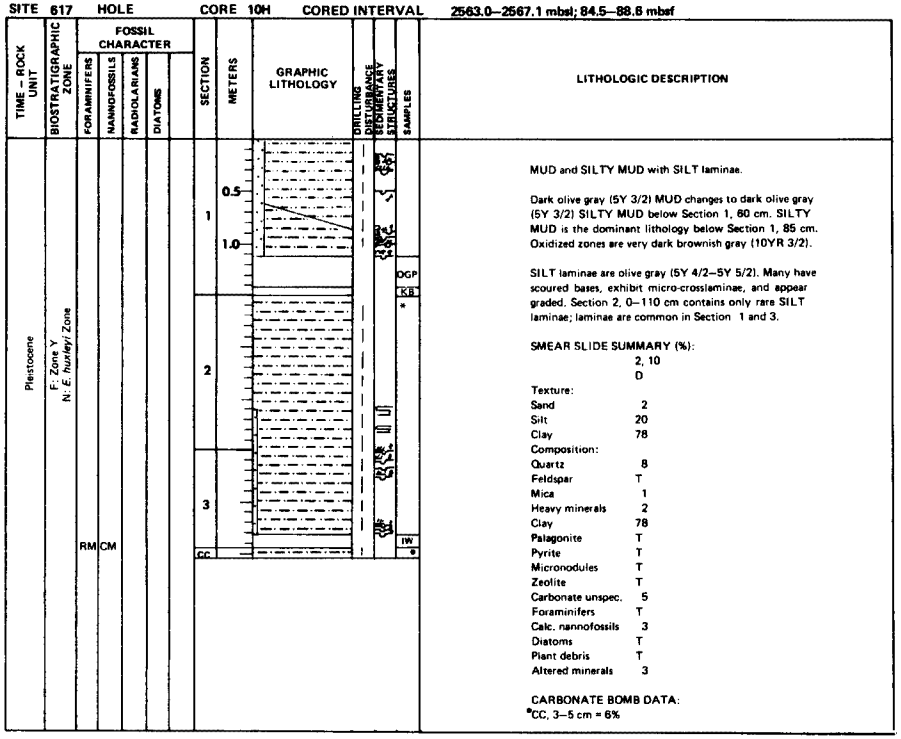
Several beds of very dark grayish brown (10YR 3/1) SILTY MUD occur in Section 2. The thickest bed (Section 2, 97–116 cm) is faulted at the top, generally homogeneous within, has a scoured base; it appears to be underlain by a muddy shear plane.

SMEAR SLIDE SUMMARY (%):

	2, 106 M
Texture:	
Sand	3
Silt	77
Clay	20
Composition:	
Quartz	38
Feldspar	5
Mica	2
Heavy minerals	8
Clay	20
Palagonite	T
Glauconite	T
Pyrite	T
Micronodules	T
Zeolite	(T)
Carbonate unspec.	10
Foraminifers	T
Calc. nannofossils	2
Plant debris	T
Altered minerals	15

CARBONATE BOMB DATA:
*2, 4–6 cm = 5.5%

SITE 617 HOLE CORE 10H CORED INTERVAL 2563.0–2567.1 mbsl; 84.5–88.6 mbsf



LITHOLOGIC DESCRIPTION

MUD and SILTY MUD with SILT laminae.

Dark olive gray (5Y 3/2) MUD changes to dark olive gray (5Y 3/2) SILTY MUD below Section 1, 60 cm. SILTY MUD is the dominant lithology below Section 1, 85 cm. Oxidized zones are very dark brownish gray (10YR 3/2).

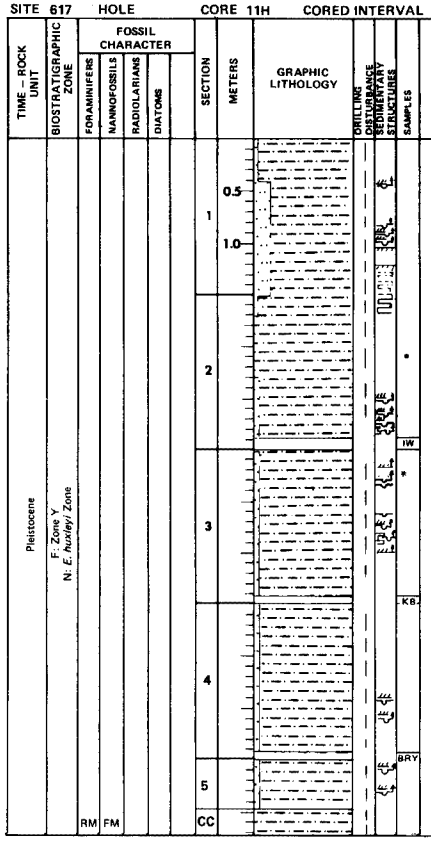
SILT laminae are olive gray (5Y 4/2–5Y 5/2). Many have scoured bases, exhibit micro-crosslaminae, and appear graded. Section 2, 0–110 cm contains only rare SILT laminae; laminae are common in Section 1 and 3.

SMEAR SLIDE SUMMARY (%):

	2, 10 D
Texture:	
Sand	2
Silt	20
Clay	78
Composition:	
Quartz	8
Feldspar	T
Mica	1
Heavy minerals	2
Clay	78
Palagonite	T
Pyrite	T
Micronodules	T
Zeolite	T
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	3
Diatoms	T
Plant debris	T
Altered minerals	3

CARBONATE BOMB DATA:
*CC, 3–5 cm = 6%

SITE 617 HOLE CORE 11H CORED INTERVAL 2572.6–2580.9 mbsl; 94.1–102.4 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD with SILT laminae.

SILTY MUD is dark olive gray (5Y 3/2) and homogeneous.

SILT laminae are very thin to thin (mostly less than 1 mm), and generally decrease infrequently downcore. They are dominantly olive gray (5Y 5/2). Grading is evident only where a number of laminae occur close together; scoured bases and micro-crosslaminations are common.

Angular discontinuities occur between Section 1, 50 and 70 cm. Angular unconformities at Section 1, 101 and 118 cm.

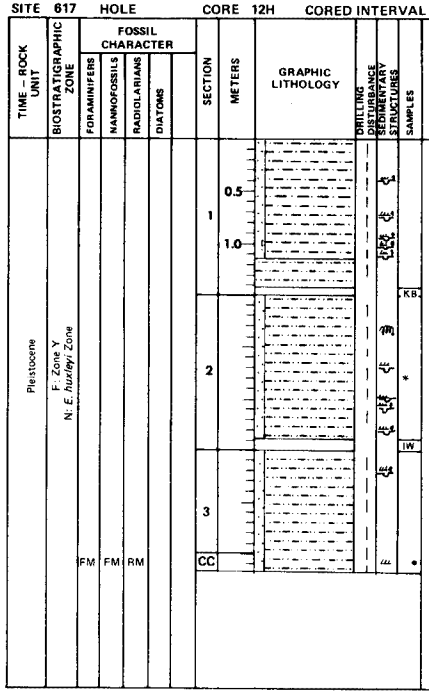
(Interpretation: silt laminae are probably very fine-grained turbidites deposited during waning period of channel development; angular discontinuites suggest small(?) scale local slides.)

SMEAR SLIDE SUMMARY (%):

	3, 25 D
Texture:	
Sand	2
Silt	28
Clay	70
Composition:	
Quartz	14
Feldspar	1
Mica	2
Heavy minerals	2
Clay	70
Palagonite	T
Pyrite	T
Micronodules	T
Zeolite	(T)
Carbonate unspec.	2
Foraminifers	T
Calc. nannofossils	4
Diatoms	T
Plant debris	T
Altered minerals	5

CARBONATE BOMB DATA:
*2, 65–67 cm = 5%

SITE 617 HOLE CORE 12H CORED INTERVAL 2582.1–2586.6 mbsl; 103.6–108.1 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD and MUD with SILT laminations.

Homogeneous, dark olive gray SILTY MUD (5Y 3/2) changes to homogeneous, dark olive gray MUD (5Y 3/2) in Section 1. Oxidation (reddish) enhanced laminations evident within contorted zone in Section 2.

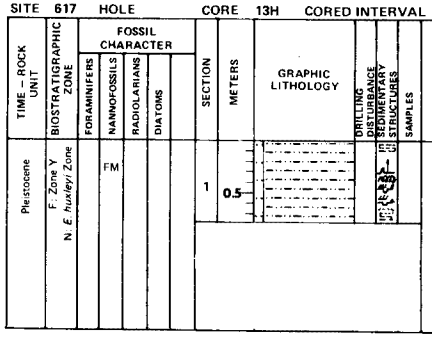
SILT laminae and blebs are gray/dark gray (5Y 4.5/1) and are generally medium- to coarse-grained. Laminae in the SILTY MUD are very thin–thin and are graded with scoured bases and micro-crosslaminae. Blebs are more common in the MUD; laminae (very thin to thin) are irregular to discontinuous and are graded with scoured bases and micro-crosslaminae. Laminae appears overturned in contorted zone (Section 2).

SMEAR SLIDE SUMMARY (%):

	2, 80 D
Texture:	
Sand	1
Silt	30
Clay	69
Composition:	
Quartz	12
Feldspar	1
Mica	1
Heavy minerals	2
Clay	69
Carbonate unspec.	7
Calc. nannofossils	3
Altered minerals	5

CARBONATE BOMB DATA:
*CC, 13–15 cm = 4.5%

SITE 617 HOLE CORE 13H CORED INTERVAL 2591.6–2592.4 mbsl; 113.1–113.9 mbsf



LITHOLOGIC DESCRIPTION

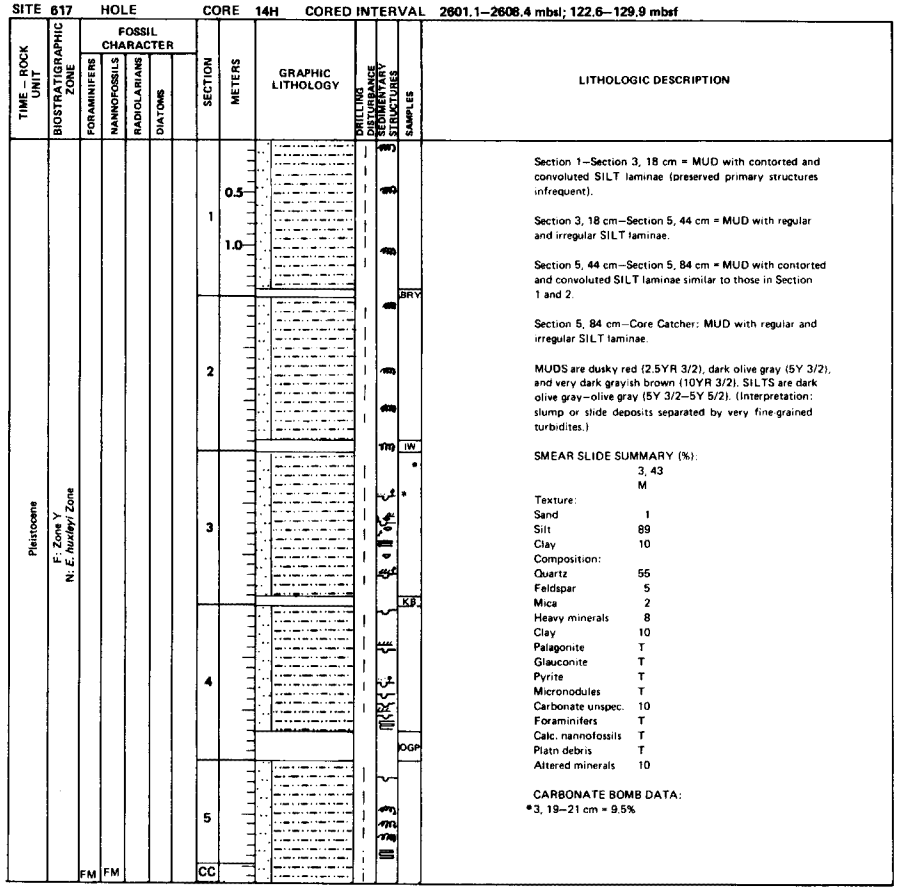
MUD with SILT laminae.

MUD is dark olive gray (5Y 3/2), and homogeneous to faintly laminated.

SILT laminae are very thin to thin and gray (5Y 5/1). Section 1, 15–35 cm consists of convoluted MUD and SILT laminae; one laminae at Section 1, 30 cm has a preserved flame structure.

NO CORE CATCHER SAMPLE RECOVERED.

SITE 617 HOLE CORE 14H CORED INTERVAL 2601.1–2608.4 mbsl; 122.6–129.9 mbsf



LITHOLOGIC DESCRIPTION

Section 1–Section 3, 18 cm = MUD with contorted and convoluted SILT laminae (preserved primary structures infrequent).

Section 3, 18 cm–Section 5, 44 cm = MUD with regular and irregular SILT laminae.

Section 5, 44 cm–Section 5, 84 cm = MUD with contorted and convoluted SILT laminae similar to those in Section 1 and 2.

Section 5, 84 cm–Core Catcher: MUD with regular and irregular SILT laminae.

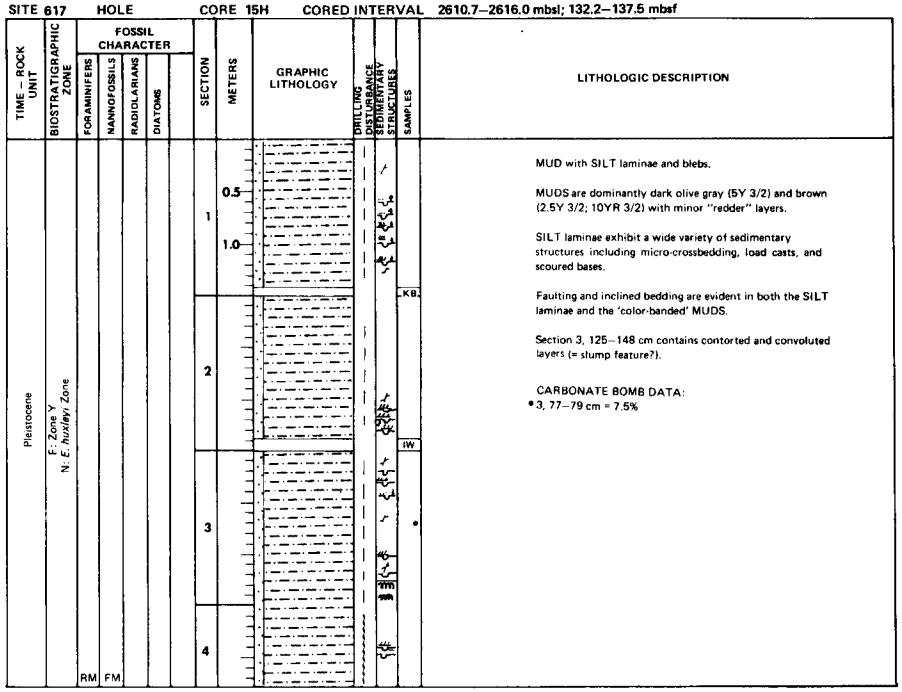
MUDS are dusky red (2.5YR 3/2), dark olive gray (5Y 3/2), and very dark grayish brown (10YR 3/2). SILTS are dark olive gray–olive gray (5Y 3/2–5Y 5/2). (Interpretation: slump or slide deposits separated by very fine-grained turbidites.)

SMEAR SLIDE SUMMARY (%):

	3, 43 M
Texture:	
Sand	1
Silt	89
Clay	10
Composition:	
Quartz	55
Feldspar	5
Mica	2
Heavy minerals	8
Clay	10
Palagonite	T
Glauconite	T
Pyrite	T
Micronodules	T
Carbonate unspec.	10
Foraminifers	T
Calc. nannofossils	T
Platn debris	T
Altered minerals	10

CARBONATE BOMB DATA:
•3, 19–21 cm = 9.5%

SITE 617 HOLE CORE 15H CORED INTERVAL 2610.7–2616.0 mbsl; 132.2–137.5 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

MUDS are dominantly dark olive gray (5Y 3/2) and brown (2.5Y 3/2; 10YR 3/2) with minor "redder" layers.

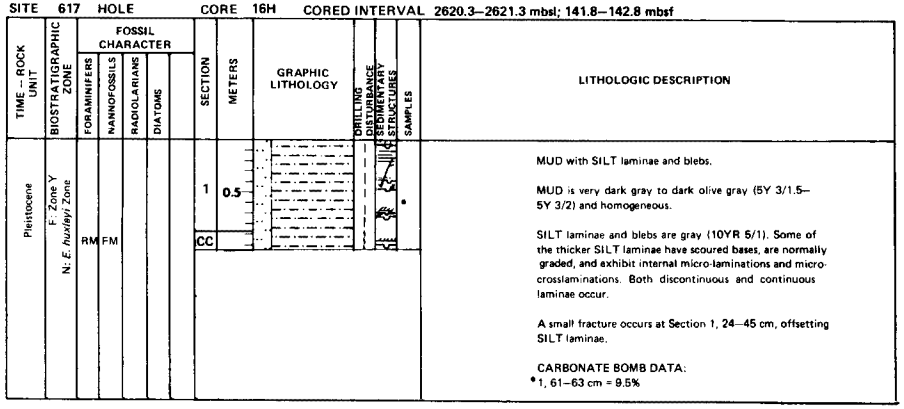
SILT laminae exhibit a wide variety of sedimentary structures including micro-crossbedding, load casts, and scoured bases.

Faulting and inclined bedding are evident in both the SILT laminae and the 'color-banded' MUDS.

Section 3, 125–148 cm contains contorted and convoluted layers (= slump feature?).

CARBONATE BOMB DATA:
•3, 77–79 cm = 7.5%

SITE 617 HOLE CORE 16H CORED INTERVAL 2620.3–2621.3 mbsl; 141.8–142.8 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

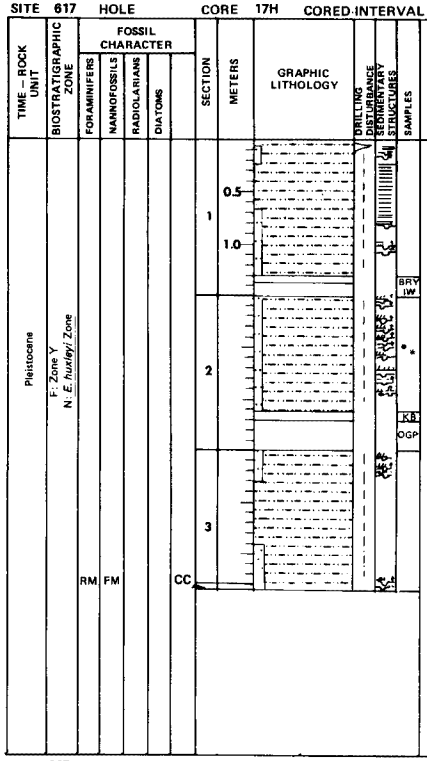
MUD is very dark gray to dark olive gray (5Y 3/1.5–5Y 3/2) and homogeneous.

SILT laminae and blebs are gray (10YR 5/1). Some of the thicker SILT laminae have scoured bases, are normally graded, and exhibit internal micro-laminations and micro-crosslaminations. Both discontinuous and continuous laminae occur.

A small fracture occurs at Section 1, 24–45 cm, offsetting SILT laminae.

CARBONATE BOMB DATA:
•1, 61–63 cm = 9.5%

SITE 617 HOLE CORE 17H CORED INTERVAL 2629.9–2634.4 mbsl; 151.4–155.9 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and blebs.

MUD is homogeneous or fine-color-laminated. Colors include very dark grayish brown (10YR 3/2) and dark olive gray (5Y 3/1.5–5Y 3/2). SILT laminae and blebs occur in both the homogeneous and the color banded MUD sections.

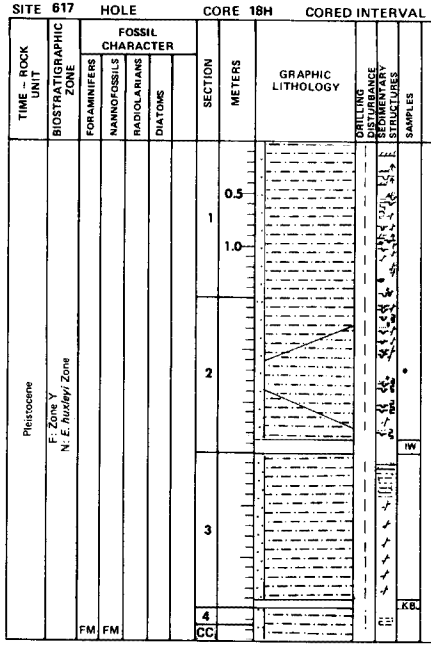
SILT laminae and blebs are gray to light gray (10YR 6/1). Laminae range from continuous to discontinuous. Some exhibit sedimentary structures, including: scoured bases, normal grading, micro-crossbedding, flame structures, and internal parallel laminations.

SMEAR SLIDE SUMMARY (%):

	2, 55 D
Texture:	
Sand	1
Silt	20
Clay	79
Composition:	
Quartz	7
Feldspar	T
Mica	1
Heavy minerals	1
Clay	79
Palagonite	T
Pyrite	T
Micronodules	T
Zeolite	(T)
Carbonate unspec.	2
Foraminifers	T
Calc. nannofossils	8
Plant debris	T
Altered minerals	2

CARBONATE BOMB DATA:
•2, 50–52 cm = 5.5%

SITE 617 HOLE CORE 18H CORED INTERVAL 2639.5–2644.3 mbsl; 161.0–165.8 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD and MUD with SILT laminations.

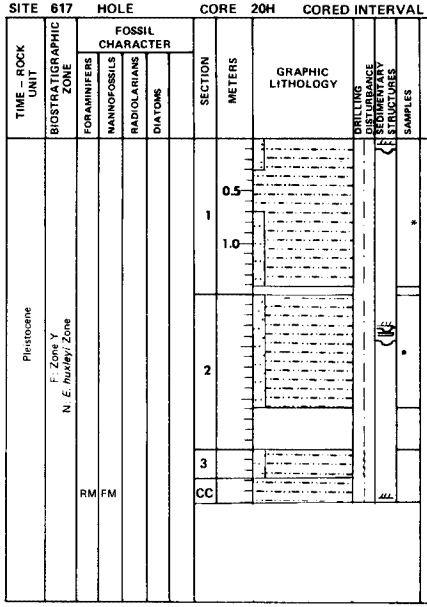
Dark olive gray (5Y 3/2) and very dark grayish brown (10YR 3/2) SILTY MUD and very dark grayish brown (10YR 3/2) MUD.

SILT laminations are dark grayish brown (10YR 4/2), gray (5Y 5.5/1), olive gray (5Y 4/2), and grayish brown (2.5Y 5/2). Laminations are irregular and often discontinuous, contorted, and fractured along micro-faults (microfaults are especially common in Section 3). Many of the laminae have scoured bases, are graded, and show micro-laminations and cross-laminations.

CARBONATE BOMB DATA:
•2, 70–72 cm = 9%

Note: Core 19H, 2649.1–2649.1 mbsl; 170.6–170.6 mbsf: no recovery.

SITE 617 HOLE CORE 20H CORED INTERVAL 2658.7–2662.3 mbsl; 181.2–184.8 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminations.

MUD, predominantly very dark gray (10YR 3/1), but also very dark olive gray (5Y 3/1.5). MUDS are subtly color-bands; colors separated by gradational contacts.

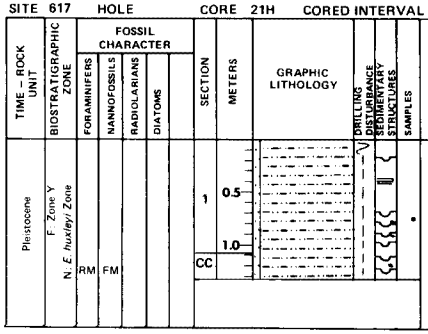
SILT laminae are grayish brown to dark grayish brown (2.5Y 5/2–10YR 4/2). Rare cross-laminations are present; the laminae are horizontal or dip slightly (maximum = 20°). Microfaulting is much less obvious than in the previous cores.

SMEAR SLIDE SUMMARY (%):

	1, 80 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Mica	3
Heavy minerals	1
Clay	81
Micronodules	T
Carbonate unspec.	5
Calc. nannofossils	T

CARBONATE BOMB DATA:
•2, 59–61 cm = 7%

SITE 617 HOLE CORE 21H CORED INTERVAL 2668.3–2669.7 mbsl; 190.8–191.2 mbsf



LITHOLOGIC DESCRIPTION

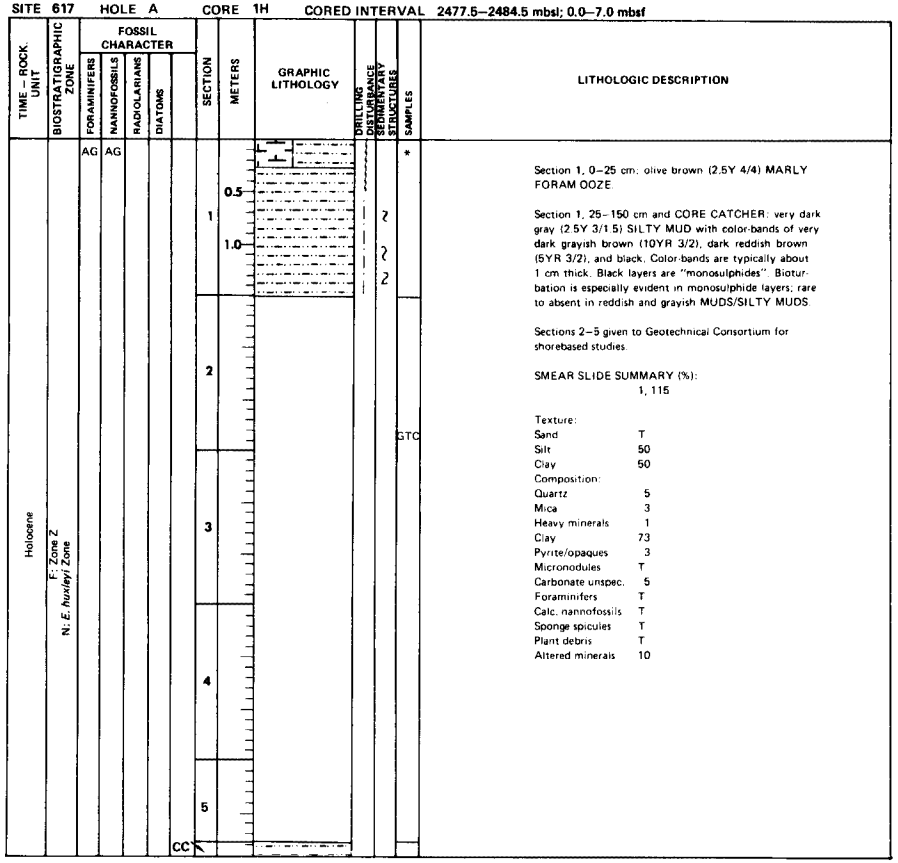
MUD with SILT laminae and blebs.

MUD is dark olive gray (5Y 3/1.5–5Y 3/2); homogeneous to very faintly color-banded.

SILT laminae olive gray (5Y 5/2) and dark grayish brown (2.5Y 4/2). A few of the SILT laminae have scoured bases and internal parallel laminations.

CARBONATE BOMB DATA:
•1, 79–81 cm = 12%

SITE 617 HOLE A CORE 1H CORED INTERVAL 2477.5–2484.5 mbsl; 0.0–7.0 mbsf



Section 1, 0–25 cm: olive brown (2.5Y 4/4) MARLY FORAM OOZE

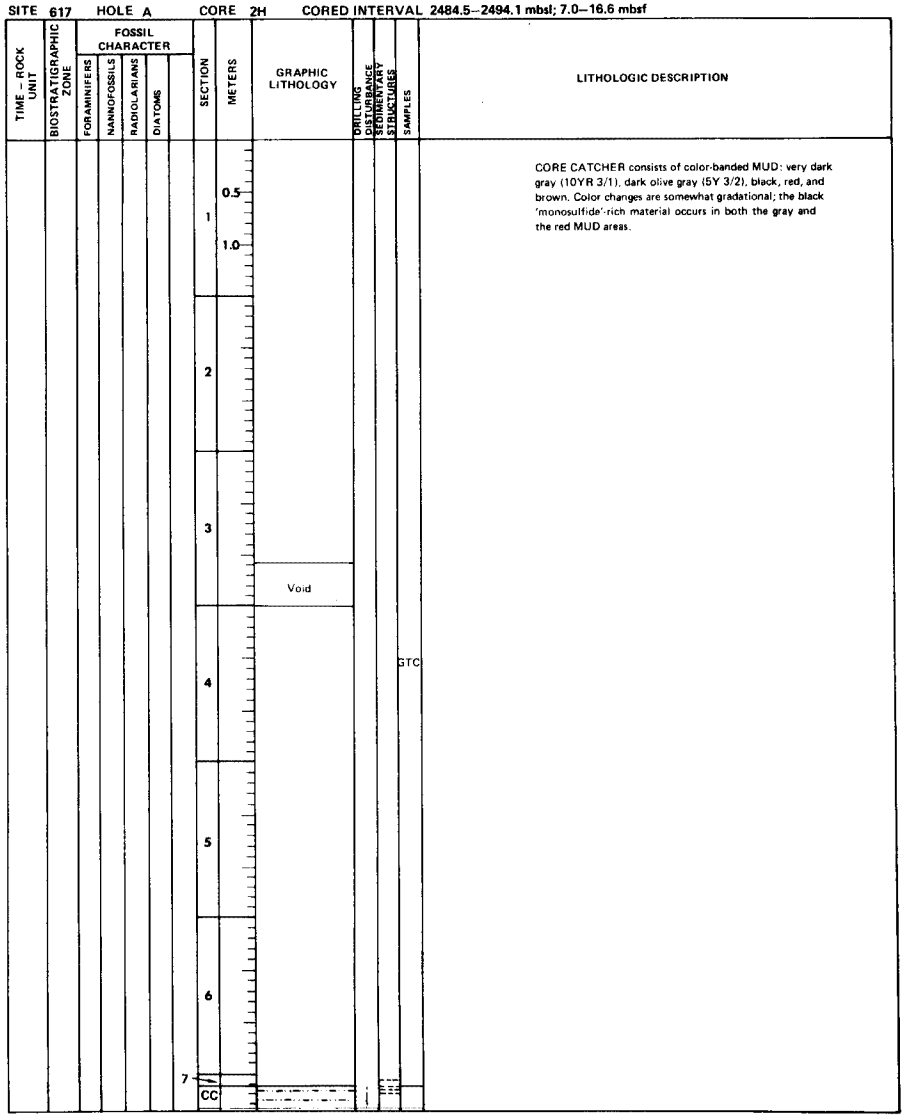
Section 1, 25–150 cm and CORE CATCHER: very dark gray (2.5Y 3/1.5) SILTY MUD with color-bands of very dark grayish brown (10YR 3/2), dark reddish brown (5YR 3/2), and black. Color-bands are typically about 1 cm thick. Black layers are "monosulphides". Bioturbation is especially evident in monosulphide layers; rare to absent in reddish and grayish MUDS/SILTY MUDS.

Sections 2–5 given to Geotechnical Consortium for shorebased studies.

SMEAR SLIDE SUMMARY (%):
1, 115

Texture:	
Sand	T
Silt	50
Clay	50
Composition:	
Quartz	5
Mica	3
Heavy minerals	1
Clay	73
Pyrite/opaques	3
Micronodules	T
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	T
Soonge spicules	T
Plant debris	T
Altered minerals	10

SITE 617 HOLE A CORE 2H CORED INTERVAL 2484.5–2494.1 mbsl; 7.0–16.6 mbsf



CORE CATCHER consists of color-banded MUD: very dark gray (10YR 3/1), dark olive gray (5Y 3/2), black, red, and brown. Color changes are somewhat gradational; the black 'monosulfide'-rich material occurs in both the gray and the red MUD areas.

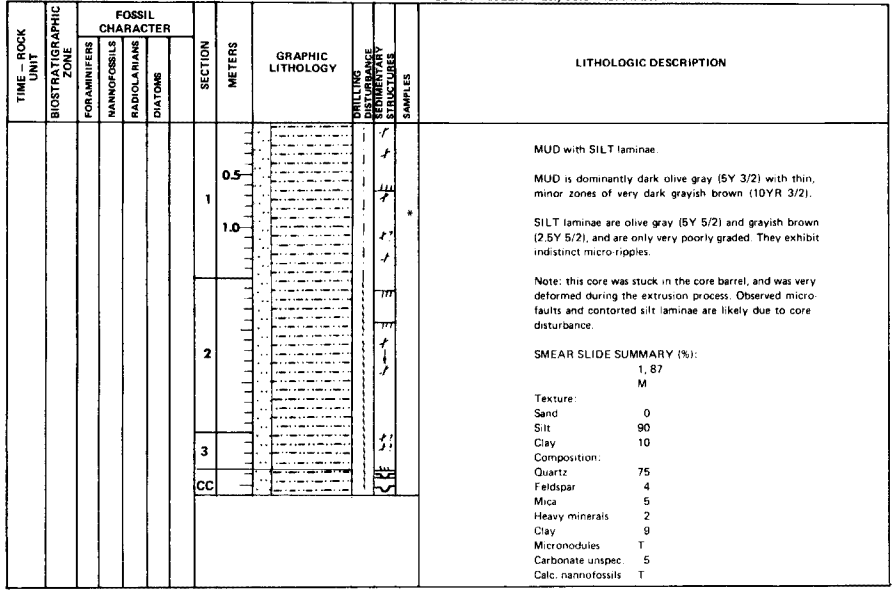
SITE 617 HOLE A CORE 3H CORED INTERVAL 2494.1–2503.7 mbsl; 16.6–26.2 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					Core Catcher, 0–8 cm: homogeneous, very dark gray (10YR 3/1) MUD. Core Catcher, 8–27 cm: very dark gray (10YR 3/1) MUD with irregular SILT blebs and laminae. Laminae are very deformed due to drilling disturbance.
							1.0					
						2						
						3					GTC	
						4						
						5						
						6						
						CC						

SITE 617 HOLE A CORE 4H CORED INTERVAL 2503.7–2513.3 mbsl; 26.2–35.8 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					Core Catcher consists of: 1) very dark gray (10YR 3/1) deformed and contorted SILT and MUD layers (CC, 0–10 cm and CC, 17–24 cm); and 2) very dark gray (10YR 3/1), fairly homogeneous MUD with minor SILT laminae (CC, 10–17 cm).
							1.0					
						2						
						3					GTC	
						4						
						5						
						6						
						CC						

SITE 617 HOLE A CORE 5H CORED INTERVAL 2513.3–2522.9 mbsl; 35.8–45.4 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae.

MUD is dominantly dark olive gray (5Y 3/2) with thin, minor zones of very dark grayish brown (10YR 3/2).

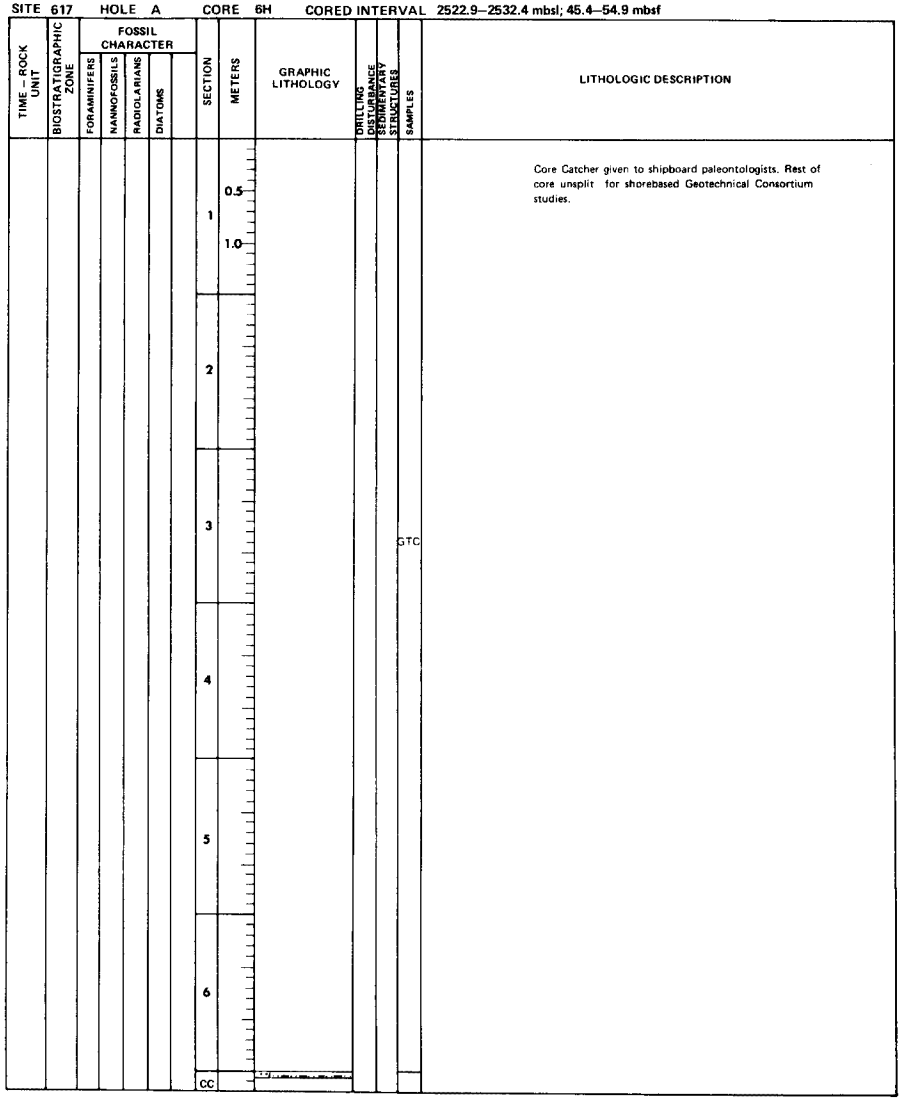
SILT laminae are olive gray (5Y 5/2) and grayish brown (2.5Y 5/2), and are only very poorly graded. They exhibit indistinct micro-ripples.

Note: this core was stuck in the core barrel, and was very deformed during the extrusion process. Observed micro-faults and contorted silt laminae are likely due to core disturbance.

SMEAR SLIDE SUMMARY (%):

	1, 87 M
Texture:	
Sand	0
Silt	90
Clay	10
Composition:	
Quartz	75
Feldspar	4
Mica	5
Heavy minerals	2
Clay	9
Micronodules	T
Carbonate unspec.	5
Calc. nannofossils	T

SITE 617 HOLE A CORE 6H CORED INTERVAL 2522.9–2532.4 mbsf



LITHOLOGIC DESCRIPTION

Core Catcher given to shipboard paleontologists. Rest of core unsplit for shorebased Geotechnical Consortium studies.

SITE 617 HOLE A CORE 7H CORED INTERVAL 2532.4–2542.9 mbsl; 54.9–64.4 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					Core Catcher sample consists of very dark gray (10YR 3/1) MUD with SILT laminae and blebs. SILT laminae have scoured bases, cross-lamination, and parallel lamination. The entire section is overturned.
						1	1.0					
						2					GTC	
						3						
						4						
						CC						

SITE 617 HOLE A CORE 8H CORED INTERVAL 2542.9–2552.4 mbsl; 64.4–73.9 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					Core Catcher sample consists of very dark gray (10YR 3/1) MUD with SILT laminae and blebs. A disturbed, 1–2 cm thick SILT layer occurs at CC, 11–12 cm.
						1	1.0					
						2					GTC	
						3						
						4						
						CC						

SITE 618

HOLE 618

Date Occupied: 19 October 1983, 2153 LCT

Date Departed: 21 October 1983, 0135 LCT

Time on Hole: 1 day, 3 hr.

Position (latitude; longitude): 27°00.68'N; 91°15.73'W

Water depth (sea level; corrected m, echo-sounding): 2412.4

Water depth (rig floor; corrected m, echo-sounding): 2422.4

Bottom felt (m, drill pipe): 2422.4

Penetration (m): 92.5

Number of cores: 11

Total length of cored section (m): 78.0

Total core recovered (m): 67.47

Core recovery (%): 87

Oldest sediment cored:

Depth sub-bottom (m): 92.5

Nature: gassy clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

SITE 618

HOLE 618A

Date Occupied: 21 October 1983, 0135 LCT

Date Departed: 21 October 1983, 1211 LCT

Time on Hole: 10 hr., 36 min.

Position (latitude; longitude): 27°00.68'N; 91°15.73'W

Water depth (sea level; corrected m, echo-sounding): 2412.4

Water depth (rig floor; corrected m, echo-sounding): 2422.4

Bottom felt (m, drill pipe): 2422.4

Penetration (m): 47.6

Number of cores: 3

Total length of cored section (m): 28.7

Total core recovered (m): 18.52

Core recovery (%): 65

Oldest sediment cored:

Depth sub-bottom (m): 47.6

Nature: gassy clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal Results:

Site 618 was located near the center of the northern subbasin of Orca Basin, an anoxic intraslope basin containing a 200 m brine water column overlying the basin sediments. The hole was cored to a depth of 92.5 m. Gravity and piston cores from previous cruises indicated the presence of a black anoxic mud in the near surface sediments. The first two cores obtained were composed of gray clays containing a reworked Pliocene fauna. The sub-bottom profiler record showed a 15 m relief seafloor high in the center of the basin, suggesting a former mass movement. Immediately below the displaced gray clays, a zone of dark black mud was cored and foraminifers indicated a Holocene age.

It appears that this uppermost section represents a Holocene mass movement deposit derived from the adjacent steep slopes of the diapir. The remainder of the core consisted of gray clays with thin alternating black clays which thinned in thickness with depth. Ericson's Zone Y (late Wisconsin glacial) contained sparse fauna and much of the section contained abundant reworked fauna. The presence of the displaced fauna, together with the high sedimentation rate, made this site extremely disappointing in that the objective of establishing a good biostratigraphic column could not be attained. The displaced sediment that interrupted the pelagic-hemipelagic sedimentation is probably related to active movement of the salt diapirs that rim the basin. Salt movement is controlled to a major degree by the large sediment loading that took place during the Pleistocene. The major Pleistocene depocenter is located immediately

to the east and the diapirs in this region display many features that suggest active movement in the late Pleistocene.

The principal results were:

1) Biogenic methane was encountered throughout the entire cored interval, ranging from 17% at the surface to 98% at 85 m depth.

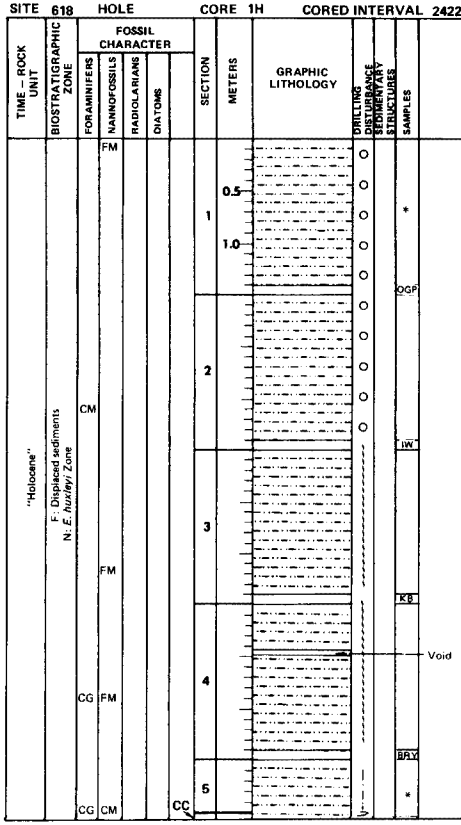
2) Thin zones of white crystalline gas hydrate were cored in the upper sediments, between 25 and 47 m sub-bottom.

3) The presence of gas thoroughly disturbed the cores, masking the sedimentary structures and precluding an assessment of the sediment transport processes.

4) Interstitial water salinity decreased from 230 ppt in the surface core to an average of 55 ppt at 30 m penetration and then remained rather constant to total depth.

5) The Holocene accumulation rate was computed at 158.3 cm/1000 yr. The cored section bottomed in Ericson's Zone Y (late Wisconsin glacial) and the minimum accumulation rate computed was 83.6 cm/1000 yr. The high sedimentation rates, primarily as a result of localized mass movement processes, resulted in the site being very poor for establishing a stratigraphic chronology.

SITE 618 HOLE CORE 1H CORED INTERVAL 2422.4–2428.9 mbsl; 0.0–6.5 mbsf



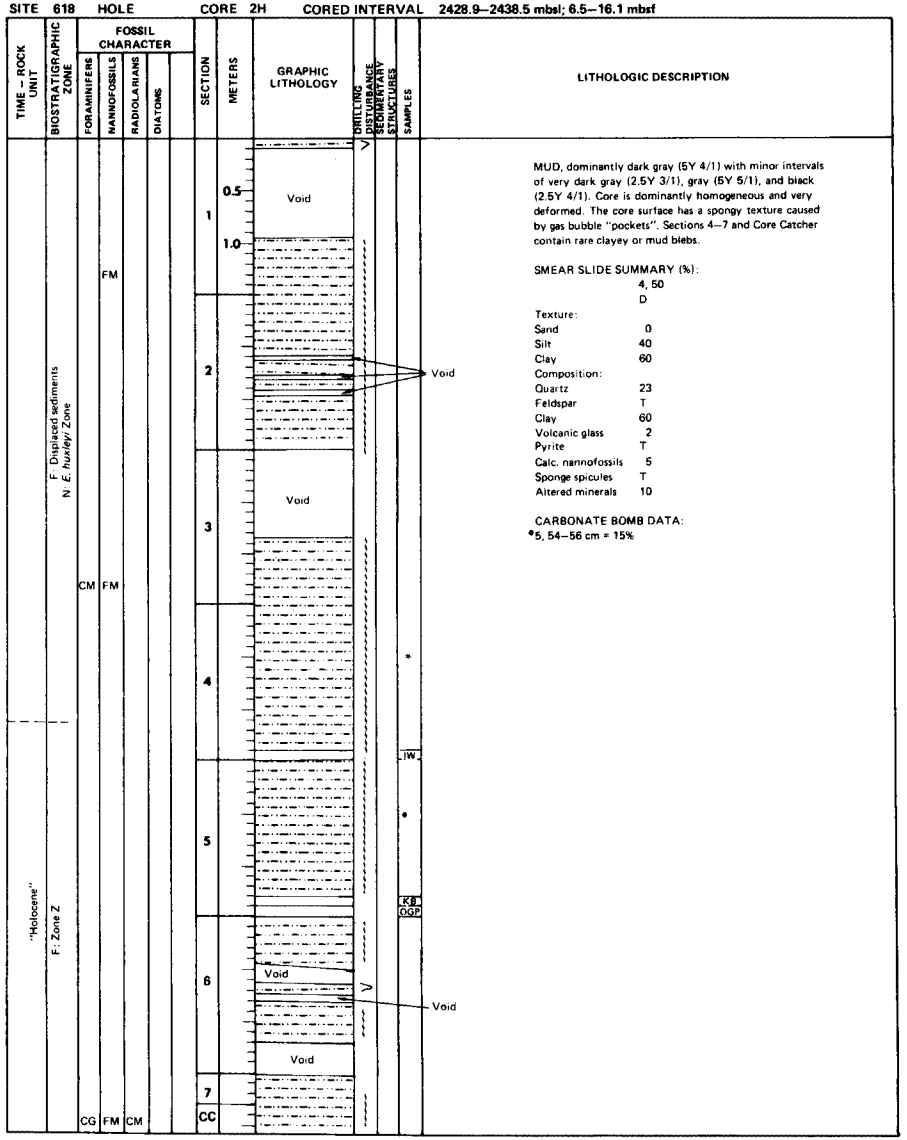
LITHOLOGIC DESCRIPTION

MUD, dominantly dark olive gray (5Y 3/2) with intervals of black in Section 4 (0–15 cm), Section 5 (24–35 cm), and the Core Catcher (black is 2.5YR 2/0). Section 5 contains minor red (10R 2/1) MUD. Most of this core is homogeneous, and either soupy or very deformed. The core surface has a spongy texture caused by gas bubble "pockets".

SMEAR SLIDE SUMMARY (%):

	1, 70 D	4, 5 M	5, 35 M
Texture:			
Sand	T	0	2
Silt	40	20	25
Clay	60	80	73
Composition:			
Quartz	20	2	5
Feldspar	5	1	–
Mica	3	T	–
Heavy minerals	3	1	3
Clay	56	55	24
Micronodules	T	–	–
Carbonate unspec.	10	10	2
Foraminifers	–	5	10
Calc. nannofossils	2	20	50
Radiolarians	–	3	1
Sponge spicules	T	3	–
Plant debris (spores)	–	T	5
Opaques	1	T	–

SITE 618 HOLE CORE 2H CORED INTERVAL 2428.9–2438.5 mbsl; 6.5–16.1 mbsf



LITHOLOGIC DESCRIPTION

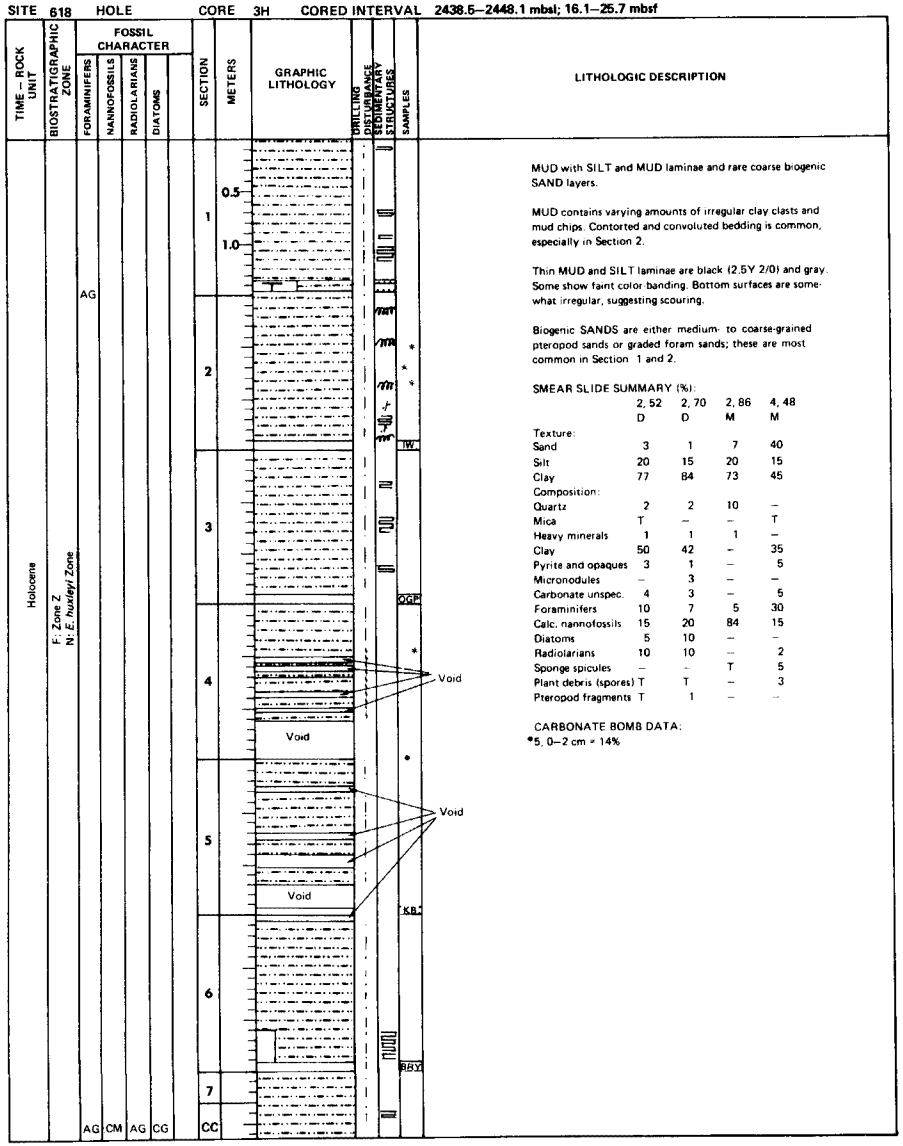
MUD, dominantly dark gray (5Y 4/1) with minor intervals of very dark gray (2.5Y 3/1), gray (5Y 5/1), and black (2.5Y 4/1). Core is dominantly homogeneous and very deformed. The core surface has a spongy texture caused by gas bubble "pockets". Sections 4–7 and Core Catcher contain rare clayey or mud blebs.

SMEAR SLIDE SUMMARY (%):

	4, 50 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	23
Feldspar	T
Clay	60
Volcanic glass	2
Pyrite	T
Calc. nannofossils	5
Sponge spicules	T
Altered minerals	10

CARBONATE BOMB DATA:
*5, 54–56 cm = 15%

SITE 618 HOLE CORE 3H CORED INTERVAL 2438.6–2448.1 mbsl; 16.1–25.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT and MUD laminae and rare coarse biogenic SAND layers.

MUD contains varying amounts of irregular clay clasts and mud chips. Contorted and convoluted bedding is common, especially in Section 2.

Thin MUD and SILT laminae are black (2.5Y 2/0) and gray. Some show faint color banding. Bottom surfaces are somewhat irregular, suggesting scouring.

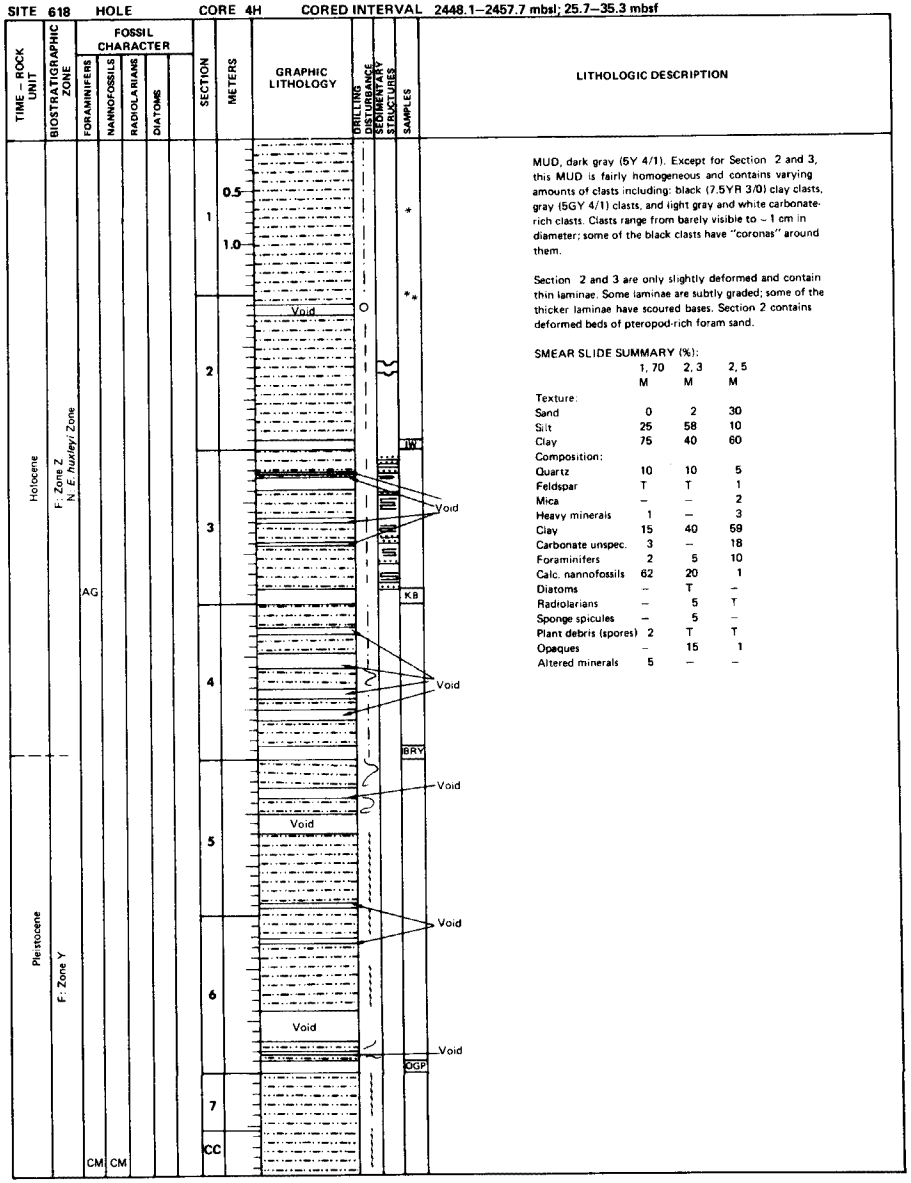
Biogenic SANDS are either medium- to coarse-grained pteropod sands or graded foram sands; these are most common in Section 1 and 2.

SMEAR SLIDE SUMMARY (%):

	2, 52 D	2, 70 D	2, 86 M	4, 48 M
Texture:				
Sand	3	1	7	40
Silt	20	15	20	15
Clay	77	84	73	45
Composition:				
Quartz	2	2	10	–
Mica	T	–	–	T
Heavy minerals	1	1	1	–
Clay	50	42	–	35
Pyrite and opaques	3	1	–	5
Micronodules	–	3	–	–
Carbonate unspec.	4	3	–	5
Foraminifers	10	7	5	30
Calc. nannofossils	15	20	84	15
Diatoms	5	10	–	–
Radiolarians	10	10	–	2
Sponge spicules	–	–	T	5
Plant debris (spores)	T	T	–	3
Pteropod fragments	T	1	–	–

CARBONATE BOMB DATA:
*5, 0–2 cm = 14%

SITE 618 HOLE CORE 4H CORED INTERVAL 2448.1–2457.7 mbsl; 25.7–35.3 mbsf



LITHOLOGIC DESCRIPTION

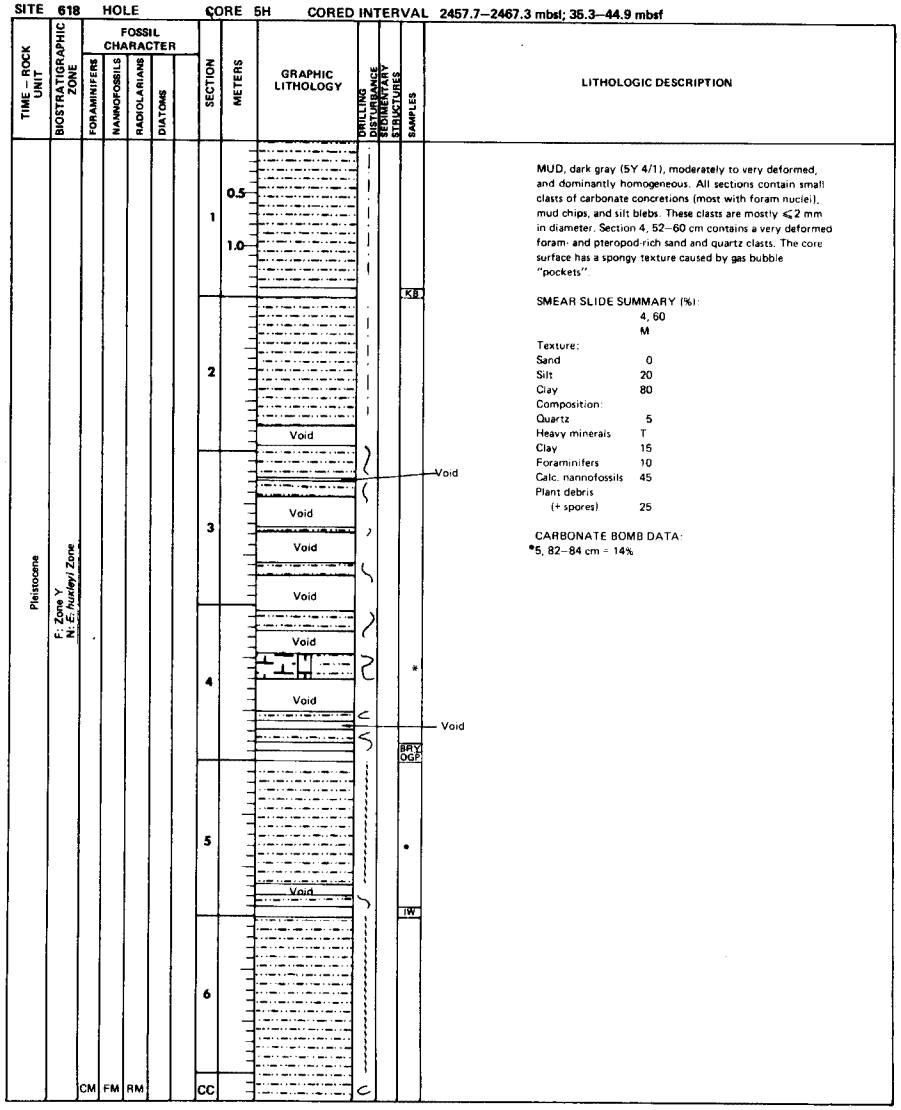
MUD, dark gray (5Y 4/1). Except for Section 2 and 3, this MUD is fairly homogeneous and contains varying amounts of clasts including: black (7.5YR 3/0) clay clasts, gray (5GY 4/1) clasts, and light gray and white carbonate-rich clasts. Clasts range from barely visible to ~ 1 cm in diameter; some of the black clasts have "coronas" around them.

Section 2 and 3 are only slightly deformed and contain thin laminae. Some laminae are subtly graded; some of the thicker laminae have scoured bases. Section 2 contains deformed beds of pteropod-rich foram sand.

SMEAR SLIDE SUMMARY (%):

	1, 70 M	2, 3 M	2, 5 M
Texture:			
Sand	0	2	30
Silt	25	58	10
Clay	75	40	60
Composition:			
Quartz	10	10	5
Feldspar	T	T	1
Mica	–	–	2
Heavy minerals	1	–	3
Clay	15	40	59
Carbonate unspec.	3	–	18
Foraminifers	2	5	10
Calc. nannofossils	62	20	1
Diatoms	–	T	–
Radiolarians	–	5	T
Sponge spicules	–	5	–
Plant debris (spores)	2	T	T
Opaques	–	15	1
Altered minerals	5	–	–

SITE 618 HOLE CORE 5H CORED INTERVAL 2457.7–2467.3 mbsl; 35.3–44.9 mbsf



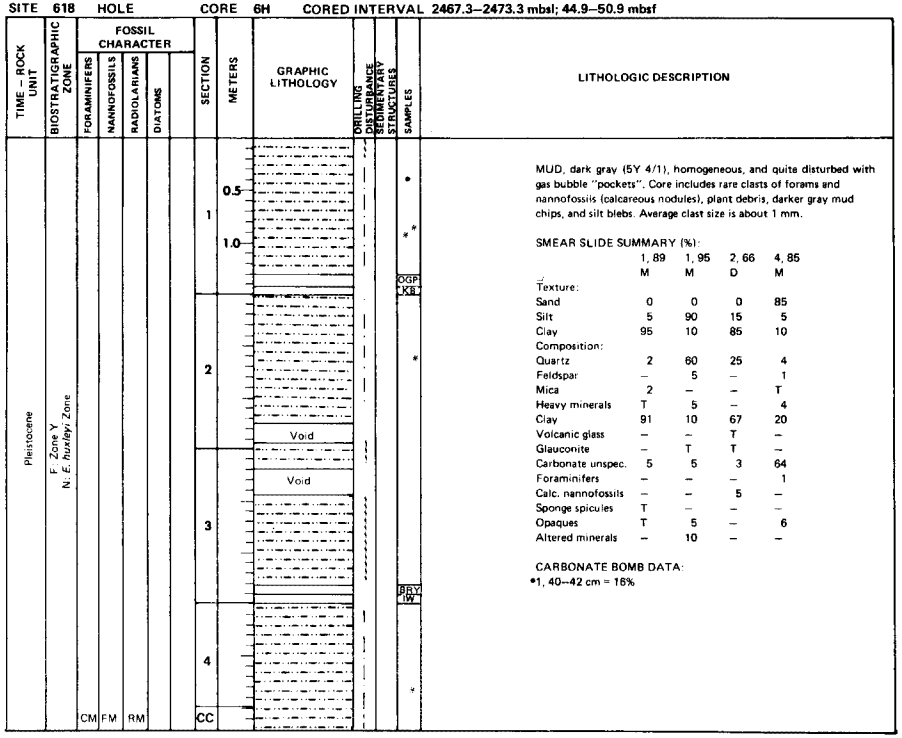
MUD, dark gray (5Y 4/1), moderately to very deformed, and dominantly homogeneous. All sections contain small clasts of carbonate concretions (most with foram nuclei), mud chips, and silt blebs. These clasts are mostly ≤2 mm in diameter. Section 4, 52–60 cm contains a very deformed foram- and pteropod-rich sand and quartz clasts. The core surface has a spongy texture caused by gas bubble "pockets".

SMEAR SLIDE SUMMARY (%):

	4, 60 M
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	5
Heavy minerals	T
Clay	15
Foraminifers	10
Calc. nannofossils	45
Plant debris (+ spores)	25

CARBONATE BOMB DATA:
•5, 82–84 cm = 14%

SITE 618 HOLE CORE 6H CORED INTERVAL 2467.3–2473.3 mbsl; 44.9–50.9 mbsf



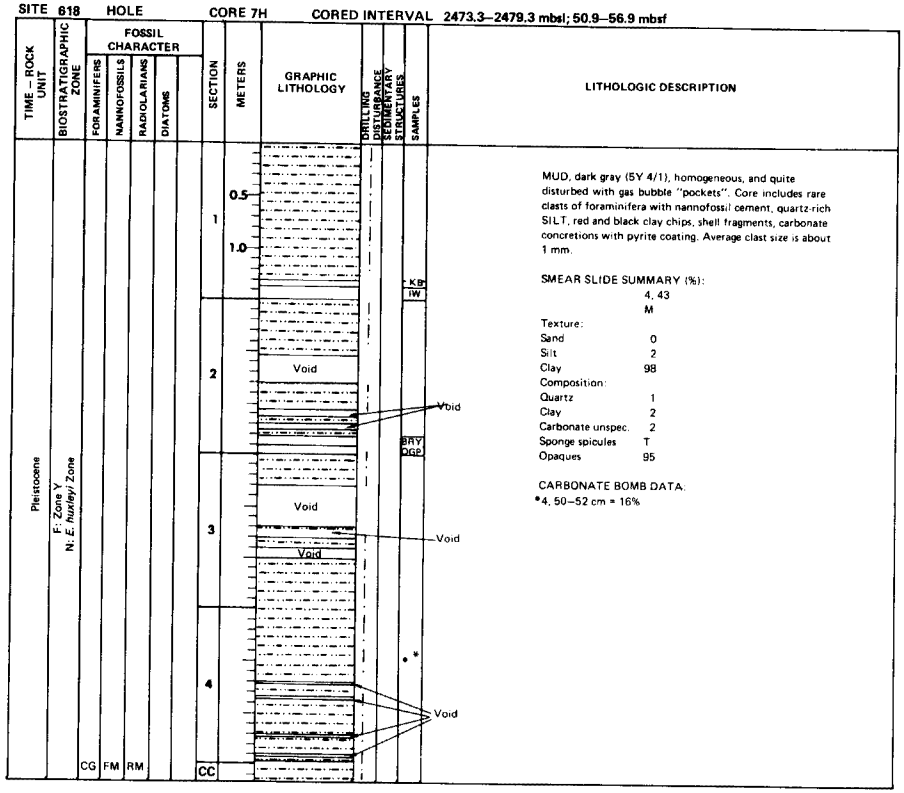
MUD, dark gray (5Y 4/1), homogeneous, and quite disturbed with gas bubble "pockets". Core includes rare clasts of forams and nannofossils (calcareous nodules), plant debris, darker gray mud chips, and silt blebs. Average clast size is about 1 mm.

SMEAR SLIDE SUMMARY (%):

	1, 89 M	1, 95 M	2, 66 D	4, 85 M
Texture:				
Sand	0	0	0	85
Silt	5	90	15	5
Clay	95	10	85	10
Composition:				
Quartz	2	60	25	4
Feldspar	–	5	–	1
Mica	2	–	–	T
Heavy minerals	T	5	–	4
Clay	91	10	67	20
Volcanic glass	–	–	T	–
Glauconite	–	T	T	–
Carbonate unspec.	5	5	3	64
Foraminifers	–	–	–	1
Calc. nannofossils	–	–	5	–
Sponge spicules	T	–	–	–
Opaques	T	5	–	6
Altered minerals	–	10	–	–

CARBONATE BOMB DATA:
•1, 40–42 cm = 16%

SITE 618 HOLE CORE 7H CORED INTERVAL 2473.3–2479.3 mbsl; 50.9–56.9 mbsf



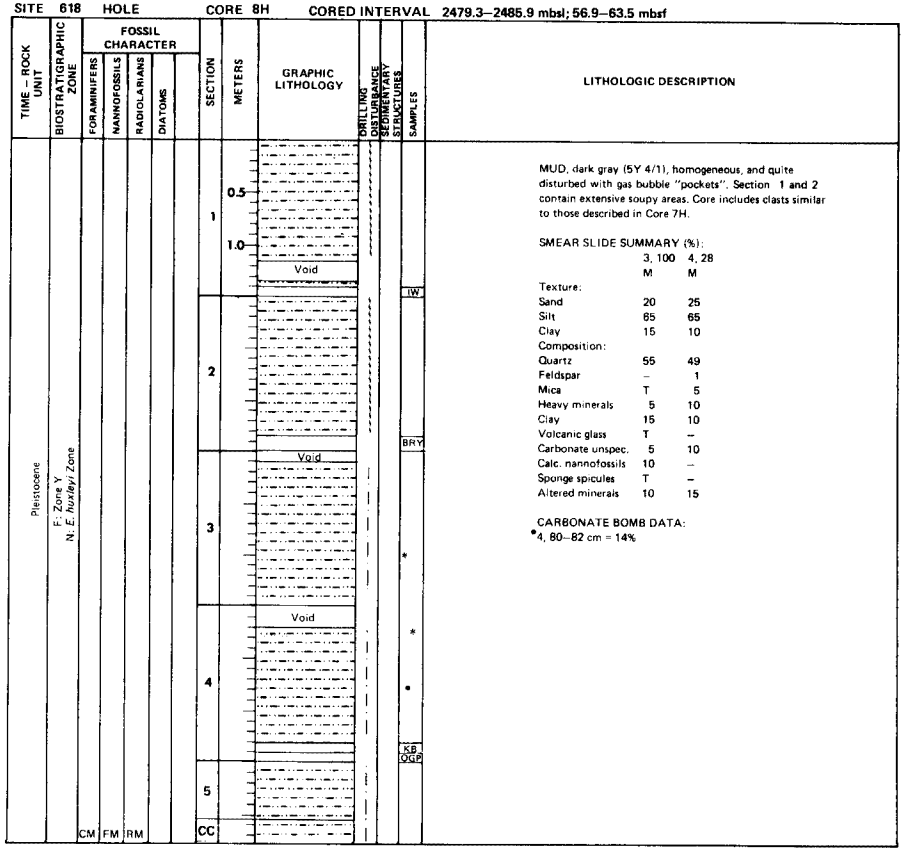
MUD, dark gray (5Y 4/1), homogeneous, and quite disturbed with gas bubble "pockets". Core includes rare clasts of foraminifera with nannofossil cement, quartz-rich SILT, red and black clay chips, shell fragments, carbonate concretions with pyrite coating. Average clast size is about 1 mm.

SMEAR SLIDE SUMMARY (%):

	4, 43 M
Texture:	
Sand	0
Silt	2
Clay	98
Composition:	
Quartz	1
Clay	2
Carbonate unspec.	2
Sponge spicules	T
Opaques	95

CARBONATE BOMB DATA:
*4, 50–52 cm = 16%

SITE 618 HOLE CORE 8H CORED INTERVAL 2479.3–2485.9 mbsl; 56.9–63.5 mbsf



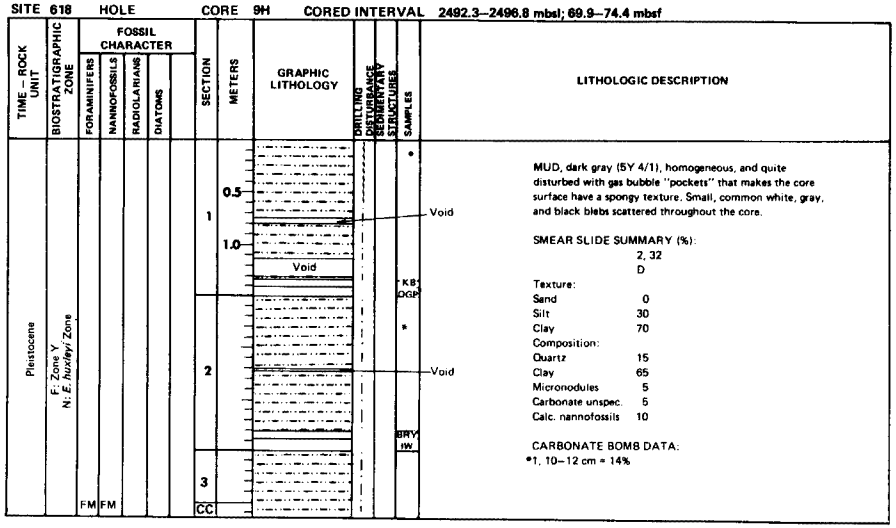
MUD, dark gray (5Y 4/1), homogeneous, and quite disturbed with gas bubble "pockets". Section 1 and 2 contain extensive soupy areas. Core includes clasts similar to those described in Core 7H.

SMEAR SLIDE SUMMARY (%):

	3, 100 M	4, 28 M
Texture:		
Sand	20	25
Silt	65	65
Clay	15	10
Composition:		
Quartz	55	49
Feldspar	–	1
Mica	T	5
Heavy minerals	5	10
Clay	15	10
Volcanic glass	T	–
Carbonate unspec.	5	10
Calc. nannofossils	10	–
Sponge spicules	T	–
Altered minerals	10	15

CARBONATE BOMB DATA:
*4, 80–82 cm = 14%

SITE 618 HOLE CORE 9H CORED INTERVAL 2492.3–2496.8 mbsl; 69.9–74.4 mbsf



LITHOLOGIC DESCRIPTION

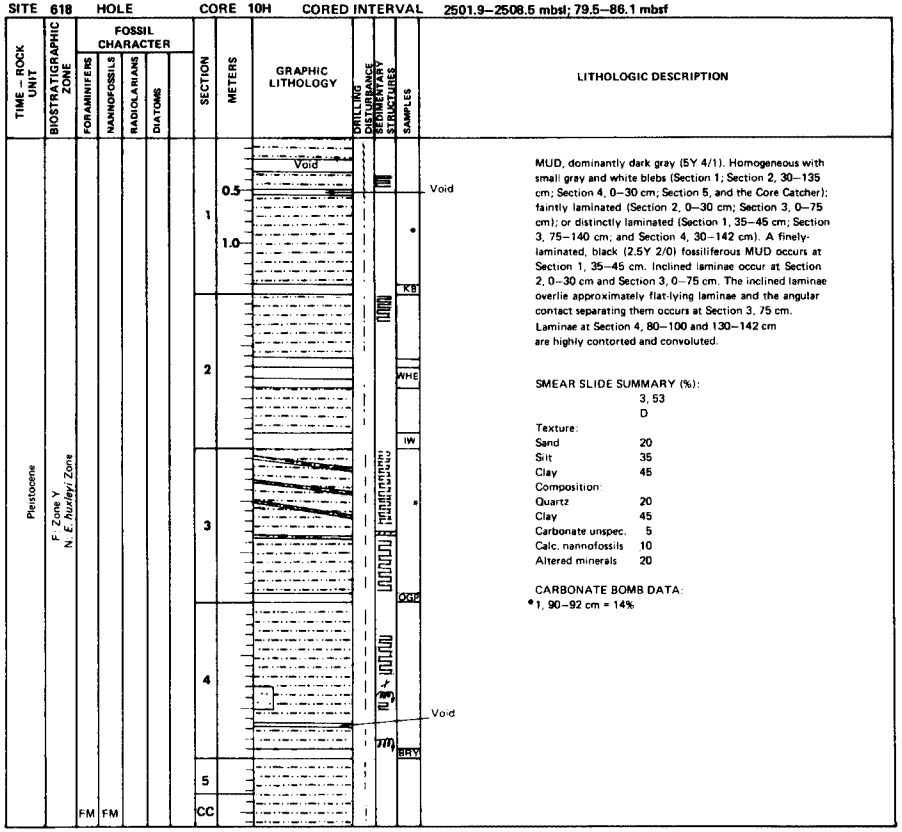
MUD, dark gray (5Y 4/1), homogeneous, and quite disturbed with gas bubble "pockets" that makes the core surface have a spongy texture. Small, common white, gray, and black blebs scattered throughout the core.

SMEAR SLIDE SUMMARY (%):

	2, 32 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	15
Clay	65
Micronodules	5
Carbonate unspec.	5
Calc. nannofossils	10

CARBONATE BOMB DATA:
*1, 10–12 cm = 14%

SITE 618 HOLE CORE 10H CORED INTERVAL 2501.9–2508.5 mbsl; 79.5–86.1 mbsf



LITHOLOGIC DESCRIPTION

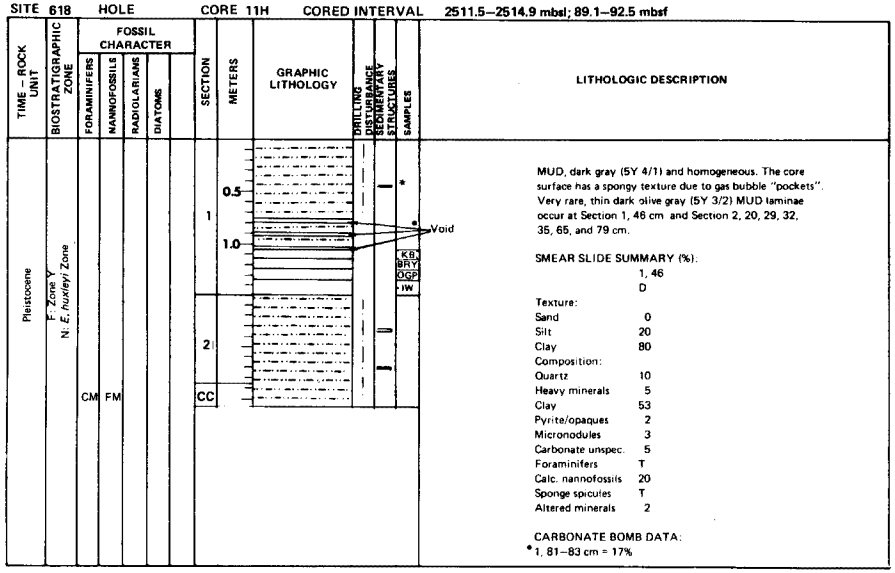
MUD, dominantly dark gray (5Y 4/1). Homogeneous with small gray and white blebs (Section 1; Section 2, 30–135 cm; Section 4, 0–30 cm; Section 5, and the Core Catcher); faintly laminated (Section 2, 0–30 cm; Section 3, 0–75 cm); or distinctly laminated (Section 1, 35–45 cm; Section 3, 75–140 cm; and Section 4, 30–142 cm). A finely-laminated, black (2.5Y 2/0) fossiliferous MUD occurs at Section 1, 35–45 cm. Inclined laminae occur at Section 2, 0–30 cm and Section 3, 0–75 cm. The inclined laminae overlie approximately flat-lying laminae and the angular contact separating them occurs at Section 3, 75 cm. Laminae at Section 4, 80–100 and 130–142 cm are highly contorted and convoluted.

SMEAR SLIDE SUMMARY (%):

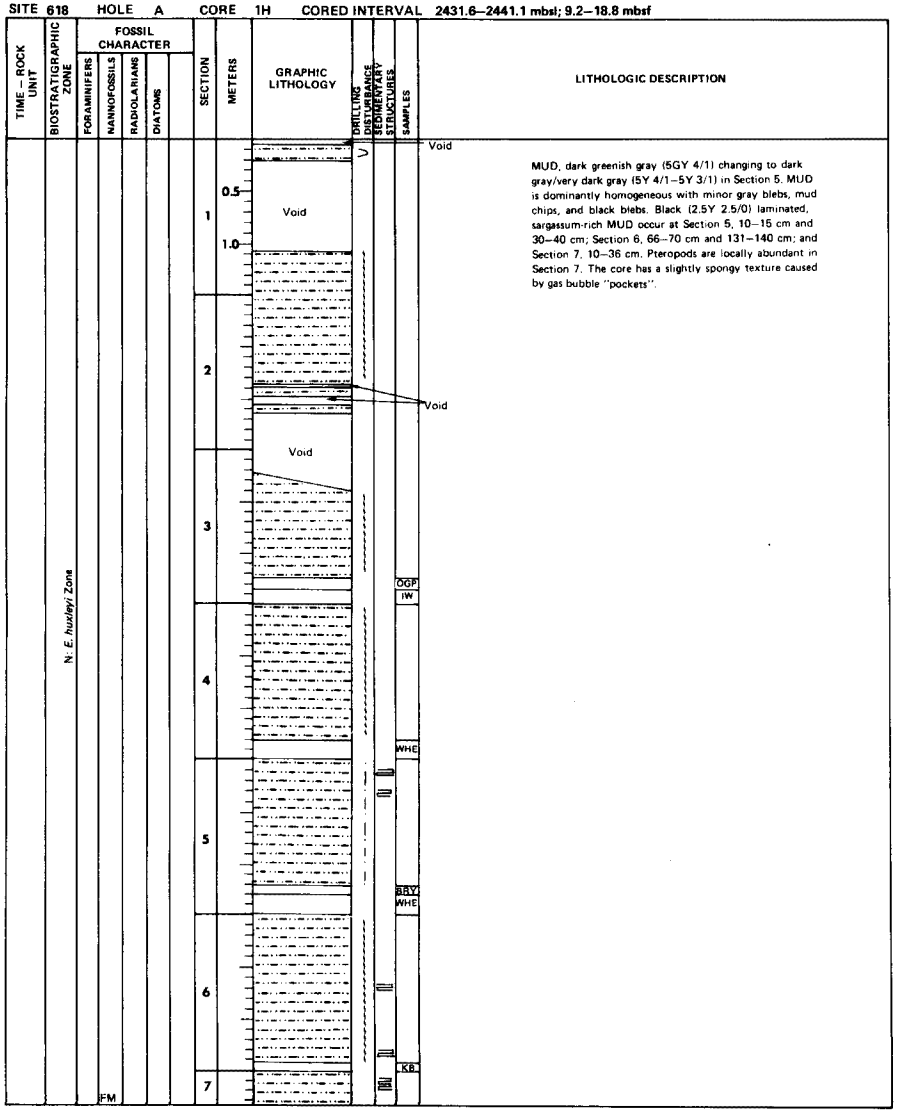
	3, 53 D
Texture:	
Sand	20
Silt	35
Clay	45
Composition:	
Quartz	20
Clay	45
Carbonate unspec.	5
Calc. nannofossils	10
Altered minerals	20

CARBONATE BOMB DATA:
*1, 90–92 cm = 14%

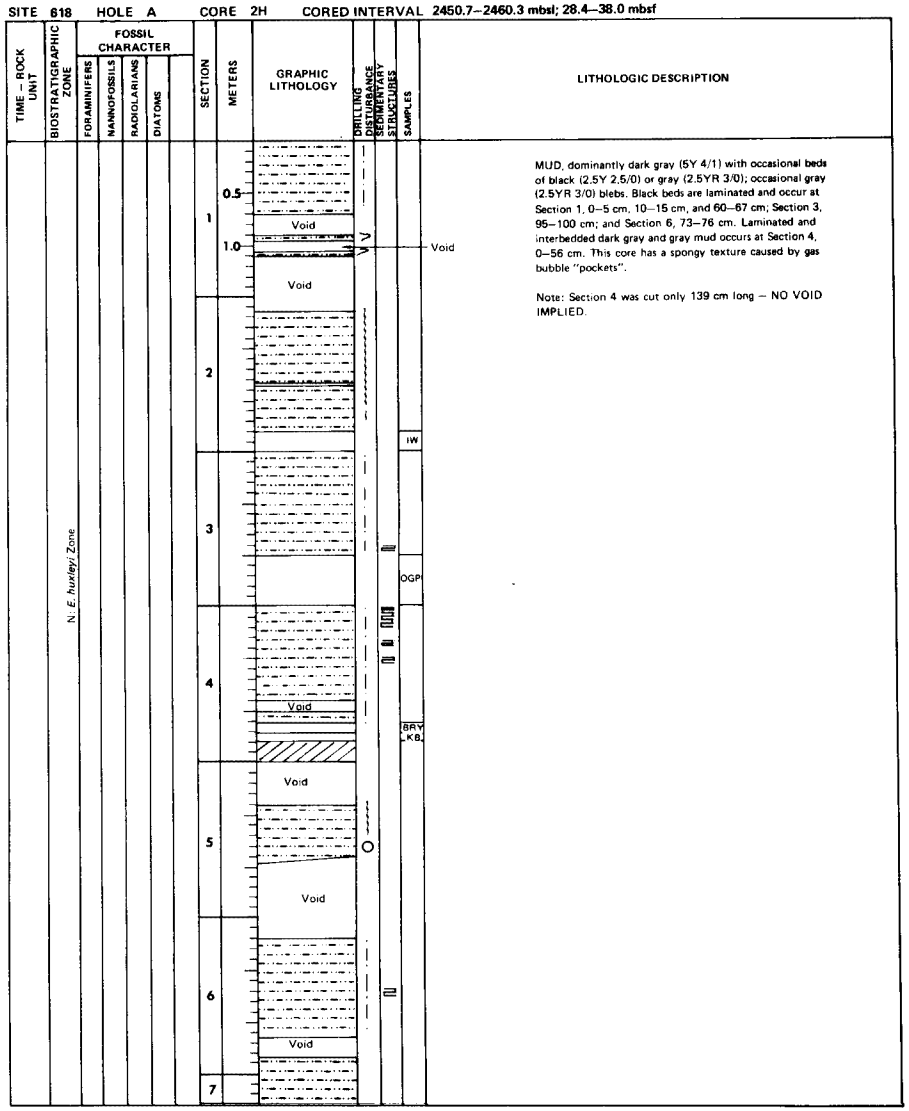
SITE 618 HOLE CORE 11H CORED INTERVAL 2511.5–2514.9 mbsl; 89.1–92.5 mbsf



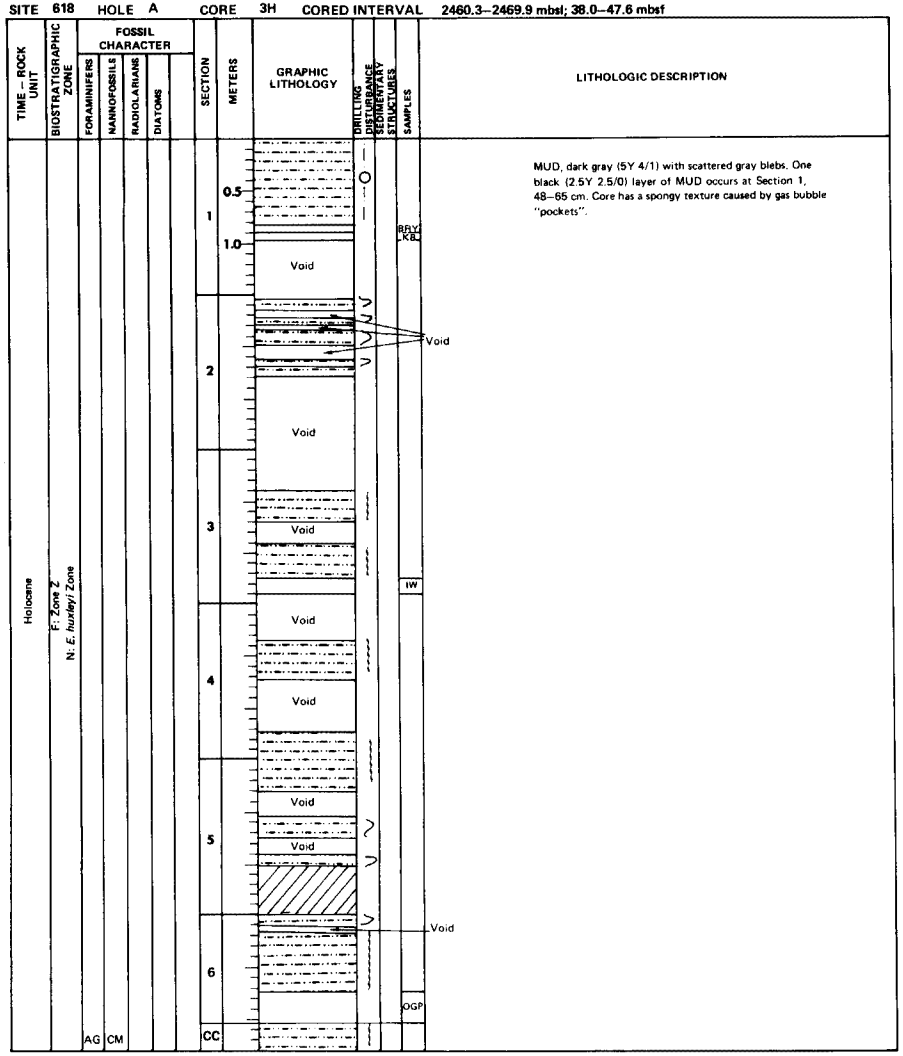
SITE 618 HOLE A CORE 1H CORED INTERVAL 2431.6–2441.1 mbsl; 9.2–18.8 mbsf



SITE 618 HOLE A CORE 2H CORED INTERVAL 2450.7–2460.3 mbsl; 28.4–38.0 mbsf



SITE 618 HOLE A CORE 3H CORED INTERVAL 2460.3–2469.9 mbsl; 38.0–47.6 mbsf



SITE 619

HOLE 619

Date Occupied: 21 October 1983, 1359 LCT

Date Departed: 22 October 1983, 2137 LCT

Time on Hole: 1 day, 8 hr.

Position (latitude; longitude): 27°11.61'N; 91°24.54'W

Water depth (sea level; corrected m, echo-sounding): 2259

Water depth (rig floor; corrected m, echo-sounding): 2269

Bottom felt (m, drill pipe): 2274.0

Penetration (m): 208.7

Number of cores: 25

Total length of cored section (m): 134.4

Total core recovered (m): 111.88

Core recovery (%): 83

Oldest sediment cored:

Depth sub-bottom (m): 208.7

Nature: clay

Age: Pleistocene (Ericson Zone W)

Measured velocity (km/s): N/A

Basement: N/A

SITE 619

HOLE 619A

Date Occupied: 22 October 1983, 2137 LCT

Date Departed: 23 October 1983, 0415 LCT

Time on Hole: 0 day, 7 hr.

Position (latitude; longitude): 27°11.61'N; 91°24.54'W

Water depth (sea level; corrected m, echo-sounding): 2259

Water depth (rig floor; corrected m, echo-sounding): 2269

Bottom felt (m, drill pipe): 2272.7

Penetration (m): 5.3

Number of cores: 1

Total length of cored section (m): 5.3

Total core recovered (m): 5.3

Core recovery (%): 100

Oldest sediment cored: N/A (mudline core only)

Basement: N/A

Principal results:

Site 619 is located in Pigmy Basin, a northeast-southwest trending intraslope basin approximately 206 km south of the Louisiana shoreline. The basin has a flat seafloor at a water depth of 2260 m and steeply sloping walls formed by the salt diapirs that rise approximately 700 m. Seismically the basin fill shows a number of acoustical sequences; each starts with a transparent or semi-transparent zone, overlain by a zone with discontinuous, more or less parallel reflectors, and topped by distinct, parallel continuous reflectors. This sequence is repeated numerous times, with varying thicknesses. Unconformities are often apparent at the lower boundary of a sequence, possibly indicating differential uplift of the adjacent salt diapirs.

The principal results of the drilling at this site were:

1) The fill of the basin in late Pleistocene times has been primarily by pelagic and hemipelagic sedimentation with only minor interruptions by localized mass-movement deposits.

2) In the deposits laid down during the glacial stages (low sea level stands), especially during the early Wisconsin glacial (Ericson's Zone W), a few thin coarse-grained turbidite sequences were present. Fine-grained mud turbidites are common throughout the section cored.

3) A well-preserved and rather complete biostratigraphic section of the Wisconsin was cored. Ericson's Zones Z, Y, X, and W were penetrated. Computed accumulation rates were 83.3 cm/1000 yr. for the Holocene (Zone Z, 10 m thick), 186.3 cm/1000 yr. for the late

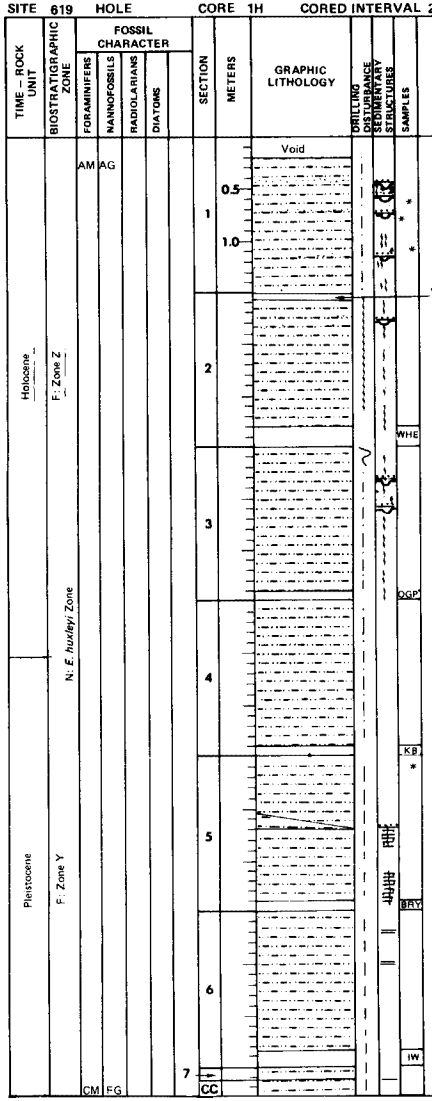
Wisconsin glacial (Zone Y, 136 m thick), 23.8 cm/1000 yr. for the Wisconsin interstadial (Zone X, 10 m thick) and a minimum of 76.5 cm/1000 yr. for the early Wisconsin glacial (Zone W, 52 m thick) as this unit was not completely penetrated.

4) The predominantly clayey section contained an abundance of bathyal benthic foraminifers except in the lower part of Zone W (early Wisconsin glacial) which contained displaced shallow-water nearshore benthic fauna.

5) The cored section showed a minimum of locally displaced sediments possibly indicating that diapiric movement has not been extremely active during the late Wisconsin.

6) A prominent ash layer was cored at a sub-bottom depth of 141.5 m and coincided with the top of Ericson's Zone X. An ash horizon in a similar stratigraphic position, the Y-8 ash (Kennett and Huddlestun, 1972), has been dated at 84,000 yr. before present. Directly below the ash layer was a dark black highly burrowed clay, 1.0 m thick, that contained abundant pyrite, indicating a time of highly reducing conditions.

SITE 619 HOLE CORE 1H CORED INTERVAL 2274.0–2283.5 mbsl; 1.0–10.5 mbsf



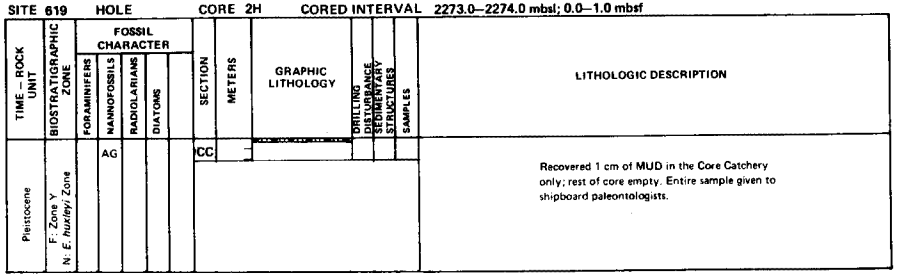
LITHOLOGIC DESCRIPTION

MUD, dark gray (5Y 4/1). Dominantly homogeneous with minor color bands of gray (10YR 4/1), grayish brown (10YR 3/2–10YR 4/2), and olive gray (5Y 4/2). Bioturbation common in Sections 1–3; less common below. Thin silts and fine sands occur in Sections 1, 2, and 3; some are graded and have scoured bases. Coarse, graded sandy mud occurs in Section 5.

SMEAR SLIDE SUMMARY (%):

	1, 68 M	1, 80 D	1, 112 D	5, 10 D
Texture:				
Sand	25	2	0	0
Silt	40	13	15	10
Clay	35	85	85	90
Composition:				
Quartz	20	15	12	5
Feldspar	–	3	–	–
Mica	–	3	–	1
Heavy minerals	1	2	1	1
Clay	23	65	50	35
Volcanic glass	–	–	2	–
Carbonate unspec.	5	5	–	5
Foraminifers	40	–	T	10
Calc. nannofossils	10	5	35	40
Radiolarians	–	T	–	–
Sponge spicules	1	T	T	1
Plant debris (spores)	T	(T)	T	–
Opaques	–	2	–	2

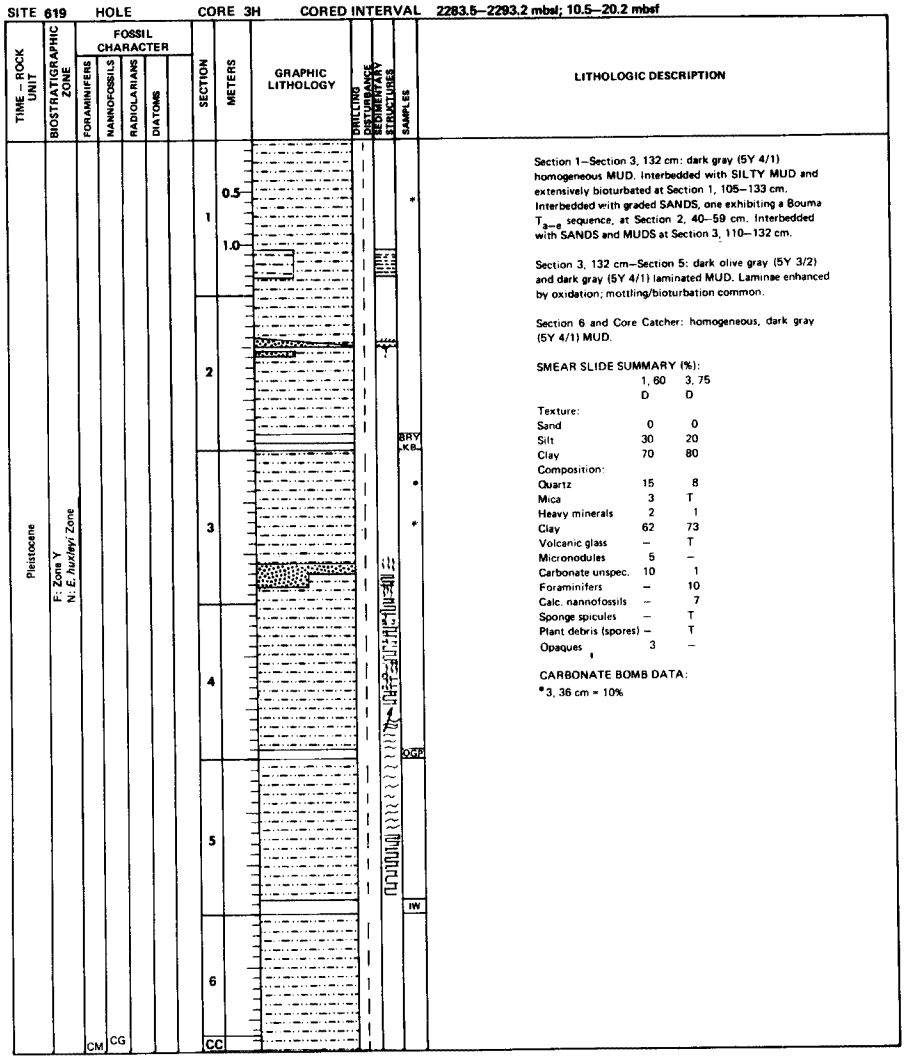
SITE 619 HOLE CORE 2H CORED INTERVAL 2273.0–2274.0 mbsl; 0.0–1.0 mbsf



LITHOLOGIC DESCRIPTION

Recovered 1 cm of MUD in the Core Catchery only; rest of core empty. Entire sample given to shipboard paleontologists.

SITE 619 HOLE CORE 3H CORED INTERVAL 2283.5–2293.2 mbsl; 10.5–20.2 mbsf



LITHOLOGIC DESCRIPTION

Section 1–Section 3, 132 cm: dark gray (5Y 4/1) homogeneous MUD. Interbedded with SILTY MUD and extensively bioturbated at Section 1, 105–133 cm. Interbedded with graded SANDS, one exhibiting a Bouma T_{a-e} sequence, at Section 2, 40–59 cm. Interbedded with SANDS and MUDS at Section 3, 110–132 cm.

Section 3, 132 cm–Section 5: dark olive gray (5Y 3/2) and dark gray (5Y 4/1) laminated MUD. Laminae enhanced by oxidation; mottling/bioturbation common.

Section 6 and Core Catcher: homogeneous, dark gray (5Y 4/1) MUD.

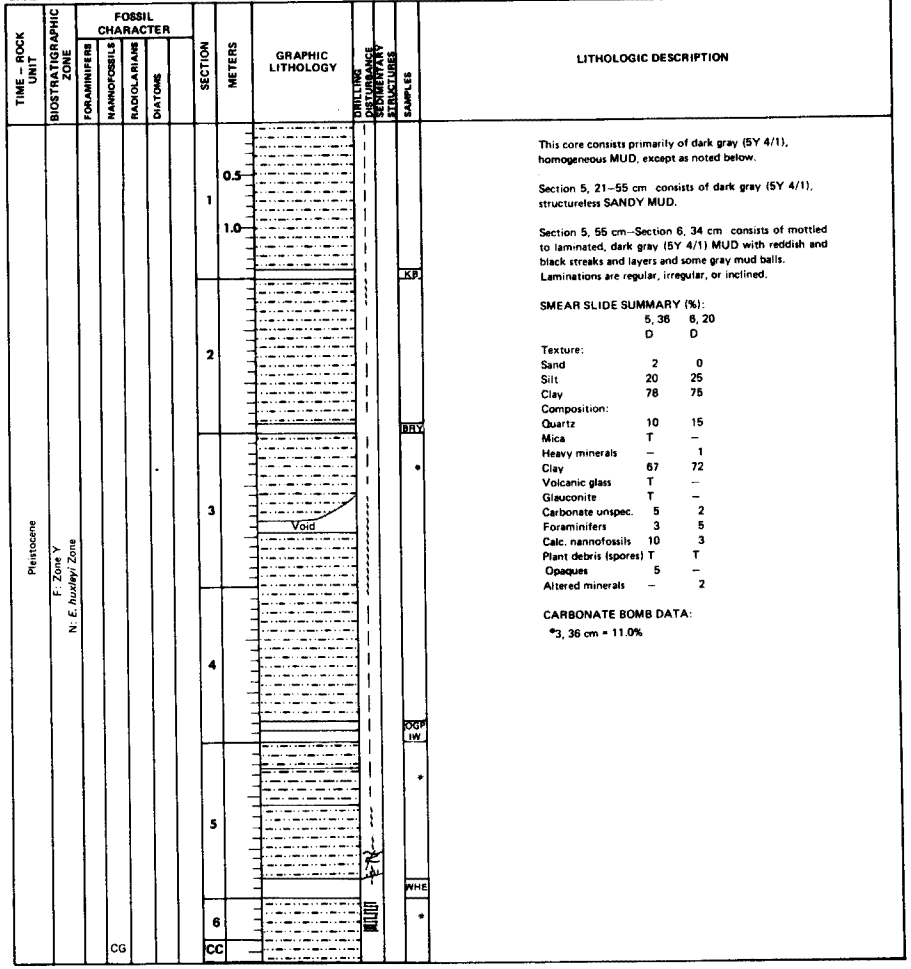
SMEAR SLIDE SUMMARY (%):

	1, 60 D	3, 75 D
Texture:		
Sand	0	0
Silt	30	20
Clay	70	80
Composition:		
Quartz	15	8
Mica	3	T
Heavy minerals	2	1
Clay	62	73
Volcanic glass	–	T
Micronodules	5	–
Carbonate unspec.	10	1
Foraminifers	–	10
Calc. nannofossils	–	7
Sponge spicules	–	T
Plant debris (spores)	–	T
Opaques	3	–

CARBONATE BOMB DATA:

*3, 36 cm = 10%

SITE 619 HOLE CORE 4H CORED INTERVAL 2293.2–2302.9 mbsl; 20.2–29.9 mbsf



LITHOLOGIC DESCRIPTION

This core consists primarily of dark gray (5Y 4/1), homogeneous MUD, except as noted below.

Section 5, 21–55 cm consists of dark gray (5Y 4/1), structureless SANDY MUD.

Section 5, 55 cm–Section 6, 34 cm consists of mottled to laminated, dark gray (5Y 4/1) MUD with reddish and black streaks and layers and some gray mud balls. Laminations are regular, irregular, or inclined.

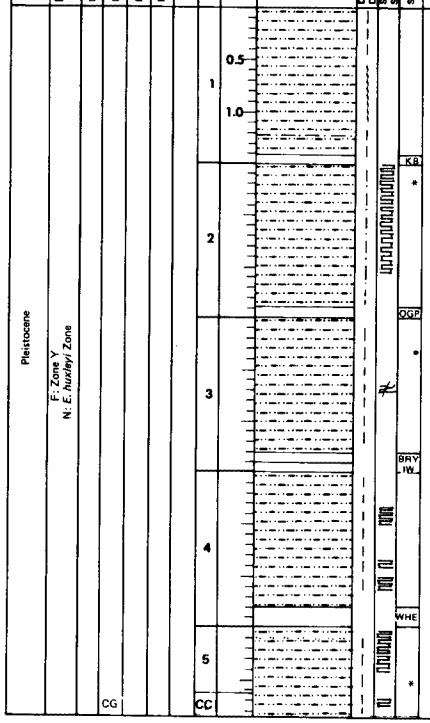
SMEAR SLIDE SUMMARY (%):

	5, 36 D	6, 20 D
Texture:		
Sand	2	0
Silt	20	25
Clay	78	75
Composition:		
Quartz	10	15
Mica	T	–
Heavy minerals	–	1
Clay	67	72
Volcanic glass	T	–
Glauconite	T	–
Carbonate unspec.	5	2
Foraminifers	3	5
Calc. nannofossils	10	3
Plant debris (spores)	T	T
Opaques	5	–
Altered minerals	–	2

CARBONATE BOMB DATA:

*3, 36 cm = 11.0%

SITE 619 HOLE CORE 5H CORED INTERVAL 2302.9–2312.6 mbsl; 29.9–39.6 mbsf



LITHOLOGIC DESCRIPTION

Section 1–Section 2, 70 cm: dark gray (5Y 4/1), homogeneous MUD with color-band laminations in the lower 24 cm. Four cm-thick SAND layer occurs at Section 1, 121–125 cm. Laminations are black (2.5YR 2.5/0).

Section 2, 70 cm–Section 4, 130 cm: dark olive gray (5Y 3/2) MUD. Mainly homogeneous with occasional interbeds of dark gray (5Y 4/1) mud especially near the base.

Section 5 and Core Catcher: dark gray (5Y 4/1) MUD laminated with very dark gray (5Y 3/1) and very dark grayish brown (2.5Y 3/2) MUD.

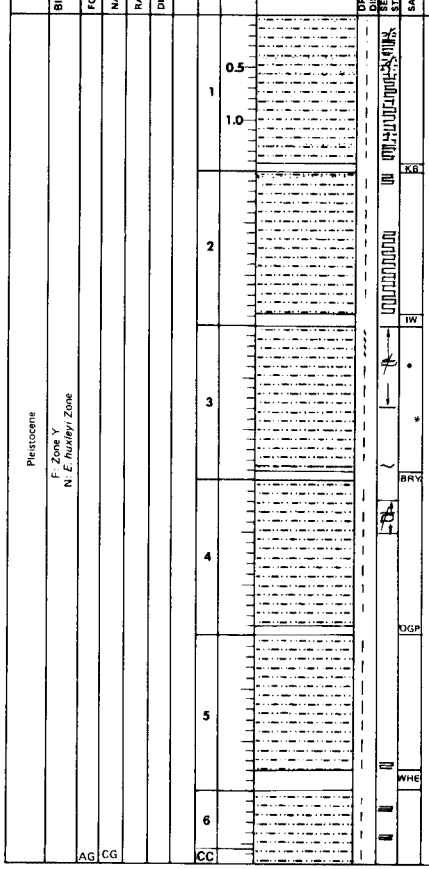
SMEAR SLIDE SUMMARY (%):

	2, 20 D	5, 55 D
Texture:		
Sand	0	0
Silt	10	20
Clay	90	80
Composition:		
Quartz	4	14
Heavy minerals	T	T
Clay	87	75
Volcanic glass	–	T
Carbonate unspec.	1	2
Foraminifers	5	3
Calc. nannofossils	3	5
Plant debris (spores)	–	T
Altered minerals	T	1

CARBONATE BOMB DATA:

• 3, 36 cm = 15%

SITE 619 HOLE CORE 6H CORED INTERVAL 2312.6–2322.3 mbsl; 39.6–49.3 mbsf



LITHOLOGIC DESCRIPTION

Dark gray (5Y 4/1) MUD. Laminated in upper part of core, and becoming more homogeneous downcore. Laminations are dominantly black MUD and range from ~2 mm to 3 cm thick (average <1 cm). Core includes rare, very thin SILT and SAND laminae as indicated in "Graphic Lithology" column.

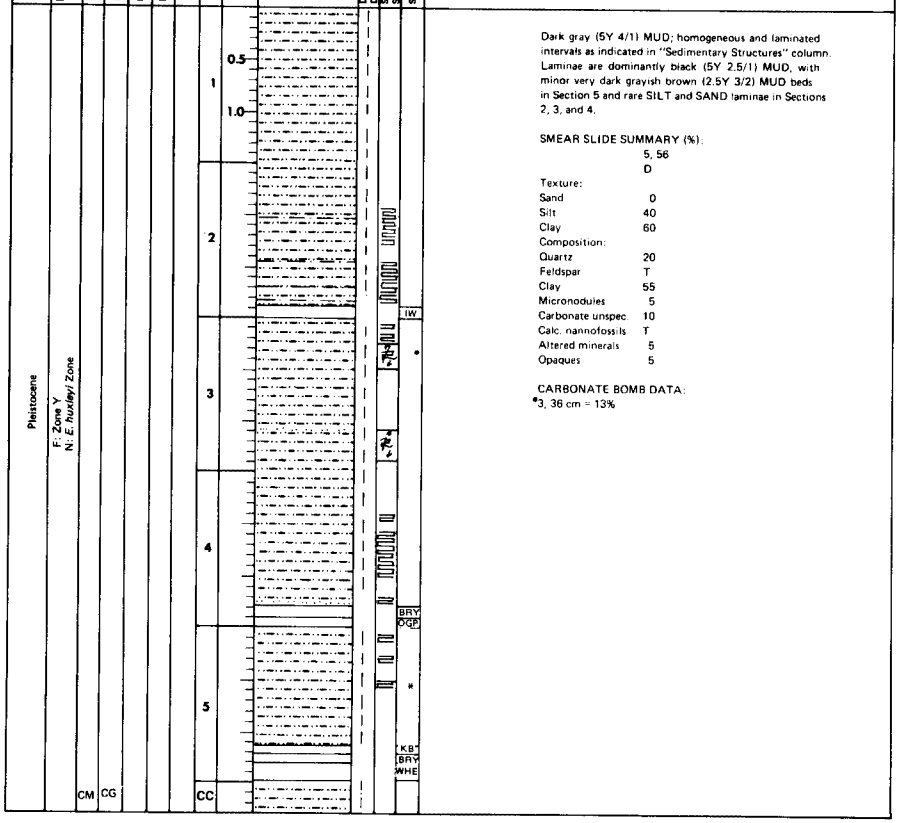
SMEAR SLIDE SUMMARY (%):

	3, 90 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	10
Feldspar	T
Clay	60
Carbonate unspec.	7
Calc. nannofossils	5
Altered minerals	10
Opaques	5

CARBONATE BOMB DATA:

• 3, 36 cm = 11%

SITE 619 HOLE CORE 7H CORED INTERVAL 2322.3–2332.0 mbsl; 49.3–59.0 mbsf



LITHOLOGIC DESCRIPTION

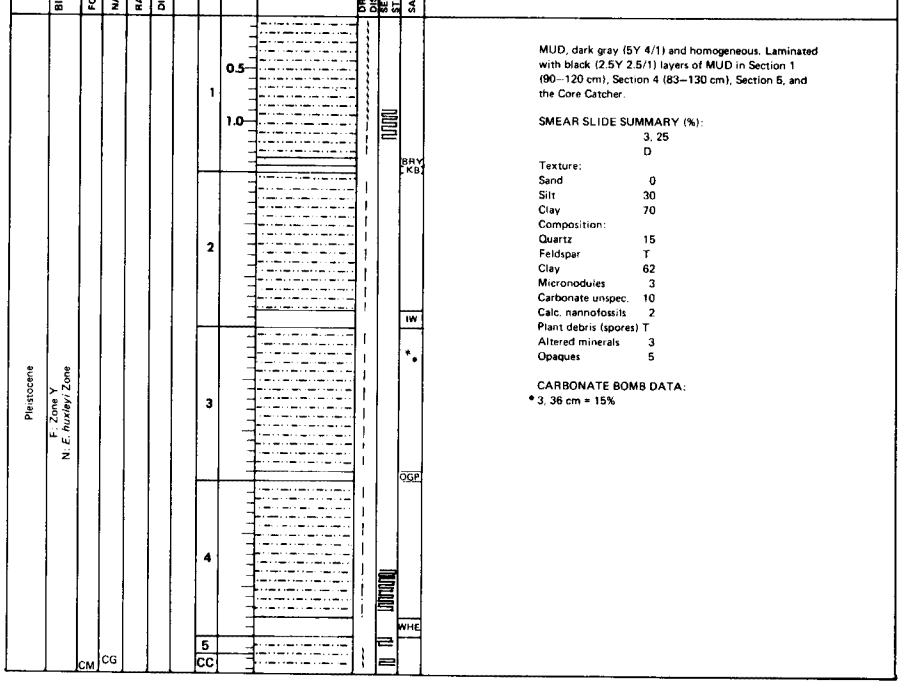
Dark gray (5Y 4/1) MUD; homogeneous and laminated intervals as indicated in "Sedimentary Structures" column. Laminae are dominantly black (5Y 2.5/1) MUD, with minor very dark grayish brown (2.5Y 3/2) MUD beds in Section 5 and rare SILT and SAND laminae in Sections 2, 3, and 4.

SMEAR SLIDE SUMMARY (%):

	5, 56 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	20
Feldspar	T
Clay	55
Micronodules	5
Carbonate unspec.	10
Calc. nannofossils	T
Altered minerals	5
Opaques	5

CARBONATE BOMB DATA:
*3, 36 cm = 13%

SITE 619 HOLE CORE 8H CORED INTERVAL 2332.0–2341.7 mbsl; 59.0–68.7 mbsf



LITHOLOGIC DESCRIPTION

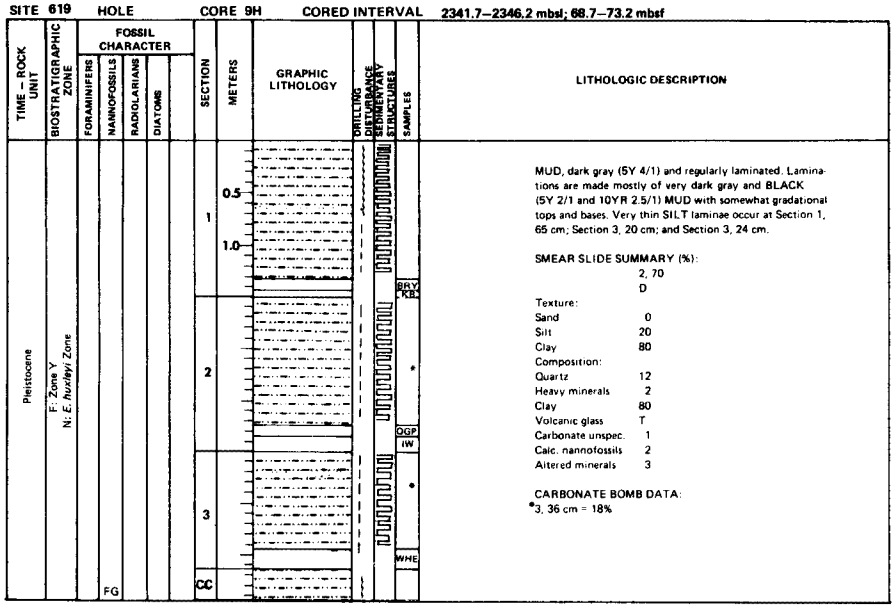
MUD, dark gray (5Y 4/1) and homogeneous. Laminated with black (2.5Y 2.5/1) layers of MUD in Section 1 (90–120 cm), Section 4 (83–130 cm), Section 5, and the Core Catcher.

SMEAR SLIDE SUMMARY (%):

	3, 25 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	15
Feldspar	T
Clay	62
Micronodules	3
Carbonate unspec.	10
Calc. nannofossils	2
Plant debris (spores)	T
Altered minerals	3
Opaques	5

CARBONATE BOMB DATA:
*3, 36 cm = 15%

SITE 619 HOLE CORE 9H CORED INTERVAL 2341.7–2346.2 mbsl; 68.7–73.2 mbsf



LITHOLOGIC DESCRIPTION

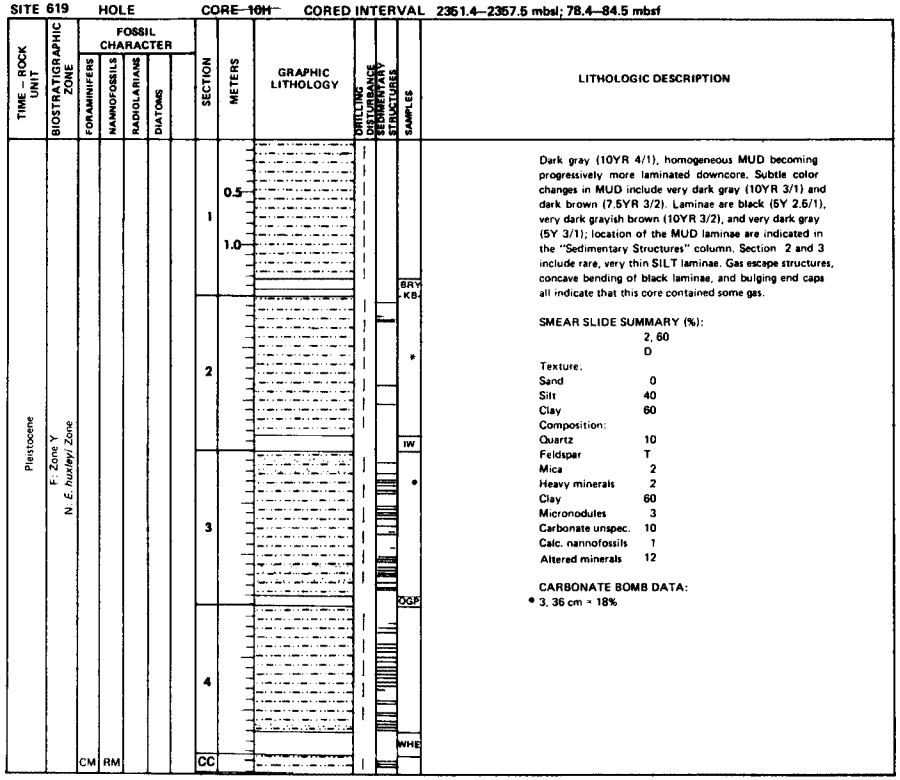
MUD, dark gray (5Y 4/1) and regularly laminated. Laminations are made mostly of very dark gray and BLACK (5Y 2/1 and 10YR 2.5/1) MUD with somewhat gradational tops and bases. Very thin SILT laminae occur at Section 1, 65 cm; Section 3, 20 cm; and Section 3, 24 cm.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	12
Heavy minerals	2
Clay	80
Volcanic glass	T
Carbonate unspec.	1
Calc. nannofossils	2
Altered minerals	3

CARBONATE BOMB DATA:
*3, 36 cm = 18%

SITE 619 HOLE CORE ~~10H~~ CORED INTERVAL 2351.4–2357.5 mbsl; 78.4–84.5 mbsf



LITHOLOGIC DESCRIPTION

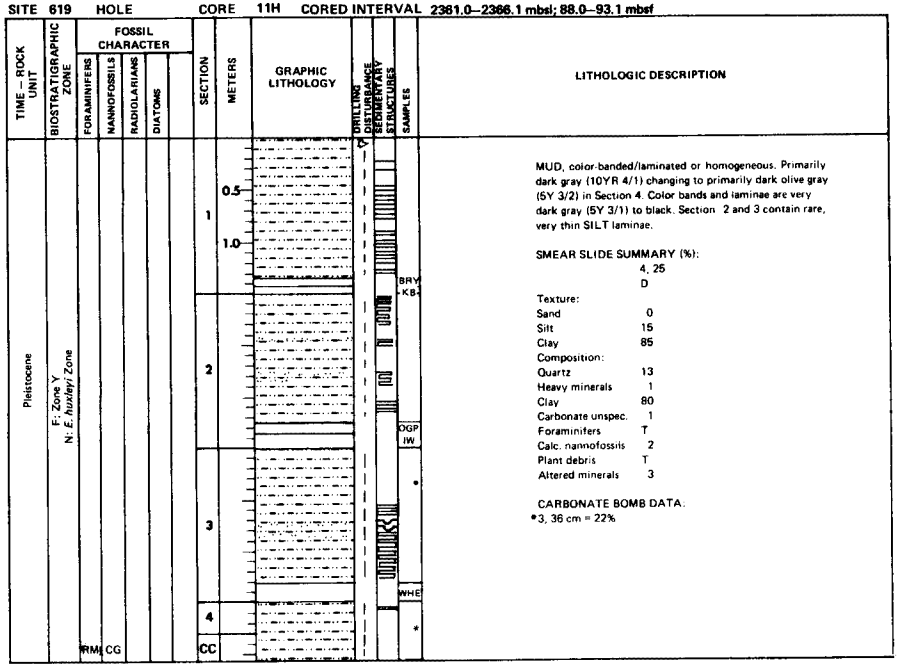
Dark gray (10YR 4/1), homogeneous MUD becoming progressively more laminated downcore. Subtle color changes in MUD include very dark gray (10YR 3/1) and dark brown (7.5YR 3/2). Laminae are black (5Y 2.5/1), very dark grayish brown (10YR 3/2), and very dark gray (5Y 3/1); location of the MUD laminae are indicated in the "Sedimentary Structures" column. Section 2 and 3 include rare, very thin SILT laminae. Gas escape structures, concave bending of black laminae, and bulging end caps all indicate that this core contained some gas.

SMEAR SLIDE SUMMARY (%):

	2, 60 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	10
Feldspar	T
Mica	2
Heavy minerals	2
Clay	60
Micronodules	3
Carbonate unspec.	10
Calc. nannofossils	1
Altered minerals	12

CARBONATE BOMB DATA:
* 3, 36 cm = 18%

SITE 619 HOLE CORE 11H CORED INTERVAL 2381.0–2386.1 mbsl; 88.0–93.1 mbsf



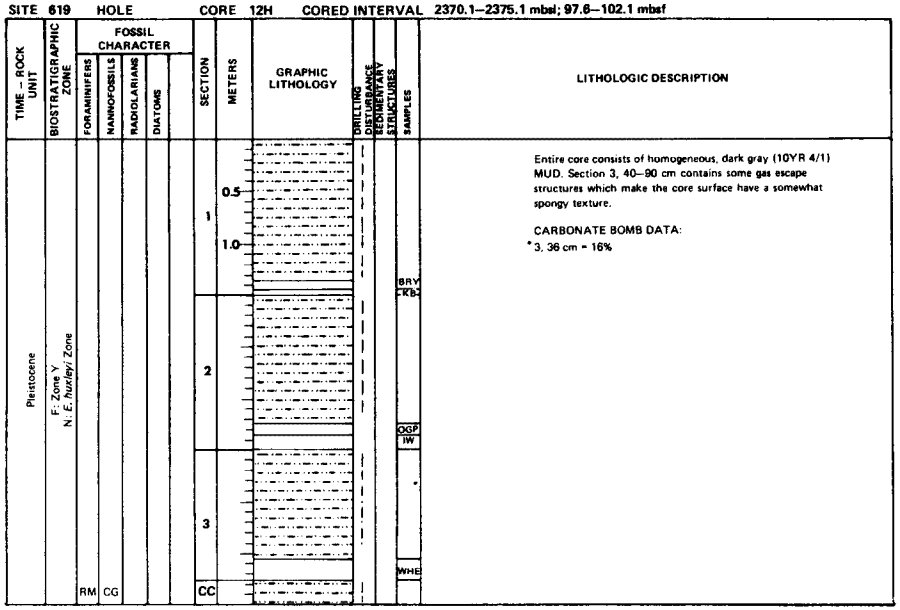
MUD, color-banded/laminated or homogeneous. Primarily dark gray (10YR 4/1) changing to primarily dark olive gray (5Y 3/2) in Section 4. Color bands and laminae are very dark gray (5Y 3/1) to black. Section 2 and 3 contain rare, very thin SILT laminae.

SMEAR SLIDE SUMMARY (%):

	4, 25 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	13
Heavy minerals	1
Clay	80
Carbonate unspec.	1
Foraminifers	T
Calc. nannofossils	2
Plant debris	T
Altered minerals	3

CARBONATE BOMB DATA.
*3, 36 cm = 22%

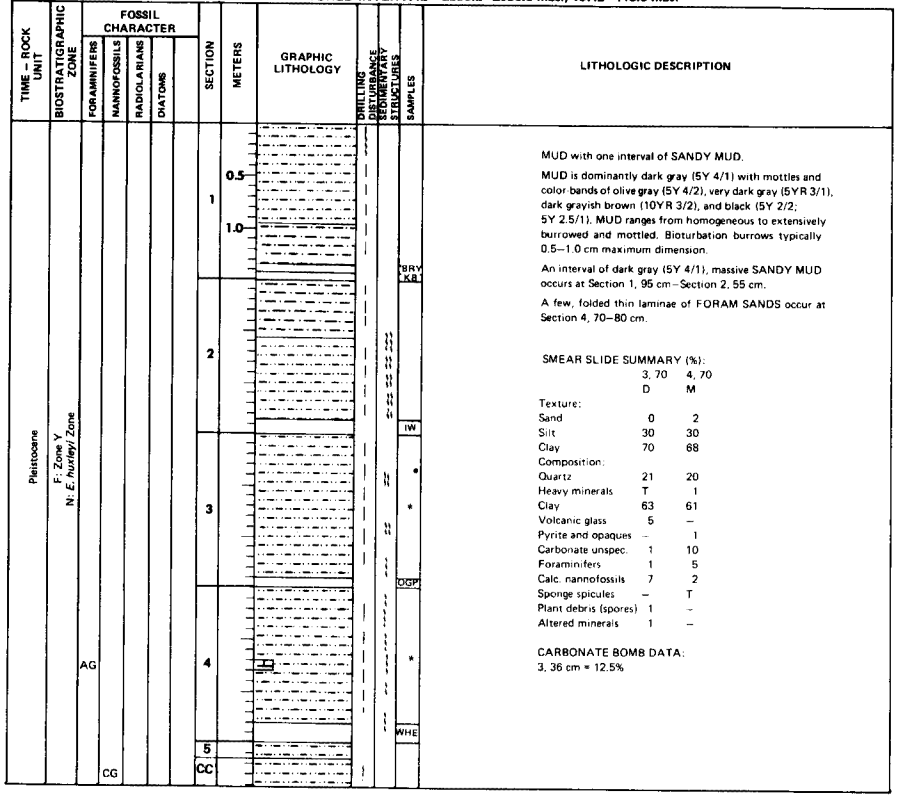
SITE 619 HOLE CORE 12H CORED INTERVAL 2370.1–2375.1 mbsl; 97.6–102.1 mbsf



Entire core consists of homogeneous, dark gray (10YR 4/1) MUD. Section 3, 40–90 cm contains some gas escape structures which make the core surface have a somewhat spongy texture.

CARBONATE BOMB DATA:
*3, 36 cm = 16%

SITE 619 HOLE CORE 13H CORED INTERVAL 2380.2–2386.8 mbsl; 107.2–113.8 mbsf



MUD with one interval of SANDY MUD.

MUD is dominantly dark gray (5Y 4/1) with mottles and color bands of olive gray (5Y 4/2), very dark gray (5YR 3/1), dark grayish brown (10YR 3/2), and black (5Y 2/2; 5Y 2.5/1). MUD ranges from homogeneous to extensively burrowed and mottled. Bioturbation burrows typically 0.5–1.0 cm maximum dimension.

An interval of dark gray (5Y 4/1), massive SANDY MUD occurs at Section 1, 95 cm–Section 2, 55 cm.

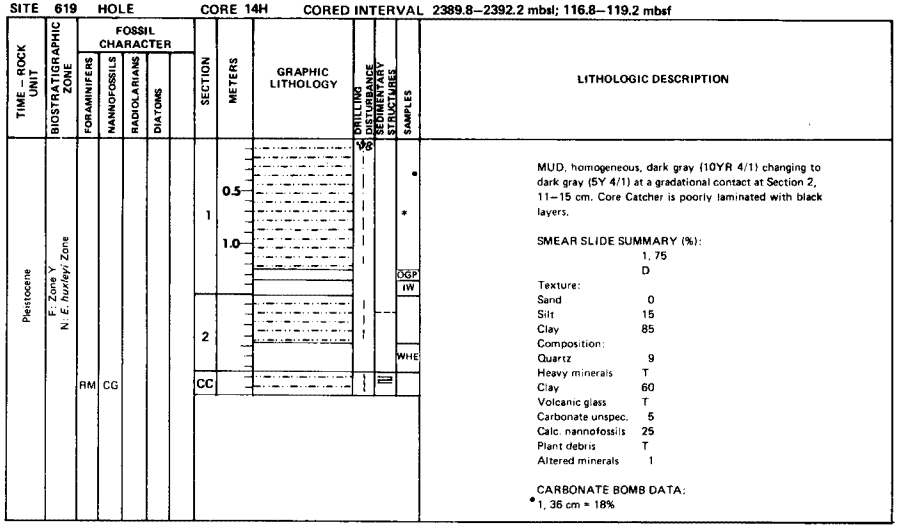
A few, folded thin laminae of FORAM SANDS occur at Section 4, 70–80 cm.

SMEAR SLIDE SUMMARY (%):

	3, 70 D	4, 70 M
Texture:		
Sand	0	2
Silt	30	30
Clay	70	68
Composition:		
Quartz	21	20
Heavy minerals	T	1
Clay	63	61
Volcanic glass	5	–
Pyrite and opaques	–	1
Carbonate unspec.	1	10
Foraminifers	1	5
Calc. nannofossils	7	2
Sponge spicules	–	T
Plant debris (spores)	1	–
Altered minerals	1	–

CARBONATE BOMB DATA:
3, 36 cm = 12.5%

SITE 619 HOLE CORE 14H CORED INTERVAL 2389.8–2392.2 mbsl; 116.8–119.2 mbsf



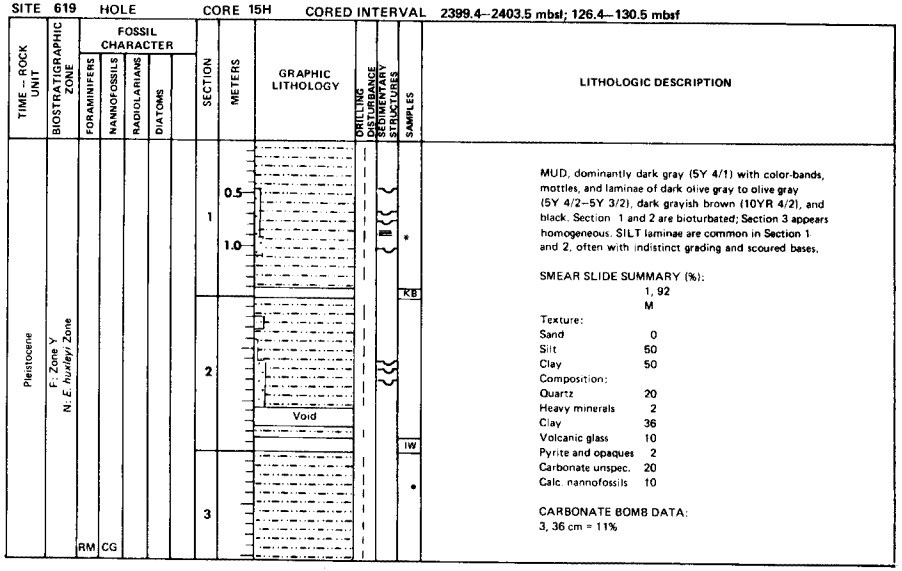
MUD, homogeneous, dark gray (10YR 4/1) changing to dark gray (5Y 4/1) at a gradational contact at Section 2, 11–15 cm. Core Catcher is poorly laminated with black layers.

SMEAR SLIDE SUMMARY (%):

	1, 75 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	9
Heavy minerals	T
Clay	60
Volcanic glass	T
Carbonate unspec.	5
Calc. nannofossils	25
Plant debris	T
Altered minerals	1

CARBONATE BOMB DATA:
•1, 36 cm = 18%

SITE 619 HOLE CORE 15H CORED INTERVAL 2399.4–2403.5 mbsl; 126.4–130.5 mbsf



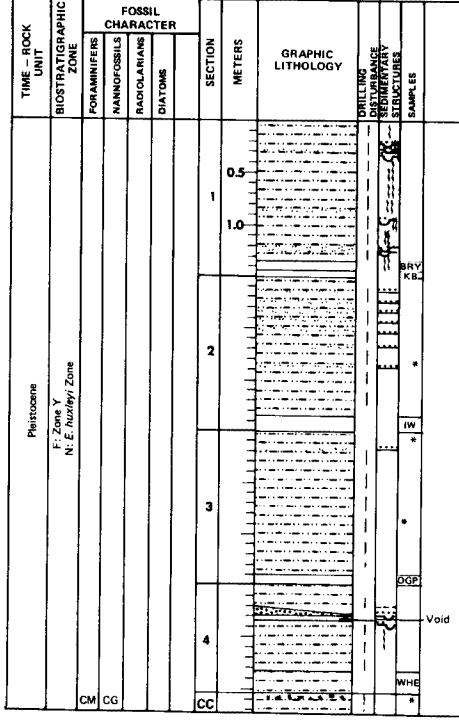
MUD, dominantly dark gray (5Y 4/1) with color-bands, mottles, and laminae of dark olive gray to olive gray (5Y 4/2–5Y 3/2), dark grayish brown (10YR 4/2), and black. Section 1 and 2 are bioturbated; Section 3 appears homogeneous. SILT laminae are common in Section 1 and 2, often with indistinct grading and scoured bases.

SMEAR SLIDE SUMMARY (%):

	1, 92 M
Texture:	
Sand	0
Silt	50
Clay	50
Composition:	
Quartz	20
Heavy minerals	2
Clay	36
Volcanic glass	10
Pyrite and opaques	2
Carbonate unspec.	20
Calc. nannofossils	10

CARBONATE BOMB DATA:
3, 36 cm = 11%

SITE 619 HOLE CORE 16H CORED INTERVAL 2409.0–2414.8 mbsl; 136.0–141.8 mbsl



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and ASH layers.

MUD is dominantly dark greenish gray (5GY 4/1) and greenish gray (5GY 5/1). Bioturbation common, especially in Section 1.

The SILT laminae are especially common in Section 1 and 2. They are thin, have scoured bases, and appear to be normally-graded.

SAND bed occurs at Section 4, 20–30 cm. It is graded and has well-developed parallel-laminae.

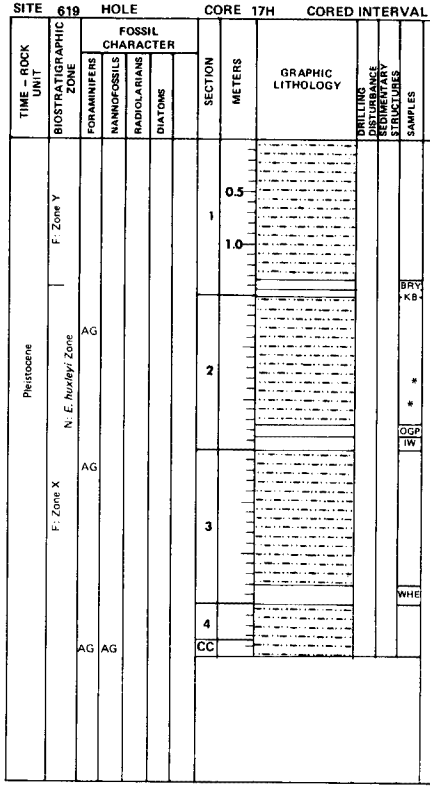
Two ASH layers occur in the Core Catcher.

SMEAR SLIDE SUMMARY (%):

	2, 87 M	3, 10 D	CC, 5 M
Texture:			
Sand	50	0	20
Silt	40	25	80
Clay	10	75	0
Composition:			
Quartz	40	10	1
Feldspar	5	–	–
Mica	5	–	T
Heavy minerals	5	1	T
Clay	10	62	–
Volcanic glass	5	–	96
Micronodules	5	–	1
Carbonate unspec.	–	3	–
Foraminifers	5	7	2
Calc. nannofossils	–	13	–
Plant debris (spores)	–	T	–
Altered minerals	10	4	–
Opaques	10	–	–

CARBONATE BOMB DATA:
•3, 90 cm = 6%

SITE 619 HOLE CORE 17H CORED INTERVAL 2418.7–2423.8 mbsl; 145.7–150.8 mbsl



LITHOLOGIC DESCRIPTION

Section 1: MUD, black (7.5YR 2/0) grading to dark gray (5Y 4/1) at 100 cm. Intensely bioturbated, homogeneous with tiny blebs of foram sand and common dispersed forams.

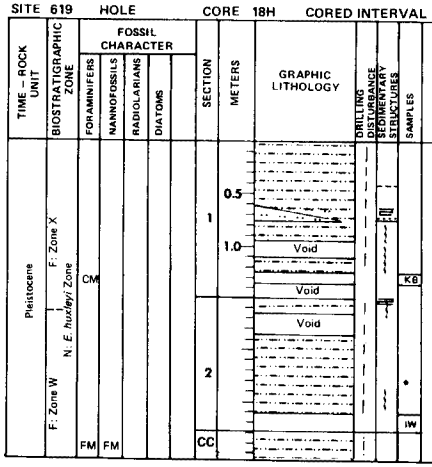
Section 2: MUD, dark greenish gray (5GY 4/1) with silty and sandy blebs and dispersed forams. The amount of coarse-grained blebs decreases upsection.

Section 3 and 4: MUD with reworked mud clasts. MUD is variegated in color, principally dark greenish gray (5GY 4/1) with minor greenish gray (5GY 5/1), dark gray (5Y 4/1), and gray (5Y 5/1). Bioturbated throughout; typical burrows are up to 2 cm in diameter. Section 3, 30 cm–Section 4, 35 cm contains reworked clay clasts and silt lenses. Whole sequence fines upward; maximum clast size at base is ~7 cm.

SMEAR SLIDE SUMMARY (%):

	2, 84 M	2, 105 M
Texture:		
Sand	35	40
Silt	55	45
Clay	10	15
Composition:		
Quartz	21	25
Feldspar	2	2
Mica	–	T
Heavy minerals	6	–
Clay	10	15
Volcanic glass	–	T
Glauconite	–	T
Pyrite and opaques	4	–
Micronodules	2	–
Carbonate unspec.	30	15
Foraminifers	20	5
Calc. nannofossils	5	T
Plant debris	–	33
Altered minerals	–	5

SITE 619 HOLE CORE 18H CORED INTERVAL 2428.4–2431.4 mbsl; 155.4–158.4 mbsl



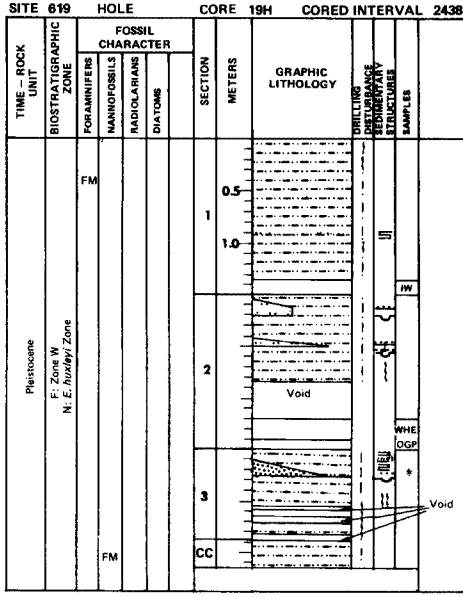
LITHOLOGIC DESCRIPTION

MUD with minor SILT layers.

MUD is very dark greenish gray (5GY 3/1) grading to dark greenish gray (5GY 4/1) at Section 1, 75 cm. Bioturbation and dispersed forams are rare. Section 1, 40–77 cm consists of a slightly siltier interval of MUD than the rest of the core; the grain size generally fines upward from Section 1, 77 cm. Several SILT layers occur at Section 1, 62–77 cm. They are graded and thin upward as a unit.

CARBONATE BOMB DATA:
•2, 83 cm = 3%

SITE 619 HOLE CORE 19H CORED INTERVAL 2438.1–2442.1 mbsl; 165.1–169.1 mbsf



LITHOLOGIC DESCRIPTION

MUD with several SILT and SAND laminae and layers.

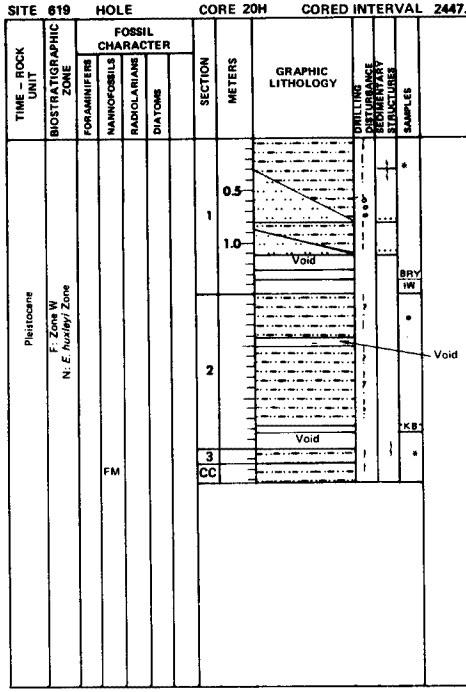
MUD, very dark greenish gray (5GY 3/1) in Section 1 and 2 and the Core Catcher; Section 3, 0–52 cm is dark gray (5Y 4/1); Section 3, 52–80 cm is dark greenish gray (5GY 4/1). Bioturbation is rare. Section 1 contains 3 soupy or washed out zones at 0–5 cm, 18–30 cm, and 96–105 cm that may have been hydrates.

Section 1 contains several very thin SILT laminae at 87–90 cm. Section 2 and 3 contain several graded SILT or SAND with scoured bases. SAND layer in Section 3 exhibits Bouma T_{a-e} sequence.

SMEAR SLIDE SUMMARY (%):

	3, 24 M
Texture:	
Sand	77
Silt	20
Clay	3
Composition:	
Quartz	24
Feldspar	3
Heavy minerals	3
Clay	20
Pyrite and opaques	3
Micronodules	2
Carbonate unspec.	45

SITE 619 HOLE CORE 20H CORED INTERVAL 2447.7–2451.2 mbsl; 174.7–178.2 mbsf



LITHOLOGIC DESCRIPTION

Section 1: MUD and two graded SILT layers. MUD is very dark gray (N3) and homogeneous. SILT layers occur at Section 1, 30–80 cm and 80–112 cm. SILT layers are graded, have sharp bottom and top contacts, and are dark greenish gray (5GY 4/1) at the base grading to very dark gray (N3) at the top. Grading is distinct in lower SILT layer; upper SILT is too disturbed and soupy to see any structure really distinctly.

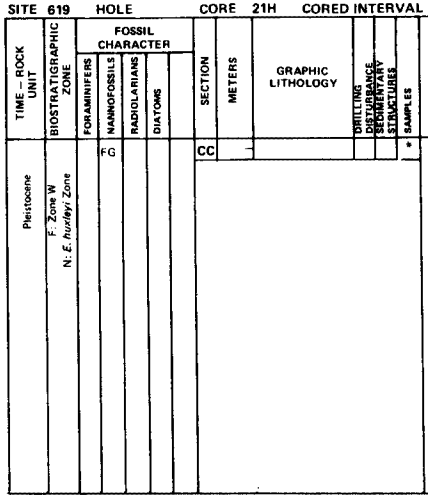
Section 2, 3, and Core Catcher: homogeneous, dark greenish gray (5GY 4/1) MUD with rare dispersed forams and silt blebs. Section 2 has very vague layering barely visible on a mm-scale.

SMEAR SLIDE SUMMARY (%):

	1, 30 D	3, 5 D
Texture:		
Sand	5	7
Silt	75	63
Clay	20	30
Composition:		
Quartz	60	50
Feldspar	T	3
Mica	–	1
Heavy minerals	–	3
Clay	20	30
Carbonate unspec.	–	1
Foraminifers	–	2
Calc. nannofossils	T	T
Altered minerals	15	10
Opaques	5	–

CARBONATE BOMB DATA:
*2, 27 cm = 4%

SITE 619 HOLE CORE 21H CORED INTERVAL 2457.3–2460.3 mbsl; 184.3–187.3 mbsf



LITHOLOGIC DESCRIPTION

Only a handful of gray MUD was recovered in this core.

SMEAR SLIDE SUMMARY (%):

	CC D
Texture:	
Sand	T
Silt	15
Clay	85
Composition:	
Quartz	10
Mica	2
Heavy minerals	1
Clay	73
Pyrite and opaques	1
Carbonate unspec.	2
Foraminifers	1
Calc. nannofossils	10
Sponge spicules	T
Plant debris (spores)	T

SITE 619 HOLE CORE 22H CORED INTERVAL 2460.3–2463.3 mbsl; 187.3–190.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES
Pleistocene	F: Zone W N: *E. huxleyi* Zone	AG				1	0.5 1.0				KB IW
						2					*
		CG	CG			CC					

LITHOLOGIC DESCRIPTION

Highly-deformed MUD and SILT laminae.

Dark greenish gray (5GY 4/1) MUD with SILT laminae and dispersed forams. Abundance of SILT laminae decreases downcore. This core contains no preserved original sedimentary structures; material is all FLOW-IN.

SMEAR SLIDE SUMMARY (%):

	2, 40 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	9
Heavy minerals	2
Clay	75
Volcanic glass	T
Foraminifers	3
Calc. nannofossils	2
Plant debris (spores)	1
Altered minerals	5

CARBONATE BOMB DATA:
*2, 50 cm = 11%

SITE 619 HOLE CORE 23H CORED INTERVAL 2476.7–2479.7 mbsl; 203.7–206.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES
Pleistocene	F: Zone W N: *E. huxleyi* Zone	CM	FG			CC					

LITHOLOGIC DESCRIPTION

Two cm of MUD recovered in Core Catcher; rest of core empty. Entire sample given to shipboard paleontologists.

SITE 619 HOLE CORE 24H CORED INTERVAL 2479.7–2480.7 mbsl; 206.7–207.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES
Pleistocene	F: Zone W N: *E. huxleyi* Zone	CG	FG			CC					

LITHOLOGIC DESCRIPTION

Two cm of MUD recovered in Core Catcher; rest of core empty. Entire sample given to shipboard paleontologists.

SITE 619 HOLE CORE 25H CORED INTERVAL 2480.7–2481.7 mbsl; 207.7–208.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES
Pleistocene	F: Zone W N: *E. huxleyi* Zone	CM	FG			1	0.5	Void			*
						CC					

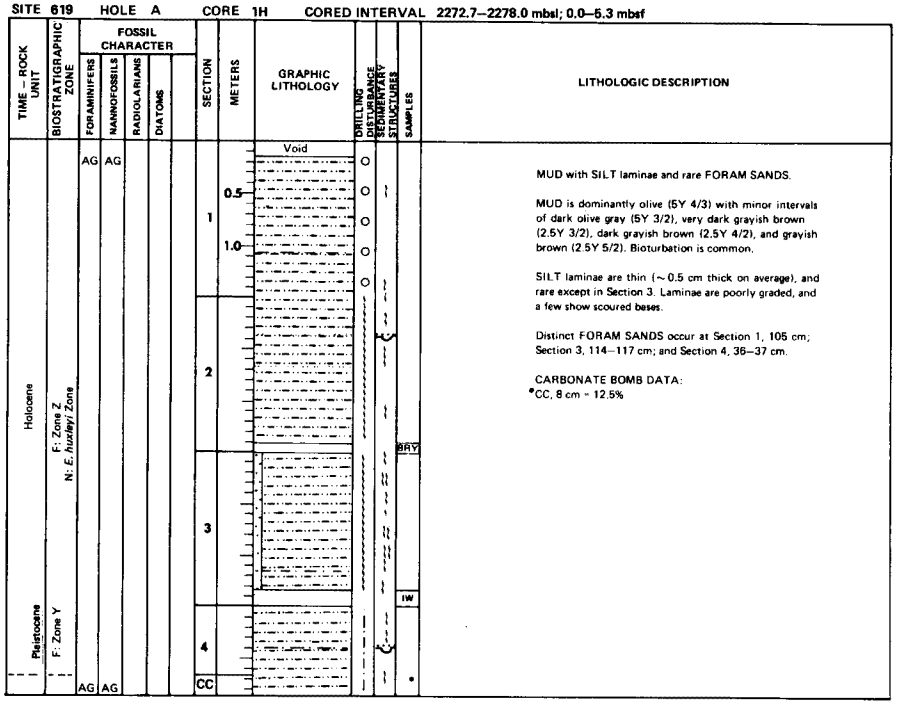
LITHOLOGIC DESCRIPTION

MUD, very dark gray (N3) from Section 1, 0–15 cm and in the Core Catcher; very dark gray black (5Y 2.5/1) at Section 1, 15–52 cm. All color variations gradational. MUD is homogeneous, with 1 very thin discontinuous SILT laminae at Section 1, 25 cm and gas cavities at Section 1, 45–48 cm.

SMEAR SLIDE SUMMARY (%):

	1, 40 D
Texture:	
Sand	2
Silt	35
Clay	63
Composition:	
Quartz	30
Clay	60
Foraminifers	T
Calc. nannofossils	3
Altered minerals	7

SITE 619 HOLE A CORE 1H CORED INTERVAL 2272.7–2278.0 mbsl; 0.0–5.3 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and rare FORAM SANDS.

MUD is dominantly olive (5Y 4/3) with minor intervals of dark olive gray (5Y 3/2), very dark grayish brown (2.5Y 3/2), dark grayish brown (2.5Y 4/2), and grayish brown (2.5Y 5/2). Bioturbation is common.

SILT laminae are thin (~0.5 cm thick on average), and rare except in Section 3. Laminae are poorly graded, and a few show scoured beses.

Distinct FORAM SANDS occur at Section 1, 105 cm; Section 3, 114–117 cm; and Section 4, 36–37 cm.

CARBONATE BOMB DATA:
*CC, 8 cm = 12.5%

SITE 620

HOLE 620

Date Occupied: 23 October 1983, 2040 LCT

Date Departed: 26 October 1983, 0930 LCT

Time on Hole: 2 days, 11 hr.

Position (latitude; longitude): 26°50.12'N; 88°22.25'W

Water depth (sea level; corrected m, echo-sounding): 2608

Water depth (rig floor; corrected m, echo-sounding): 2618

Bottom felt (m, drill pipe): 2612.4

Penetration (m): 422.7

Number of cores: 45

Total length of cored section (m): 421.3

Total core recovered (m): 197.95

Core recovery (%): 47

Oldest sediment cored:

Depth sub-bottom (m): 422.7

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Site 620 was drilled approximately 18 km northeast of the channel in overbank sediments. Seismic data indicated that a few reflectors offlapped onto an underlying reflector that could be traced over much of the Mississippi Fan and marked at the base of the youngest fan lobe. These low angle dipping reflectors terminated onto the basal reflector approximately 70 km away from the channel and a distance of 44 km east of the site. Thus the site was located in such a position that a considerable section of the overbank deposits could be cored.

The site was to be the deepest hole drilled in the middle fan and a standard rotary coring bit and BHA were assembled. Cores were highly disturbed, but within each core, a portion of undisturbed sediments was commonly obtained. At a depth of 422.7 m, high back pressure on the drill pipe indicated that the sediment was "heaving" and that the chances of attaining the proposed depth of 774 m were slim. A decision was made to terminate the hole and obtain a well log run. A good log was obtained from a depth of 292 m to the seafloor, aiding the interpretation of the missed cored intervals.

The major scientific conclusions achieved were:

1) The overbank sediments are composed primarily of fine-grained clays, silty clays and silts that are basically arranged in alternating coarsening-upward trends.

2) Only a minor percentage of coarser-grained clastic sediment escapes the channel complex to be deposited marginally in the overbank environment. Thus the channel serves primarily as a conduit for transporting the coarser sediment downslope and only suspended

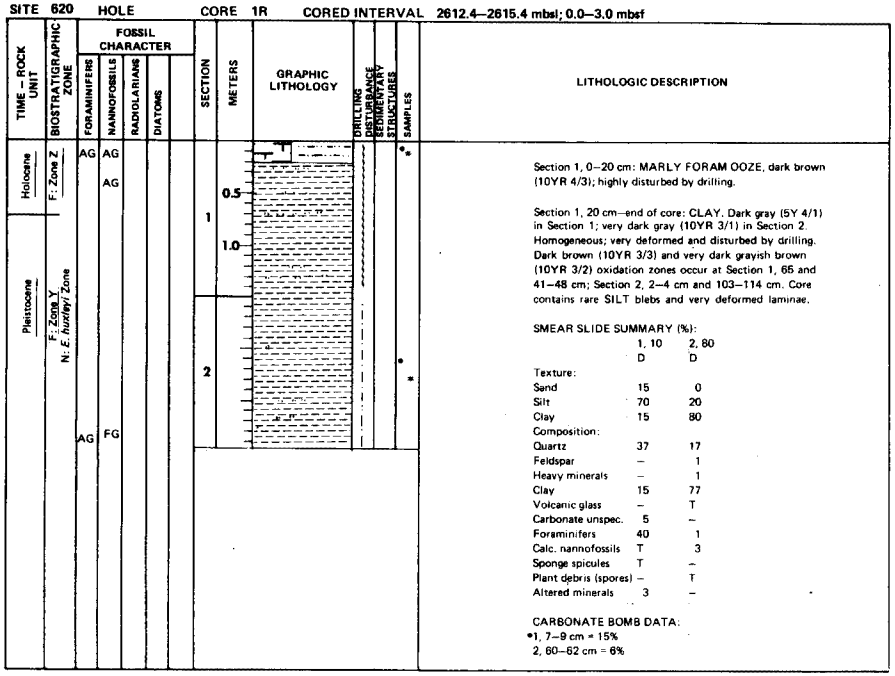
sediments are delivered overbank to build up the marginal areas of the fan lobe.

3) The cored section bottomed in Ericson Zone Y (late Wisconsin glacial); the seismically projected depth to Ericson Zone X being 858 m. The Holocene/Pleistocene boundary occurred at a depth of 3.0 m. The base of the modern fan lobe was encountered at a depth of 366 m at a point where an increase in benthic and planktonic foraminifers occurred.

4) Computed accumulation rates were 25 cm/1000 yr. for the Holocene (Ericson Zone X), and a minimum of 575 cm/1000 yr. for the late Wisconsin glacial (Ericson Zone Y) because the cored interval did not penetrate Ericson Zone X. Based on the seismic correlation, a computed accumulation rate for Zone Y is 1175 cm/1000 yr.

5) The overbank sediments did not contain a high percentage of displaced shallow-water benthic fauna, yet accumulation rates were extremely high. Cores in the channel fill (Site 621) and in the lower fan (Sites 614 and 615) all contained a high percentage of displaced fauna. This tends to indicate that the channel does indeed function as a conduit for coarser-grained particles and none of the large faunal elements were moved out of the adjacent channel onto the overbank area. Incipient benthic foraminifer species were encountered that likely can live in highly turbid areas.

SITE 620 HOLE CORE 1R CORED INTERVAL 2612.4–2615.4 mbsl; 0.0–3.0 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–20 cm: MARLY FORAM OOZE, dark brown (10YR 4/3); highly disturbed by drilling.

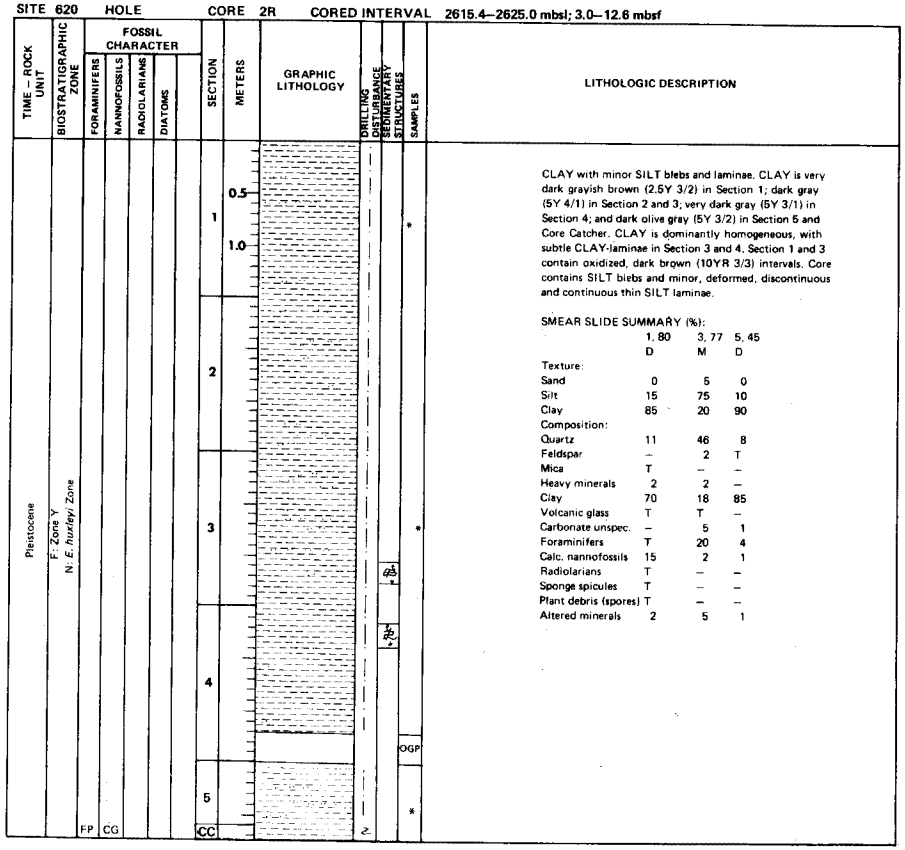
Section 1, 20 cm–end of core: CLAY. Dark gray (5Y 4/1) in Section 1; very dark gray (10YR 3/1) in Section 2. Homogeneous; very deformed and disturbed by drilling. Dark brown (10YR 3/3) and very dark grayish brown (10YR 3/2) oxidation zones occur at Section 1, 65 and 41–48 cm; Section 2, 2–4 cm and 103–114 cm. Core contains rare SILT blebs and very deformed laminae.

SMEAR SLIDE SUMMARY (%):

	1, 10 D	2, 80 D
Texture:		
Sand	15	0
Silt	70	20
Clay	15	80
Composition:		
Quartz	37	17
Feldspar	–	1
Heavy minerals	–	1
Clay	15	77
Volcanic glass	–	T
Carbonate unspec.	5	–
Foraminifers	40	1
Calc. nannofossils	T	3
Sponge spicules	T	–
Plant debris (spores)	–	T
Altered minerals	3	–

CARBONATE BOMB DATA:
•1, 7–9 cm = 15%
2, 60–62 cm = 6%

SITE 620 HOLE CORE 2R CORED INTERVAL 2615.4–2625.0 mbsl; 3.0–12.6 mbsf



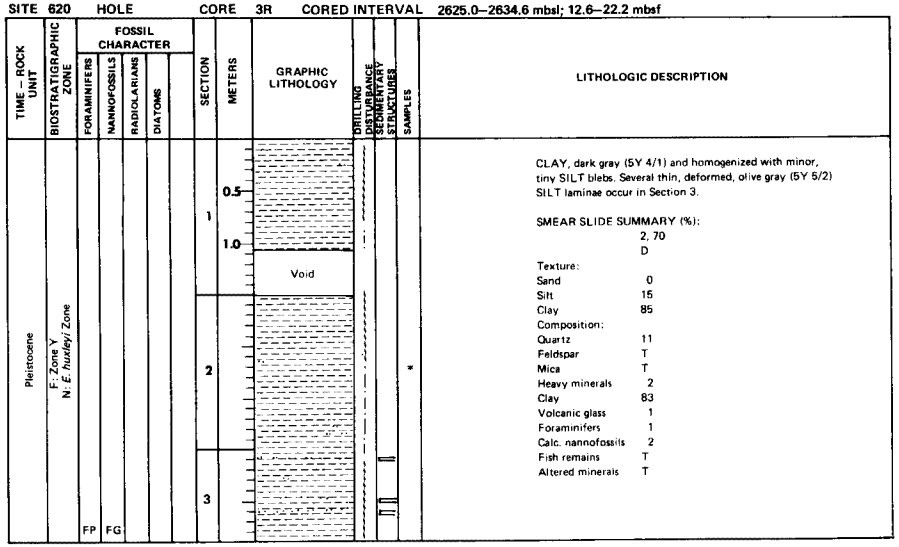
LITHOLOGIC DESCRIPTION

CLAY with minor SILT blebs and laminae. CLAY is very dark grayish brown (2.5Y 3/2) in Section 1; dark gray (5Y 4/1) in Section 2 and 3; very dark gray (5Y 3/1) in Section 4; and dark olive gray (5Y 3/2) in Section 5 and Core Catcher. CLAY is dominantly homogeneous, with subtle CLAY-laminae in Section 3 and 4. Section 1 and 3 contain oxidized, dark brown (10YR 3/3) intervals. Core contains SILT blebs and minor, deformed, discontinuous and continuous thin SILT laminae.

SMEAR SLIDE SUMMARY (%):

	1, 80 D	3, 77 M	5, 45 D
Texture:			
Sand	0	5	0
Silt	15	75	10
Clay	85	20	90
Composition:			
Quartz	11	46	8
Feldspar	–	2	T
Mica	T	–	–
Heavy minerals	2	2	–
Clay	70	18	85
Volcanic glass	T	T	–
Carbonate unspec.	–	5	1
Foraminifers	T	20	4
Calc. nannofossils	15	2	1
Radiolarians	T	–	–
Sponge spicules	T	–	–
Plant debris (spores)	T	–	–
Altered minerals	2	5	1

SITE 620 HOLE CORE 3R CORED INTERVAL 2625.0–2634.6 mbsl; 12.6–22.2 mbsf



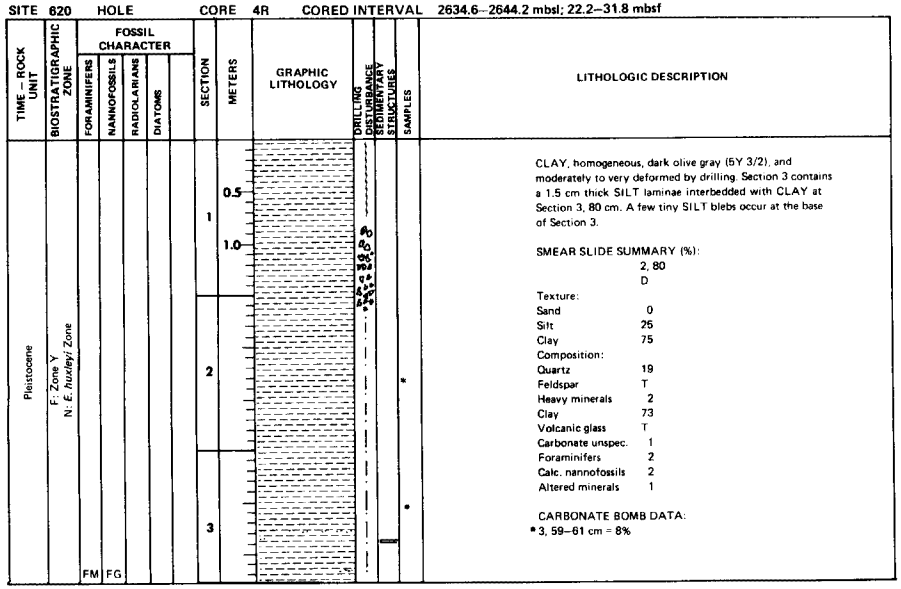
LITHOLOGIC DESCRIPTION

CLAY, dark gray (5Y 4/1) and homogenized with minor, tiny SILT blebs. Several thin, deformed, olive gray (5Y 5/2) SILT laminae occur in Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	11
Feldspar	T
Mica	T
Heavy minerals	2
Clay	83
Volcanic glass	1
Foraminifers	1
Calc. nannofossils	2
Fish remains	T
Altered minerals	T

SITE 620 HOLE CORE 4R CORED INTERVAL 2634.6–2644.2 mbsl; 22.2–31.8 mbsf



LITHOLOGIC DESCRIPTION

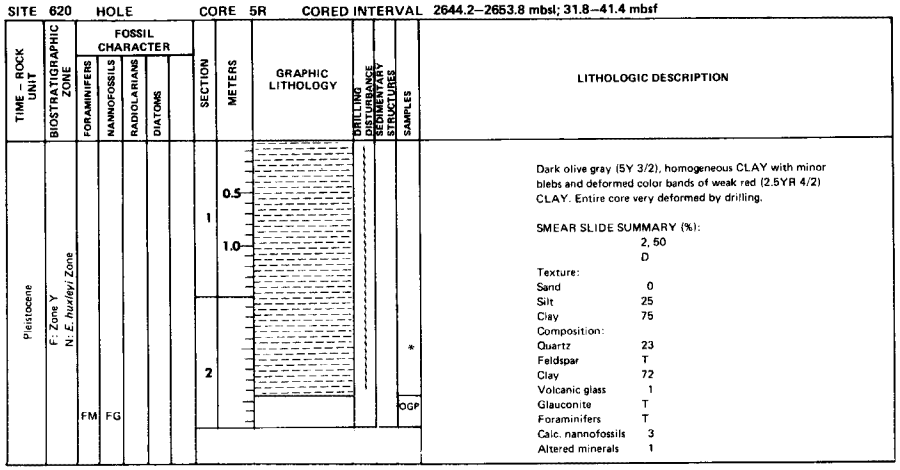
CLAY, homogeneous, dark olive gray (5Y 3/2), and moderately to very deformed by drilling. Section 3 contains a 1.5 cm thick SILT laminae interbedded with CLAY at Section 3, 80 cm. A few tiny SILT blebs occur at the base of Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 80 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	19
Feldspar	T
Heavy minerals	2
Clay	73
Volcanic glass	T
Carbonate unspec.	1
Foraminifers	2
Calc. nannofossils	2
Altered minerals	1

CARBONATE BOMB DATA:
*3, 59–61 cm = 8%

SITE 620 HOLE CORE 5R CORED INTERVAL 2644.2–2653.8 mbsl; 31.8–41.4 mbsf



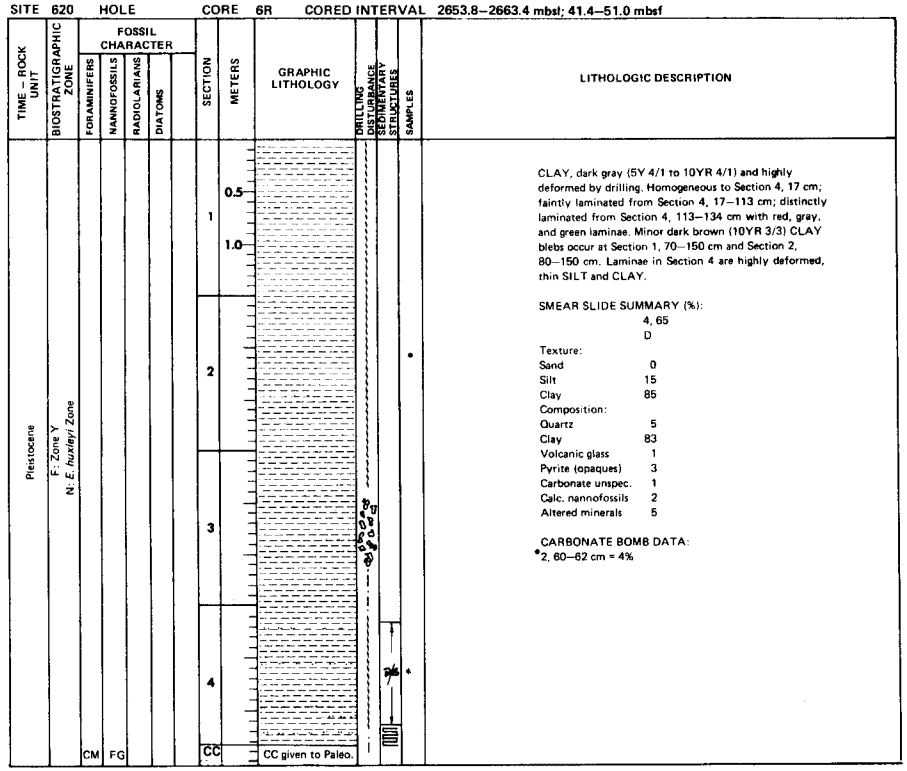
LITHOLOGIC DESCRIPTION

Dark olive gray (5Y 3/2), homogeneous CLAY with minor blebs and deformed color bands of weak red (2.5YR 4/2) CLAY. Entire core very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	2, 50 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	23
Feldspar	T
Clay	72
Volcanic glass	1
Glauconite	T
Foraminifers	T
Calc. nannofossils	3
Altered minerals	1

SITE 620 HOLE CORE 6R CORED INTERVAL 2653.8–2663.4 mbsl; 41.4–51.0 mbsf



LITHOLOGIC DESCRIPTION

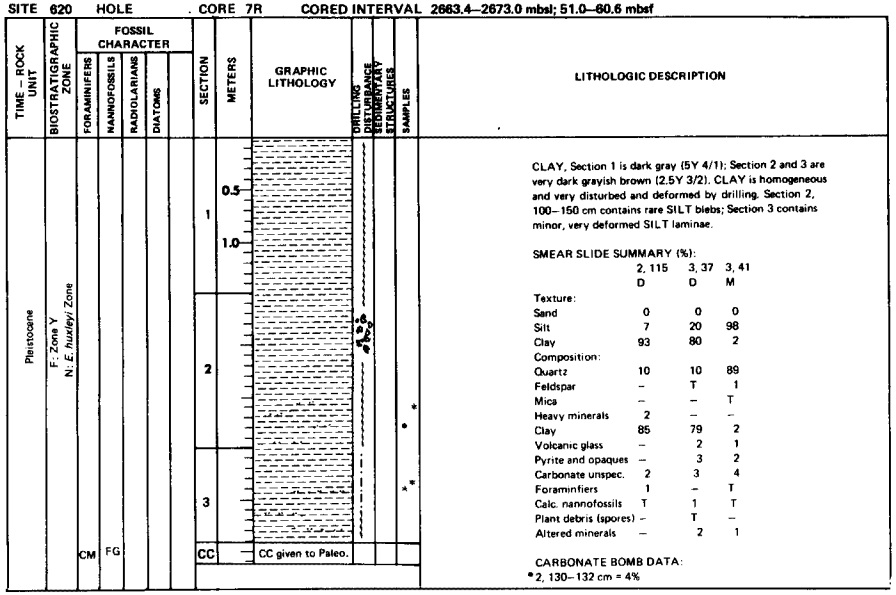
CLAY, dark gray (5Y 4/1 to 10YR 4/1) and highly deformed by drilling. Homogeneous to Section 4, 17 cm; faintly laminated from Section 4, 17–113 cm; distinctly laminated from Section 4, 113–134 cm with red, gray, and green laminae. Minor dark brown (10YR 3/3) CLAY blebs occur at Section 1, 70–150 cm and Section 2, 80–150 cm. Laminae in Section 4 are highly deformed, thin SILT and CLAY.

SMEAR SLIDE SUMMARY (%):

	4, 65 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	5
Clay	83
Volcanic glass	1
Pyrite (opaques)	3
Carbonate unspec.	1
Calc. nannofossils	2
Altered minerals	5

CARBONATE BOMB DATA:
*2, 60–62 cm = 4%

SITE 620 HOLE . CORE 7R CORED INTERVAL 2663.4–2673.0 mbsl; 51.0–60.6 mbsf



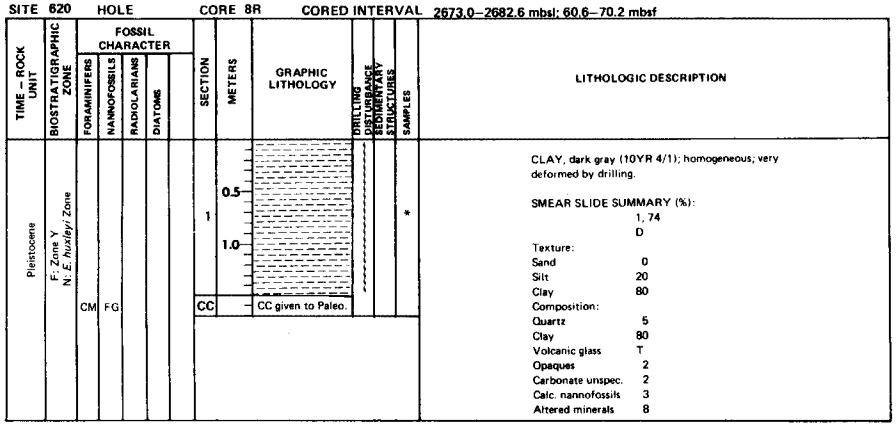
CLAY, Section 1 is dark gray (5Y 4/1); Section 2 and 3 are very dark grayish brown (2.5Y 3/2). CLAY is homogeneous and very disturbed and deformed by drilling. Section 2, 100–150 cm contains rare SILT blebs; Section 3 contains minor, very deformed SILT laminae.

SMEAR SLIDE SUMMARY (%):

	2, 115 D	3, 37 D	3, 41 M
Texture:			
Sand	0	0	0
Silt	7	20	98
Clay	93	80	2
Composition:			
Quartz	10	10	89
Feldspar	–	T	1
Mica	–	–	T
Heavy minerals	2	–	–
Clay	85	79	2
Volcanic glass	–	2	1
Pyrite and opaques	–	3	2
Carbonate unspec.	2	3	4
Foraminfiers	1	–	T
Calc. nannofossils	T	1	T
Plant debris (spores)	–	T	–
Altered minerals	–	2	1

CARBONATE BOMB DATA:
*2, 130–132 cm = 4%

SITE 620 HOLE CORE 8R CORED INTERVAL 2673.0–2682.6 mbsl; 60.6–70.2 mbsf

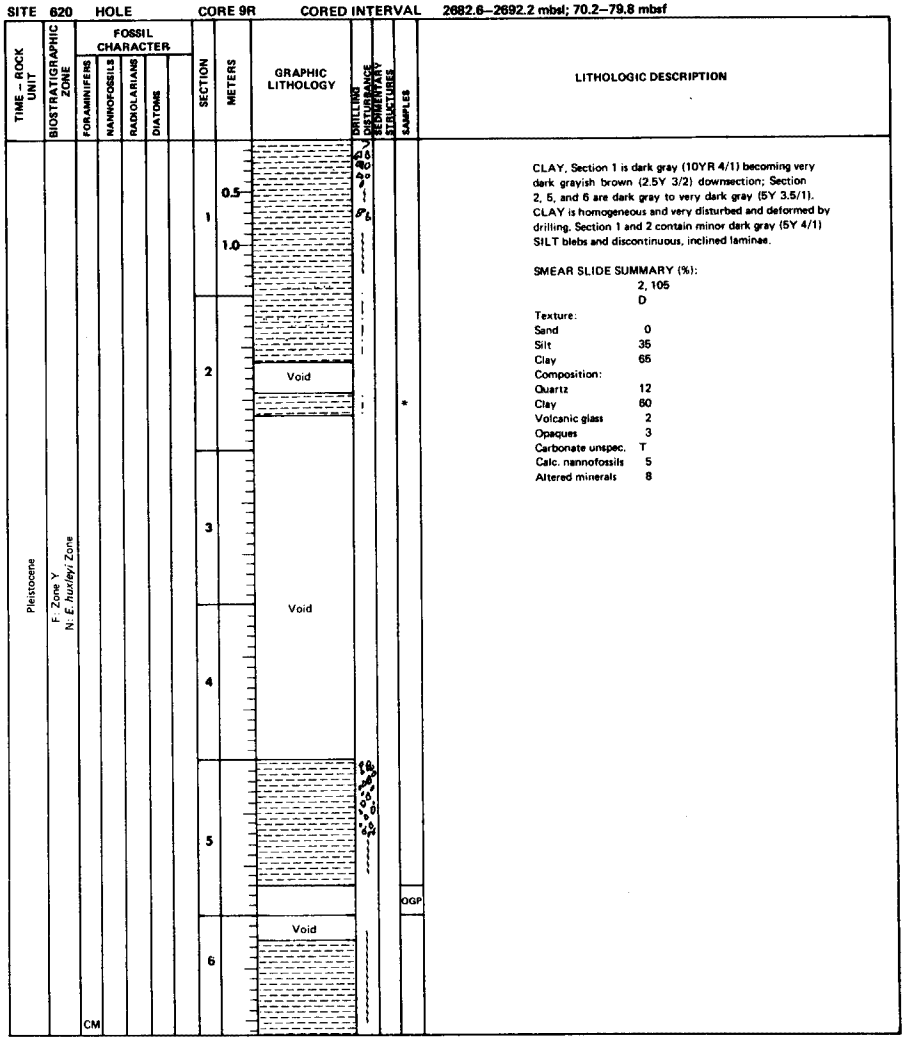


CLAY, dark gray (10YR 4/1); homogeneous; very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 74 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	5
Clay	80
Volcanic glass	T
Opaques	2
Carbonate unspec.	2
Calc. nannofossils	3
Altered minerals	8

SITE 620 HOLE CORE 9R CORED INTERVAL 2682.6–2692.2 mbsl; 70.2–79.8 mbsf

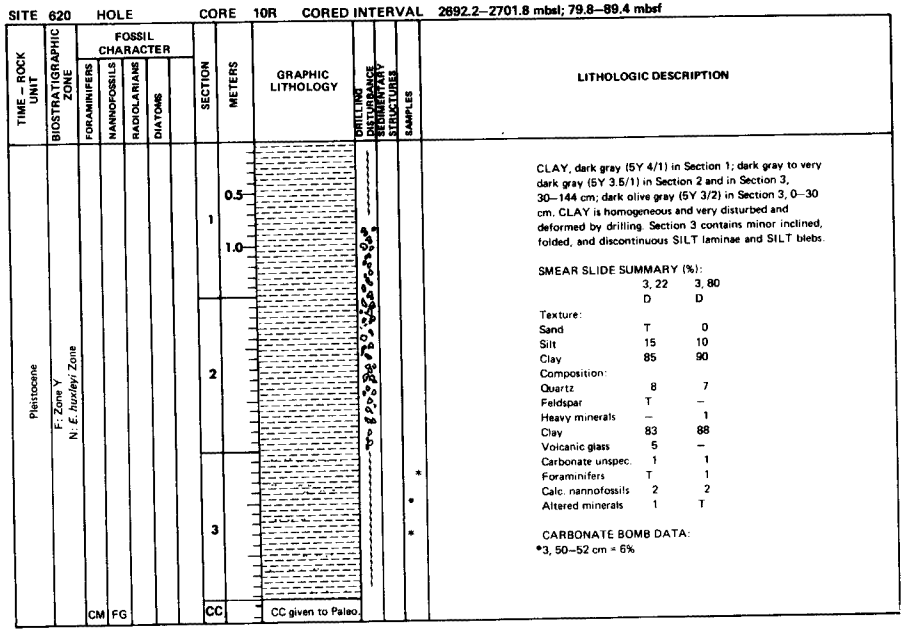


CLAY, Section 1 is dark gray (10YR 4/1) becoming very dark grayish brown (2.5Y 3/2) downsection; Section 2, 5, and 6 are dark gray to very dark gray (5Y 3.5/1). CLAY is homogeneous and very disturbed and deformed by drilling. Section 1 and 2 contain minor dark gray (5Y 4/1) SILT blebs and discontinuous, inclined laminae.

SMEAR SLIDE SUMMARY (%):

	2, 105 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	12
Clay	80
Volcanic glass	2
Opaques	3
Carbonate unspec.	T
Calc. nannofossils	5
Altered minerals	8

SITE 620 HOLE CORE 10R CORED INTERVAL 2892.2–2701.8 mbsl; 79.8–89.4 mbsf



LITHOLOGIC DESCRIPTION

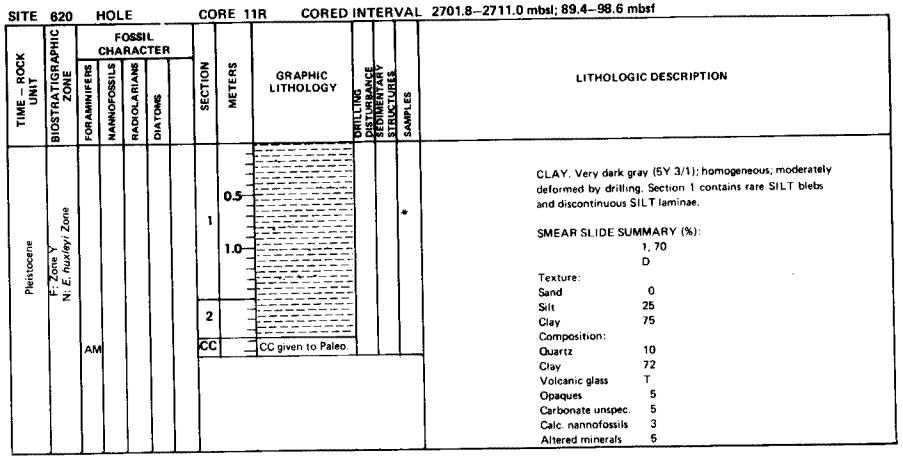
CLAY, dark gray (5Y 4/1) in Section 1; dark gray to very dark gray (5Y 3.5/1) in Section 2 and in Section 3, 30–144 cm; dark olive gray (5Y 3/2) in Section 3, 0–30 cm. CLAY is homogeneous and very disturbed and deformed by drilling. Section 3 contains minor inclined, folded, and discontinuous SILT laminae and SILT blebs.

SMEAR SLIDE SUMMARY (%):

	3, 22 D	3, 80 D
Texture:		
Sand	T	0
Silt	15	10
Clay	85	90
Composition:		
Quartz	8	7
Feldspar	T	–
Heavy minerals	–	1
Clay	83	88
Volcanic glass	5	–
Carbonate unspec.	1	1
Foraminifers	T	1
Calc. nannofossils	2	2
Altered minerals	1	T

CARBONATE BOMB DATA:
*3, 50–52 cm = 6%

SITE 620 HOLE CORE 11R CORED INTERVAL 2701.8–2711.0 mbsl; 89.4–98.6 mbsf



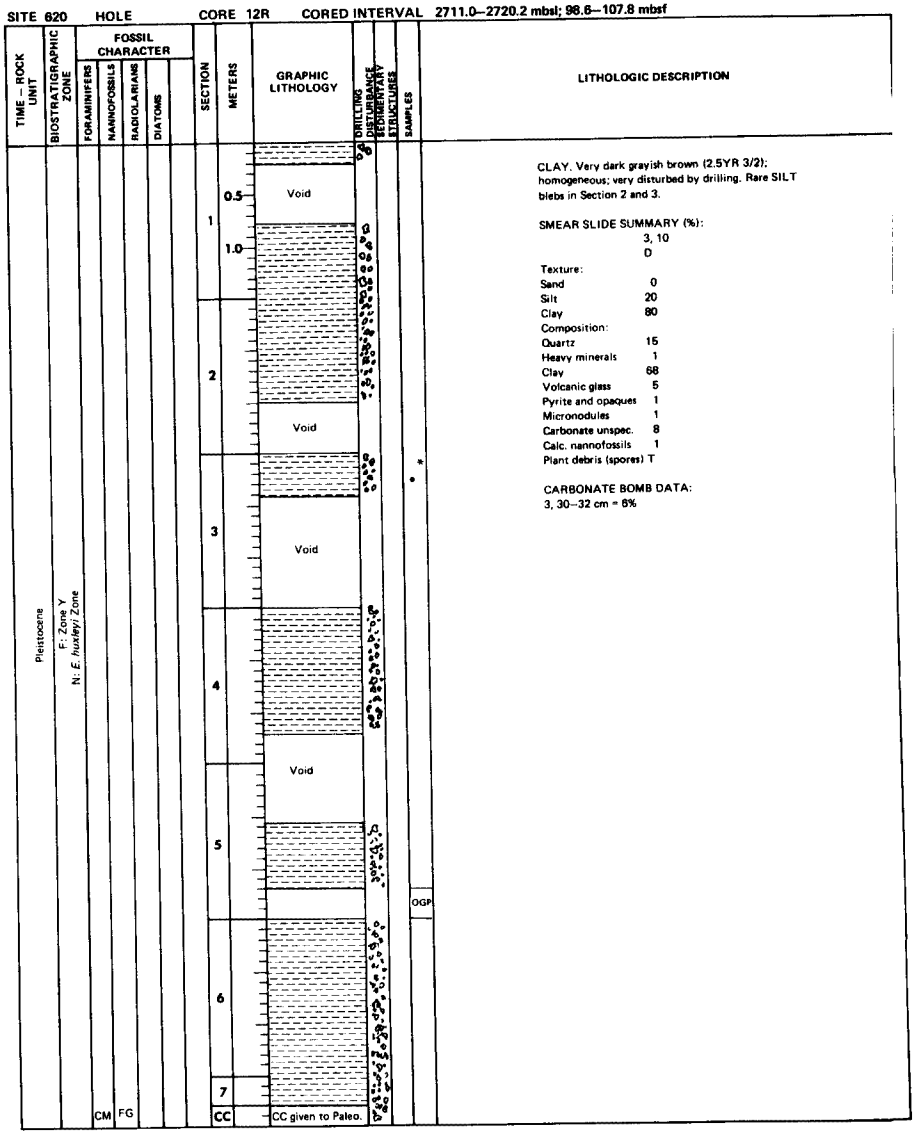
LITHOLOGIC DESCRIPTION

CLAY. Very dark gray (5Y 3/1); homogeneous; moderately deformed by drilling. Section 1 contains rare SILT blebs and discontinuous SILT laminae.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	10
Clay	72
Volcanic glass	T
Opaques	5
Carbonate unspec.	5
Calc. nannofossils	3
Altered minerals	5

SITE 620 HOLE CORE 12R CORED INTERVAL 2711.0–2720.2 mbsl; 98.6–107.8 mbsf



LITHOLOGIC DESCRIPTION

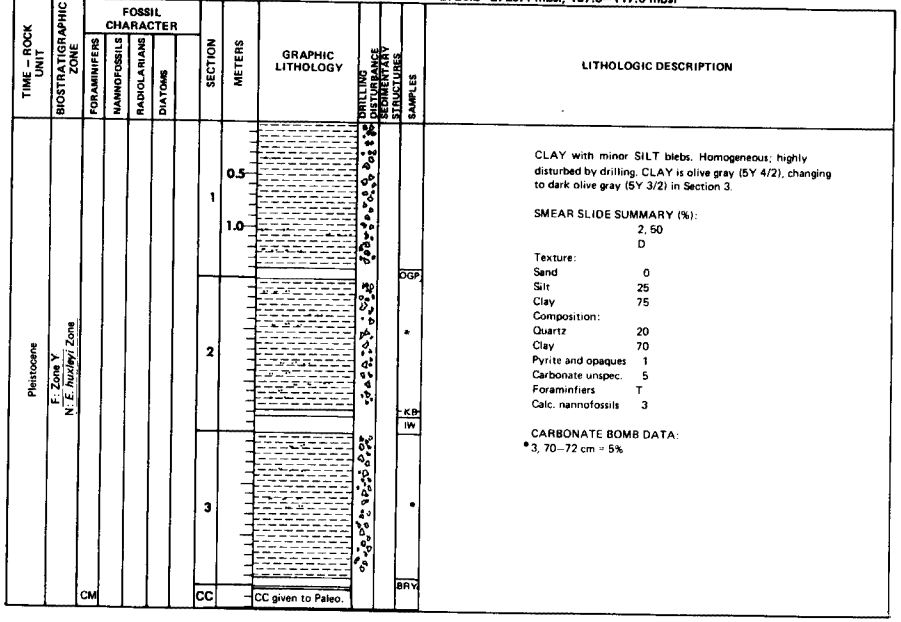
CLAY. Very dark grayish brown (2.5YR 3/2); homogeneous; very disturbed by drilling. Rare SILT blebs in Section 2 and 3.

SMEAR SLIDE SUMMARY (%):

	3, 10 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	15
Heavy minerals	1
Clay	68
Volcanic glass	5
Pyrite and opaques	1
Micronodules	1
Carbonate unspec.	8
Calc. nannofossils	1
Plant debris (spores)	T

CARBONATE BOMB DATA:
3, 30–32 cm = 8%

SITE 620 HOLE CORE 13R CORED INTERVAL 2720.2–2729.4 mbsl; 107.8–117.0 mbsf



LITHOLOGIC DESCRIPTION

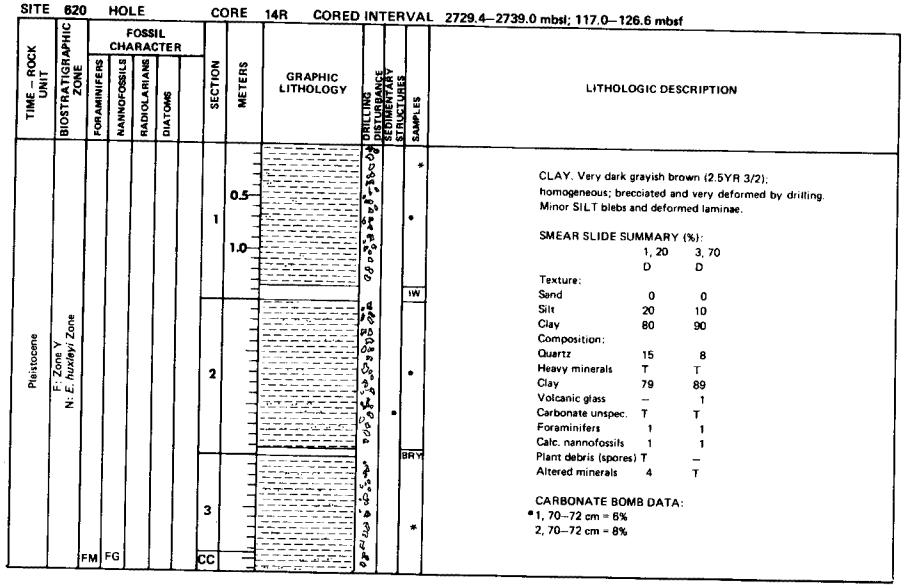
CLAY with minor SILT blebs. Homogeneous; highly disturbed by drilling. CLAY is olive gray (5Y 4/2), changing to dark olive gray (5Y 3/2) in Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 50 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	20
Clay	70
Pyrite and opaques	1
Carbonate unspec.	5
Foraminfiers	T
Calc. nannofossils	3

CARBONATE BOMB DATA:
*3, 70–72 cm = 5%

SITE 620 HOLE CORE 14R CORED INTERVAL 2729.4–2739.0 mbsl; 117.0–126.6 mbsf



LITHOLOGIC DESCRIPTION

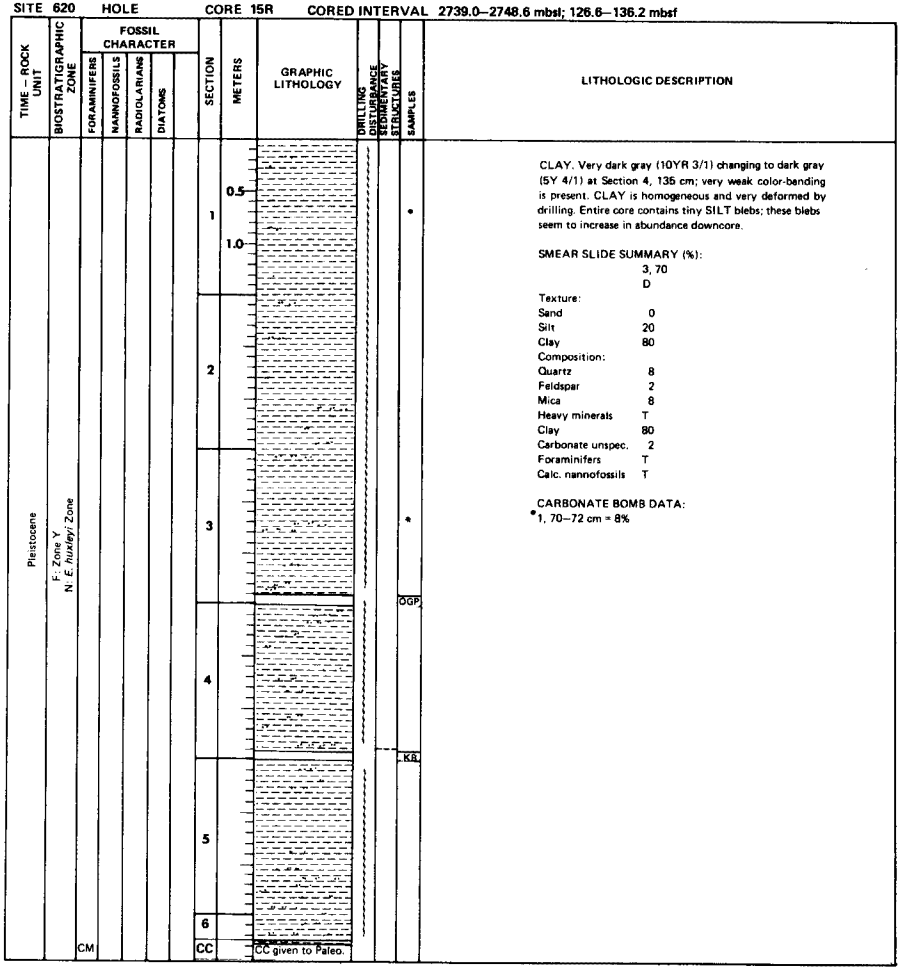
CLAY. Very dark grayish brown (2.5YR 3/2); homogeneous; brecciated and very deformed by drilling. Minor SILT blebs and deformed laminae.

SMEAR SLIDE SUMMARY (%):

	1, 20 D	3, 70 D
Texture:		
Sand	0	0
Silt	20	10
Clay	80	90
Composition:		
Quartz	15	8
Heavy minerals	T	T
Clay	79	89
Volcanic glass	–	1
Carbonate unspec.	T	T
Foraminifers	1	1
Calc. nannofossils	1	1
Plant debris (spores)	T	–
Altered minerals	4	T

CARBONATE BOMB DATA:
*1, 70–72 cm = 6%
2, 70–72 cm = 8%

SITE 620 HOLE CORE 15R CORED INTERVAL 2739.0–2748.6 mbsl; 126.6–136.2 mbsf



LITHOLOGIC DESCRIPTION

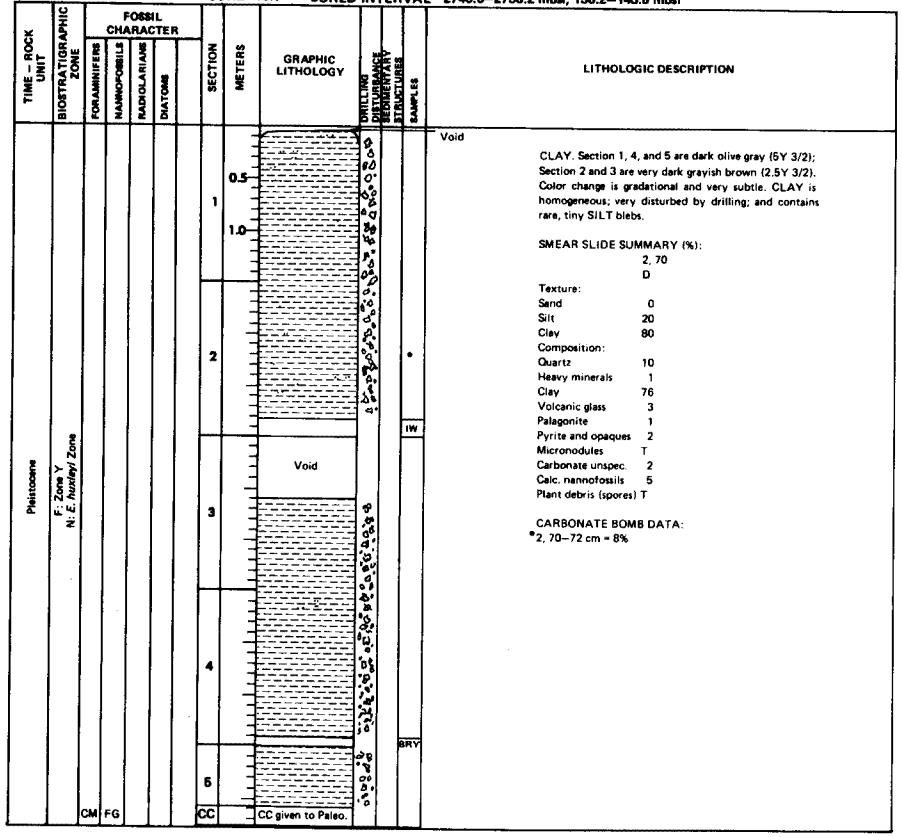
CLAY. Very dark gray (10YR 3/1) changing to dark gray (5Y 4/1) at Section 4, 135 cm; very weak color-banding is present. CLAY is homogeneous and very deformed by drilling. Entire core contains tiny SILT blebs; these blebs seem to increase in abundance downcore.

SMEAR SLIDE SUMMARY (%):

	3, 70 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	8
Feldspar	2
Mica	8
Heavy minerals	T
Clay	80
Carbonate unspec.	2
Foraminifers	T
Calc. nannofossils	T

CARBONATE BOMB DATA:
*1, 70–72 cm = 8%

SITE 620 HOLE CORE 16R CORED INTERVAL 2748.6–2758.2 mbsl; 136.2–145.8 mbsf



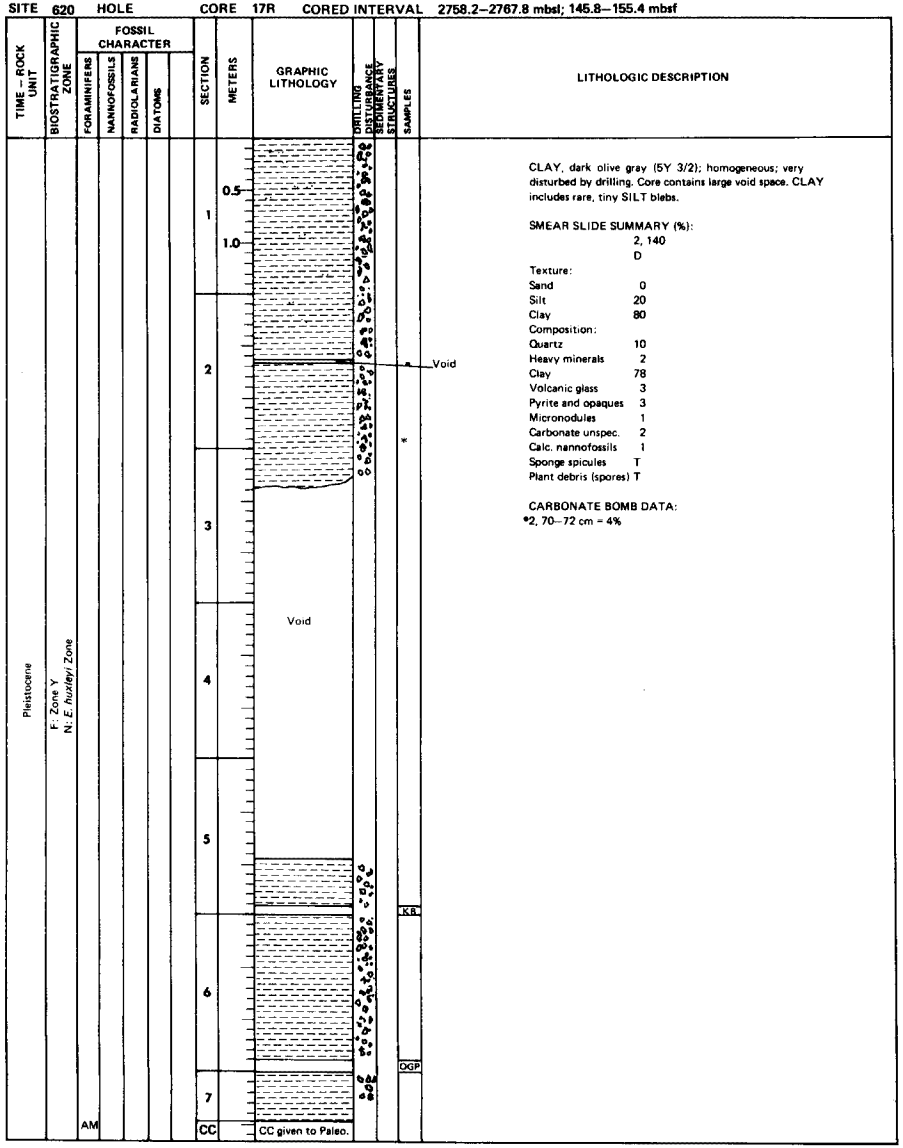
CLAY. Section 1, 4, and 5 are dark olive gray (5Y 3/2); Section 2 and 3 are very dark grayish brown (2.5Y 3/2). Color change is gradational and very subtle. CLAY is homogeneous; very disturbed by drilling; and contains rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Heavy minerals	1
Clay	76
Volcanic glass	3
Palagonite	1
Pyrite and opaques	2
Micronodules	T
Carbonate unspec.	2
Calc. nannofossils	5
Plant debris (spores)	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 8%

SITE 620 HOLE CORE 17R CORED INTERVAL 2758.2–2767.8 mbsf



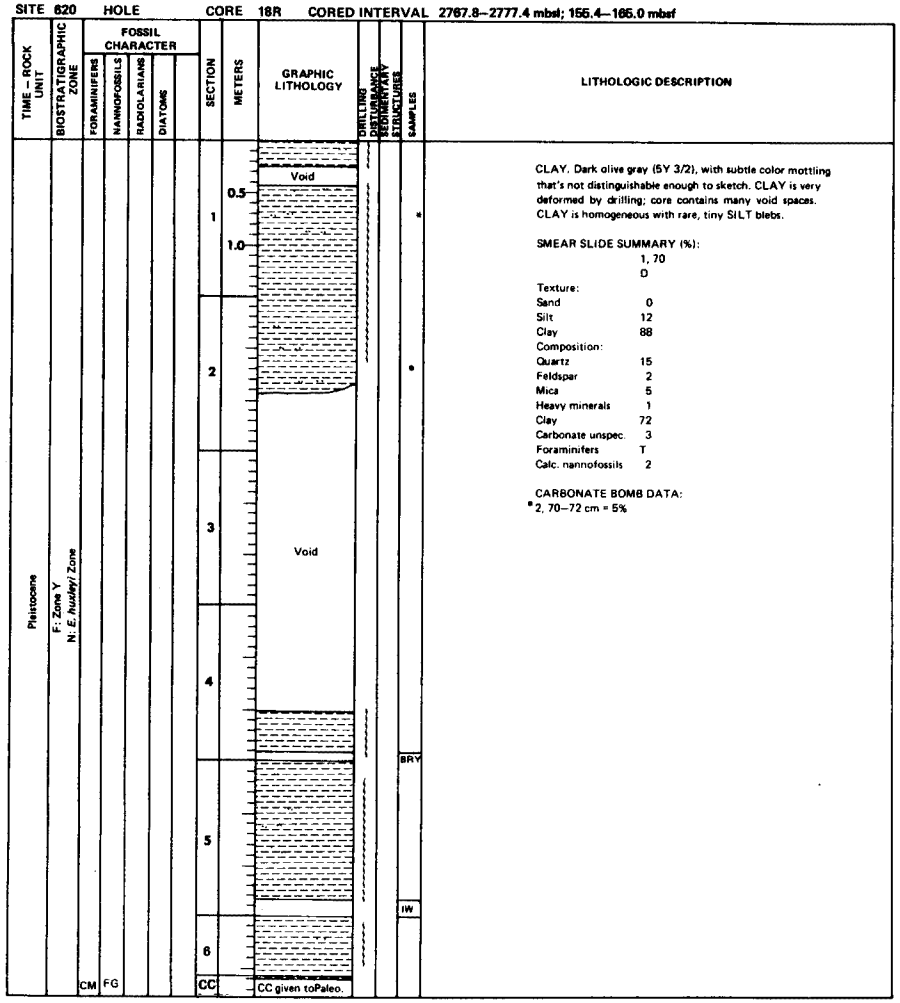
CLAY, dark olive gray (5Y 3/2); homogeneous; very disturbed by drilling. Core contains large void space. CLAY includes rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	2, 140 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Heavy minerals	2
Clay	78
Volcanic glass	3
Pyrite and opaques	3
Micronodules	1
Carbonate unspec.	2
Calc. nannofossils	1
Sponge spicules	T
Plant debris (spores)	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 4%

SITE 620 HOLE CORE 18R CORED INTERVAL 2767.8–2777.4 mbsl; 155.4–165.0 mbsf



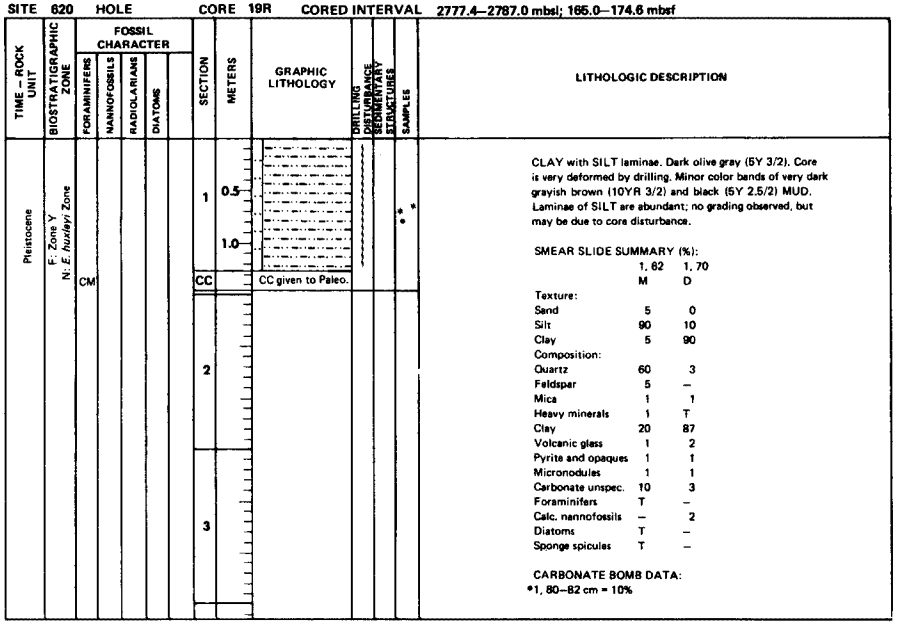
CLAY. Dark olive gray (5Y 3/2), with subtle color mottling that's not distinguishable enough to sketch. CLAY is very deformed by drilling; core contains many void spaces. CLAY is homogeneous with rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	12
Clay	88
Composition:	
Quartz	15
Feldspar	2
Mica	5
Heavy minerals	1
Clay	72
Carbonate unspec.	3
Foraminifers	T
Calc. nannofossils	2

CARBONATE BOMB DATA:
*2, 70–72 cm = 5%

SITE 620 HOLE CORE 19R CORED INTERVAL 2777.4–2787.0 mbsl; 165.0–174.6 mbsf



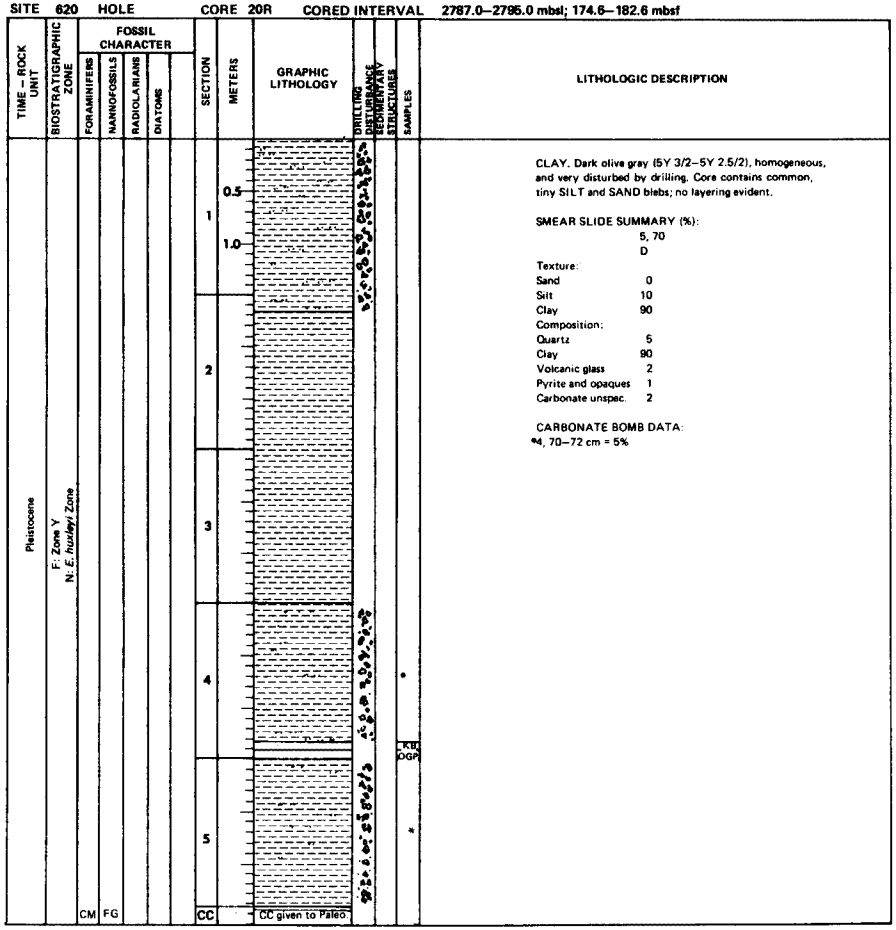
CLAY with SILT laminae. Dark olive gray (5Y 3/2). Core is very deformed by drilling. Minor color bands of very dark grayish brown (10YR 3/2) and black (5Y 2.5/2) MUD. Laminae of SILT are abundant; no grading observed, but may be due to core disturbance.

SMEAR SLIDE SUMMARY (%):

	1, 62 M	1, 70 D
Texture:		
Sand	5	0
Silt	90	10
Clay	5	90
Composition:		
Quartz	60	3
Feldspar	5	–
Mica	1	1
Heavy minerals	1	T
Clay	20	87
Volcanic glass	1	2
Pyrite and opaques	1	1
Micronodules	1	1
Carbonate unspec.	10	3
Foraminifers	T	–
Calc. nannofossils	–	2
Diatoms	T	–
Sponge spicules	T	–

CARBONATE BOMB DATA:
*1, 80–82 cm = 10%

SITE 620 HOLE CORE 20R CORED INTERVAL 2787.0–2795.0 mbsl; 174.6–182.6 mbsf



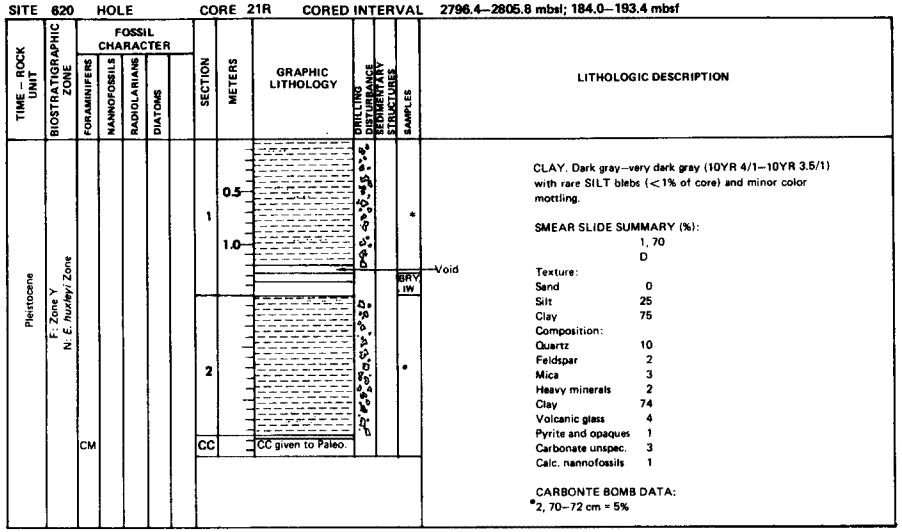
CLAY. Dark olive gray (5Y 3/2–5Y 2.5/2), homogeneous, and very disturbed by drilling. Core contains common, tiny SILT and SAND blebs; no layering evident.

SMEAR SLIDE SUMMARY (%):

	5, 70 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	5
Clay	90
Volcanic glass	2
Pyrite and opaques	1
Carbonate unspec.	2

CARBONATE BOMB DATA:
*4, 70–72 cm = 5%

SITE 620 HOLE CORE 21R CORED INTERVAL 2796.4–2805.8 mbsl; 184.0–193.4 mbsf



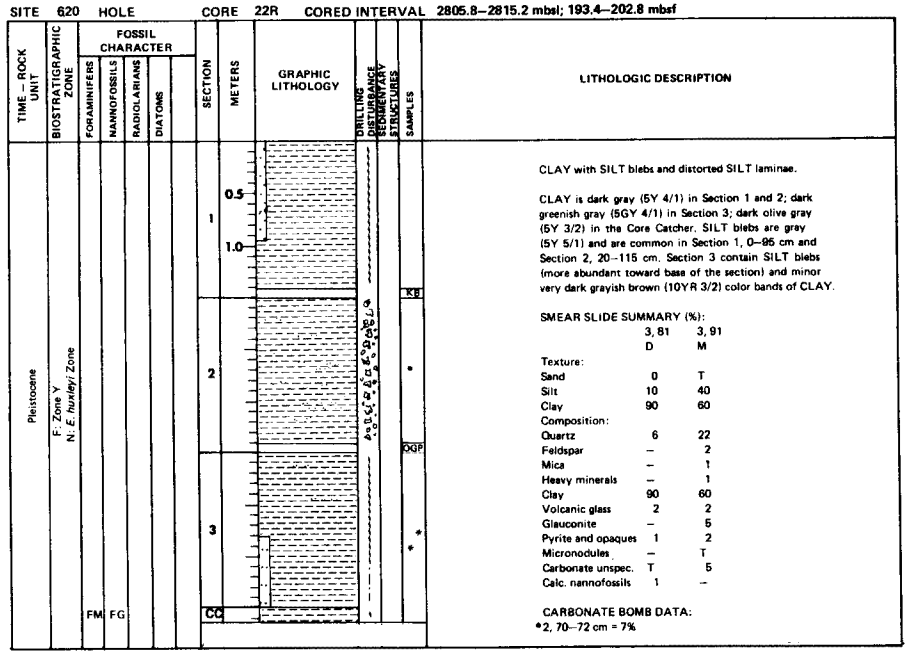
CLAY. Dark gray–very dark gray (10YR 4/1–10YR 3.5/1) with rare SILT blebs (<1% of core) and minor color mottling.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	10
Feldspar	2
Mica	3
Heavy minerals	2
Clay	74
Volcanic glass	4
Pyrite and opaques	1
Carbonate unspec.	3
Calc. nannofossils	1

CARBONTE BOMB DATA:
*2, 70–72 cm = 5%

SITE 620 HOLE CORE 22R CORED INTERVAL 2805.8–2815.2 mbsl; 193.4–202.8 mbsf



CLAY with SILT blebs and distorted SILT laminae.

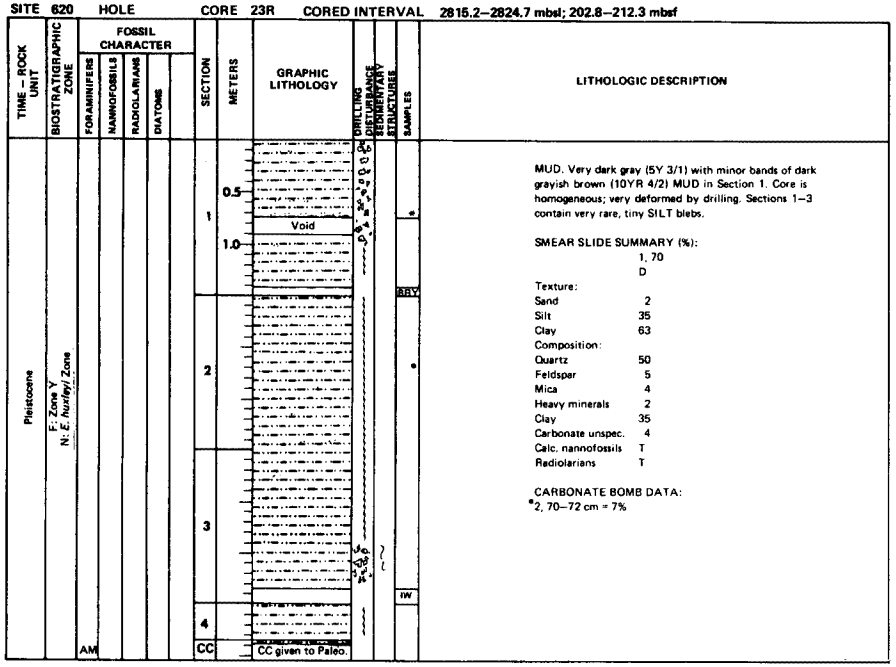
CLAY is dark gray (5Y 4/1) in Section 1 and 2; dark greenish gray (5GY 4/1) in Section 3; dark olive gray (5Y 3/2) in the Core Catcher. SILT blebs are gray (5Y 5/1) and are common in Section 1, 0–95 cm and Section 2, 20–115 cm. Section 3 contain SILT blebs (more abundant toward base of the section) and minor very dark grayish brown (10YR 3/2) color bands of CLAY.

SMEAR SLIDE SUMMARY (%):

	3, 81 D	3, 91 M
Texture:		
Sand	0	T
Silt	10	40
Clay	90	60
Composition:		
Quartz	6	22
Feldspar	–	2
Mica	–	1
Heavy minerals	–	1
Clay	90	60
Volcanic glass	2	2
Glauconite	–	5
Pyrite and opaques	1	2
Micronodules	–	T
Carbonate unspec.	T	5
Calc. nannofossils	1	–

CARBONATE BOMB DATA:
*2, 70–72 cm = 7%

SITE 620 HOLE CORE 23R CORED INTERVAL 2815.2–2824.7 mbsl; 202.8–212.3 mbsf



LITHOLOGIC DESCRIPTION

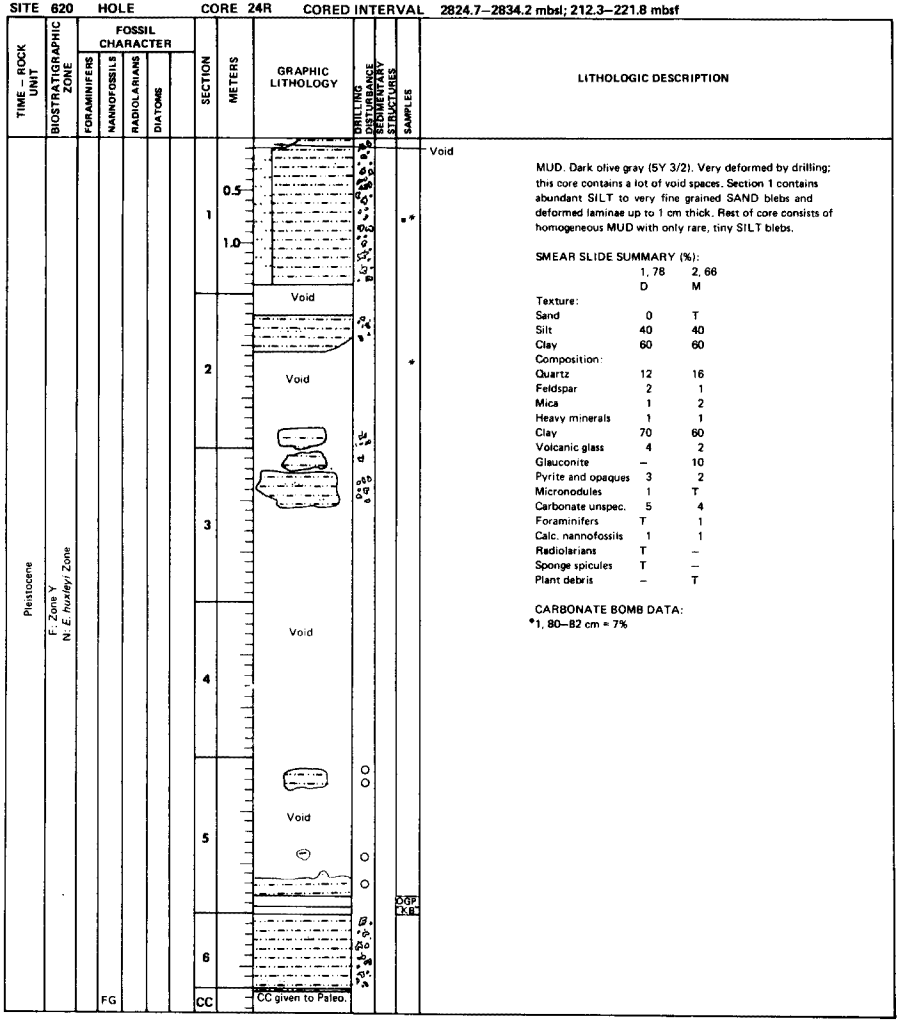
MUD. Very dark gray (5Y 3/1) with minor bands of dark grayish brown (10YR 4/2) MUD in Section 1. Core is homogeneous; very deformed by drilling. Sections 1–3 contain very rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	2
Silt	35
Clay	63
Composition:	
Quartz	50
Feldspar	5
Mica	4
Heavy minerals	2
Clay	35
Carbonate unspec.	4
Calc. nannofossils	T
Radiolarians	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 7%

SITE 620 HOLE CORE 24R CORED INTERVAL 2824.7–2834.2 mbsl; 212.3–221.8 mbsf



LITHOLOGIC DESCRIPTION

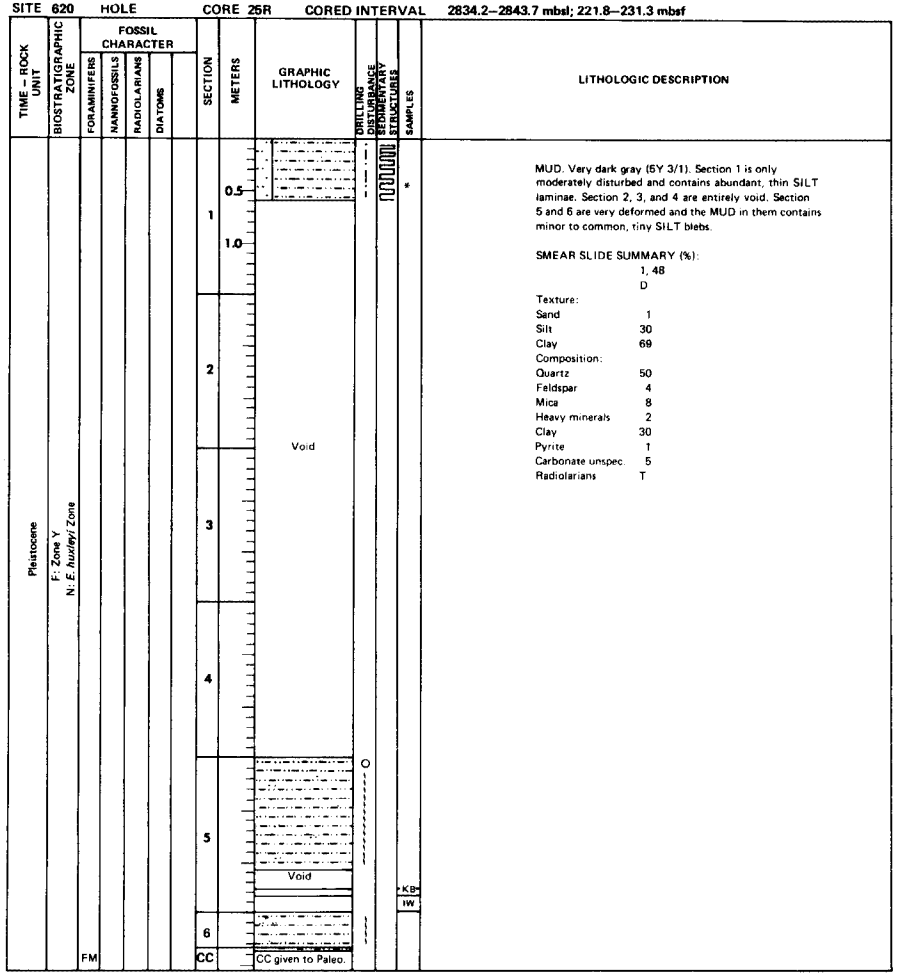
MUD. Dark olive gray (5Y 3/2). Very deformed by drilling; this core contains a lot of void spaces. Section 1 contains abundant SILT to very fine grained SAND blebs and deformed laminae up to 1 cm thick. Rest of core consists of homogeneous MUD with only rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 78 D	2, 66 M
Texture:		
Sand	0	T
Silt	40	40
Clay	60	60
Composition:		
Quartz	12	16
Feldspar	2	1
Mica	1	2
Heavy minerals	1	1
Clay	70	60
Volcanic glass	4	2
Glauconite	–	10
Pyrite and opaques	3	2
Micronodules	1	T
Carbonate unspec.	5	4
Foraminifers	T	1
Calc. nannofossils	1	1
Radiolarians	T	–
Sponge spicules	T	–
Plant debris	–	T

CARBONATE BOMB DATA:
*1, 80–82 cm = 7%

SITE 620 HOLE CORE 26R CORED INTERVAL 2834.2–2843.7 mbsl; 221.8–231.3 mbsf



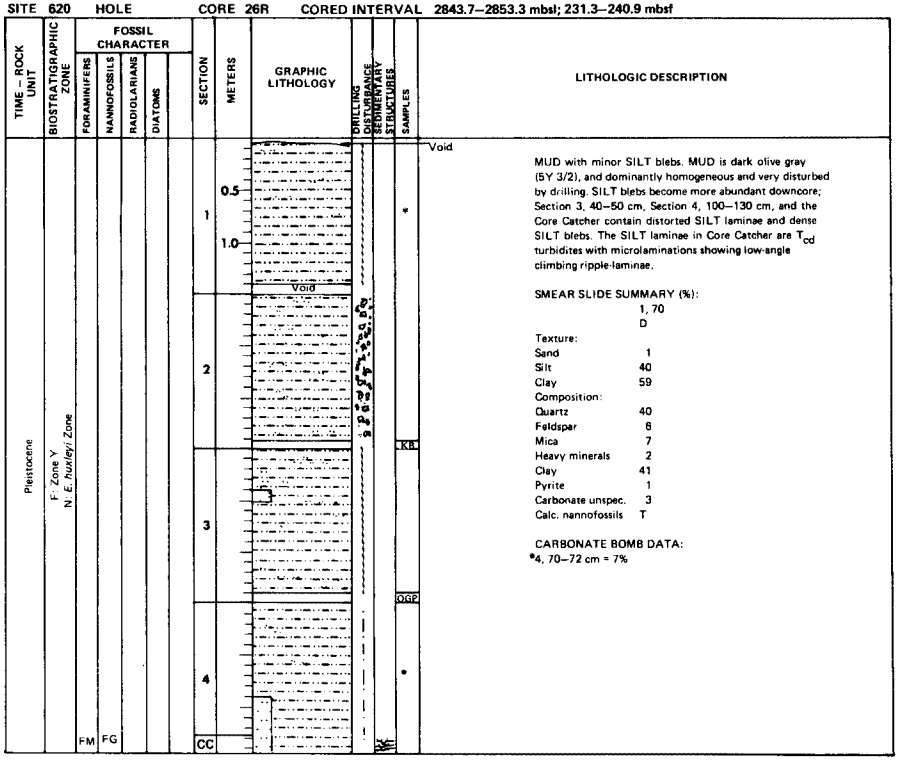
LITHOLOGIC DESCRIPTION

MUD. Very dark gray (5Y 3/1). Section 1 is only moderately disturbed and contains abundant, thin SILT laminae. Section 2, 3, and 4 are entirely void. Section 5 and 6 are very deformed and the MUD in them contains minor to common, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 48 D
Texture:	
Sand	1
Silt	30
Clay	69
Composition:	
Quartz	50
Feldspar	4
Mica	8
Heavy minerals	2
Clay	30
Pyrite	1
Carbonate unspec.	5
Radiolarians	T

SITE 620 HOLE CORE 26R CORED INTERVAL 2843.7–2853.3 mbsl; 231.3–240.9 mbsf



LITHOLOGIC DESCRIPTION

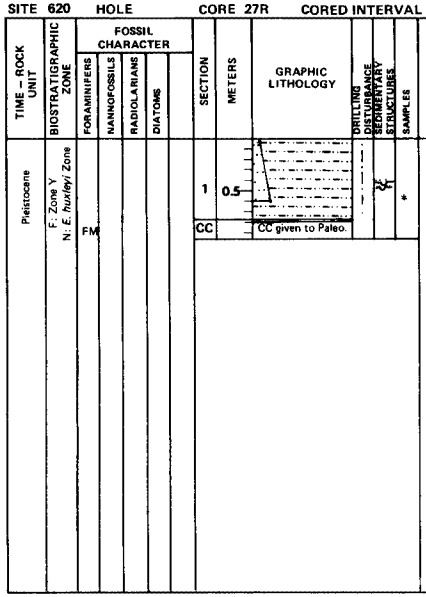
MUD with minor SILT blebs. MUD is dark olive gray (5Y 3/2), and dominantly homogeneous and very disturbed by drilling. SILT blebs become more abundant downcore; Section 3, 40–50 cm, Section 4, 100–130 cm, and the Core Catcher contain distorted SILT laminae and dense SILT blebs. The SILT laminae in Core Catcher are T_{cd} turbidites with microlaminations showing low-angle climbing ripple-laminae.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	1
Silt	40
Clay	59
Composition:	
Quartz	40
Feldspar	6
Mica	7
Heavy minerals	2
Clay	41
Pyrite	1
Carbonate unspec.	3
Calc. nannofossils	T

CARBONATE BOMB DATA:
*4, 70–72 cm = 7%

SITE 620 HOLE CORE 27R CORED INTERVAL 2853.3–2862.9 mbsl; 240.9–250.5 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae.

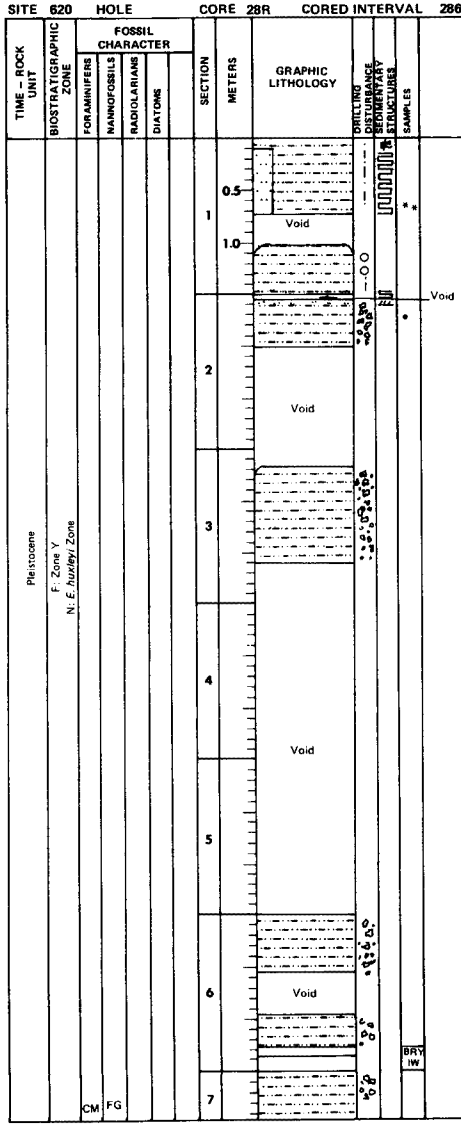
MUD is very dark gray (5Y 3/1).

SILT laminae are dark gray (5Y 4/1). Laminae are graded, have scoured bases; some have climbing ripples. Vary in thickness from ~2 cm to 0.2 cm; some of the thinner ones are interlaminated with MUD.

SMEAR SLIDE SUMMARY (%):

	1, 60 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	15
Feldspar	4
Mica	5
Heavy minerals	2
Clay	57
Volcanic glass	2
Glauconite	5
Pyrite and opaques	2
Micronodules	1
Carbonate unspec.	4
Calc. nannofossils	3
Radiolarians	T

SITE 620 HOLE CORE 28R CORED INTERVAL 2862.9–2872.5 mbsl; 250.5–260.1 mbsf



LITHOLOGIC DESCRIPTION

MUD. Dominantly very dark gray (10YR 3/1); moderately to very deformed or brecciated by drilling. Many voids.

Section 1, 0–73 cm contains abundant SILT laminae. SILT laminae are dominantly olive gray (5Y 4.5/2), range from 1–3 cm thick, and have sharp scoured bases and sharp tops. SILT laminae also occur at Section 1, 140–150 cm and Section 2, 0–10 cm.

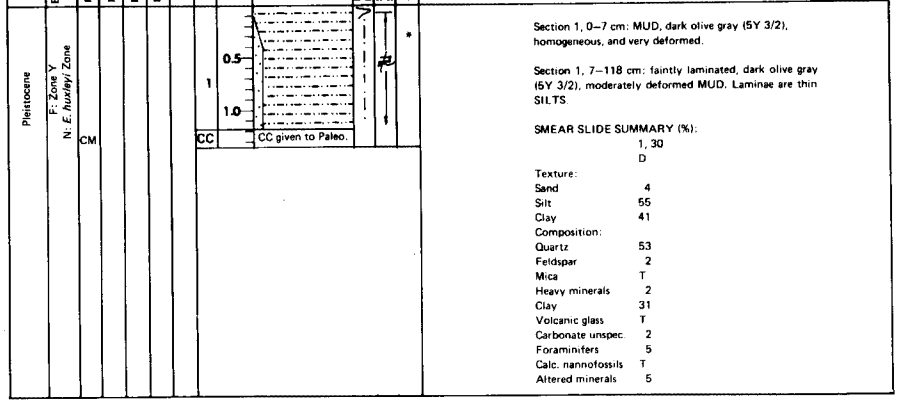
Core below Section 2, 10 cm contains homogeneous MUD with very rare SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 63 M	1, 67 D
Texture:		
Sand	3	0
Silt	87	35
Clay	10	65
Composition:		
Quartz	60	32
Feldspar	5	T
Mica	3	–
Heavy minerals	13	1
Clay	8	60
Volcanic glass	–	2
Glauconite	T	–
Opaques	2	–
Carbonate unspec.	2	–
Foraminifers	–	2
Calc. nannofossils	–	T
Altered minerals	7	3

CARBONATE BOMB DATA:
*2, 22–24 cm = 8%

SITE 620 HOLE CORE 29R CORED INTERVAL 2872.5–2882.1 mbsl; 260.1–269.7 mbsf



LITHOLOGIC DESCRIPTION

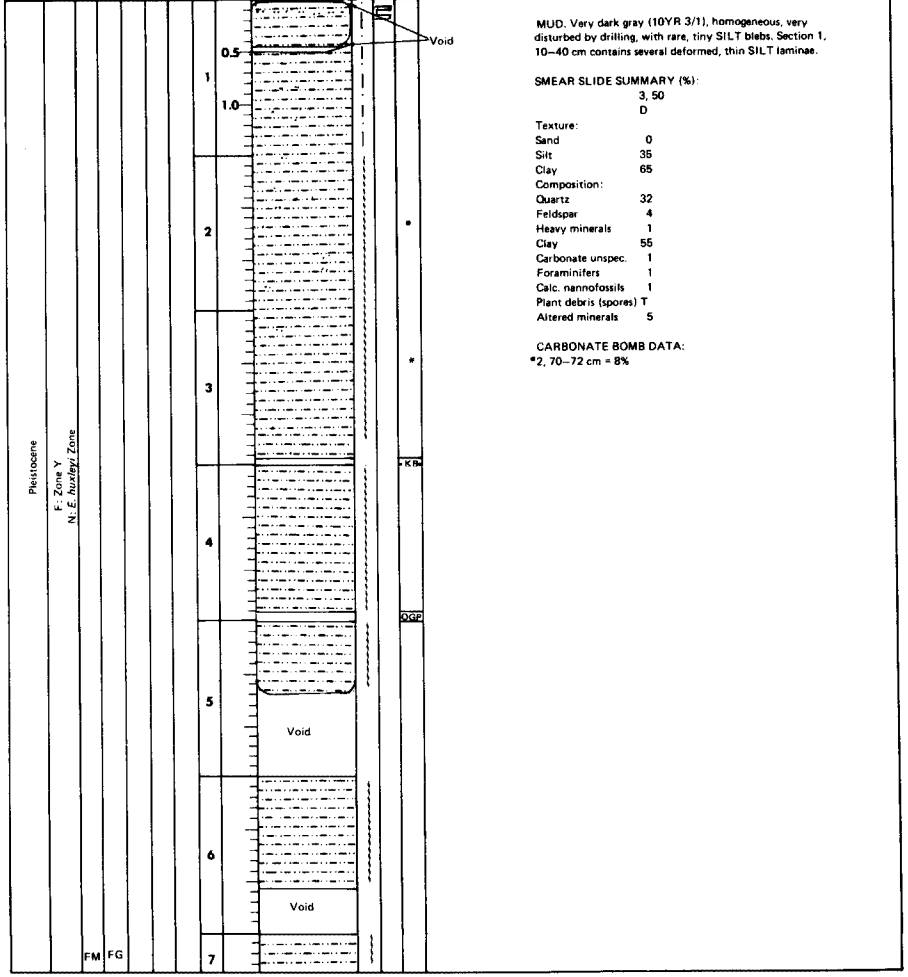
Section 1, 0–7 cm: MUD, dark olive gray (5Y 3/2), homogeneous, and very deformed.

Section 1, 7–118 cm: faintly laminated, dark olive gray (5Y 3/2), moderately deformed MUD. Laminae are thin SILTS.

SMEAR SLIDE SUMMARY (%):

	1, 30 D
Texture:	
Sand	4
Silt	55
Clay	41
Composition:	
Quartz	53
Feldspar	2
Mica	T
Heavy minerals	2
Clay	31
Volcanic glass	T
Carbonate unspec.	2
Foraminifers	5
Calc. nannofossils	T
Altered minerals	5

SITE 620 HOLE CORE 30R CORED INTERVAL 2882.1–2891.7 mbsl; 269.7–279.3 mbsf



LITHOLOGIC DESCRIPTION

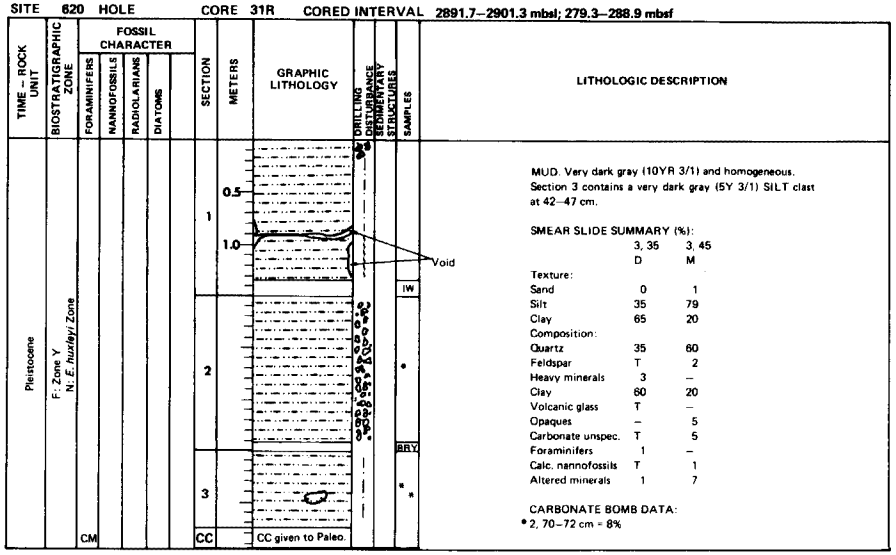
MUD. Very dark gray (10YR 3/1), homogeneous, very disturbed by drilling, with rare, tiny SILT blebs. Section 1, 10–40 cm contains several deformed, thin SILT laminae.

SMEAR SLIDE SUMMARY (%):

	3, 50 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	32
Feldspar	4
Heavy minerals	1
Clay	55
Carbonate unspec.	1
Foraminifers	1
Calc. nannofossils	1
Plant debris (spores)	T
Altered minerals	5

CARBONATE BOMB DATA:
*2, 70–72 cm = 8%

SITE 620 HOLE CORE 31R CORED INTERVAL 2891.7–2901.3 mbsl; 279.3–288.9 mbsf



LITHOLOGIC DESCRIPTION

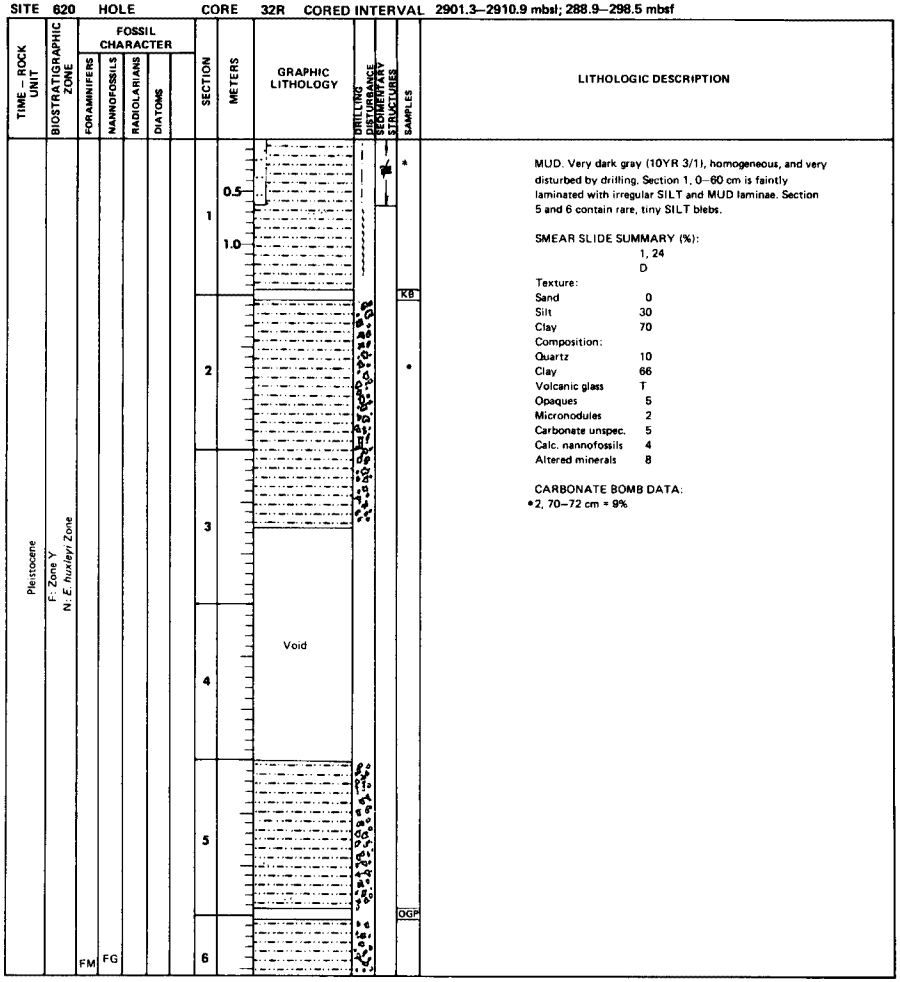
MUD. Very dark gray (10YR 3/1) and homogeneous. Section 3 contains a very dark gray (5Y 3/1) SILT clast at 42–47 cm.

SMEAR SLIDE SUMMARY (%):

	3, 35 D	3, 45 M
Texture:		
Sand	0	1
Silt	35	79
Clay	65	20
Composition:		
Quartz	35	60
Feldspar	T	2
Heavy minerals	3	–
Clay	60	20
Volcanic glass	T	–
Opaques	–	5
Carbonate unspec.	T	5
Foraminifers	1	–
Calc. nannofossils	T	1
Altered minerals	1	7

CARBONATE BOMB DATA:
*2, 70–72 cm = 8%

SITE 620 HOLE CORE 32R CORED INTERVAL 2901.3–2910.9 mbsl; 288.9–298.5 mbsf



LITHOLOGIC DESCRIPTION

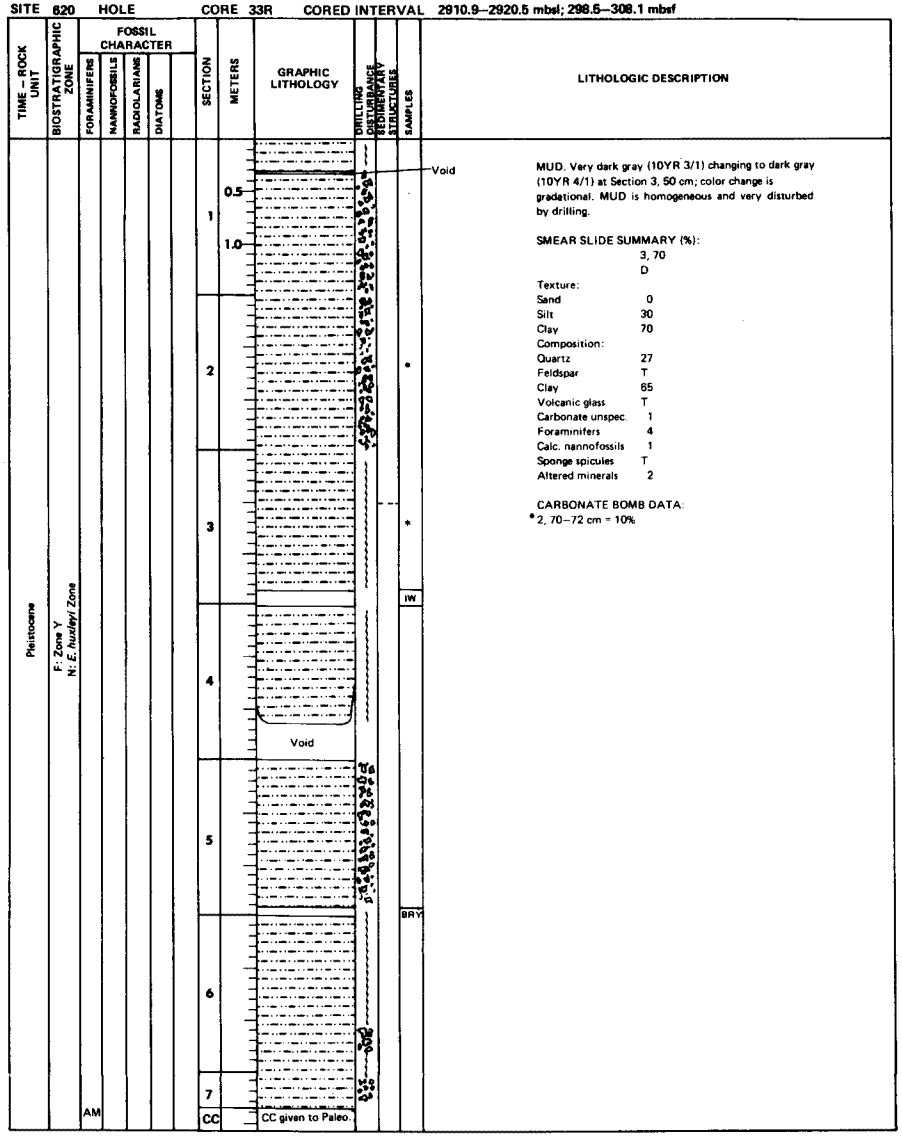
MUD. Very dark gray (10YR 3/1), homogeneous, and very disturbed by drilling. Section 1, 0–60 cm is faintly laminated with irregular SILT and MUD laminae. Section 5 and 6 contain rare, tiny SILT blebs.

SMEAR SLIDE SUMMARY (%):

	1, 24 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	10
Clay	66
Volcanic glass	T
Opaques	5
Micronodules	2
Carbonate unspec.	5
Calc. nannofossils	4
Altered minerals	8

CARBONATE BOMB DATA:
*2, 70–72 cm = 9%

SITE 620 HOLE CORE 33R CORED INTERVAL 2910.9–2920.5 mbsl; 298.5–308.1 mbsf



LITHOLOGIC DESCRIPTION

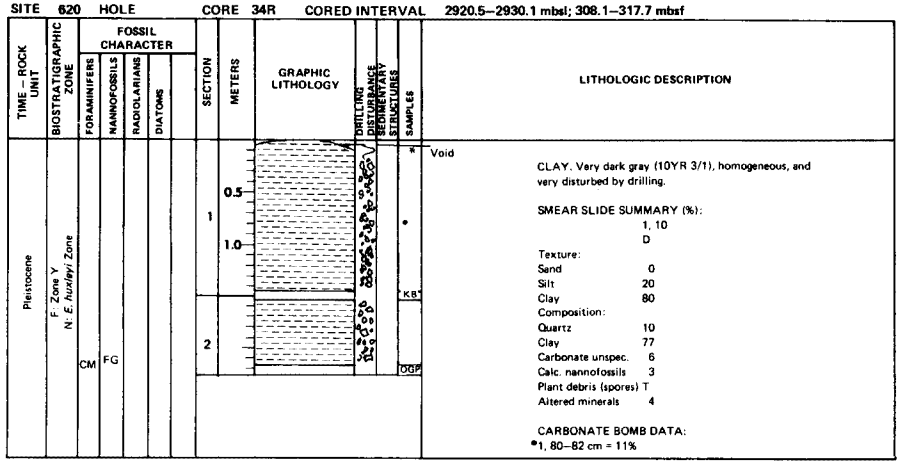
MUD. Very dark gray (10YR 3/1) changing to dark gray (10YR 4/1) at Section 3, 50 cm; color change is gradational. MUD is homogeneous and very disturbed by drilling.

SMEAR SLIDE SUMMARY (%):

	3, 70 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	27
Feldspar	T
Clay	65
Volcanic glass	T
Carbonate unspec.	1
Foraminifers	4
Calc. nannofossils	1
Sponge spicules	T
Altered minerals	2

CARBONATE BOMB DATA:
*2, 70–72 cm = 10%

SITE 620 HOLE CORE 34R CORED INTERVAL 2920.5–2930.1 mbsl; 308.1–317.7 mbsf



LITHOLOGIC DESCRIPTION

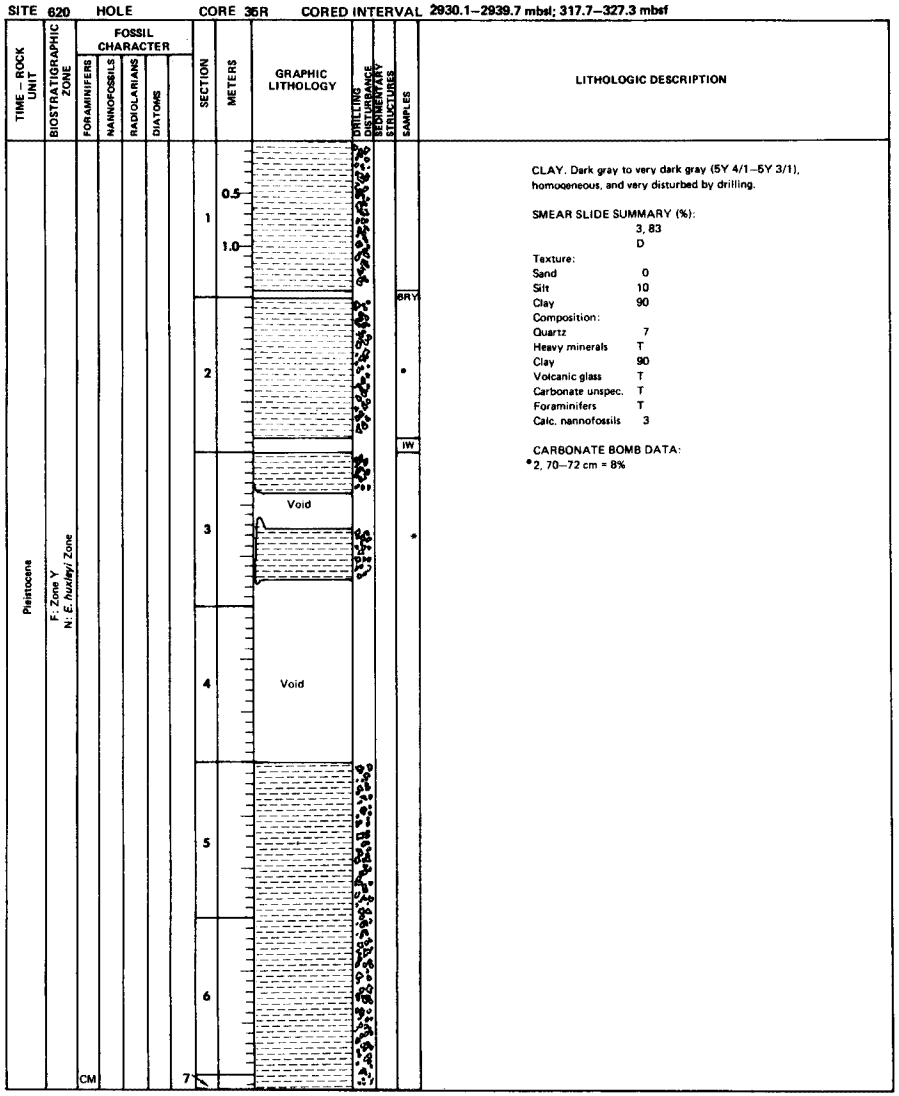
CLAY. Very dark gray (10YR 3/1), homogeneous, and very disturbed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 10 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Clay	77
Carbonate unspec.	6
Calc. nannofossils	3
Plant debris (spores)	T
Altered minerals	4

CARBONATE BOMB DATA:
*1, 80–82 cm = 11%

SITE 620 HOLE CORE 35R CORED INTERVAL 2930.1–2939.7 mbsl; 317.7–327.3 mbsf



LITHOLOGIC DESCRIPTION

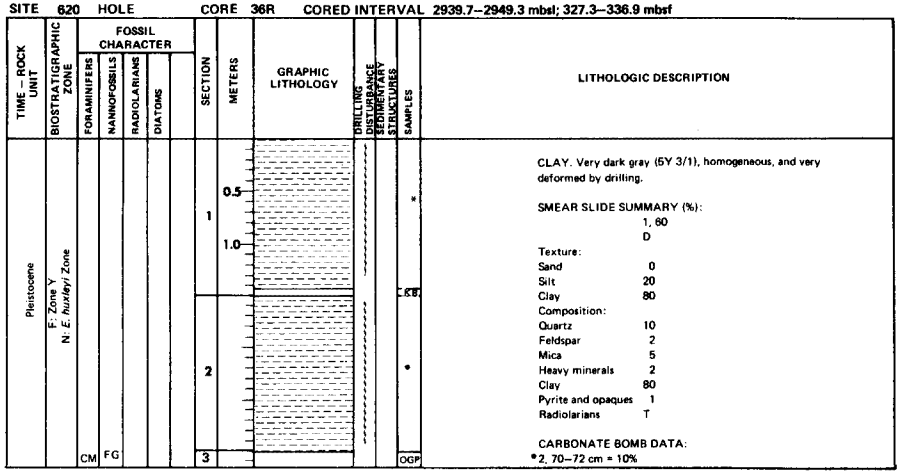
CLAY. Dark gray to very dark gray (5Y 4/1–5Y 3/1), homogeneous, and very disturbed by drilling.

SMEAR SLIDE SUMMARY (%):

	3, 83 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	7
Heavy minerals	T
Clay	90
Volcanic glass	T
Carbonate unspec.	T
Foraminifers	T
Calc. nannofossils	3

CARBONATE BOMB DATA:
•2, 70–72 cm = 8%

SITE 620 HOLE CORE 36R CORED INTERVAL 2939.7–2949.3 mbsf; 327.3–336.9 mbsf



LITHOLOGIC DESCRIPTION

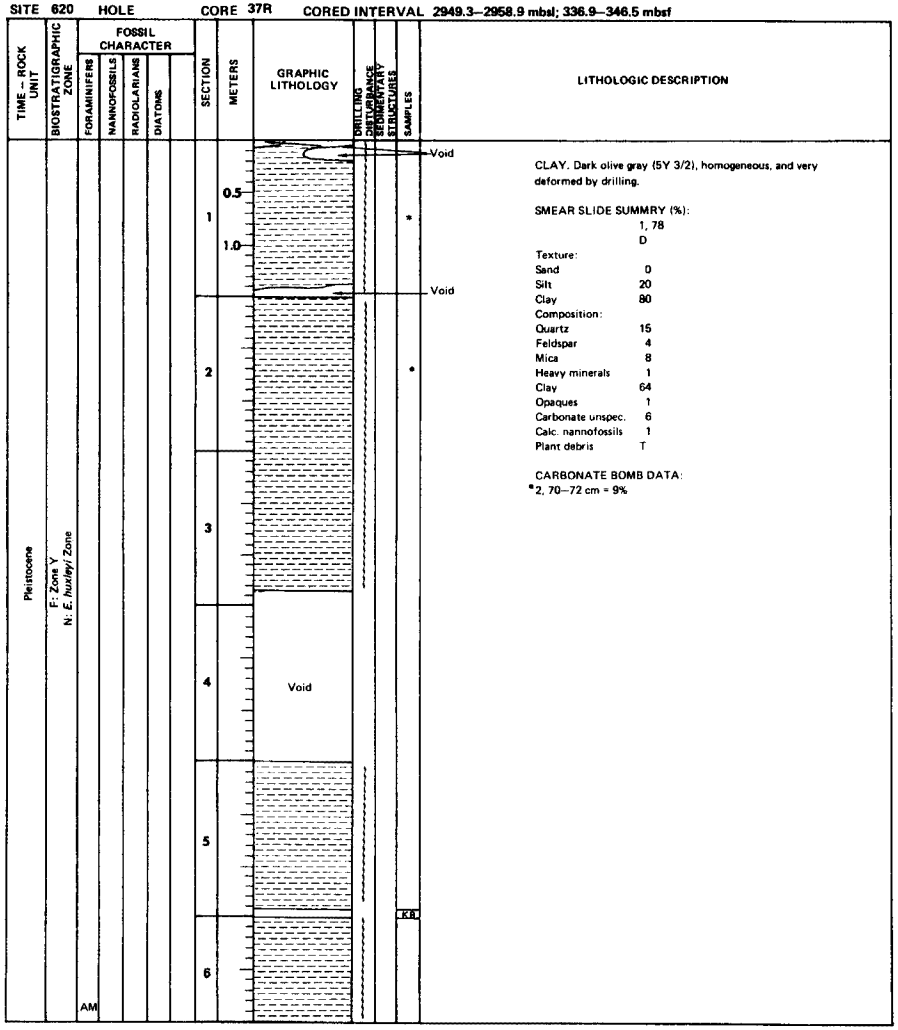
CLAY. Very dark gray (5Y 3/1), homogeneous, and very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 60 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Feldspar	2
Mica	5
Heavy minerals	2
Clay	80
Pyrite and opaques	1
Radiolarians	T

CARBONATE BOMB DATA:
•2, 70–72 cm = 10%

SITE 620 HOLE CORE 37R CORED INTERVAL 2949.3–2958.9 mbsl; 336.9–346.5 mbsf



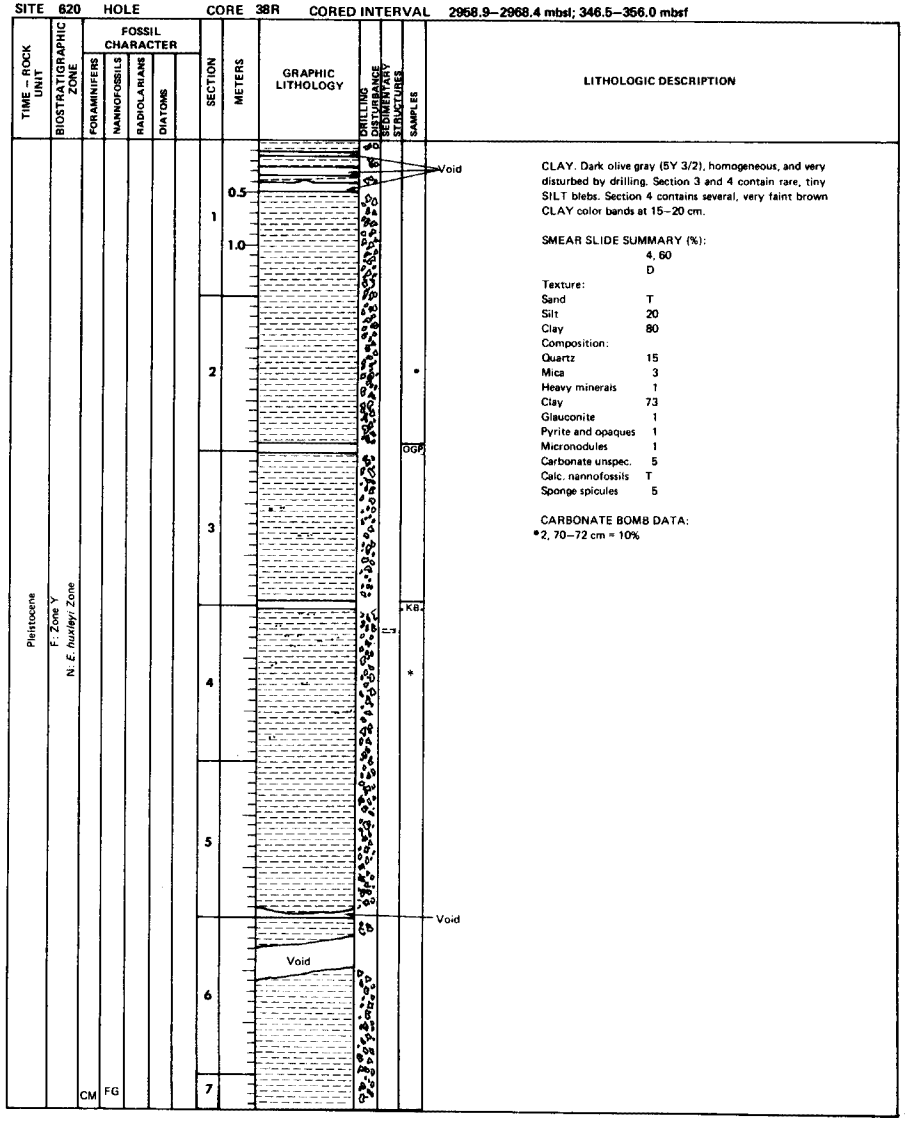
CLAY. Dark olive gray (5Y 3/2), homogeneous, and very deformed by drilling.

SMEAR SLIDE SUMMRY (%):

	1, 78 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	15
Feldspar	4
Mica	8
Heavy minerals	1
Clay	64
Opaques	1
Carbonate unspec.	6
Calc. nannofossils	1
Plant debris	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 9%

SITE 620 HOLE CORE 38R CORED INTERVAL 2958.9–2968.4 mbsl; 346.5–356.0 mbsf



CLAY. Dark olive gray (5Y 3/2), homogeneous, and very disturbed by drilling. Section 3 and 4 contain rare, tiny SILT blebs. Section 4 contains several, very faint brown CLAY color bands at 15–20 cm.

SMEAR SLIDE SUMMARY (%):

	4, 60 D
Texture:	
Sand	T
Silt	20
Clay	80
Composition:	
Quartz	15
Mica	3
Heavy minerals	1
Clay	73
Glauconite	1
Pyrite and opaques	1
Micronodules	1
Carbonate unspec.	5
Calc. nannofossils	T
Sponge spicules	5

CARBONATE BOMB DATA:
*2, 70–72 cm = 10%

SITE 620 HOLE CORE 39R CORED INTERVAL 2968.4–2977.9 mbsl; 356.0–365.5 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	AG				1 CC	0.5	CC given to Paleo.				CLAY. Dark olive gray (5Y 3/2); homogeneous; very disturbed by drilling.

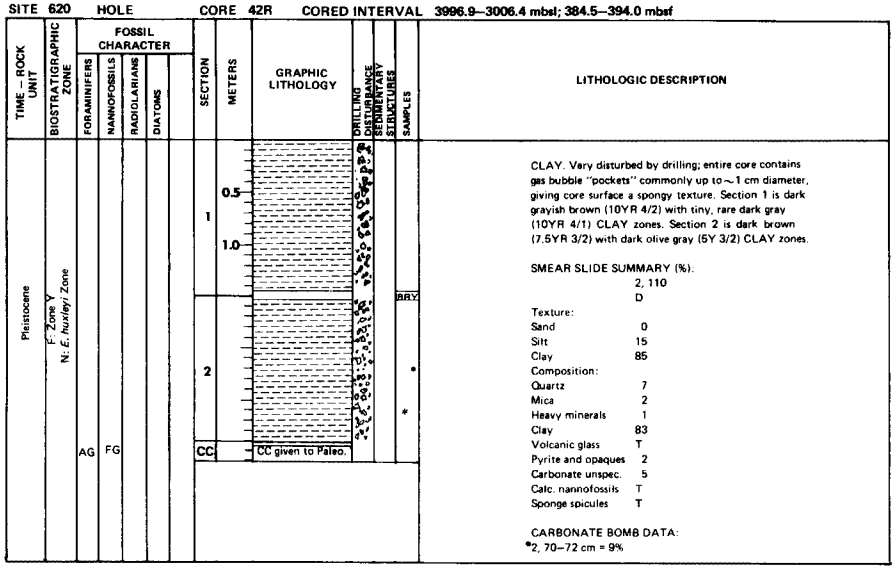
SITE 620 HOLE CORE 40R CORED INTERVAL 2977.9–2987.4 mbsl; 365.5–375.0 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	AG	FG			1 2 3 4 5 CC	0.5 1.0	Void Void CC given to Paleo.			* • IW BRY	CLAY. Dark gray (5Y 4/1) with very minor color banding of very dark gray (5Y 3/1) CLAY. Core is very disturbed by drilling; disturbance increases downcore. CLAY includes rare SILT blebs; Section 1 contains two very thin SILT laminae. SMEAR SLIDE SUMMARY (%): 1, 80 D Texture: Sand 0 Silt 10 Clay 90 Composition: Quartz 8 Feldspar 2 Mica 5 Heavy minerals 1 Clay 80 Opaques 1 Carbonate unspec. 3 Calc. nannofossils T CARBONATE BOMB DATA: *2, 70–72 cm = 11%

SITE 620 HOLE CORE 41R CORED INTERVAL 2987.4–2996.9 mbsl; 375.0–384.5 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	AG				1 2 3 4 5 6 7 CC	0.5 1.0	Void Void Void CC given to Paleo.			* QGP • LKB	CLAY. Very dark grayish brown (2.5Y 3/2). Very disturbed by drilling; entire core contains gas bubble "pockets" typically 1–10 mm in diameter, giving core surface a somewhat spongy texture. SMEAR SLIDE SUMMARY (%): 1, 40 D Texture: Sand 0 Silt 12 Clay 88 Composition: Quartz 5 Mica 2 Heavy minerals T Clay 89 Pyrite and opaques 1 Carbonate unspec. 3 Calc. nannofossils T CARBONATE BOMB DATA: *5, 70–72 cm = 19%

SITE 620 HOLE CORE 42R CORED INTERVAL 3996.9–3006.4 mbsl; 384.5–394.0 mbsf



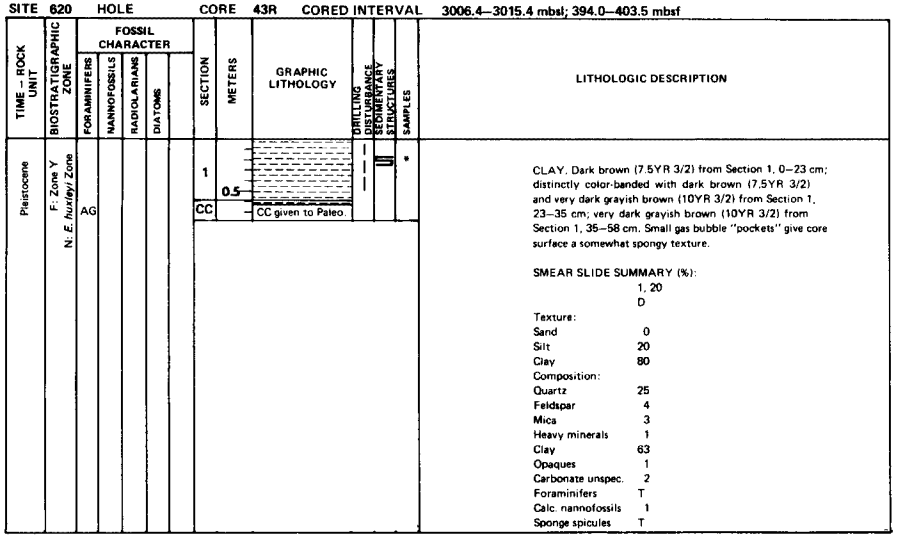
CLAY. Vary disturbed by drilling; entire core contains gas bubble "pockets" commonly up to ~1 cm diameter, giving core surface a spongy texture. Section 1 is dark grayish brown (10YR 4/2) with tiny, rare dark gray (10YR 4/1) CLAY zones. Section 2 is dark brown (7.5YR 3/2) with dark olive gray (5Y 3/2) CLAY zones.

SMEAR SLIDE SUMMARY (%):

	2, 110 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	7
Mica	2
Heavy minerals	1
Clay	83
Volcanic glass	T
Pyrite and opaques	2
Carbonate unspec.	5
Calc. nannofossils	T
Sponge spicules	T

CARBONATE BOMB DATA:
*2, 70–72 cm = 9%

SITE 620 HOLE CORE 43R CORED INTERVAL 3006.4–3015.4 mbsl; 394.0–403.5 mbsf

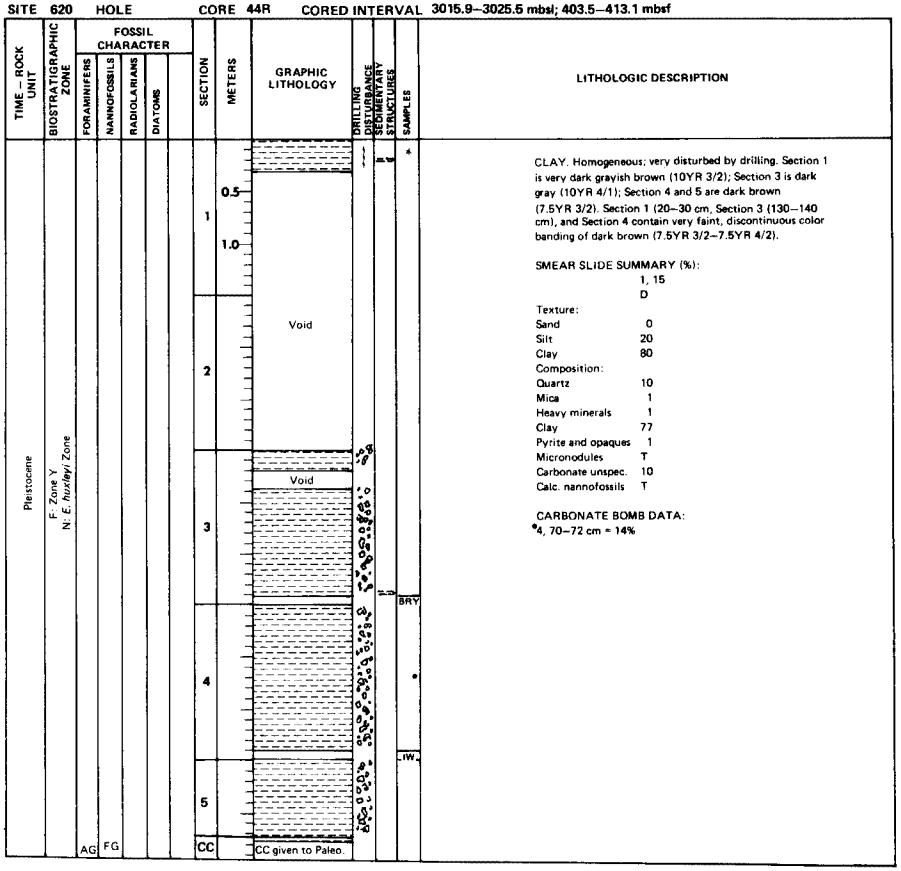


CLAY. Dark brown (7.5YR 3/2) from Section 1, 0–23 cm; distinctly color-banded with dark brown (7.5YR 3/2) and very dark grayish brown (10YR 3/2) from Section 1, 23–35 cm; very dark grayish brown (10YR 3/2) from Section 1, 35–58 cm. Small gas bubble "pockets" give core surface a somewhat spongy texture.

SMEAR SLIDE SUMMARY (%):

	1, 20 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	25
Feldspar	4
Mica	3
Heavy minerals	1
Clay	63
Opaques	1
Carbonate unspec.	2
Foraminifers	T
Calc. nannofossils	1
Sponge spicules	T

SITE 620 HOLE CORE 44R CORED INTERVAL 3015.9–3025.5 mbsl; 403.5–413.1 mbsf



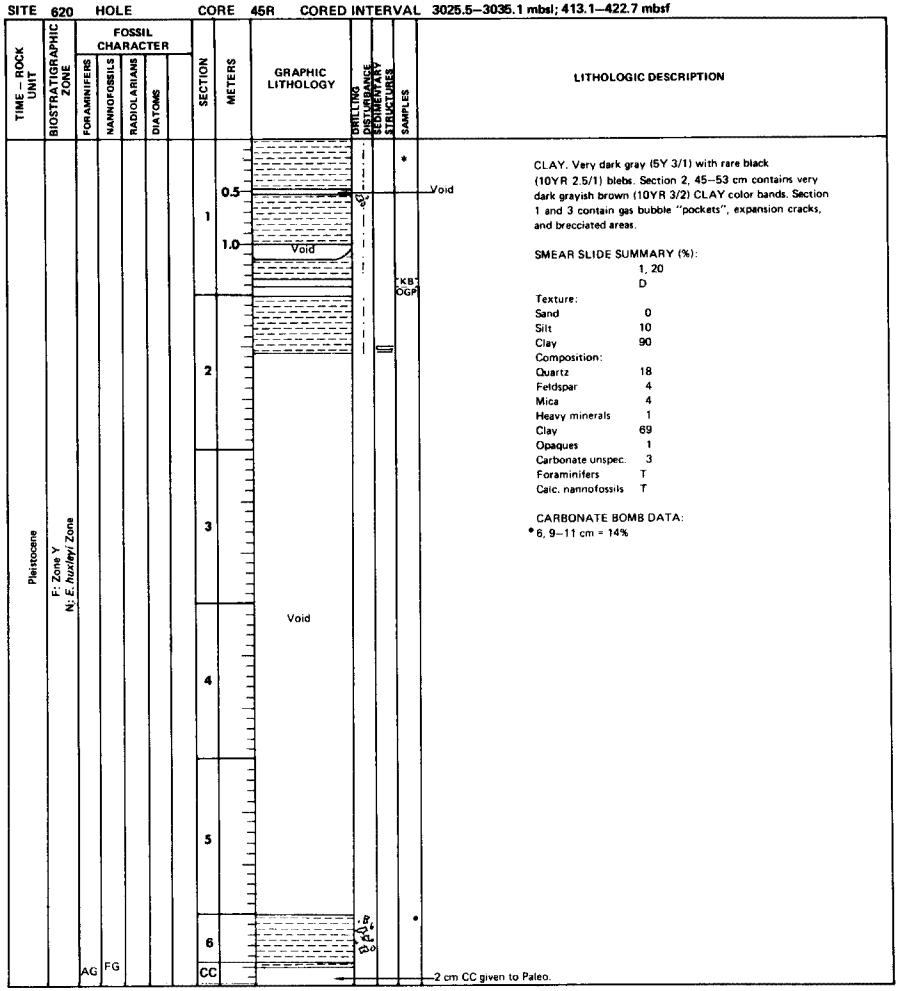
CLAY. Homogeneous; very disturbed by drilling. Section 1 is very dark grayish brown (10YR 3/2); Section 3 is dark gray (10YR 4/1); Section 4 and 5 are dark brown (7.5YR 3/2). Section 1 (20–30 cm, Section 3 (130–140 cm), and Section 4 contain very faint, discontinuous color banding of dark brown (7.5YR 3/2–7.5YR 4/2).

SMEAR SLIDE SUMMARY (%):

	1, 15 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	10
Mica	1
Heavy minerals	1
Clay	77
Pyrite and opaques	1
Micronodules	T
Carbonate unspec.	10
Calc. nannofossils	T

CARBONATE BOMB DATA:
*4, 70–72 cm = 14%

SITE 620 HOLE CORE 45R CORED INTERVAL 3025.5–3035.1 mbsl; 413.1–422.7 mbsf



CLAY. Very dark gray (5Y 3/1) with rare black (10YR 2.5/1) blebs. Section 2, 45–53 cm contains very dark grayish brown (10YR 3/2) CLAY color bands. Section 1 and 3 contain gas bubble "pockets", expansion cracks, and brecciated areas.

SMEAR SLIDE SUMMARY (%):

	1, 20 D
Texture:	
Sand	0
Silt	10
Clay	90
Composition:	
Quartz	18
Feldspar	4
Mica	4
Heavy minerals	1
Clay	69
Opaques	1
Carbonate unspec.	3
Foraminifers	T
Calc. nannofossils	T

CARBONATE BOMB DATA:
*6, 9–11 cm = 14%

SITE 621

HOLE 621

Date Occupied: 26 October 1983, 2316 LCT

Date Departed: 29 October 1983, 0115 LCT

Time on Hole: 3 days, 0 hr

Position (latitude; longitude): 26°43.86'N; 88°29.76'W

Water depth (sea level; corrected m, echo-sounding): 2481

Water depth (rig floor; corrected m, echo-sounding): 2491

Bottom felt (m, drill pipe): 2485

Penetration (m): 214.8

Number of cores: 34

Total length of cored section (m): 157.3

Total core recovered (m): 136.83

Core recovery (%): 87

Oldest sediment cored:

Depth sub-bottom (m): 214.8

Nature: gravel

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Site 621 was drilled near the thalweg along the convex side of the channel in 2481 m water depth. The channel at this site is approximately 3 km wide and has a relief of 40 m between the top of the adjacent levee and the present channel floor. The major objectives of this site were to obtain the sedimentological characteristics of the channel fill and to obtain a vertical sequence of the lithologic trends. In addition, high amplitude seismic reflectors are associated with the channel complex and knowledge concerning their lithology would aid in reconstructing the history of the channel development.

The 214.8 m hole was cored using the Hydraulic Piston Corer; recovery was excellent and the cores displayed little disturbance until near the bottom of the hole. After completing the coring program, a gamma ray and sonic log run was successfully completed.

Principal results were:

1) The channel sequence displays a fining-upward trend, commencing with coarse gravel at total depth and ending with fine-grained clays capped by a thin foraminiferal ooze. The coarser-grained sediments, sands and gravel, extend from the total depth of penetration to 182 m (minimum 32 m thick). The base of the channel was not penetrated, but seismically the channel base is interpreted to lie at a depth of 317 m. The basal coarse sediments grade upward into interbedded sands and silts with sands rarely exceeding 1 m thick. The sands and silts extend up to a penetration of 150 m and grade into overlying silty muds containing minor amounts

of sand. At approximately 94 m penetration, the sediments grade into dark gray homogeneous muds approximately 94 m thick.

2) The sediments comprising the channel fill contain predominantly reworked shallow-water microfauna and planktonic and bathyal benthic fauna are sparse.

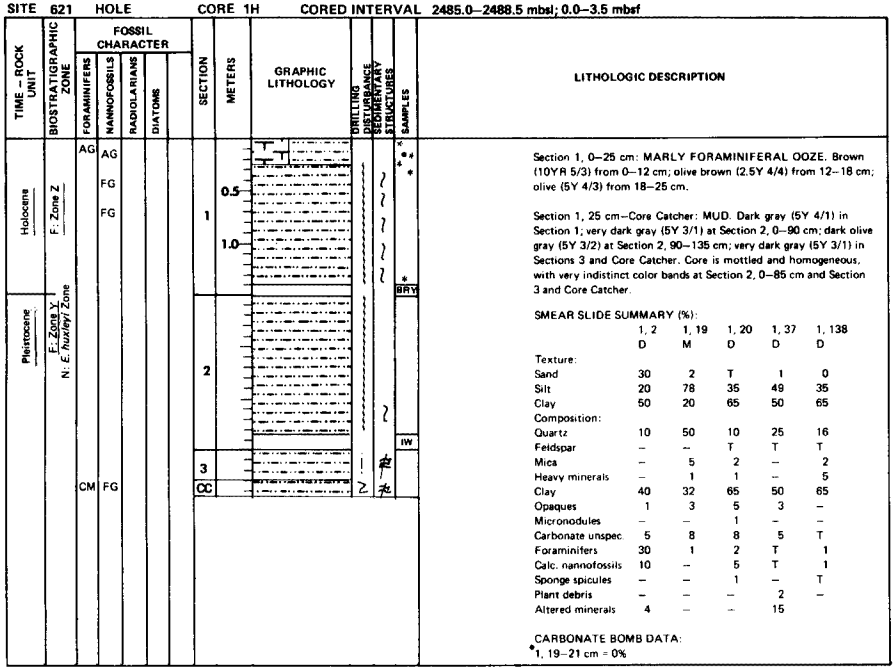
3) Interpreting the lower coarser-grained sediments to represent the active phase of the channel results in a minimum channel depth (from levee crest to thalweg) of 221 m. Such channel relief proves to be sufficient to contain coarser sediment flows within the channel and shows that only the finer-grained components were being transported over the levee to form the marginal overbank deposits.

4) The finer-grained upper part of the channel fill must have occurred rapidly since few bathyal benthic fauna are present and displaced shallow-water forms are abundant.

5) Computed accumulation rates were 25.0 cm/1000 yr. for the Holocene (Ericson Zone Z) and a minimum of 290.0 cm/1000 yr. for the late Wisconsin glacial (Ericson Zone Y) as the base of Zone Y was not penetrated. Based on seismic correlation of the top of Zone X, a computed accumulation is 1111.0 cm/1000 yr. for the late Wisconsin glacial period. This is an extremely high sedimentation rate and indicates that large volumes of sediment have been delivered down this channel to form the modern fan lobe.

6) The nearest source of graveliferous deposits is on the shelf near the head of the present Mississippi Canyon. These deposits are late Pleistocene in age.

SITE 621 HOLE CORE 1H CORED INTERVAL 2485.0–2488.5 mbsl; 0.0–3.5 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–25 cm: MARLY FORAMINIFERAL OOZE. Brown (10YR 5/3) from 0–12 cm; olive brown (2.5Y 4/4) from 12–18 cm; olive (5Y 4/3) from 18–25 cm.

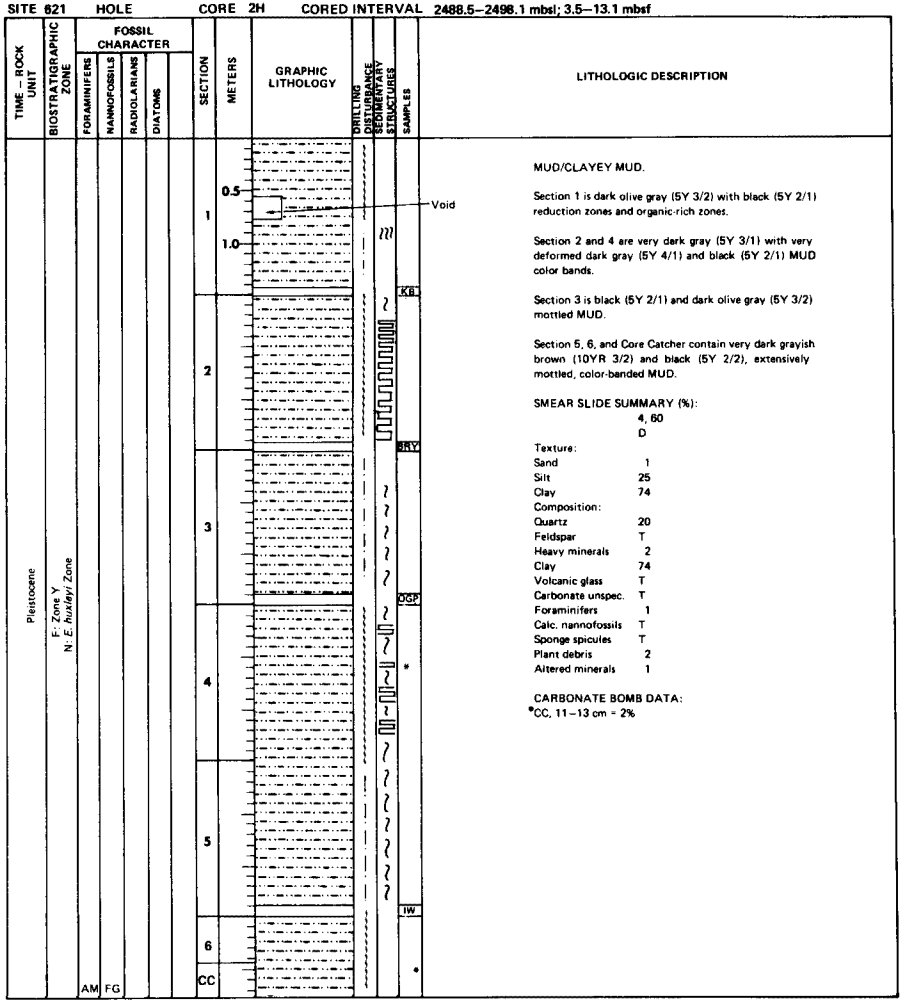
Section 1, 25 cm–Core Catcher: MUD. Dark gray (5Y 4/1) in Section 1; very dark gray (5Y 3/1) at Section 2, 0–90 cm; dark olive gray (5Y 3/2) at Section 2, 90–135 cm; very dark gray (5Y 3/1) in Sections 3 and Core Catcher. Core is mottled and homogeneous, with very indistinct color bands at Section 2, 0–85 cm and Section 3 and Core Catcher.

SMEAR SLIDE SUMMARY (%):

	1, 2 D	1, 19 M	1, 20 D	1, 37 D	1, 138 D
Texture:					
Sand	30	2	T	1	0
Silt	20	78	35	49	35
Clay	50	20	65	50	65
Composition:					
Quartz	10	50	10	25	16
Feldspar	–	–	T	T	T
Mica	–	5	2	–	2
Heavy minerals	–	1	1	–	5
Clay	40	32	65	50	65
Opaques	1	3	5	3	–
Micronodules	–	–	1	–	–
Carbonate unspec	5	8	8	5	T
Foraminifers	30	1	2	T	1
Calc. nannofossils	10	–	5	T	1
Sponge spicules	–	–	1	–	T
Plant debris	–	–	–	2	–
Altered minerals	4	–	–	15	

CARBONATE BOMB DATA:
*1, 19–21 cm = 0%

SITE 621 HOLE CORE 2H CORED INTERVAL 2488.5–2498.1 mbsl; 3.5–13.1 mbsf



LITHOLOGIC DESCRIPTION

MUD/CLAYEY MUD.

Section 1 is dark olive gray (5Y 3/2) with black (5Y 2/1) reduction zones and organic-rich zones.

Section 2 and 4 are very dark gray (5Y 3/1) with very deformed dark gray (5Y 4/1) and black (5Y 2/1) MUD color bands.

Section 3 is black (5Y 2/1) and dark olive gray (5Y 3/2) mottled MUD.

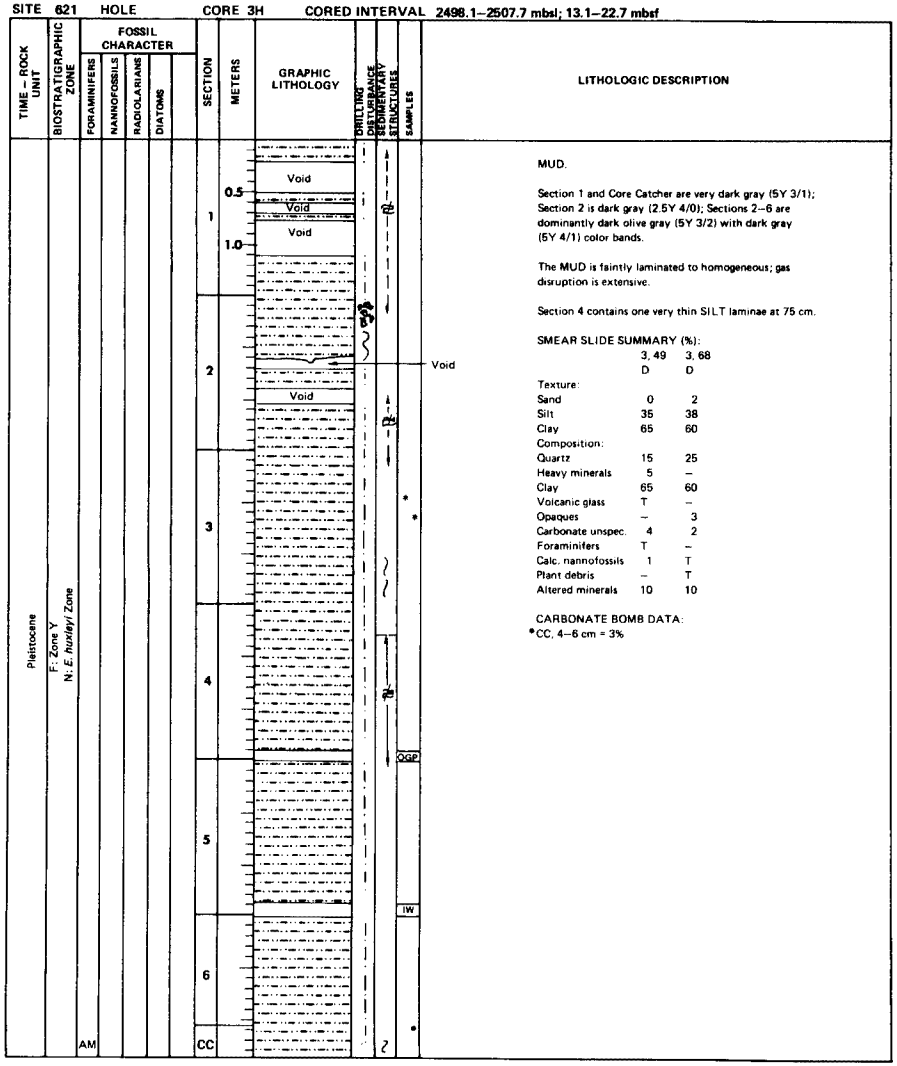
Section 5, 6, and Core Catcher contain very dark grayish brown (10YR 3/2) and black (5Y 2/2), extensively mottled, color-banded MUD.

SMEAR SLIDE SUMMARY (%):

	4, 60 D
Texture:	
Sand	1
Silt	25
Clay	74
Composition:	
Quartz	20
Feldspar	T
Heavy minerals	2
Clay	74
Volcanic glass	T
Carbonate unspec.	T
Foraminifers	1
Calc. nannofossils	T
Sponge spicules	T
Plant debris	2
Altered minerals	1

CARBONATE BOMB DATA:
*CC, 11–13 cm = 2%

SITE 621 HOLE CORE 3H CORED INTERVAL 2498.1–2507.7 mbsl; 13.1–22.7 mbsf



MUD.

Section 1 and Core Catcher are very dark gray (5Y 3/1); Section 2 is dark gray (2.5Y 4/0); Sections 2–6 are dominantly dark olive gray (5Y 3/2) with dark gray (5Y 4/1) color bands.

The MUD is faintly laminated to homogeneous; gas disruption is extensive.

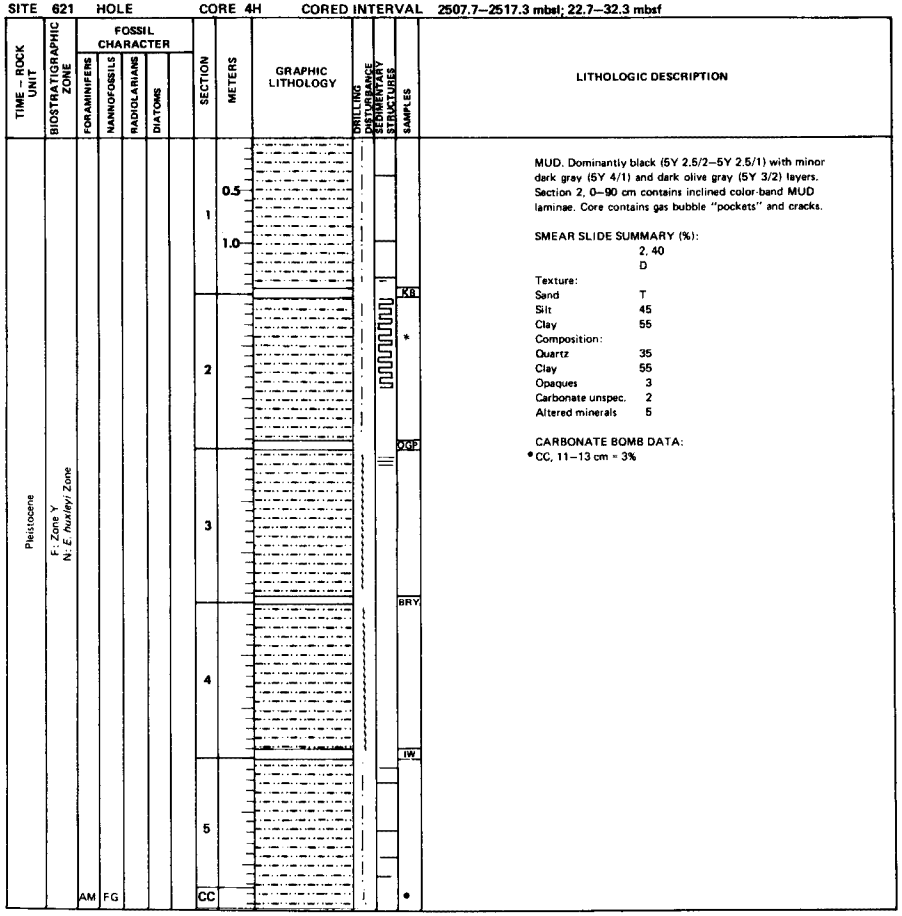
Section 4 contains one very thin SILT laminae at 75 cm.

SMEAR SLIDE SUMMARY (%):

	3, 49 D	3, 68 D
Texture:		
Sand	0	2
Silt	35	38
Clay	65	60
Composition:		
Quartz	15	25
Heavy minerals	5	–
Clay	65	60
Volcanic glass	T	–
Opaques	–	3
Carbonate unspec.	4	2
Foraminifers	T	–
Calc. nannofossils	1	T
Plant debris	–	T
Altered minerals	10	10

CARBONATE BOMB DATA:
•CC, 4–6 cm = 3%

SITE 621 HOLE CORE 4H CORED INTERVAL 2507.7–2517.3 mbsl; 22.7–32.3 mbsf



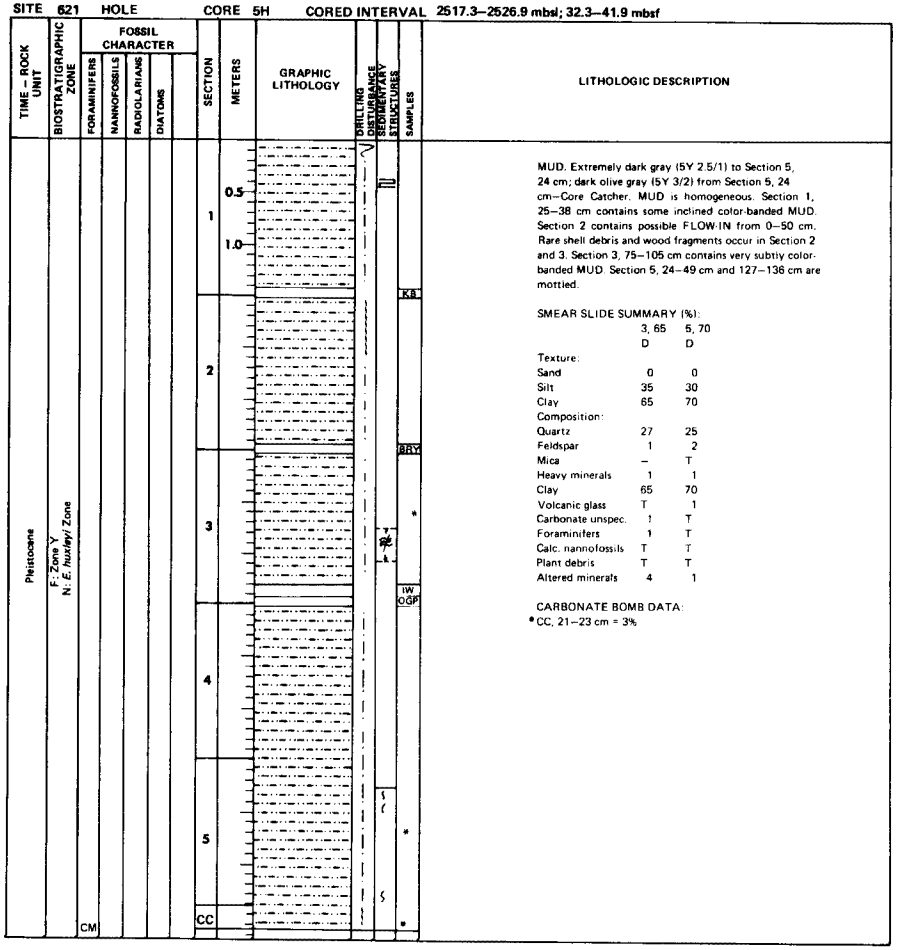
MUD. Dominantly black (5Y 2.5/2–5Y 2.5/1) with minor dark gray (5Y 4/1) and dark olive gray (5Y 3/2) layers. Section 2, 0–90 cm contains inclined color-band MUD laminae. Core contains gas bubble "pockets" and cracks.

SMEAR SLIDE SUMMARY (%):

	2, 40 D
Texture:	
Sand	T
Silt	45
Clay	55
Composition:	
Quartz	35
Clay	55
Opaques	3
Carbonate unspec.	2
Altered minerals	5

CARBONATE BOMB DATA:
•CC, 11–13 cm = 3%

SITE 621 HOLE CORE 5H CORED INTERVAL 2517.3–2526.9 mbsl; 32.3–41.9 mbsf



LITHOLOGIC DESCRIPTION

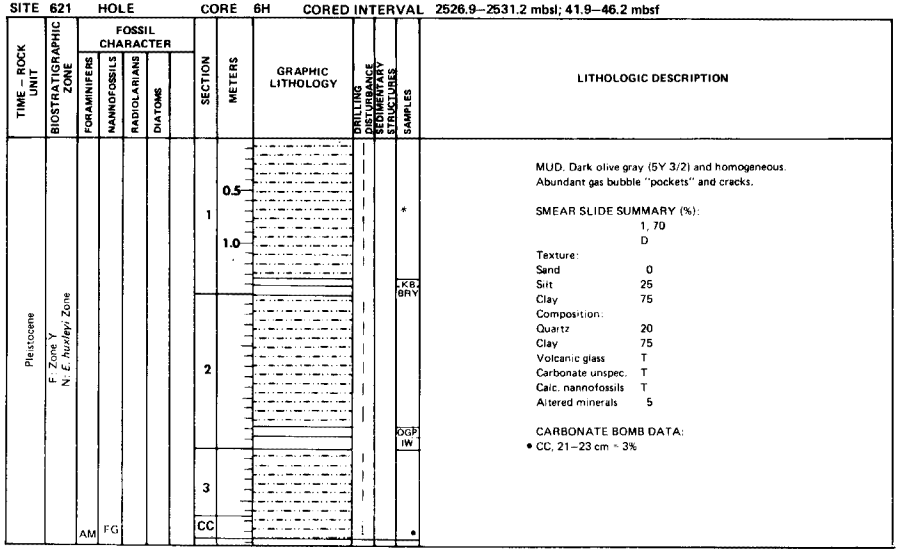
MUD. Extremely dark gray (5Y 2.5/1) to Section 5, 24 cm; dark olive gray (5Y 3/2) from Section 5, 24 cm–Core Catcher. MUD is homogeneous. Section 1, 25–38 cm contains some inclined color-banded MUD. Section 2 contains possible FLOW-IN from 0–50 cm. Rare shell debris and wood fragments occur in Section 2 and 3. Section 3, 75–105 cm contains very subtly color-banded MUD. Section 5, 24–49 cm and 127–136 cm are mottled.

SMEAR SLIDE SUMMARY (%):

	3, 65 D	5, 70 D
Texture:		
Sand	0	0
Silt	35	30
Clay	65	70
Composition:		
Quartz	27	25
Feldspar	1	2
Mica	–	T
Heavy minerals	1	1
Clay	65	70
Volcanic glass	T	1
Carbonate unspec.	?	T
Foraminifers	1	T
Calc. nannofossils	T	T
Plant debris	T	T
Altered minerals	4	1

CARBONATE BOMB DATA:
* CC, 21–23 cm = 3%

SITE 621 HOLE CORE 6H CORED INTERVAL 2526.9–2531.2 mbsl; 41.9–46.2 mbsf



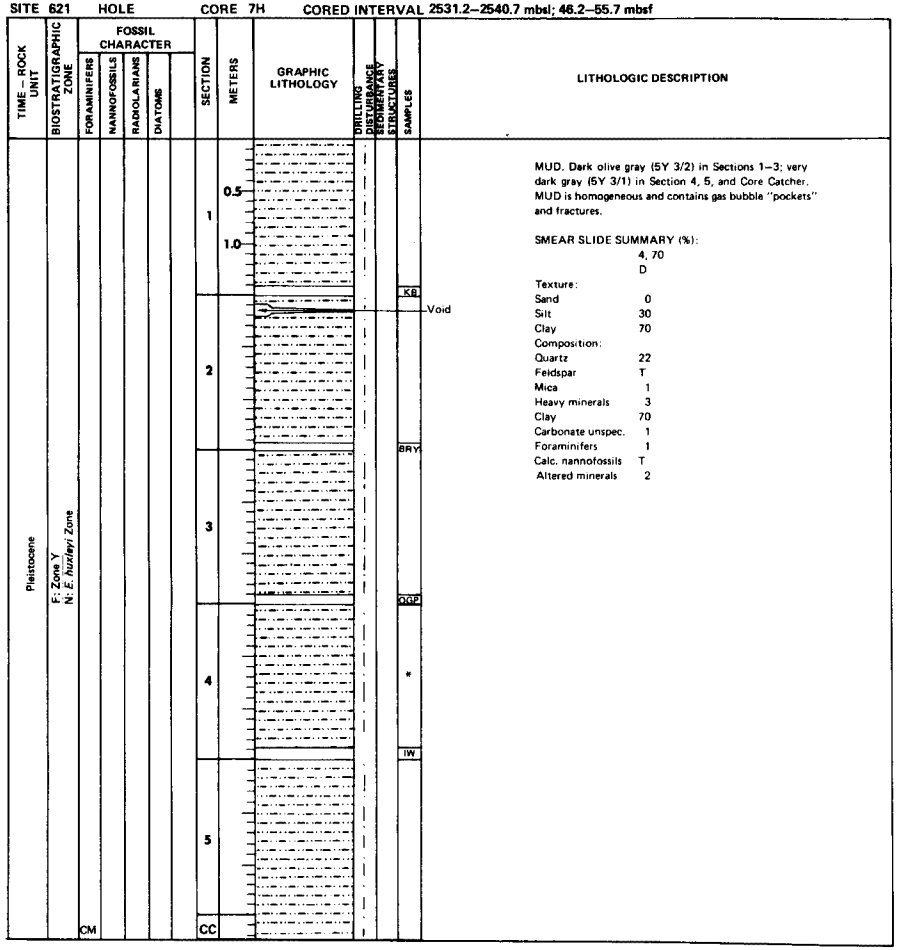
MUD. Dark olive gray (5Y 3/2) and homogeneous. Abundant gas bubble "pockets" and cracks.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	25
Clay	75
Composition:	
Quartz	20
Clay	75
Volcanic glass	T
Carbonate unspec.	T
Calc. nannofossils	T
Altered minerals	5

CARBONATE BOMB DATA:
* CC, 21–23 cm = 3%

SITE 621 HOLE CORE 7H CORED INTERVAL 2531.2–2540.7 mbsl; 46.2–55.7 mbsf



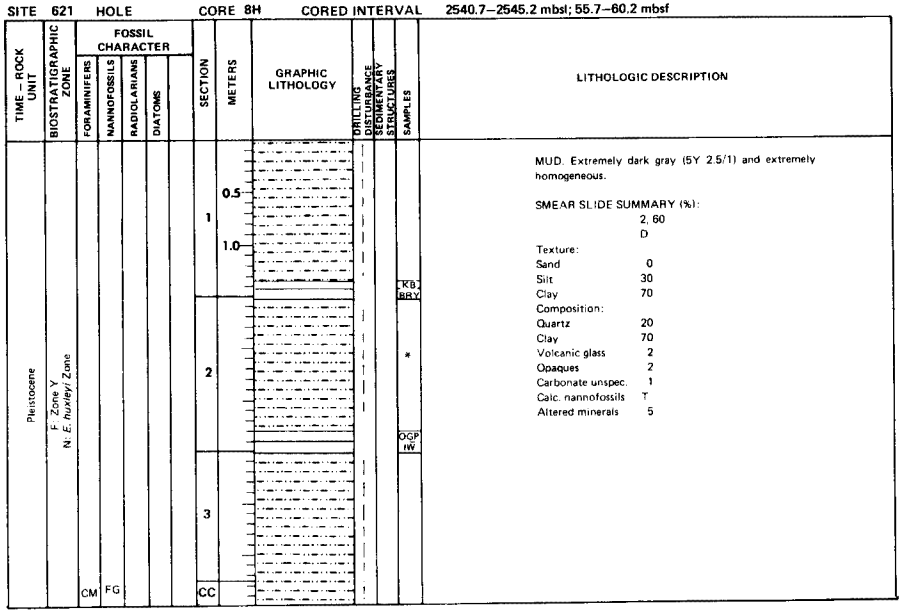
LITHOLOGIC DESCRIPTION

MUD. Dark olive gray (5Y 3/2) in Sections 1–3; very dark gray (5Y 3/1) in Section 4, 5, and Core Catcher. MUD is homogeneous and contains gas bubble "pockets" and fractures.

SMEAR SLIDE SUMMARY (%):

	4, 70 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	22
Feldspar	T
Mica	1
Heavy minerals	3
Clay	70
Carbonate unspec.	1
Foraminifers	1
Calc. nannofossils	T
Altered minerals	2

SITE 621 HOLE CORE 8H CORED INTERVAL 2540.7–2545.2 mbsl; 55.7–60.2 mbsf



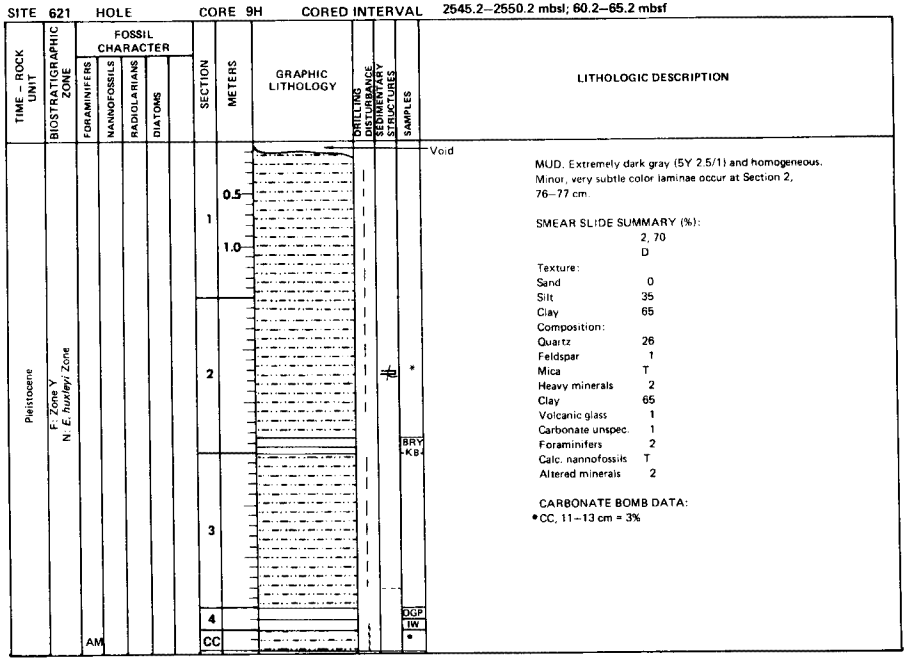
LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1) and extremely homogeneous.

SMEAR SLIDE SUMMARY (%):

	2, 60 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	20
Clay	70
Volcanic glass	2
Opaques	2
Carbonate unspec.	1
Calc. nannofossils	T
Altered minerals	5

SITE 621 HOLE CORE 9H CORED INTERVAL 2545.2–2550.2 mbsl; 60.2–65.2 mbsf



LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1) and homogeneous. Minor, very subtle color laminae occur at Section 2, 76–77 cm.

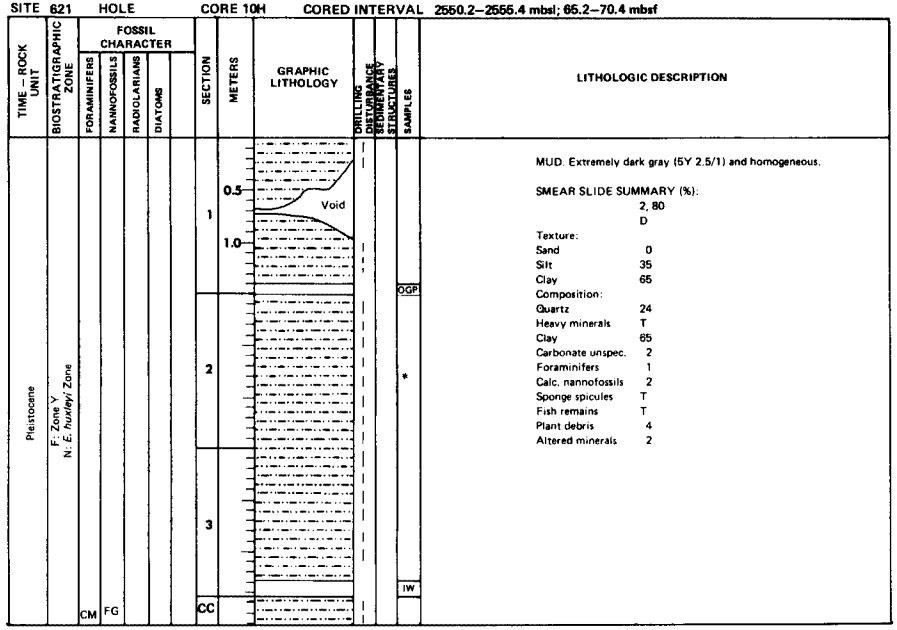
SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	26
Feldspar	1
Mica	T
Heavy minerals	2
Clay	65
Volcanic glass	1
Carbonate unspec.	1
Foraminifers	2
Calc. nannofossils	T
Altered minerals	2

CARBONATE BOMB DATA:

*CC, 11–13 cm = 3%

SITE 621 HOLE CORE 10H CORED INTERVAL 2550.2–2555.4 mbsl; 65.2–70.4 mbsf



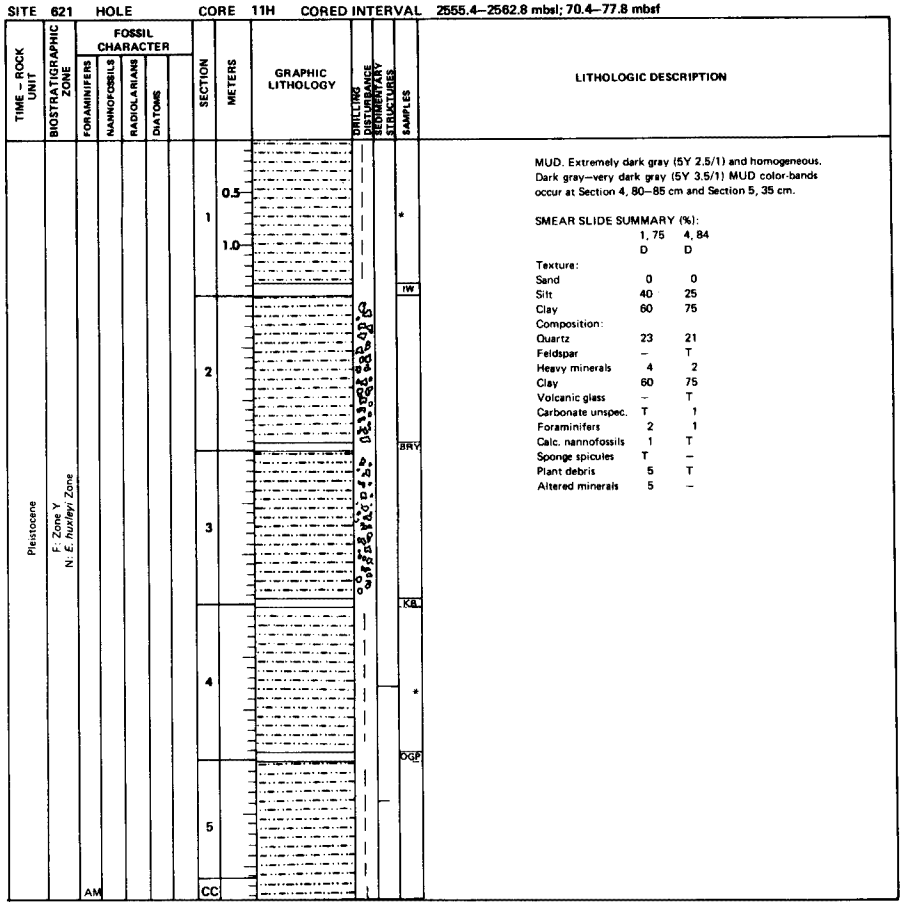
LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1) and homogeneous.

SMEAR SLIDE SUMMARY (%):

	2, 80 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	24
Heavy minerals	T
Clay	65
Carbonate unspec.	2
Foraminifers	1
Calc. nannofossils	2
Sponge spicules	T
Fish remains	T
Plant debris	4
Altered minerals	2

SITE 621 HOLE CORE 11H CORED INTERVAL 2555.4–2562.8 mbsl; 70.4–77.8 mbsf



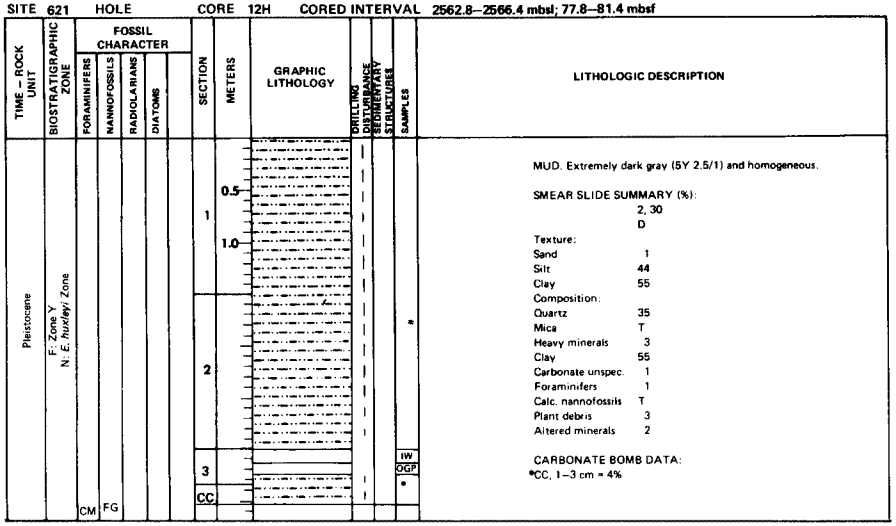
LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1) and homogeneous. Dark gray–very dark gray (5Y 3.5/1) MUD color-bands occur at Section 4, 80–85 cm and Section 5, 35 cm.

SMEAR SLIDE SUMMARY (%):

	1, 75 D	4, 84 D
Texture:		
Sand	0	0
Silt	40	25
Clay	60	75
Composition:		
Quartz	23	21
Feldspar	–	T
Heavy minerals	4	2
Clay	60	75
Volcanic glass	–	T
Carbonate unspec.	T	1
Foraminifers	2	1
Calc. nannofossils	1	T
Sponge spicules	T	–
Plant debris	5	T
Altered minerals	5	–

SITE 621 HOLE CORE 12H CORED INTERVAL 2562.8–2566.4 mbsl; 77.8–81.4 mbsf



LITHOLOGIC DESCRIPTION

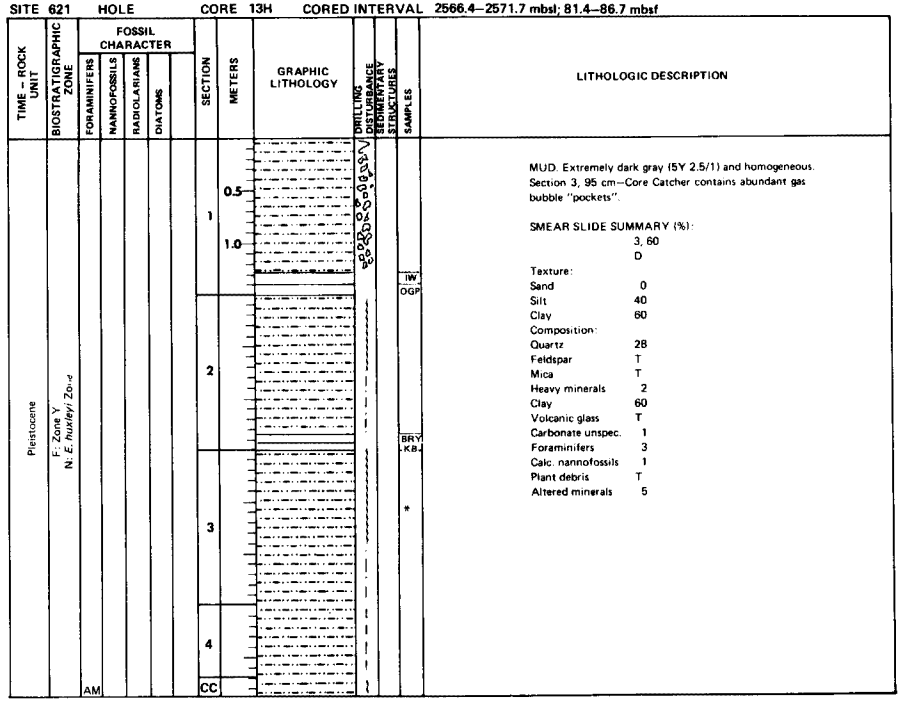
MUD. Extremely dark gray (5Y 2.5/1) and homogeneous.

SMEAR SLIDE SUMMARY (%):

	2, 30 D
Texture:	
Sand	1
Silt	44
Clay	55
Composition:	
Quartz	35
Mica	T
Heavy minerals	3
Clay	55
Carbonate unspec.	1
Foraminifers	1
Calc. nannofossils	T
Plant debris	3
Altered minerals	2

CARBONATE BOMB DATA:
*CC, 1–3 cm = 4%

SITE 621 HOLE CORE 13H CORED INTERVAL 2566.4–2571.7 mbsl; 81.4–86.7 mbsf



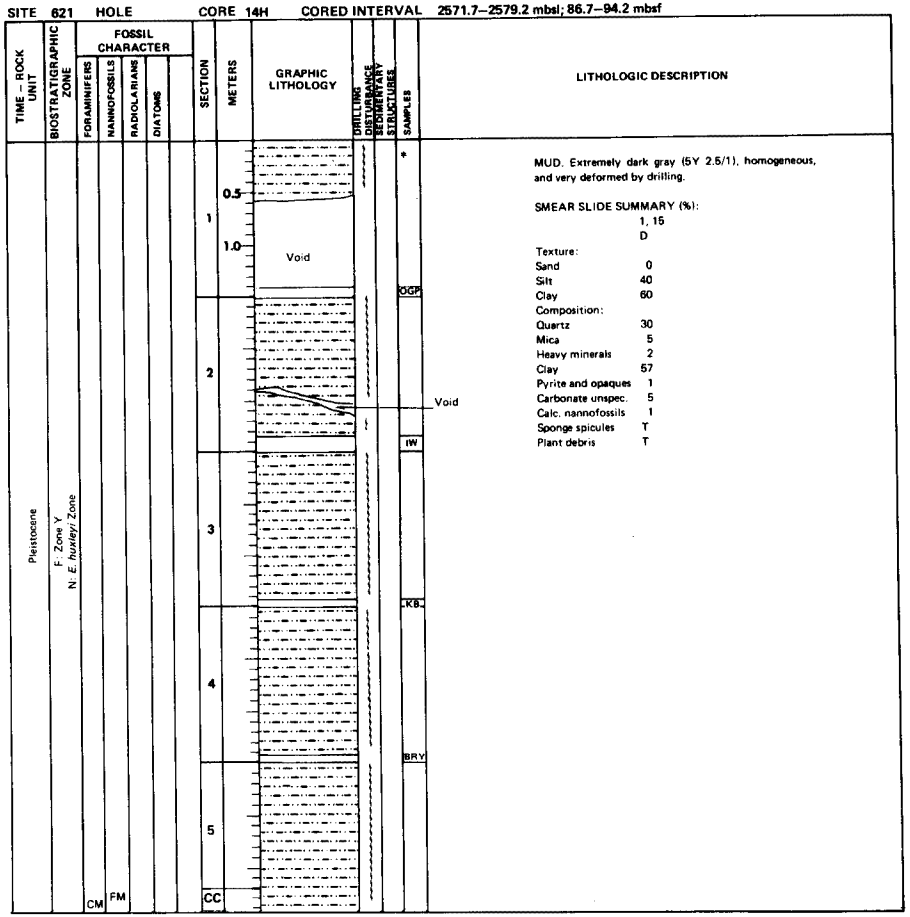
LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1) and homogeneous. Section 3, 95 cm–Core Catcher contains abundant gas bubble "pockets".

SMEAR SLIDE SUMMARY (%):

	3, 60 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	28
Feldspar	T
Mica	T
Heavy minerals	2
Clay	60
Volcanic glass	T
Carbonate unspec.	1
Foraminifers	3
Calc. nannofossils	1
Plant debris	T
Altered minerals	5

SITE 621 HOLE CORE 14H CORED INTERVAL 2571.7–2579.2 mbsl; 86.7–94.2 mbsf



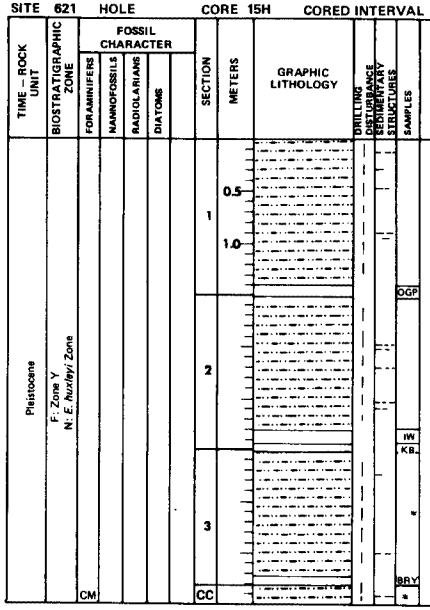
LITHOLOGIC DESCRIPTION

MUD. Extremely dark gray (5Y 2.5/1), homogeneous, and very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 15 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	30
Mica	5
Heavy minerals	2
Clay	57
Pyrite and opaques	1
Carbonate unspec.	5
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

SITE 621 HOLE CORE 15H CORED INTERVAL 2579.2–2584.7 mbsl; 94.2–99.7 mbsf

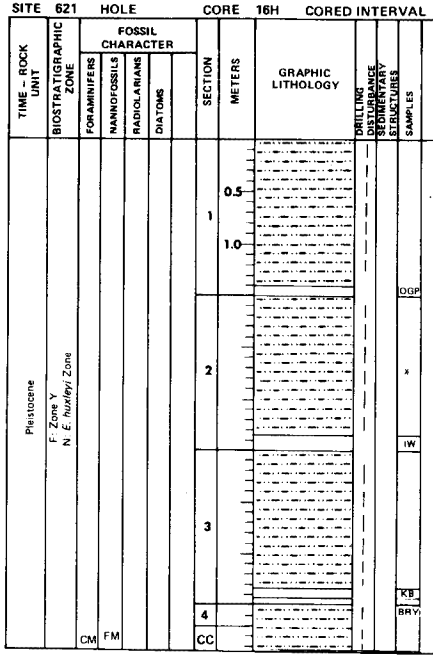


MUD. Extremely dark gray (5Y 2.5/1) and homogeneous with lots of gas bubble "pockets" and cracks. Core has subtle, minor color-banding; locations of color bands shown in "Sedimentary Structures" column.

SMEAR SLIDE SUMMARY (%):

	CC, 14 D	3, 60 D
Texture:		
Sand	0	1
Silt	50	40
Clay	50	59
Composition:		
Quartz	40	35
Feldspar	3	3
Mica	2	3
Heavy minerals	2	1
Clay	45	53
Opaques	1	2
Carbonate unspec.	3	2
Plant debris	3	1

SITE 621 HOLE CORE 16H CORED INTERVAL 2584.7–2589.7 mbsl; 99.7–104.7 mbsf



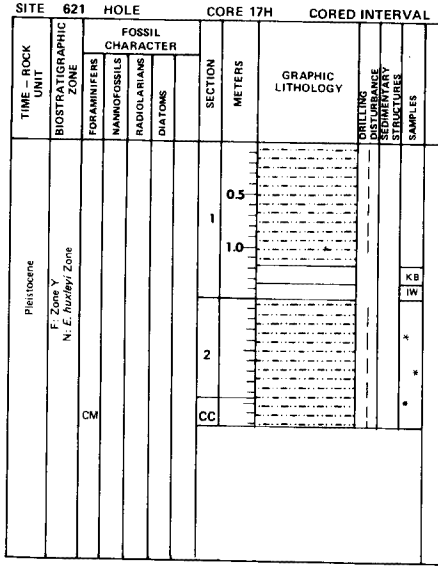
MUD. Very dark gray (5Y 3/1) and homogeneous. Entire core contains tiny gas cavities. Section 2 has rare dispersed coarse silt blebs and very fine sand grains.

Very faint laminae and layers > 1 cm thick are visible in slab cut at Section 1, 88–116 cm. These are not observable in the archive core half.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	T
Silt	40
Clay	60
Composition:	
Quartz	28
Mica	3
Heavy minerals	T
Clay	59
Pyrite and opaques	2
Micronodules	T
Carbonate unspec.	5
Calc. nannofossils	2
Plant debris	1

SITE 621 HOLE CORE 17H CORED INTERVAL 2589.7–2599.2 mbsl; 104.7–114.2 mbsf



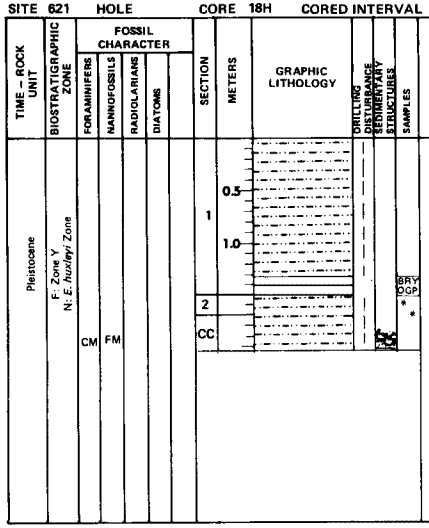
MUD. Section 1 is very dark gray (2.5Y 3/0); Section 2 is dark olive gray (5Y 3/2); Core Catcher is dark olive gray (5Y 2.5/2). MUD is homogeneous with some gas bubble "pockets" and cracks.

SMEAR SLIDE SUMMARY (%):

	2, 30 D	2, 70 D
Texture:		
Sand	0	1
Silt	30	49
Clay	70	50
Composition:		
Quartz	35	40
Feldspar	3	–
Mica	2	3
Heavy minerals	T	1
Clay	55	46
Opaques	1	3
Carbonate unspec.	3	5
Foraminifers	T	–
Calc. nannofossils	1	–
Plant debris	T	2

CARBONATE BOMB DATA:
* CC, 1–3 cm = 4%

SITE 621 HOLE CORE 18H CORED INTERVAL 2599.2–2602.2 mbsl; 114.2–117.2 mbsf



LITHOLOGIC DESCRIPTION

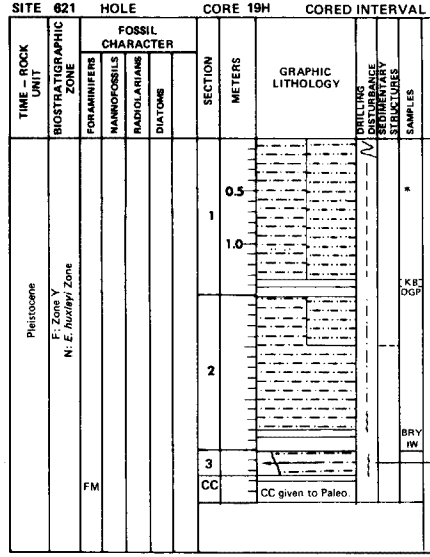
MUD. Very dark olive gray (5Y 2.5/2) and homogeneous with gas bubble "pockets" and cracks.

Core Catcher contains three graded, laminated SILT beds at Core Catcher, 18–19 cm, 21–24 cm, and 24–32 cm.

SMEAR SLIDE SUMMARY (%):

	2, 10 D	CC, 2 M
Texture:		
Sand	1	25
Silt	45	65
Clay	54	10
Composition:		
Quartz	30	50
Feldspar	–	5
Mica	3	1
Heavy minerals	2	4
Clay	55	10
Pyrite and opaques	1	3
Micronodules	T	–
Carbonate unspec.	7	27
Calc. nannofossils	T	–
Plant debris	2	T

SITE 621 HOLE CORE 19H CORED INTERVAL 2608.7–2612.7 mbsl; 123.7–127.7 mbsf



LITHOLOGIC DESCRIPTION

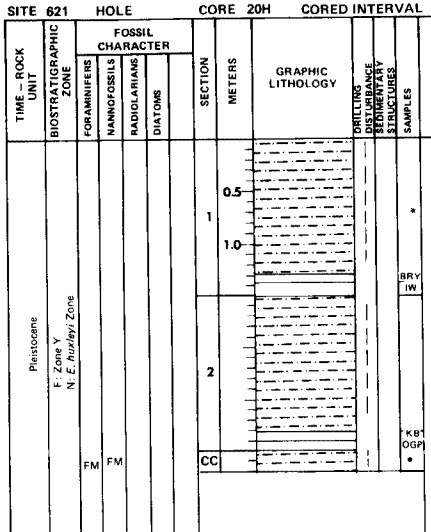
Section 1, 0 cm–Section 2, 44 cm: MUD. Very dark gray (5Y 3/1). Section 2, 0–44 cm contains some SILT blebs and laminae and some color banding.

Section 2, 44 cm–Section 3: SILTY MUD. Very dark gray (5Y 3/1).

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	3
Silt	60
Clay	37
Composition:	
Quartz	50
Feldspar	6
Mica	3
Heavy minerals	1
Clay	32
Opaques	2
Carbonate unspec.	4
Foraminifers	1
Calc. nannofossils	T
Radiolarians	1
Plant debris	T

SITE 621 HOLE CORE 20H CORED INTERVAL 2612.7–2615.9 mbsl; 127.7–130.9 mbsf



LITHOLOGIC DESCRIPTION

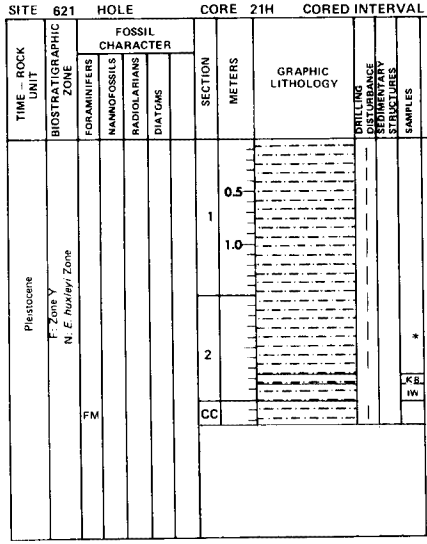
SILTY MUD. Very dark gray (5Y 3/1). Silty mud contains SILT blebs and dispersed very fine- to fine-grained SAND grains and tiny, disseminated lignite. No laminae or layers visible.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	10
Silt	50
Clay	40
Composition:	
Quartz	37
Feldspar	4
Mica	3
Heavy minerals	1
Clay	40
Pyrite and opaques	1
Micronodules	T
Carbonate unspec.	10
Calc. nannofossils	T
Sponge spicules	T
Plant debris	4

CARBONATE BOMB DATA:
•CC, 1–3 cm = 3%

SITE 621 HOLE CORE 21H CORED INTERVAL 2615.9–2618.7 mbsl; 130.9–133.7 mbsf



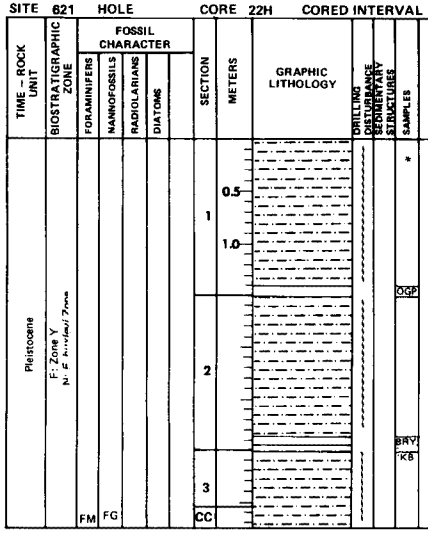
LITHOLOGIC DESCRIPTION

SILTY MUD. Very dark gray (5Y 3/1), with very subtle color variations at Section 1, 100–105 cm. Subtle changes in percentage of coarse grains; slightly coarser-grained intervals occur at Section 1, 30–34, 58–60, 105–113, and 135–140 cm; and Section 2, 0–50 cm. Wood and lignite fragments are common.

SMEAR SLIDE SUMMARY (%):

	2, 45 D
Texture:	
Sand	5
Silt	45
Clay	50
Composition:	
Quartz	35
Feldspar	6
Mica	5
Heavy minerals	2
Clay	44
Opaques	2
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	T
Plant debris	1

SITE 621 HOLE CORE 22H CORED INTERVAL 2618.7–2622.5 mbsl; 133.7–137.5 mbsf



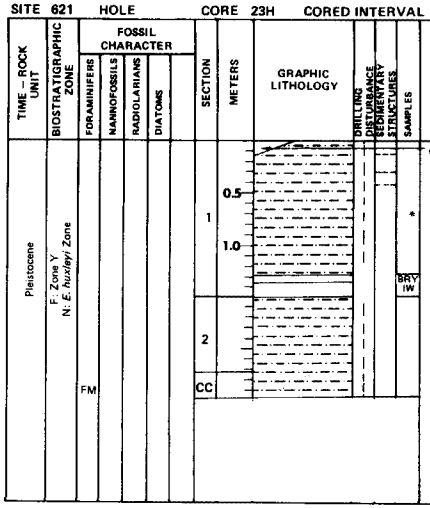
LITHOLOGIC DESCRIPTION

SILTY MUD. Very dark gray (5Y 3/1), homogeneous, and very deformed by drilling. Areas of less coarse sediment (i. e. MUD) occur at Section 1, 27–43, 81–83, and 110 cm; Section 2, 90, 115–134 cm; and Section 3 10 and 15 cm.

SMEAR SLIDE SUMMARY (%):

	1, 20 D
Texture:	
Sand	5
Silt	50
Clay	45
Composition:	
Quartz	30
Feldspar	2
Mica	5
Heavy minerals	2
Clay	45
Pyrite and opaques	3
Carbonate unspec.	12
Foraminifers	T
Calc. nannofossils	T
Plant debris	1

SITE 621 HOLE CORE 23H CORED INTERVAL 2622.5–2625.0 mbsl; 137.5–140.0 mbsf



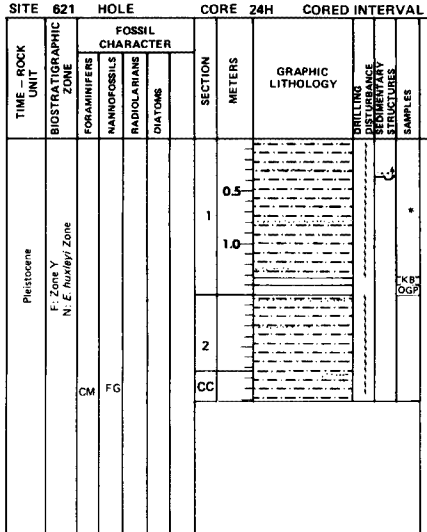
LITHOLOGIC DESCRIPTION

SILTY MUD. Very dark gray (5Y 3/1) with minor SILT blebs and common gas bubble "pockets" and cracks. Common wood and lignite. Section 1, 0–40 cm contains grain-size variations: Section 1, 7–14 and 29–38 cm contain fewer coarse grains.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	2
Silt	50
Clay	48
Composition:	
Quartz	40
Feldspar	5
Mica	3
Heavy minerals	2
Clay	46
Opaques	2
Micronodules	T
Zeolite	1
Plant debris	1

SITE 621 HOLE CORE 24H CORED INTERVAL 2632.1–2634.6 mbsl; 147.1–149.6 mbsf



LITHOLOGIC DESCRIPTION

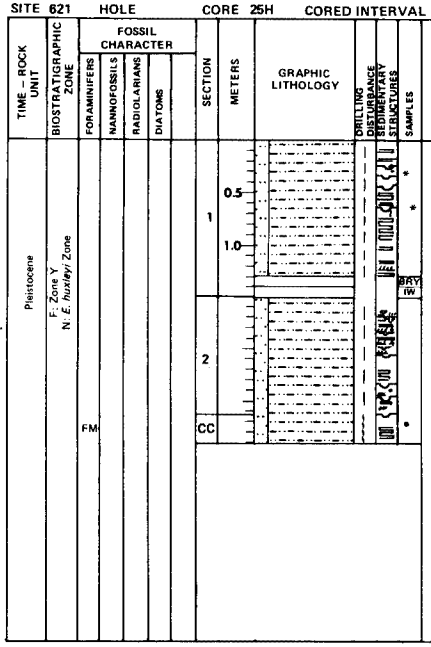
SILTY MUD with minor, thin SAND laminae.

MUD is very dark gray (5Y 3/1) and very deformed by both drilling and gas disruption. Thin, very fine- to fine-grained SAND laminae and layers occur at Section 1, 30–31, 78–80, and 127 cm; Section 2, 5 and 27–31 cm; and Core Catcher, 1 cm. Core contains common lignite fragments up to 2 mm in diameter.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	8
Silt	50
Clay	42
Composition:	
Quartz	35
Mica	5
Heavy minerals	3
Clay	40
Pyrite and opaques	1
Micronodules	T
Carbonate unspec.	15
Calc. nannofossils	T
Plant debris	1

SITE 621 HOLE CORE 25H CORED INTERVAL 2641.7–2644.7 mbsl; 156.7–159.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae.

MUD is dominantly very dark gray (10YR 3/1) with minor dark reddish gray (10R 3/1) color-banded.

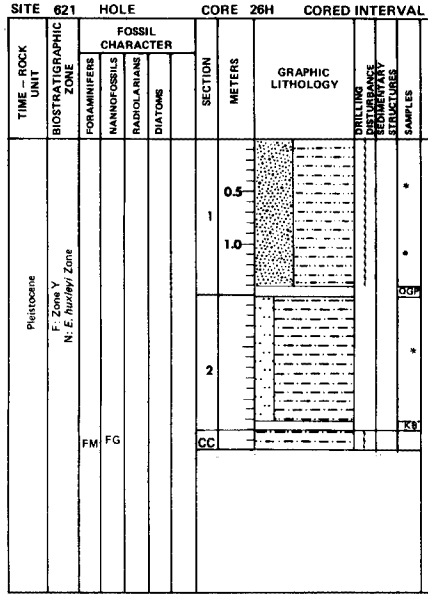
SILT laminae are gray (10YR 5/1). Many are graded, have scoured bases, lenticular bedding, and/or micro-cross-laminations. Many SILT laminae include granules of iron sulphide.

SMEAR SLIDE SUMMARY (%):

	1, 35 M	1, 68 D
Texture:		
Sand	2	0
Silt	88	45
Clay	10	55
Composition:		
Quartz	73	30
Feldspar	T	–
Mica	1	1
Heavy minerals	5	3
Clay	10	55
Volcanic glass	–	T
Carbonate unspec.	T	1
Foraminifers	1	3
Calc. nannofossils	T	T
Plant debris	–	3
Altered minerals	10	4

CARBONATE BOMB DATA:
*CC, 14–16 cm = 5%

SITE 621 HOLE CORE 26H CORED INTERVAL 2651.3–2654.3 mbsl; 166.3–169.3 mbsf



LITHOLOGIC DESCRIPTION

Section 1: MUD with SANDY SILT zones. MUD is very dark gray (10YR 3/1). Oxidized, very dark grayish brown (10YR 3/2) MUD intervals occur at Section 1, 100–110 and 115–120 cm. SANDY SILT "layers" are very dark gray (5Y 3/1), inclined, and deformed.

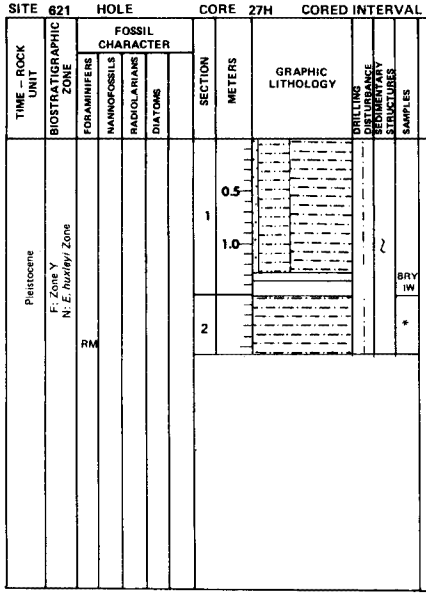
Section 2 and Core Catcher: SILTY MUD with SILT laminae. SILTY MUD is very dark gray (5Y 3/1–5Y 3/1.5). SILT laminae are dark gray to very dark gray (5Y 4/1–5Y 3/1), deformed, and inclined. Rare SAND blebs.

SMEAR SLIDE SUMMARY (%):

	1, 48 M	2, 58 D
Texture:		
Sand	40	3
Silt	50	47
Clay	10	50
Composition:		
Quartz	70	30
Feldspar	1	–
Heavy minerals	5	–
Clay	10	50
Opaques	–	5
Carbonate unspec.	–	7
Altered minerals	14	7

CARBONATE BOMB DATA:
*1, 112–114 cm = 0%

SITE 621 HOLE CORE 27H CORED INTERVAL 2660.9–2663.0 mbsl; 175.9–178.0 mbsf



LITHOLOGIC DESCRIPTION

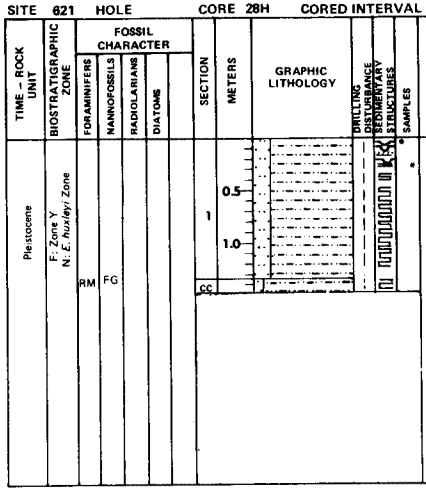
Section 1: MUD with interbedded MUDDY SAND beds and SILT laminae and blebs. MUD is very dark gray (5Y 3/1); MUDDY SAND is very dark gray (5Y 3/1); SILT is very dark gray to olive gray (5Y 3/1–5Y 4/2). MUDDY SAND beds and SILT laminae are inclined and contorted.

Section 2: MUDDY SAND/SANDY MUD. Very dark gray (5Y 3/1) and very dark grayish brown (10YR 3/2). Minor beds of deformed MUD or SILTY MUD at Section 2, 10–16 cm.

SMEAR SLIDE SUMMARY (%):

	2, 30 D
Texture:	
Sand	25
Silt	30
Clay	45
Composition:	
Quartz	40
Feldspar	T
Mica	1
Heavy minerals	3
Clay	45
Carbonate unspec.	T
Calc. nannofossils	1
Plant debris	3
Altered minerals	7

SITE 621 HOLE CORE 28H CORED INTERVAL 2670.5–2672.0 mbsl; 185.5–187.0 mbsf



LITHOLOGIC DESCRIPTION

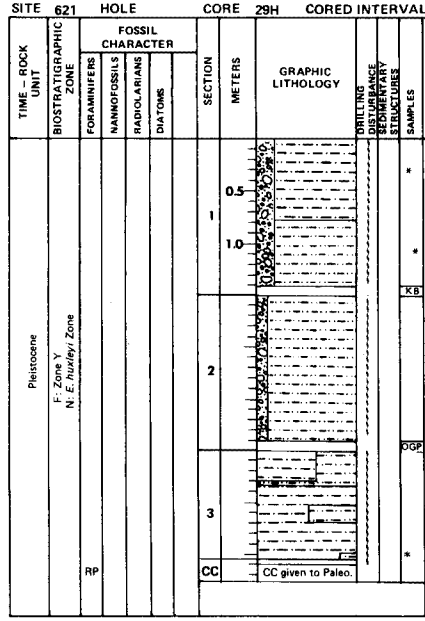
Interlaminated SILT and MUD. Dominant color is dark gray (5Y 4/1). Section 1, 50–120 cm is very finely-laminated.

SMEAR SLIDE SUMMARY (%):

	1, 29 D
Texture:	
Sand	T
Silt	35
Clay	65
Composition:	
Quartz	20
Clay	65
Volcanic glass	T
Opaques	2
Carbonate unspec.	5
Calc. nannofossils	T
Altered minerals	8

CARBONATE BOMB DATA:
*1, 4–6 cm = 3%

SITE 621 HOLE CORE 29H CORED INTERVAL 2680.1–2684.2 mbsl; 195.1–199.2 mbsf



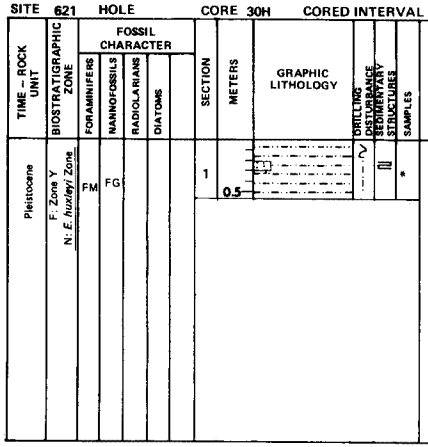
LITHOLOGIC DESCRIPTION

PEBBLY MUD. Dark olive gray (5Y 3/2) with a SANDY MUD matrix from Section 1, 0–77 cm; very dark gray (5Y 3/1–10YR 3/1) with a MUDDY matrix from Section 1, 77 cm to end of core. This is a very disorganized, very deformed, very poorly sorted PEBBLY MUD. Particles range from clay- to pebble-sized (<4 μm–3.4 cm). Gravel-sized fraction makes up 15–20% of the visible cut surface, decreasing downcore. Section 2 and 3 contain common SILTY and SANDY blebs.

SMEAR SLIDE SUMMARY (%):

	1, 30 D	1, 110 D	3, 101 M
Texture:			
Sand	15	T	2
Silt	20	45	24
Clay	65	55	74
Composition:			
Quartz	17	39	20
Feldspar	1	T	–
Mica	1	–	–
Heavy minerals	2	3	–
Clay	65	55	74
Volcanic glass	–	T	–
Opaques	–	–	2
Carbonate unspec.	2	T	2
Foraminifers	1	2	–
Calc. nannofossils	2	T	T
Plant debris	2	–	–
Altered minerals	7	1	2

SITE 621 HOLE CORE 30H CORED INTERVAL 2684.2–2685.2 mbsl; 199.2–200.2 mbsf



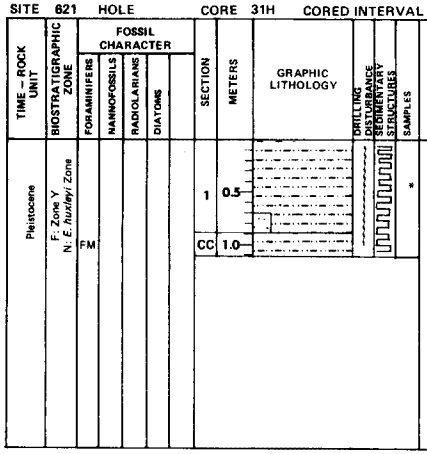
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. Very dark gray (5Y 3/1) and moderately to very deformed by drilling. Common SILT laminae at Section 1, 20–30 cm.

SMEAR SLIDE SUMMARY (%):

	1, 35 M
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	25
Clay	64
Volcanic glass	T
Carbonate unspec.	6
Foraminifers	T
Calc. nannofossils	1
Altered minerals	4

SITE 621 HOLE CORE 31H CORED INTERVAL 2685.2–2686.3 mbsl; 200.2–201.3 mbsf



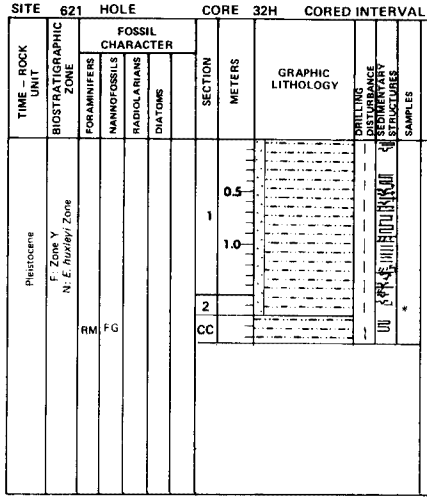
LITHOLOGIC DESCRIPTION

MUD. Dominantly very dark gray (5Y 3/1) laminated with numerous subtle color bands. Whole core is very deformed by drilling. Section 1, 70–87 cm and the Core Catcher contain rare thin SILT laminae. SILT laminae are dark gray (10YR 4/1).

SMEAR SLIDE SUMMARY (%):

	1, 46 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	25
Clay	70
Carbonate unspec.	3
Calc. nannofossils	T
Altered minerals	2

SITE 621 HOLE CORE 32H CORED INTERVAL 2686.3–2688.3 mbsl; 201.3–203.3 mbsf



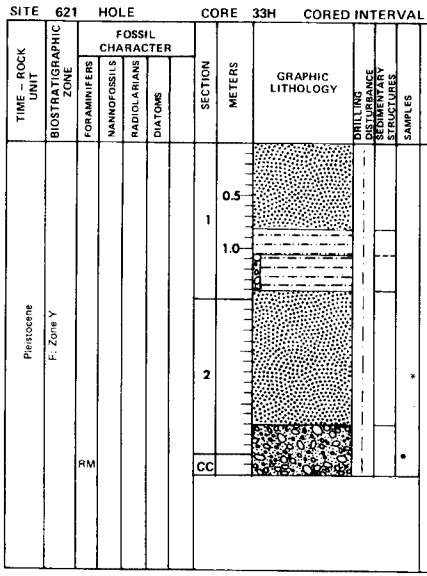
LITHOLOGIC DESCRIPTION

LAMINATED MUD. Dominantly very dark gray (5Y 3/1). Laminae are both color-banded MUD and SILT laminae. Folds are defined by laminae at Section 1, 0–9, 32–40, 60–68, and 100–105 cm.

SMEAR SLIDE SUMMARY (%):

	2, 10 D
Texture:	
Sand	0
Silt	50
Clay	50
Composition:	
Quartz	40
Mica	1
Heavy minerals	2
Clay	50
Volcanic glass	T
Carbonate unspec.	T
Foraminifers	1
Calc. nannofossils	2
Altered minerals	4

SITE 621 HOLE CORE 33H CORED INTERVAL 2696.3–2699.8 mbsl; 211.3–214.8 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–79 cm: SAND. Olive gray (5Y 4/2) and homogeneous.

Section 1, 79–105 cm: MUD with SILT laminae and blebs. Dark gray (5Y 4/1).

Section 1, 105–140 cm: SILTY MUD with minor GRAVEL. Dark olive gray (5Y 3/2).

Section 1, 140 cm–Section 2, 120 cm: SAND. Olive gray (5Y 4/2), structureless, and medium-grained.

Section 2, 120 cm–Core Catcher: GRAVEL, ~ 2 mm through 2.15 cm in diameter. Composed of 45% brown chert, 25% black chert, 5% mudstone, 3% jasper, 15% quartz, 2% shell fragments, and 5% miscellaneous.

SMEAR SLIDE SUMMARY (%):

	2, 75 D
Texture:	
Sand	95
Silt	5
Clay	0

CARBONATE BOMB DATA:

* CC, 3–5 cm = 6%

SITE 622

HOLE 622

Date Occupied: 29 October 1983, 0445 LCT

Date Departed: 30 October 1983, 2345 LCT

Time on Hole: 1 day, 19 hr.

Position (latitude; longitude): 26°41.41'N; 88°22.82'W

Water depth (sea level; corrected m, echo-sounding): 2491

Water depth (rig floor; corrected m, echo-sounding): 2501

Bottom felt (m, drill pipe): 2495

Penetration (m): 208.0

Number of cores: 26

Total length of cored section (m): 132.7

Total core recovered (m): 100.17

Core recovery (%): 75

Oldest sediment cored:

Depth sub-bottom (m): 208.0

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

SITE 622

HOLE 622A

Date Occupied: 31 October 1983, 0130 LCT

Date Departed: 31 October 1983, 0734 LCT

Time on Hole: 0 day, 6 hr.

Position (latitude; longitude): 26°41.41'N; 88°22.82'W

Water depth (sea level; corrected m, echo-sounding): 2491

Water depth (rig floor; corrected m, echo-sounding): 2501

Bottom felt (m, drill pipe): 2495.5

Penetration (m): 5.6

Number of cores: 1

Total length of cored section (m): 5.6

Total core recovered (m): 5.55

Core recovery (%): 99

Oldest sediment cored:

Depth sub-bottom (m): 5.6

Nature: clay

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Site 622 was drilled on the concave side of a sinuous bend in the middle fan channel. Good core recovery was obtained with the Hydraulic Piston Corer to a depth of approximately 160 m and partial recovery thereafter to a total depth of 199.5 m sub-bottom. Gamma and sonic well logs were obtained to a depth of 208.0 m.

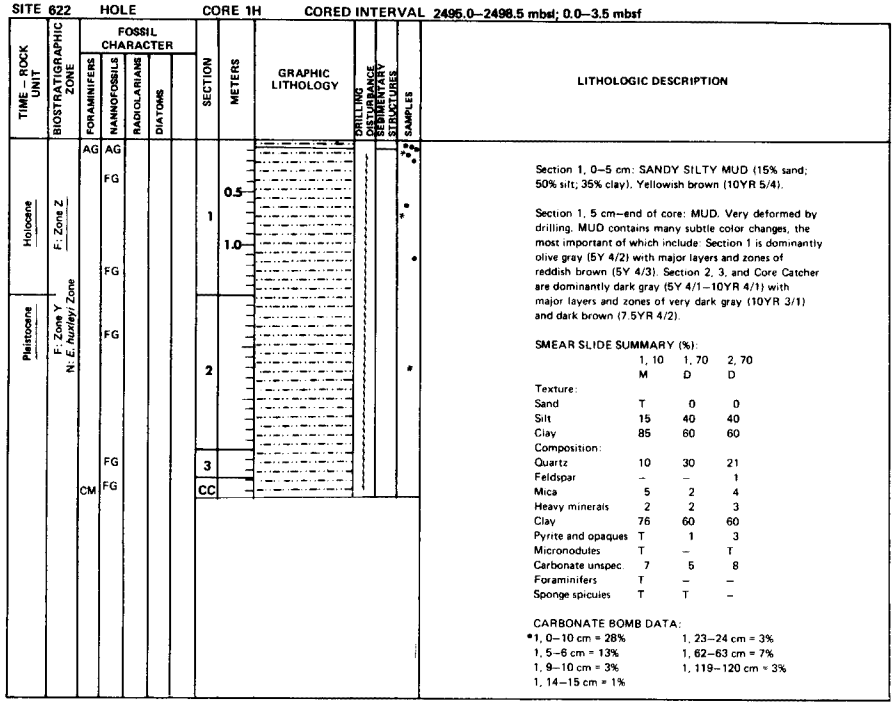
The principal findings at this site were:

1) The channel fill on the concave side of the channel contains a much thicker section of sandy sediments in the basal part of the cored hole than the section at Site 621 on the thalweg of the channel. The pebbly mud unit is at approximately the same elevation in both channel sites (621 and 622) and from the well log interpretation, is underlain by coarser-grained sand deposits.

2) The vertical sequences at the two channel sites combined with the interpretations from seismic data tend to indicate that channel migration and aggradation was an active process during the development of the channel.

3) Accumulation rates are extremely high; 10.98 m/1000 yr. for the late Wisconsin glacial (Ericson Zone Y) and 29.0 cm/1000 yr. for the Holocene (Ericson Zone Z).

SITE 622 HOLE CORE 1H CORED INTERVAL 2495.0–2498.5 mbsl; 0.0–3.5 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–5 cm: SANDY SILTY MUD (15% sand; 50% silt; 35% clay). Yellowish brown (10YR 5/4).

Section 1, 5 cm–end of core: MUD. Very deformed by drilling. MUD contains many subtle color changes, the most important of which include: Section 1 is dominantly olive gray (5Y 4/2) with major layers and zones of reddish brown (5Y 4/3). Section 2, 3, and Core Catcher are dominantly dark gray (5Y 4/1–10YR 4/1) with major layers and zones of very dark gray (10YR 3/1) and dark brown (7.5YR 4/2).

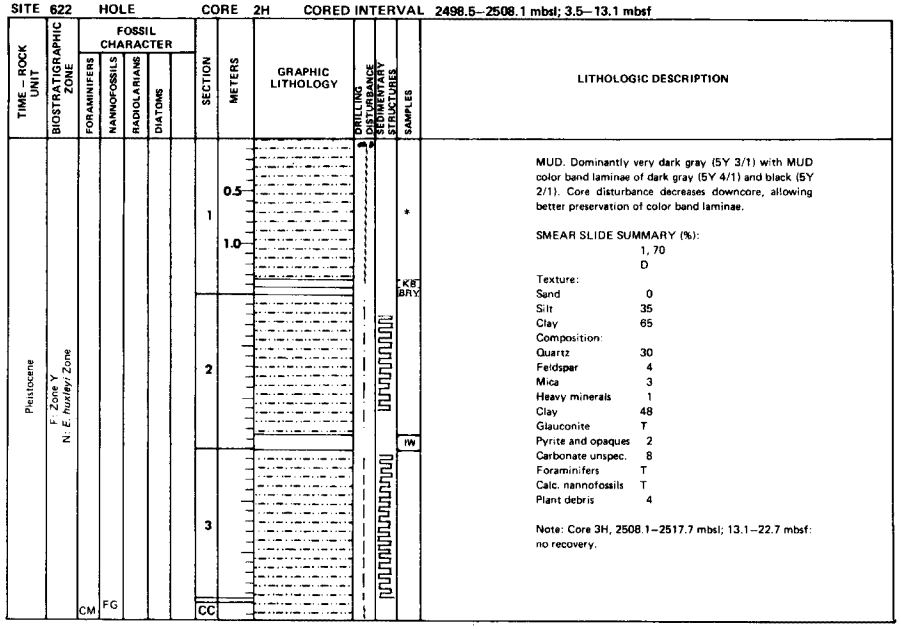
SMEAR SLIDE SUMMARY (%):

	1, 10 M	1, 70 D	2, 70 D
Texture:			
Sand	T	0	0
Silt	15	40	40
Clay	85	60	60
Composition:			
Quartz	10	30	21
Feldspar	–	–	1
Mica	5	2	4
Heavy minerals	2	2	3
Clay	76	60	60
Pyrite and opaques	T	1	3
Micronodules	T	–	T
Carbonate unspec.	7	5	8
Foraminifers	T	–	–
Sponge spicules	T	T	–

CARBONATE BOMB DATA:

•1, 0–10 cm = 28%
1, 5–6 cm = 13%
1, 9–10 cm = 3%
1, 14–15 cm = 1%
1, 23–24 cm = 3%
1, 62–63 cm = 7%
1, 119–120 cm = 3%

SITE 622 HOLE CORE 2H CORED INTERVAL 2498.5–2508.1 mbsl; 3.5–13.1 mbsf



LITHOLOGIC DESCRIPTION

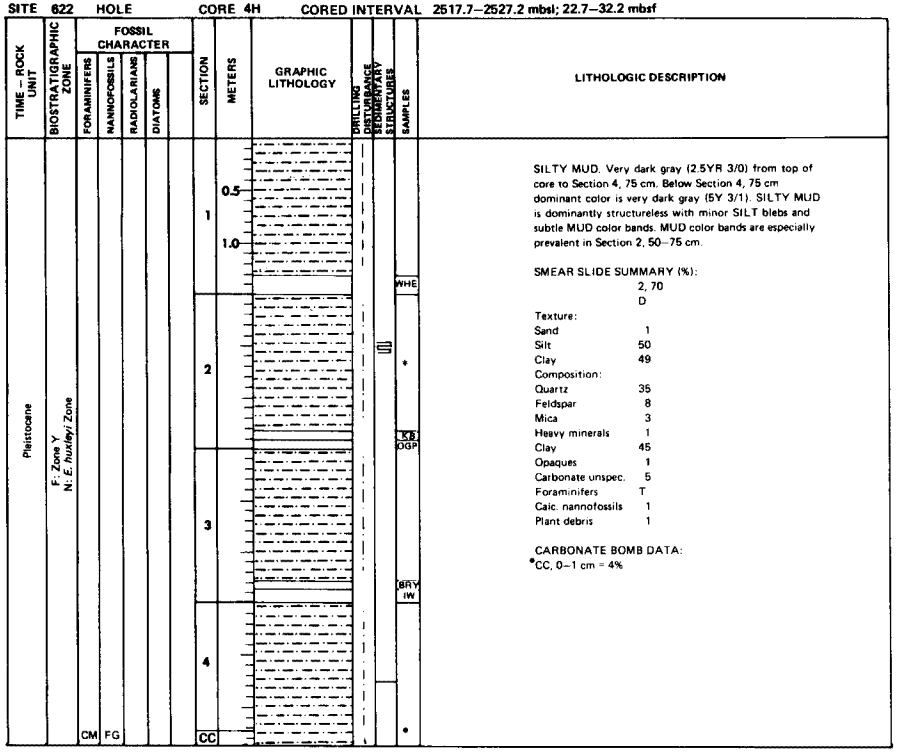
MUD. Dominantly very dark gray (5Y 3/1) with MUD color band laminae of dark gray (5Y 4/1) and black (5Y 2/1). Core disturbance decreases downcore, allowing better preservation of color band laminae.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	30
Feldspar	4
Mica	3
Heavy minerals	1
Clay	48
Glauconite	T
Pyrite and opaques	2
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	4

Note: Core 3H, 2508.1–2517.7 mbsl; 13.1–22.7 mbsf: no recovery.

SITE 622 HOLE CORE 4H CORED INTERVAL 2517.7–2527.2 mbsl; 22.7–32.2 mbsf



LITHOLOGIC DESCRIPTION

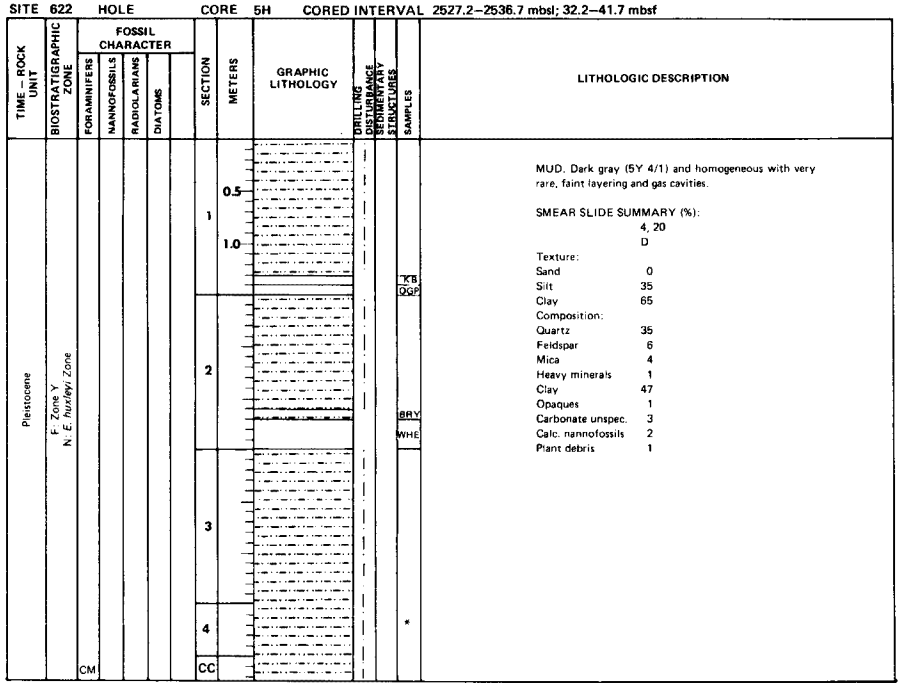
SILTY MUD. Very dark gray (2.5YR 3/0) from top of core to Section 4, 75 cm. Below Section 4, 75 cm dominant color is very dark gray (5Y 3/1). SILTY MUD is dominantly structureless with minor SILT blebs and subtle MUD color bands. MUD color bands are especially prevalent in Section 2, 50–75 cm.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	1
Silt	50
Clay	49
Composition:	
Quartz	35
Feldspar	8
Mica	3
Heavy minerals	1
Clay	45
Opaques	1
Carbonate unspec.	5
Foraminifers	T
Calc. nannofossils	1
Plant debris	1

CARBONATE BOMB DATA:
*CC, 0–1 cm = 4%

SITE 622 HOLE CORE 5H CORED INTERVAL 2527.2–2536.7 mbsl; 32.2–41.7 mbsf



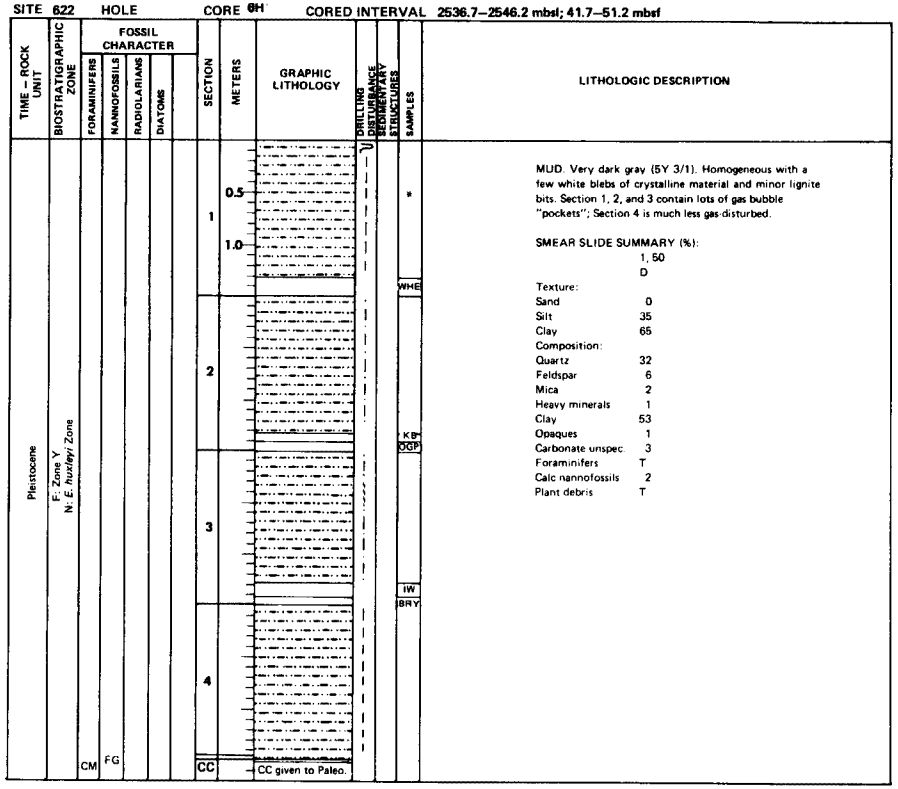
LITHOLOGIC DESCRIPTION

MUD. Dark gray (5Y 4/1) and homogeneous with very rare, faint layering and gas cavities.

SMEAR SLIDE SUMMARY (%):

	4, 20 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	35
Feldspar	6
Mica	4
Heavy minerals	1
Clay	47
Opaques	1
Carbonate unspec.	3
Calc. nannofossils	2
Plant debris	1

SITE 622 HOLE CORE 6H CORED INTERVAL 2536.7–2546.2 mbsl; 41.7–51.2 mbsf

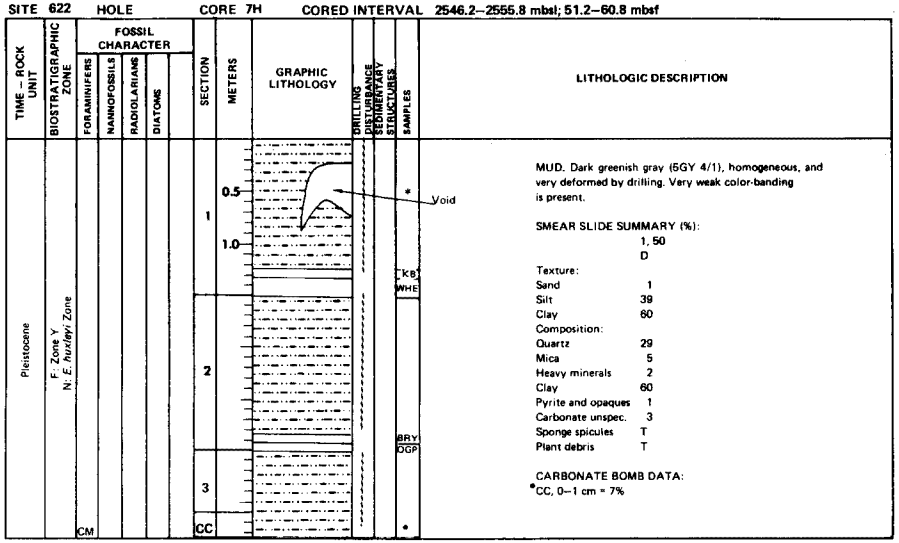


MUD. Very dark gray (5Y 3/1). Homogeneous with a few white blebs of crystalline material and minor lignite bits. Section 1, 2, and 3 contain lots of gas bubble "pockets"; Section 4 is much less gas-disturbed.

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	32
Feldspar	6
Mica	2
Heavy minerals	1
Clay	53
Opaques	1
Carbonate unspec.	3
Foraminifers	T
Calc nannofossils	2
Plant debris	T

SITE 622 HOLE CORE 7H CORED INTERVAL 2546.2–2555.8 mbsl; 51.2–60.8 mbsf



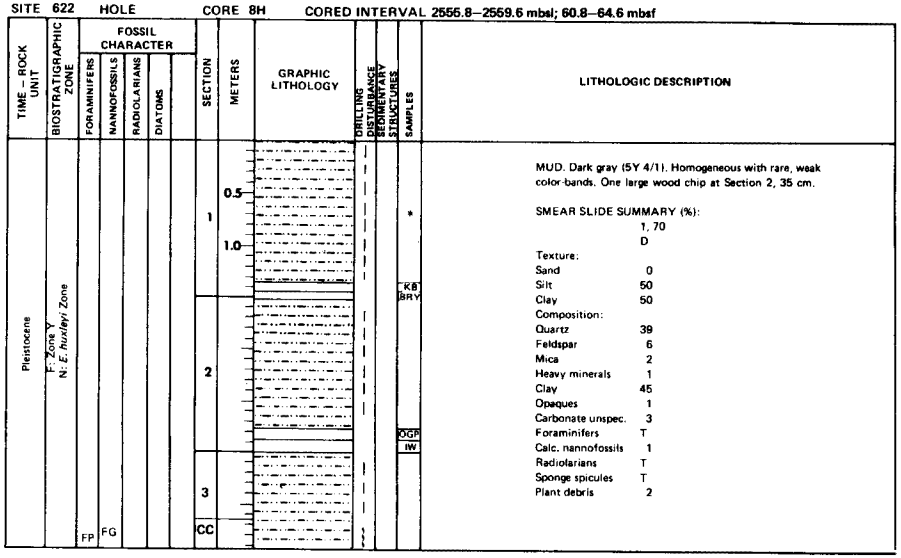
MUD. Dark greenish gray (5GY 4/1), homogeneous, and very deformed by drilling. Very weak color-banding is present.

SMEAR SLIDE SUMMARY (%):

	1, 50 D
Texture:	
Sand	1
Silt	39
Clay	60
Composition:	
Quartz	29
Mica	5
Heavy minerals	2
Clay	60
Pyrite and opaques	1
Carbonate unspec.	3
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
*CC, 0–1 cm = 7%

SITE 622 HOLE CORE 8H CORED INTERVAL 2555.8–2569.6 mbsl; 60.8–64.6 mbsf

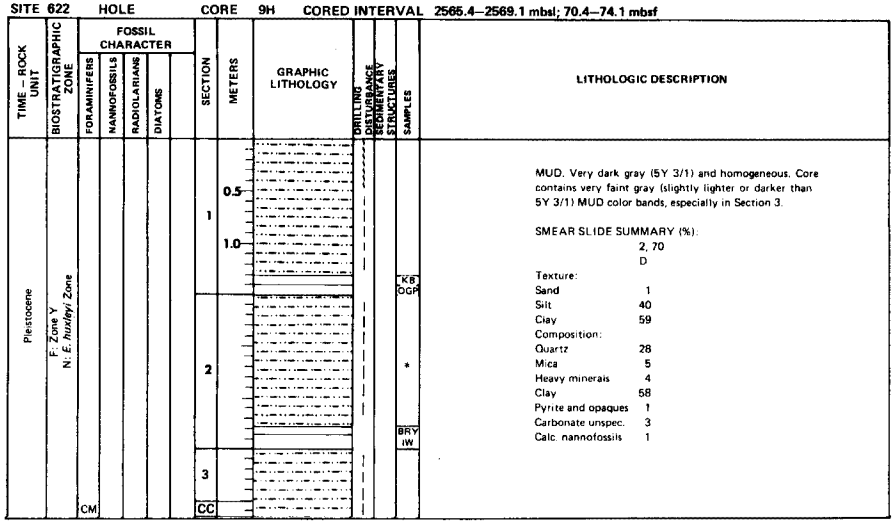


MUD. Dark gray (5Y 4/1). Homogeneous with rare, weak color-bands. One large wood chip at Section 2, 35 cm.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	50
Clay	50
Composition:	
Quartz	39
Feldspar	6
Mica	2
Heavy minerals	1
Clay	45
Opaques	1
Carbonate unspec.	3
Foraminifers	T
Calc. nannofossils	1
Radiolarians	T
Sponge spicules	T
Plant debris	2

SITE 622 HOLE CORE 9H CORED INTERVAL 2565.4–2569.1 mbsl; 70.4–74.1 mbsf

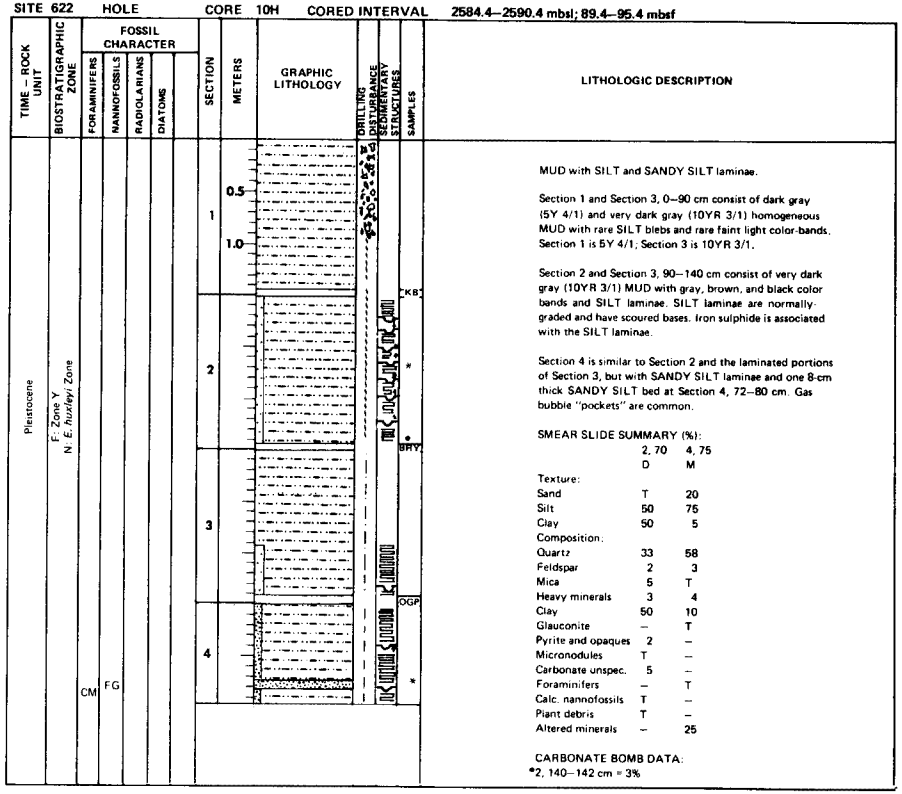


MUD. Very dark gray (5Y 3/1) and homogeneous. Core contains very faint gray (slightly lighter or darker than 5Y 3/1) MUD color bands, especially in Section 3.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	1
Silt	40
Clay	59
Composition:	
Quartz	28
Mica	5
Heavy minerals	4
Clay	58
Pyrite and opaques	1
Carbonate unspec.	3
Calc. nannofossils	1

SITE 622 HOLE CORE 10H CORED INTERVAL 2584.4–2590.4 mbsl; 89.4–95.4 mbsf



MUD with SILT and SANDY SILT laminae.

Section 1 and Section 3, 0–90 cm consist of dark gray (5Y 4/1) and very dark gray (10YR 3/1) homogeneous MUD with rare SILT blebs and rare faint light color-bands. Section 1 is 5Y 4/1; Section 3 is 10YR 3/1.

Section 2 and Section 3, 90–140 cm consist of very dark gray (10YR 3/1) MUD with gray, brown, and black color bands and SILT laminae. SILT laminae are normally-graded and have scoured bases. Iron sulphide is associated with the SILT laminae.

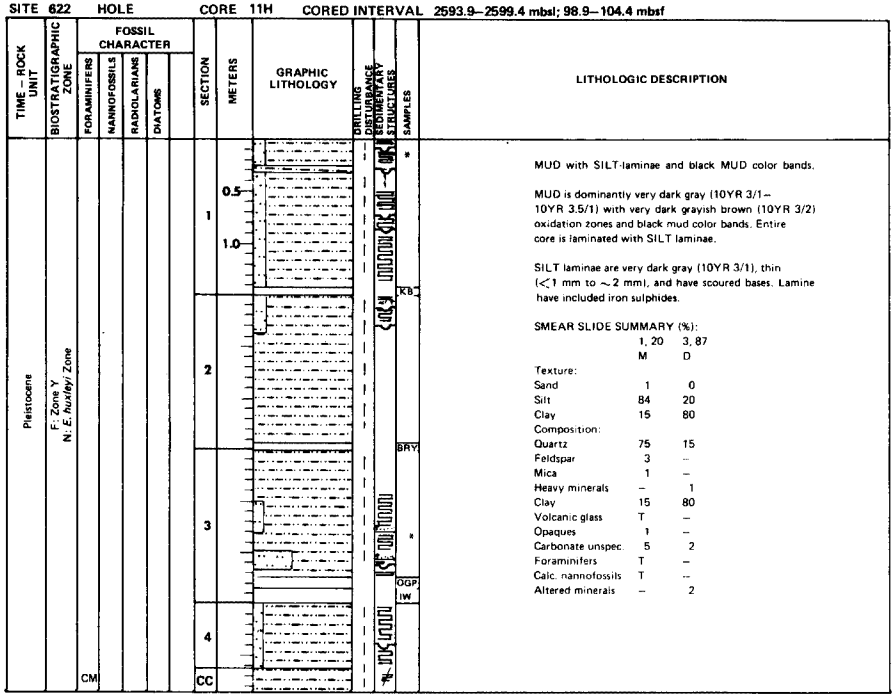
Section 4 is similar to Section 2 and the laminated portions of Section 3, but with SANDY SILT laminae and one 8-cm thick SANDY SILT bed at Section 4, 72–80 cm. Gas bubble "pockets" are common.

SMEAR SLIDE SUMMARY (%):

	2, 70 D	4, 75 M
Texture:		
Sand	T	20
Silt	50	75
Clay	50	5
Composition:		
Quartz	33	58
Feldspar	2	3
Mica	5	T
Heavy minerals	3	4
Clay	50	10
Glauconite	–	T
Pyrite and opaques	2	–
Micronodules	T	–
Carbonate unspec.	5	–
Foraminifers	–	T
Calc. nannofossils	T	–
Plant debris	T	–
Altered minerals	–	25

CARBONATE BOMB DATA:
*2, 140–142 cm = 3%

SITE 622 HOLE CORE 11H CORED INTERVAL 2593.9–2599.4 mbsl; 98.9–104.4 mbsf



MUD with SILT-laminae and black MUD color bands.

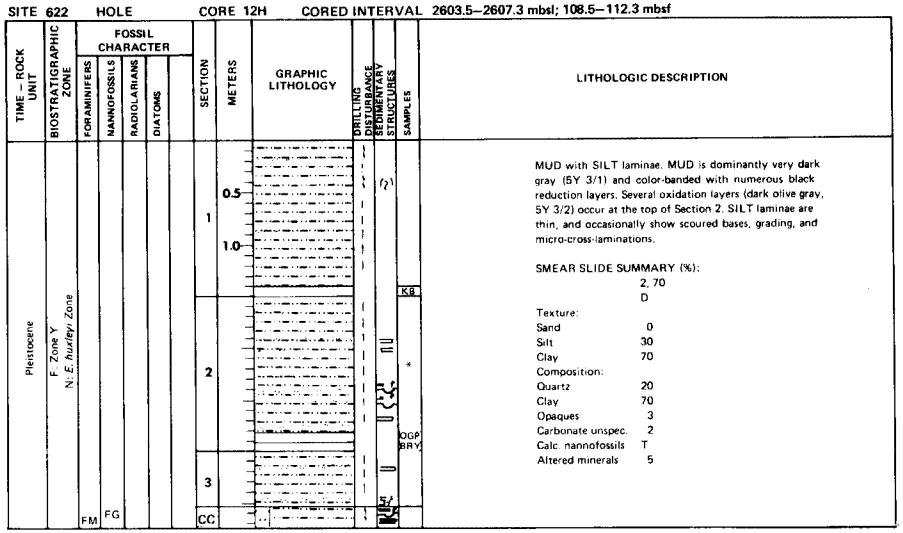
MUD is dominantly very dark gray (10YR 3/1–10YR 3.5/1) with very dark grayish brown (10YR 3/2) oxidation zones and black mud color bands. Entire core is laminated with SILT laminae.

SILT laminae are very dark gray (10YR 3/1), thin (<1 mm to ~2 mm), and have scoured bases. Lamine have included iron sulphides.

SMEAR SLIDE SUMMARY (%):

	1, 20 M	3, 87 D
Texture:		
Sand	1	0
Silt	84	20
Clay	15	80
Composition:		
Quartz	75	15
Feldspar	3	–
Mica	1	–
Heavy minerals	–	1
Clay	15	80
Volcanic glass	T	–
Opaques	1	–
Carbonate unspec.	5	2
Foraminifers	T	–
Calc. nannofossils	T	–
Altered minerals	–	2

SITE 622 HOLE CORE 12H CORED INTERVAL 2603.5–2607.3 mbsl; 108.5–112.3 mbsf

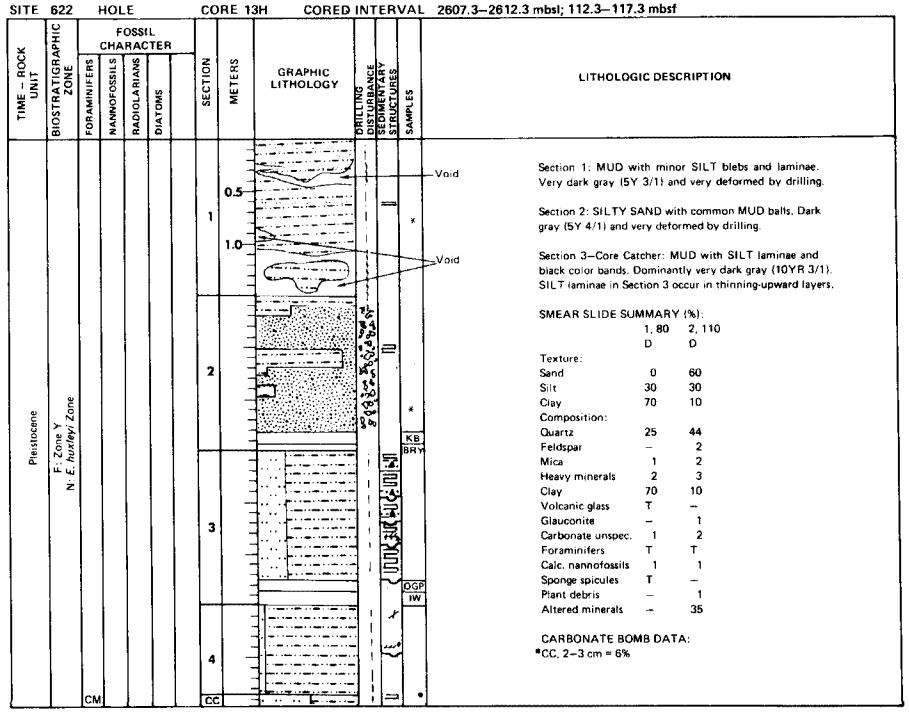


MUD with SILT laminae. MUD is dominantly very dark gray (5Y 3/1) and color-banded with numerous black reduction layers. Several oxidation layers (dark olive gray, 5Y 3/2) occur at the top of Section 2. SILT laminae are thin, and occasionally show scoured bases, grading, and micro-cross-laminations.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	20
Clay	70
Opaques	3
Carbonate unspec.	2
Calc. nannofossils	T
Altered minerals	5

SITE 622 HOLE CORE 13H CORED INTERVAL 2607.3–2612.3 mbsl; 112.3–117.3 mbsf



Section 1: MUD with minor SILT blebs and laminae. Very dark gray (5Y 3/1) and very deformed by drilling.

Section 2: SILTY SAND with common MUD balls. Dark gray (5Y 4/1) and very deformed by drilling.

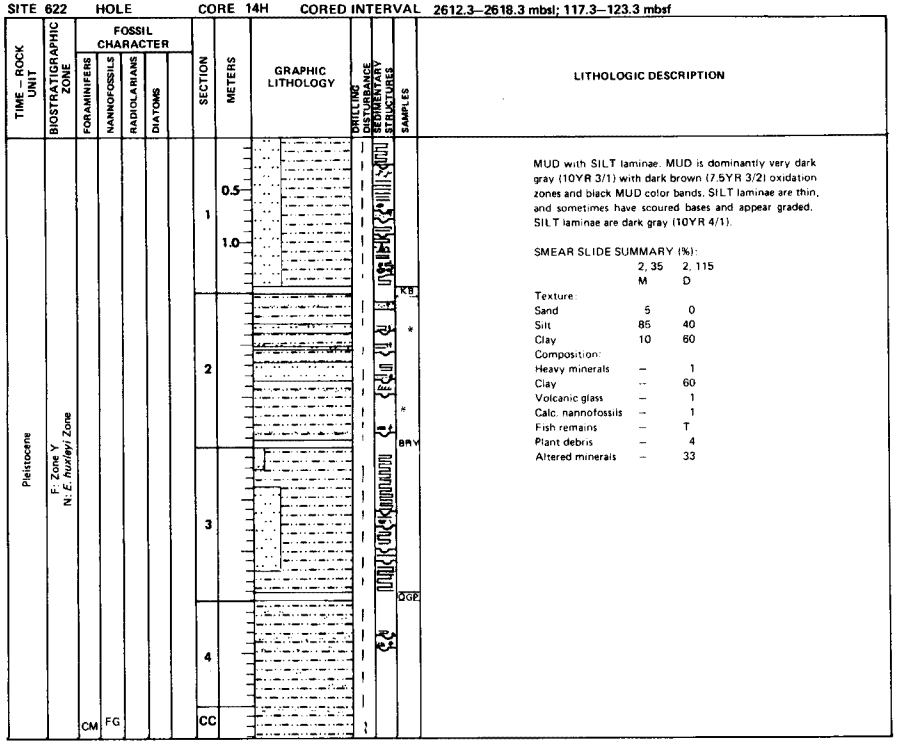
Section 3–Core Catcher: MUD with SILT laminae and black color bands. Dominantly very dark gray (10YR 3/1). SILT laminae in Section 3 occur in thinning-upward layers.

SMEAR SLIDE SUMMARY (%):

	1, 80 D	2, 110 D
Texture:		
Sand	0	60
Silt	30	30
Clay	70	10
Composition:		
Quartz	25	44
Feldspar	–	2
Mica	1	2
Heavy minerals	2	3
Clay	70	10
Volcanic glass	T	–
Glauconite	–	1
Carbonate unspec.	1	2
Foraminifers	T	T
Calc. nannofossils	1	1
Sponge spicules	T	–
Plant debris	–	1
Altered minerals	–	35

CARBONATE BOMB DATA:
*CC, 2–3 cm = 6%

SITE 622 HOLE CORE 14H CORED INTERVAL 2612.3–2618.3 mbsl; 117.3–123.3 mbsf



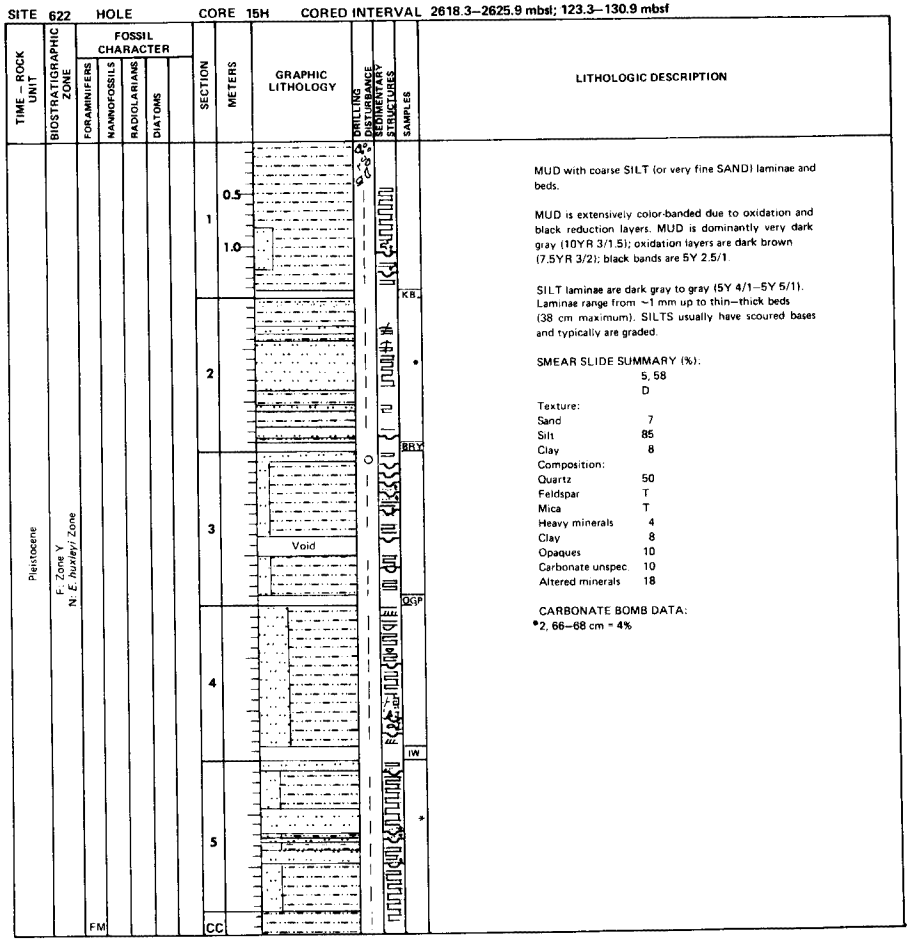
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. MUD is dominantly very dark gray (10YR 3/1) with dark brown (7.5YR 3/2) oxidation zones and black MUD color bands. SILT laminae are thin, and sometimes have scoured bases and appear graded. SILT laminae are dark gray (10YR 4/1).

SMEAR SLIDE SUMMARY (%):

	2, 35 M	2, 115 D
Texture:		
Sand	5	0
Silt	85	40
Clay	10	60
Composition:		
Heavy minerals	–	1
Clay	–	60
Volcanic glass	–	1
Calc. nannofossils	–	1
Fish remains	–	T
Plant debris	–	4
Altered minerals	–	33

SITE 622 HOLE CORE 15H CORED INTERVAL 2618.3–2625.9 mbsl; 123.3–130.9 mbsf



LITHOLOGIC DESCRIPTION

MUD with coarse SILT (or very fine SAND) laminae and beds.

MUD is extensively color-banded due to oxidation and black reduction layers. MUD is dominantly very dark gray (10YR 3/1.5); oxidation layers are dark brown (7.5YR 3/2); black bands are 5Y 2.5/1.

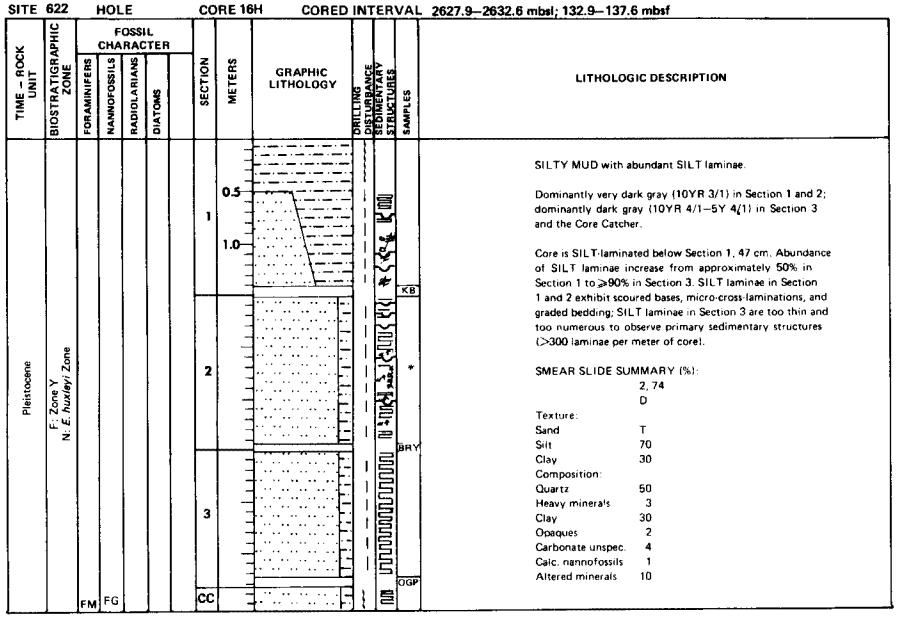
SILT laminae are dark gray to gray (5Y 4/1–5Y 5/1). Laminae range from ~1 mm up to thin–thick beds (38 cm maximum). SILTS usually have scoured bases and typically are graded.

SMEAR SLIDE SUMMARY (%):

	5, 58 D
Texture:	
Sand	7
Silt	85
Clay	8
Composition:	
Quartz	50
Feldspar	T
Mica	T
Heavy minerals	4
Clay	8
Opaques	10
Carbonate unspec.	10
Altered minerals	18

CARBONATE BOMB DATA:
*2, 66–68 cm = 4%

SITE 622 HOLE CORE 16H CORED INTERVAL 2627.9–2632.6 mbsl; 132.9–137.6 mbsf



LITHOLOGIC DESCRIPTION

SILTY MUD with abundant SILT laminae.

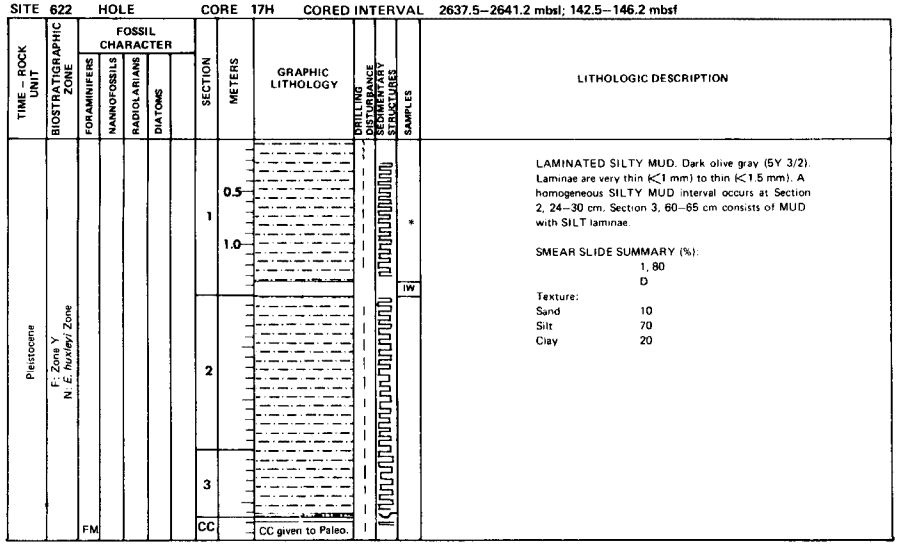
Dominantly very dark gray (10YR 3/1) in Section 1 and 2; dominantly dark gray (10YR 4/1–5Y 4/1) in Section 3 and the Core Catcher.

Core is SILT-laminated below Section 1, 47 cm. Abundance of SILT laminae increase from approximately 50% in Section 1 to ≥90% in Section 3. SILT laminae in Section 1 and 2 exhibit scoured bases, micro-cross-laminations, and graded bedding; SILT laminae in Section 3 are too thin and too numerous to observe primary sedimentary structures (>300 laminae per meter of core).

SMEAR SLIDE SUMMARY (%):

	2, 74 D
Texture:	
Sand	T
Silt	70
Clay	30
Composition:	
Quartz	50
Heavy minerals	3
Clay	30
Opaques	2
Carbonate unspec.	4
Calc. nannofossils	1
Altered minerals	10

SITE 622 HOLE CORE 17H CORED INTERVAL 2637.5–2641.2 mbsl; 142.5–146.2 mbsf



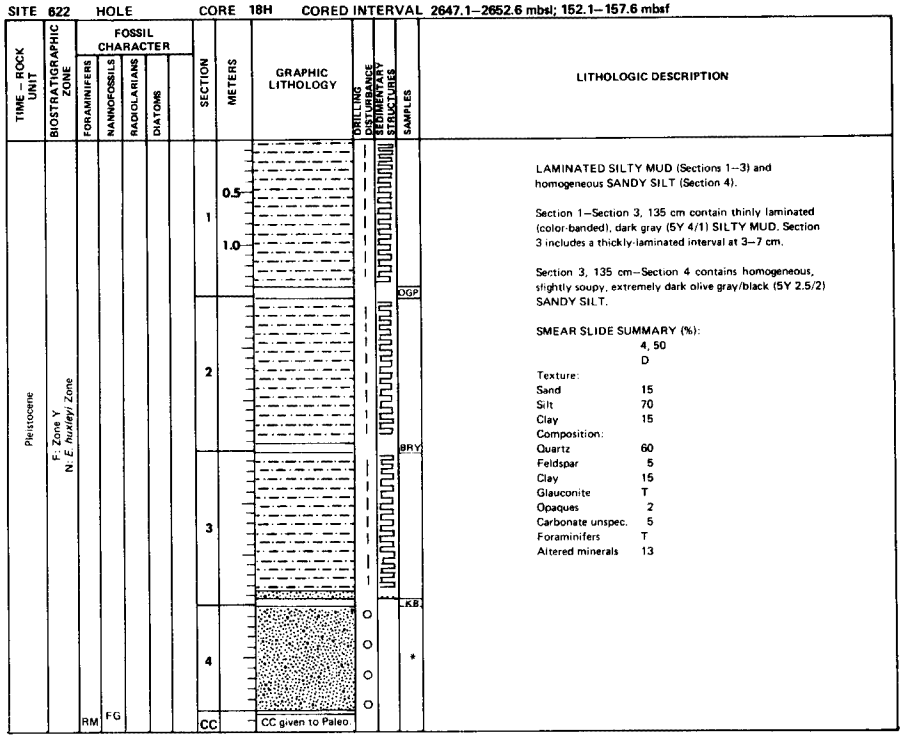
LITHOLOGIC DESCRIPTION

LAMINATED SILTY MUD. Dark olive gray (5Y 3/2). Laminae are very thin (<1 mm) to thin (<1.5 mm). A homogeneous SILTY MUD interval occurs at Section 2, 24–30 cm. Section 3, 60–65 cm consists of MUD with SILT laminae.

SMEAR SLIDE SUMMARY (%):

	1, 80 D
Texture:	
Sand	10
Silt	70
Clay	20

SITE 622 HOLE CORE 18H CORED INTERVAL 2647.1–2652.6 mbsl; 152.1–157.6 mbsf



LITHOLOGIC DESCRIPTION

LAMINATED SILTY MUD (Sections 1–3) and homogeneous SANDY SILT (Section 4).

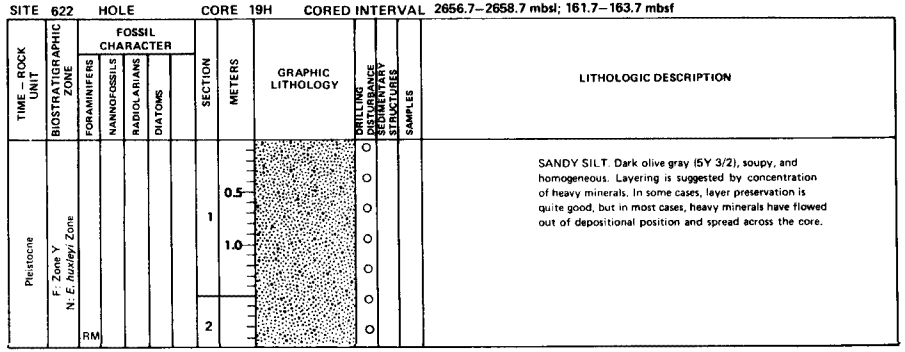
Section 1–Section 3, 135 cm contain thinly laminated (color-banded), dark gray (5Y 4/1) SILTY MUD. Section 3 includes a thickly-laminated interval at 3–7 cm.

Section 3, 135 cm–Section 4 contains homogeneous, slightly soupy, extremely dark olive gray/black (5Y 2.5/2) SANDY SILT.

SMEAR SLIDE SUMMARY (%):

	4, 50 D
Texture:	
Sand	15
Silt	70
Clay	15
Composition:	
Quartz	60
Feldspar	5
Clay	15
Glauconite	T
Opaques	2
Carbonate unspec.	5
Foraminifers	T
Altered minerals	13

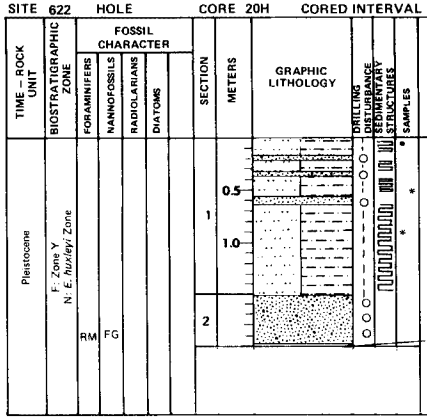
SITE 622 HOLE CORE 19H CORED INTERVAL 2656.7–2658.7 mbsl; 161.7–163.7 mbsf



LITHOLOGIC DESCRIPTION

SANDY SILT. Dark olive gray (5Y 3/2), soupy, and homogeneous. Layering is suggested by concentration of heavy minerals. In some cases, layer preservation is quite good, but in most cases, heavy minerals have flowed out of depositional position and spread across the core.

SITE 622 HOLE CORE 20H CORED INTERVAL 2665.0–2667.0 mbsl; 170.0–172.0 mbsf



LITHOLOGIC DESCRIPTION

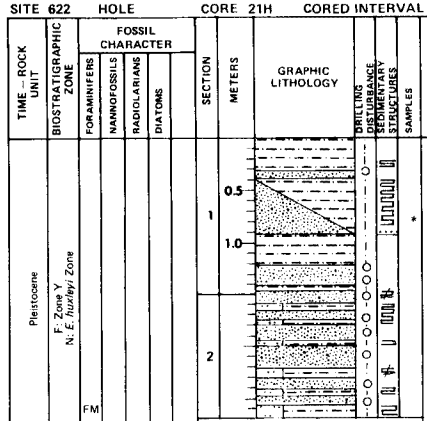
This core contains LAMINATED SILT/SILTY MUD and homogeneous SANDY SILT. Dominant color is dark gray (5Y 4/1). Laminated SILT/SILTY MUD intervals are only slightly deformed by drilling; SANDY SILT intervals are soupy.

SMEAR SLIDE SUMMARY (%):

	1, 59	1, 91
	D	D
Texture:		
Sand	20	15
Silt	70	75
Clay	10	10

CARBONATE BOMB DATA:
*1, 0–1 cm = 5%

SITE 622 HOLE CORE 21H CORED INTERVAL 2667.0–2669.7 mbsl; 172.0–174.7 mbsf



LITHOLOGIC DESCRIPTION

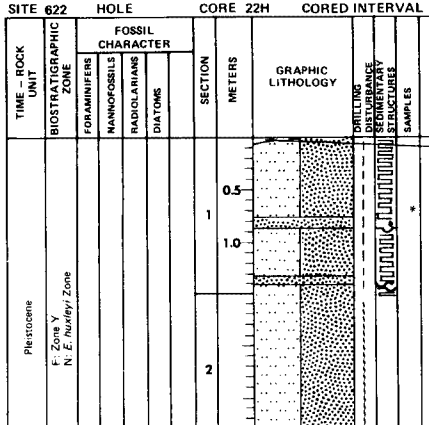
Section 1: Interlayered SILTY MUD/MUDDY SILT and SANDY SILT. Dominant colors are dark gray (5Y 4/1–10YR 4/1) and very dark gray (10YR 3/1). SANDY SILT intervals are soupy. Section 1, 38–90 cm fines upward and contains numerous black laminae. Section 1 also includes minor intervals of very dark grayish brown (10YR 3/2) MUD.

Section 2: Interlayered massive- to thinly-laminated, soupy, SANDY SILT and SILT-laminated SILTY MUD. Dominant color is very dark gray (10YR 3/1).

SMEAR SLIDE SUMMARY (%):

	1, 81
Texture:	
Sand	30
Silt	55
Clay	15
Composition:	
Quartz	50
Feldspar	5
Heavy minerals	5
Clay	15
Glauconite	1
Opaques	3
Carbonate unspec.	1
Foraminifers	T
Altered minerals	20

SITE 622 HOLE CORE 22H CORED INTERVAL 2669.7–2672.7 mbsl; 174.7–177.7 mbsf



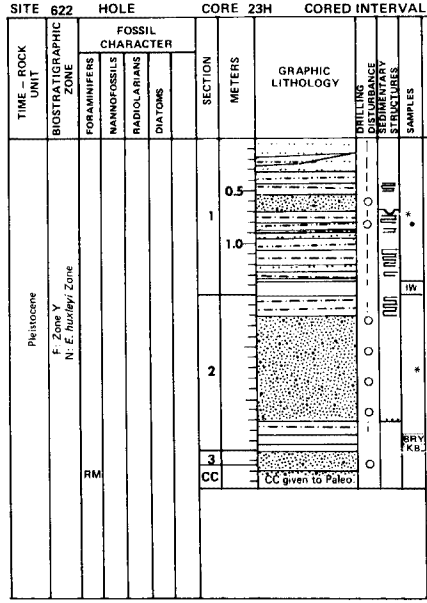
LITHOLOGIC DESCRIPTION

LAMINATED SILTS and SANDS. Entire core consists of thoroughly laminated (parallel, sub-parallel, and cross-laminated) SILTS and very fine-grained SANDS. Some beds are clearly graded; generally laminae are graded on mm-scale from very fine-grained SAND → SILT → red/brown MUD → black/dark MUD. Local high-angle discordances ± truncation of underlying laminae are either depositional or erosional. Section 2 is extremely disrupted by gas expansion and escape structures and does not show sedimentary structures as clearly as Section 1.

SMEAR SLIDE SUMMARY (%):

	1, 70
	D
Texture:	
Sand	30
Silt	60
Clay	10
Composition:	
Quartz	63
Feldspar	5
Mica	5
Heavy minerals	4
Clay	10
Glauconite	T
Pyrite and opaques	2
Carbonate unspec.	8
Foraminifers	T
Calc. nannofossils	T
Plant debris	3

SITE 622 HOLE CORE 23H CORED INTERVAL 2672.7–2676.0 mbsl; 177.7–181.0 mbsf



LITHOLOGIC DESCRIPTION

MUDS, SILTS and SANDY SILTS, and finely-laminated SILTY MUDS.

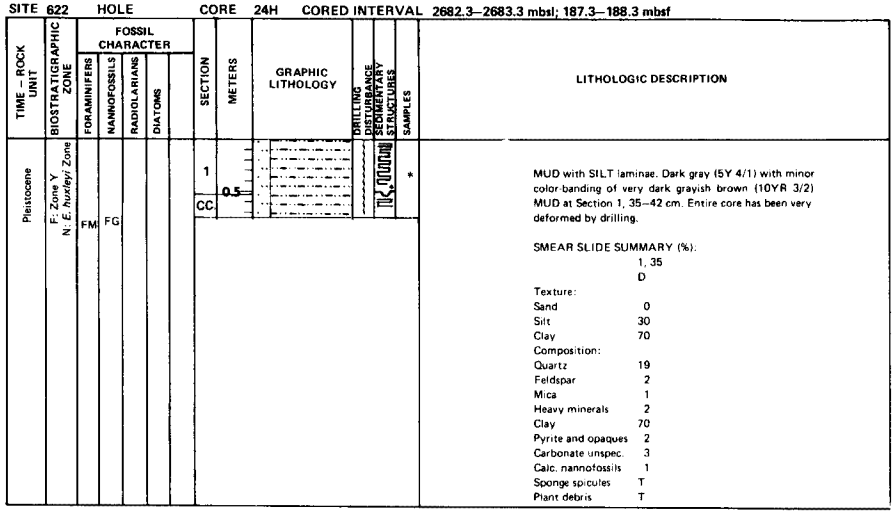
Dominant color is dark gray (5Y 4/1). Many of the homogeneous SILT and SANDY SILT layers are soupy. Thick SANDY SILT in Section 2 is normally-graded.

SMEAR SLIDE SUMMARY (%):

	1, 70	2, 75
	D	D
Texture:		
Sand	40	40
Silt	50	40
Clay	10	20
Composition:		
Quartz	72	59
Feldspar	8	9
Mica	3	5
Heavy minerals	1	4
Clay	8	18
Glauconite	–	T
Opaques	2	4
Carbonate unspec.	5	–
Calc. nannofossils	T	T
Plant debris	1	1

CARBONATE BOMB DATA:
*1, 86–88 cm = 7%

SITE 622 HOLE CORE 24H CORED INTERVAL 2682.3–2683.3 mbsl; 187.3–188.3 mbsf



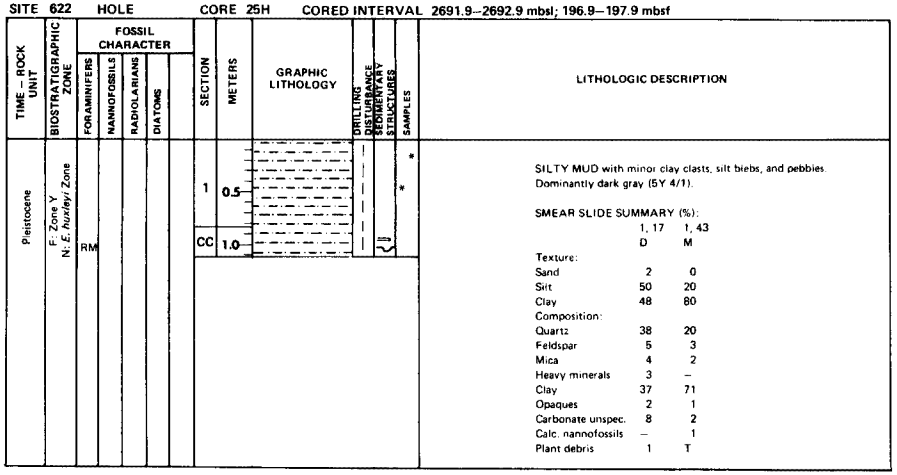
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. Dark gray (5Y 4/1) with minor color-banding of very dark grayish brown (10YR 3/2) MUD at Section 1, 35–42 cm. Entire core has been very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	1, 35 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	19
Feldspar	2
Mica	1
Heavy minerals	2
Clay	70
Pyrite and opaques	2
Carbonate unspec.	3
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

SITE 622 HOLE CORE 25H CORED INTERVAL 2691.9–2692.9 mbsl; 196.9–197.9 mbsf



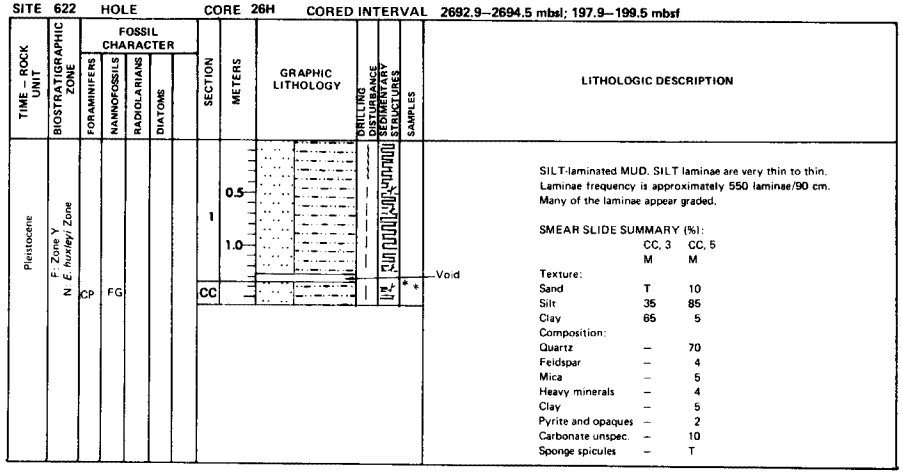
LITHOLOGIC DESCRIPTION

SILTY MUD with minor clay clasts, silt biebs, and pebbles. Dominantly dark gray (5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	1, 17 D	1, 43 M
Texture:		
Sand	2	0
Silt	50	20
Clay	48	80
Composition:		
Quartz	38	20
Feldspar	5	3
Mica	4	2
Heavy minerals	3	–
Clay	37	71
Opaques	2	1
Carbonate unspec.	8	2
Calc. nannofossils	–	1
Plant debris	1	T

SITE 622 HOLE CORE 26H CORED INTERVAL 2692.9–2694.5 mbsl; 197.9–199.5 mbsf



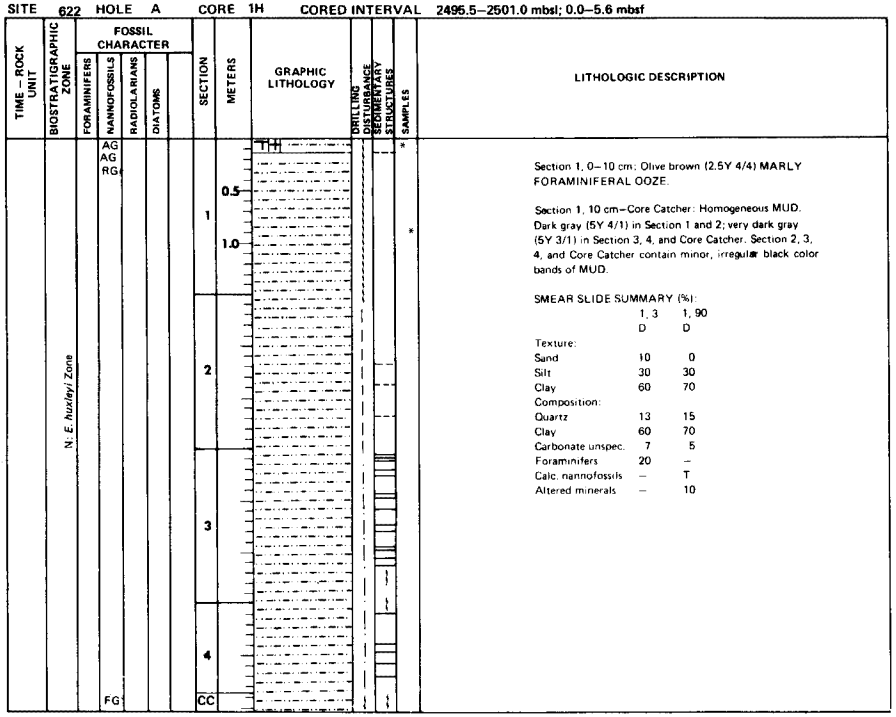
LITHOLOGIC DESCRIPTION

SILT-laminated MUD. SILT laminae are very thin to thin. Laminae frequency is approximately 550 laminae/90 cm. Many of the laminae appear graded.

SMEAR SLIDE SUMMARY (%):

	CC, 3 M	CC, 5 M
Texture:		
Sand	T	10
Silt	35	85
Clay	65	5
Composition:		
Quartz	–	70
Feldspar	–	4
Mica	–	5
Heavy minerals	–	4
Clay	–	5
Pyrite and opaques	–	2
Carbonate unspec.	–	10
Sponge spicules	–	T

SITE 622 HOLE A CORE 1H CORED INTERVAL 2495.5–2501.0 mbsl; 0.0–5.6 mbsf



Section 1, 0–10 cm: Olive brown (2.5Y 4/4) MARLY FORAMINIFERAL OOZE.

Section 1, 10 cm–Core Catcher: Homogeneous MUD. Dark gray (5Y 4/1) in Section 1 and 2; very dark gray (5Y 3/1) in Section 3, 4, and Core Catcher. Section 2, 3, 4, and Core Catcher contain minor, irregular black color bands of MUD.

SMEAR SLIDE SUMMARY (%):

	1, 3 D	1, 90 D
Texture:		
Sand	10	0
Silt	30	30
Clay	60	70
Composition:		
Quartz	13	15
Clay	60	70
Carbonate unspec.	7	5
Foraminifers	20	–
Calc. nannofossils	–	T
Altered minerals	–	10

SITE 623

HOLE 623

Date Occupied: 1 November 1983, 0434 LCT

Date Departed: 2 November 1983, 2130 LCT

Time on Hole: 1 day, 19 hr.

Position (latitude; longitude): 25°46.09'N; 86°13.84'W

Water depth (sea level; corrected m, echo-sounding): 3177

Water depth (rig floor; corrected m, echo-sounding): 3187

Bottom felt (m, drill pipe): 3188.0

Penetration (m): 202.2

Number of cores: 20

Total length of cored section (m): 110.2

Total core recovered (m): 89.24

Core recovery (%): 81

Oldest sediment cored:

Depth sub-bottom (m): 202.2

Nature: clay/silt

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Site 623 was drilled on the lower fan in 3188 m water depth adjacent to the lower fan channel. It is located approximately 55 km north-northwest of Site 615. The hole was cored to a depth of 202.2 m and a gamma ray and sonic log was obtained. The main objective was to define the nature of the lower fan channel processes. Based on the cores, well logs, and seismic data, it appears that the channels in the lower fan tend to shift position frequently during the development of a fan lobe. It is highly probable that several lower fan channels receive sediment from the main channel that is present on the middle fan.

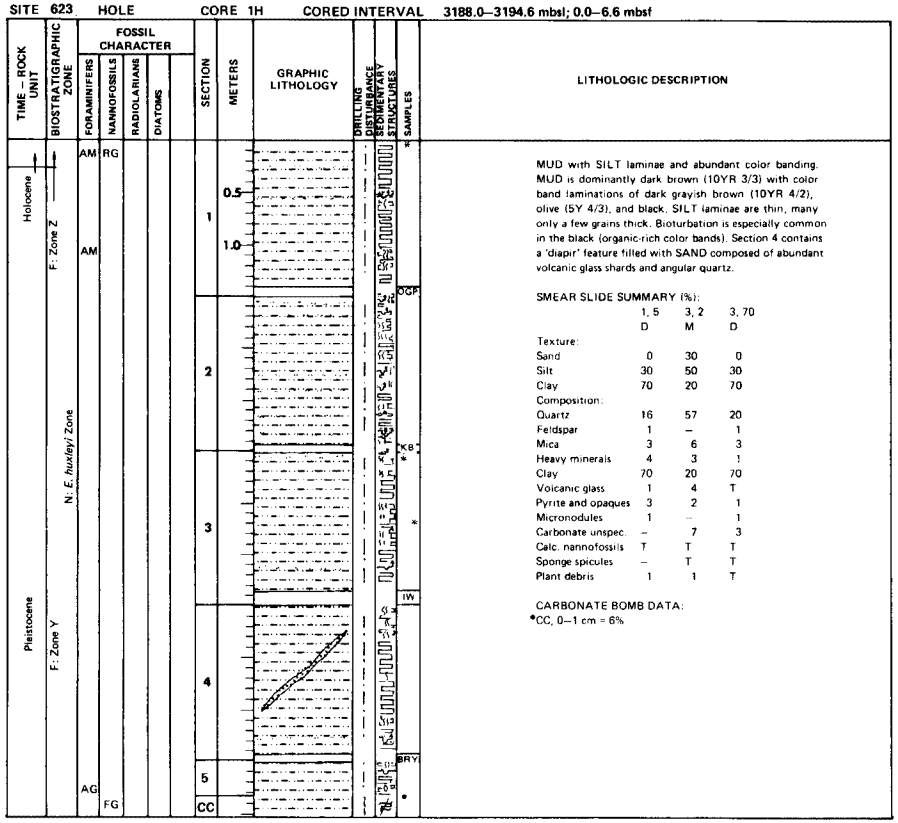
Principal results were:

1) The cored interval represents alternating channel fill and overbank deposits.

2) All data combined seem to suggest that the channel neither actively migrated nor maintained a stable position throughout the late Wisconsin glacial stage. Instead, it seems that the channel occupied several sites for short periods of time, thus building a series of vertical sequences that represent fining-upward channel fill and coarsening-upward or ragged-patterned overbank deposits.

4) Accumulation rates were high; 17.0 cm/1000 yr. for the Holocene (Ericson Zone Z); a minimum of 274.0 cm/1000 yr. for Ericson Zone Y; and based on seismic correlation, 743.0 cm/1000 yr. for the late Wisconsin glacial (Ericson Zone Y).

SITE 623 HOLE CORE 1H CORED INTERVAL 3188.0–3194.6 mbsl; 0.0–6.6 mbsf



LITHOLOGIC DESCRIPTION

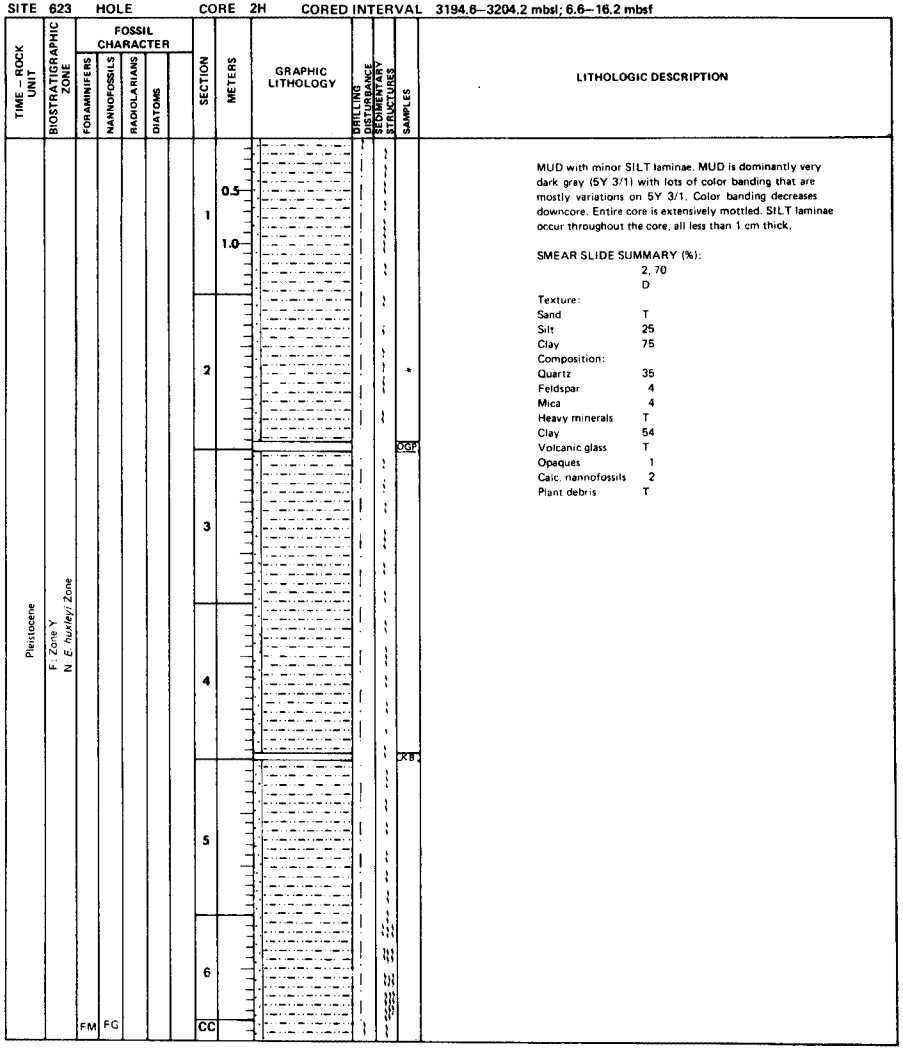
MUD with SILT laminae and abundant color banding. MUD is dominantly dark brown (10YR 3/3) with color band laminations of dark grayish brown (10YR 4/2), olive (5Y 4/3), and black. SILT laminae are thin, many only a few grains thick. Bioturbation is especially common in the black (organic-rich color bands). Section 4 contains a 'diapir' feature filled with SAND composed of abundant volcanic glass shards and angular quartz.

SMEAR SLIDE SUMMARY (%):

	1, 5 D	3, 2 M	3, 70 D
Texture:			
Sand	0	30	0
Silt	30	50	30
Clay	70	20	70
Composition:			
Quartz	16	57	20
Feldspar	1	–	1
Mica	3	6	3
Heavy minerals	4	3	1
Clay	70	20	70
Volcanic glass	1	4	T
Pyrite and opaques	3	2	1
Micronodules	1	–	1
Carbonate unspec.	–	7	3
Calc. nannofossils	T	T	T
Sponge spicules	–	T	T
Plant debris	1	1	T

CARBONATE BOMB DATA:
*CC, 0–1 cm = 6%

SITE 623 HOLE CORE 2H CORED INTERVAL 3194.6–3204.2 mbsl; 6.6–16.2 mbsf



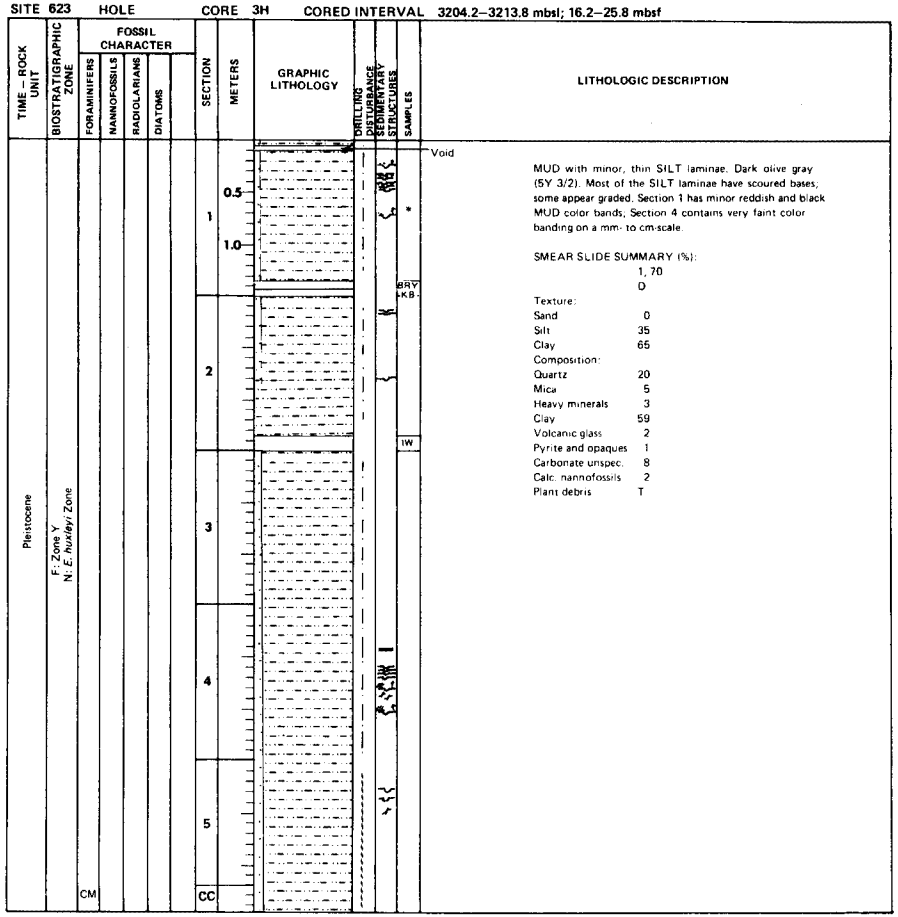
LITHOLOGIC DESCRIPTION

MUD with minor SILT laminae. MUD is dominantly very dark gray (5Y 3/1) with lots of color banding that are mostly variations on 5Y 3/1. Color banding decreases downcore. Entire core is extensively mottled. SILT laminae occur throughout the core, all less than 1 cm thick.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	T
Silt	25
Clay	75
Composition:	
Quartz	35
Feldspar	4
Mica	4
Heavy minerals	T
Clay	54
Volcanic glass	T
Opaques	1
Calc. nannofossils	2
Plant debris	T

SITE 623 HOLE CORE 3H CORED INTERVAL 3204.2–3213.8 mbsl; 16.2–25.8 mbsf



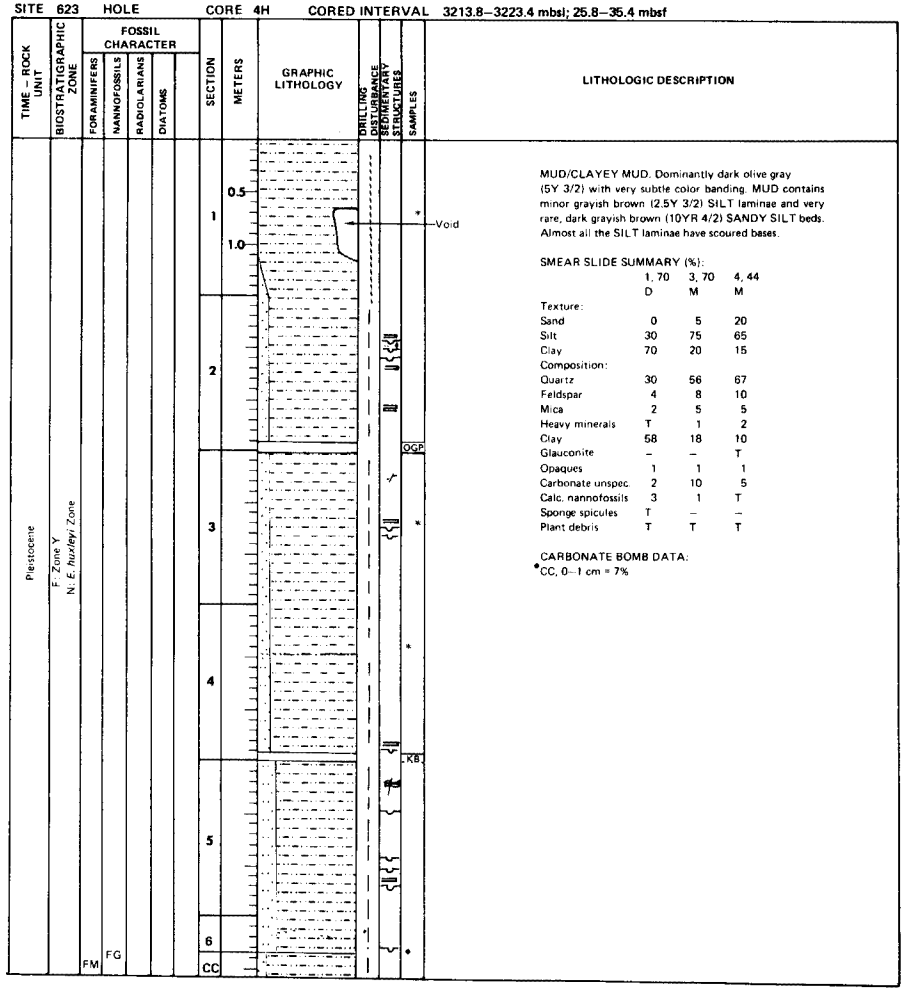
LITHOLOGIC DESCRIPTION

MUD with minor, thin SILT laminae. Dark olive gray (5Y 3/2). Most of the SILT laminae have scoured bases; some appear graded. Section 1 has minor reddish and black MUD color bands; Section 4 contains very faint color banding on a mm- to cm-scale.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	20
Mica	5
Heavy minerals	3
Clay	59
Volcanic glass	2
Pyrite and opaques	1
Carbonate unspec.	8
Calc. nannofossils	2
Plant debris	T

SITE 623 HOLE CORE 4H CORED INTERVAL 3213.8–3223.4 mbsl; 25.8–35.4 mbsf



LITHOLOGIC DESCRIPTION

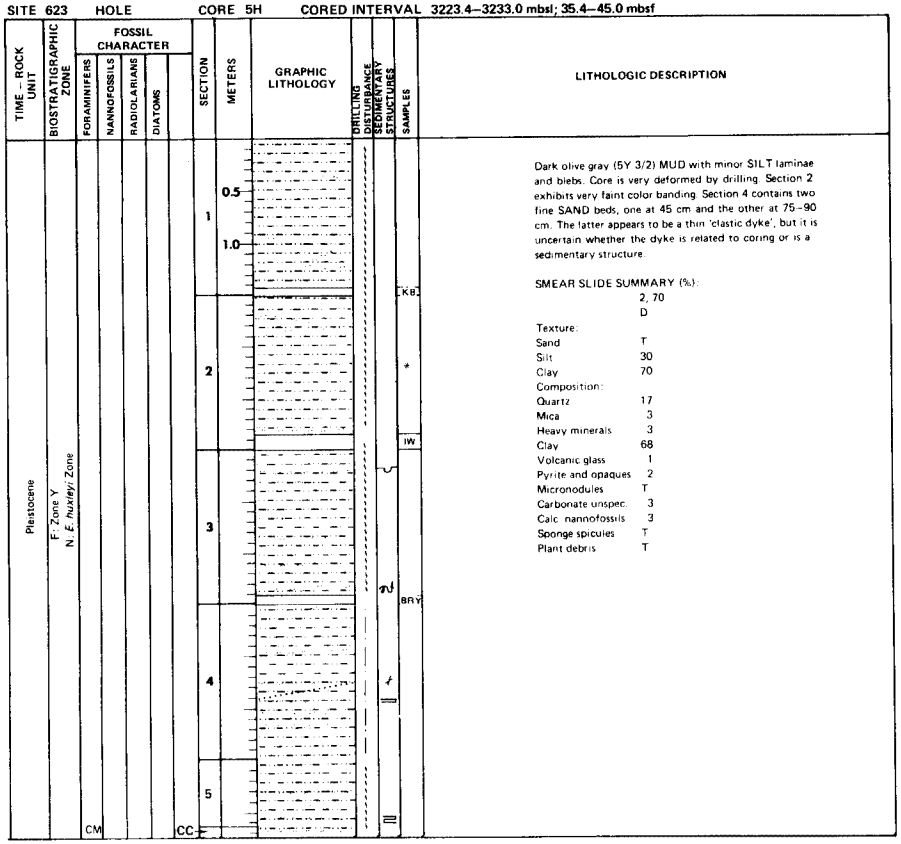
MUD/CLAYEY MUD. Dominantly dark olive gray (5Y 3/2) with very subtle color banding. MUD contains minor grayish brown (2.5Y 3/2) SILT laminae and very rare, dark grayish brown (10YR 4/2) SANDY SILT beds. Almost all the SILT laminae have scoured bases.

SMEAR SLIDE SUMMARY (%):

	1, 70 D	3, 70 M	4, 44 M
Texture:			
Sand	0	5	20
Silt	30	75	65
Clay	70	20	15
Composition:			
Quartz	30	56	67
Feldspar	4	8	10
Mica	2	5	5
Heavy minerals	T	1	2
Clay	58	18	10
Glauconite	–	–	T
Opaques	1	1	1
Carbonate unspec.	2	10	5
Calc. nannofossils	3	1	T
Sponge spicules	T	–	–
Plant debris	T	T	T

CARBONATE BOMB DATA:
*CC, 0–1 cm = 7%

SITE 623 HOLE CORE 5H CORED INTERVAL 3223.4–3233.0 mbsl; 35.4–45.0 mbsf



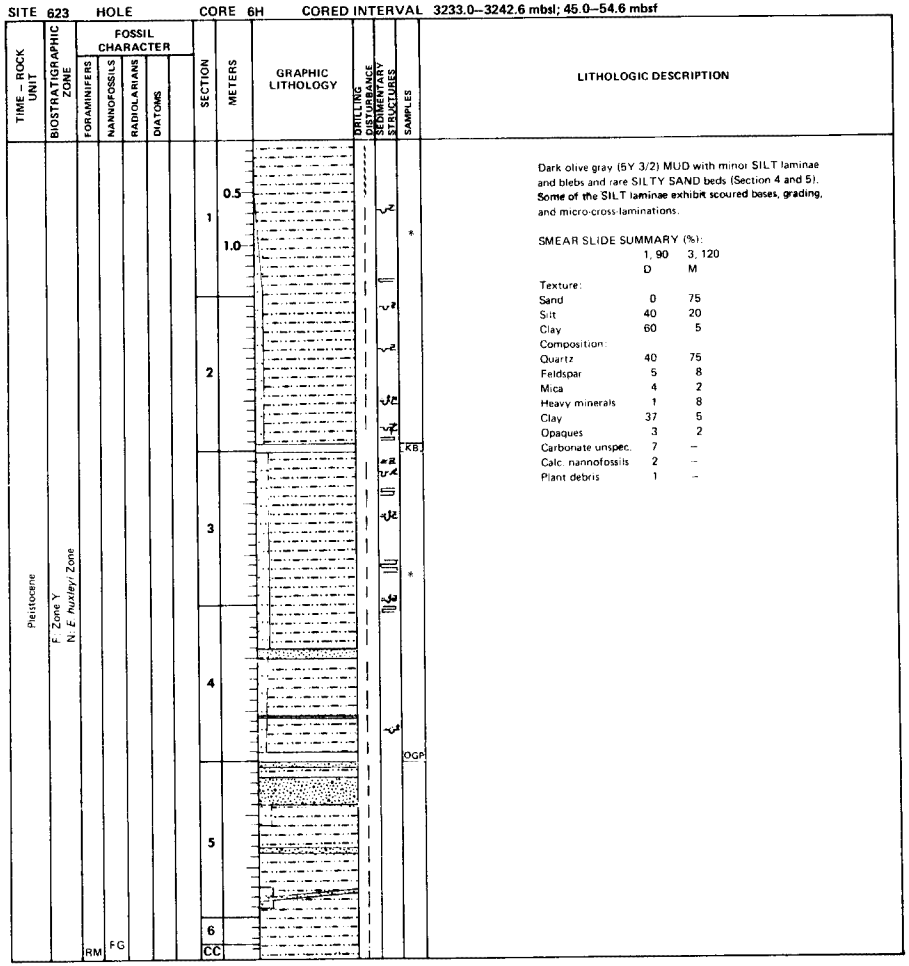
LITHOLOGIC DESCRIPTION

Dark olive gray (5Y 3/2) MUD with minor SILT laminae and blebs. Core is very deformed by drilling. Section 2 exhibits very faint color banding. Section 4 contains two fine SAND beds, one at 45 cm and the other at 75–90 cm. The latter appears to be a thin 'clastic dyke', but it is uncertain whether the dyke is related to coring or is a sedimentary structure.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	T
Silt	30
Clay	70
Composition:	
Quartz	17
Mica	3
Heavy minerals	3
Clay	68
Volcanic glass	1
Pyrite and opaques	2
Micronodules	T
Carbonate unspec.	3
Calc. nannofossils	3
Sponge spicules	T
Plant debris	T

SITE 623 HOLE CORE 6H CORED INTERVAL 3233.0–3242.6 mbsl; 45.0–54.6 mbsf



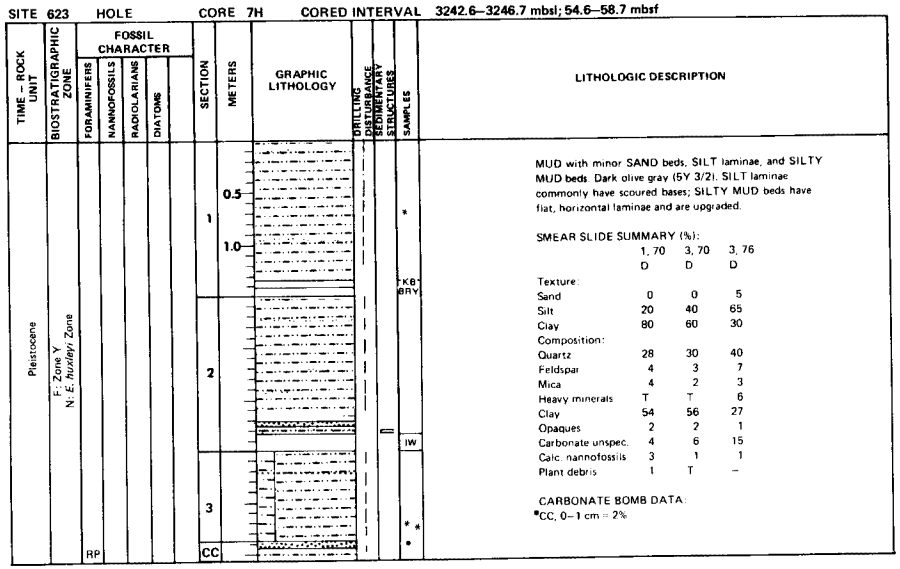
LITHOLOGIC DESCRIPTION

Dark olive gray (5Y 3/2) MUD with minor SILT laminae and blebs and rare SILTY SAND beds (Section 4 and 5). Some of the SILT laminae exhibit scoured bases, grading, and micro-cross-laminations.

SMEAR SLIDE SUMMARY (%):

	1, 90 D	3, 120 M
Texture:		
Sand	0	75
Silt	40	20
Clay	60	5
Composition:		
Quartz	40	75
Feldspar	5	8
Mica	4	2
Heavy minerals	1	8
Clay	37	5
Opaques	3	2
Carbonate unspec.	7	–
Calc. nannofossils	2	–
Plant debris	1	–

SITE 623 HOLE CORE 7H CORED INTERVAL 3242.6–3246.7 mbsl; 54.6–58.7 mbsf



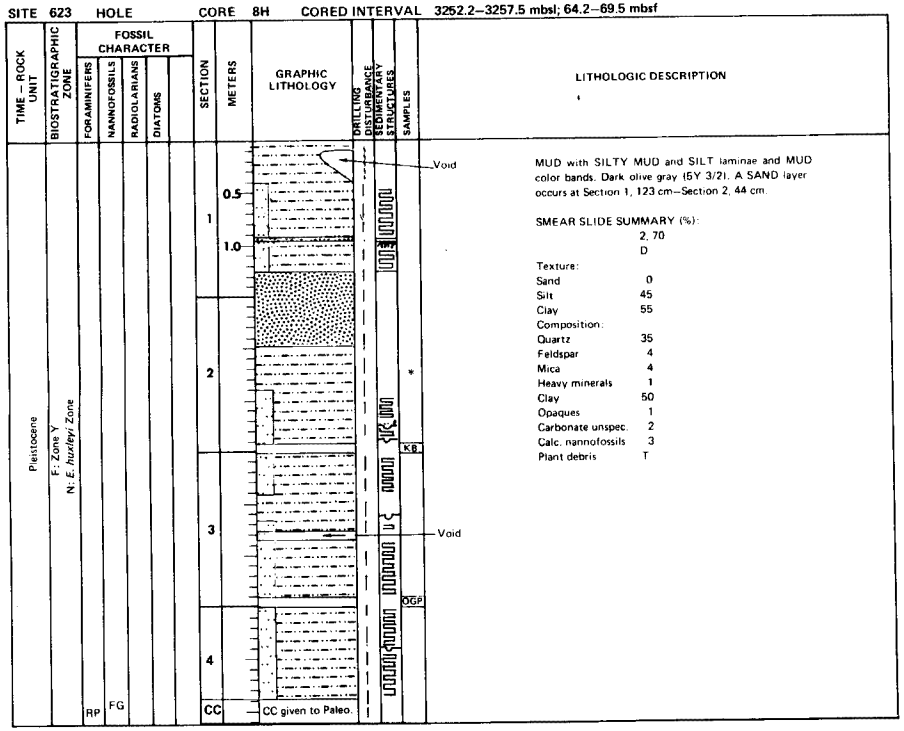
MUD with minor SAND beds, SILT laminae, and SILTY MUD beds. Dark olive gray (5Y 3/2). SILT laminae commonly have scoured bases; SILTY MUD beds have flat, horizontal laminae and are upgraded.

SMEAR SLIDE SUMMARY (%):

	1, 70 D	3, 70 D	3, 76 D
Texture:			
Sand	0	0	5
Silt	20	40	65
Clay	80	60	30
Composition:			
Quartz	28	30	40
Feldspar	4	3	7
Mica	4	2	3
Heavy minerals	T	T	6
Clay	54	56	27
Opaques	2	2	1
Carbonate unspec.	4	6	15
Calc. nannofossils	3	1	1
Plant debris	1	T	–

CARBONATE BOMB DATA:
*CC, 0–1 cm = 2%

SITE 623 HOLE CORE 8H CORED INTERVAL 3252.2–3257.5 mbsl; 64.2–69.5 mbsf

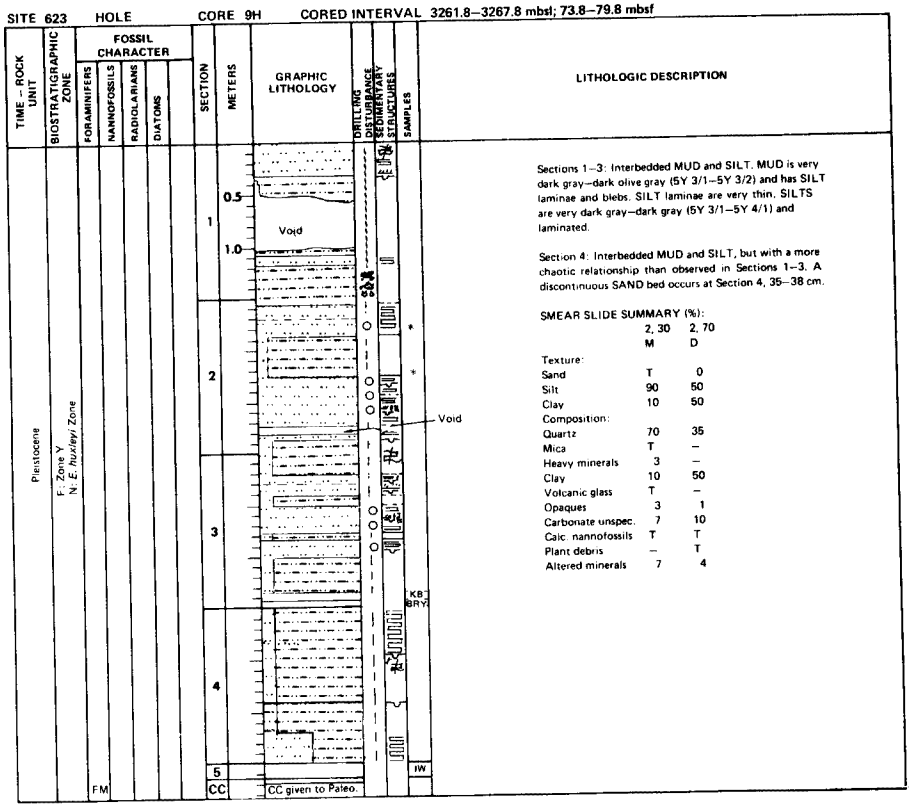


MUD with SILTY MUD and SILT laminae and MUD color bands. Dark olive gray (5Y 3/2). A SAND layer occurs at Section 1, 123 cm–Section 2, 44 cm.

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	0
Silt	45
Clay	55
Composition:	
Quartz	35
Feldspar	4
Mica	4
Heavy minerals	1
Clay	50
Opaques	1
Carbonate unspec.	2
Calc. nannofossils	3
Plant debris	T

SITE 623 HOLE CORE 9H CORED INTERVAL 3261.8–3267.8 mbsl; 73.8–79.8 mbsf



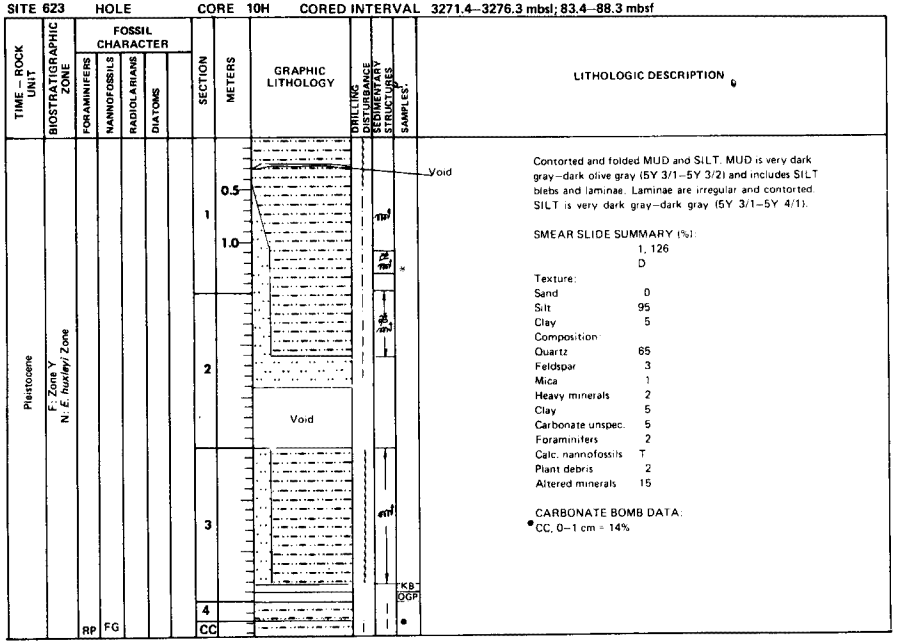
Sections 1–3: Interbedded MUD and SILT. MUD is very dark gray–dark olive gray (5Y 3/1–5Y 3/2) and has SILT laminae and blebs. SILT laminae are very thin. SILTS are very dark gray–dark gray (5Y 3/1–5Y 4/1) and laminated.

Section 4: Interbedded MUD and SILT, but with a more chaotic relationship than observed in Sections 1–3. A discontinuous SAND bed occurs at Section 4, 35–38 cm.

SMEAR SLIDE SUMMARY (%):

	2, 30 M	2, 70 D
Texture:		
Sand	T	0
Silt	90	50
Clay	10	50
Composition:		
Quartz	70	35
Mica	T	–
Heavy minerals	3	–
Clay	10	50
Volcanic glass	T	–
Opaques	3	1
Carbonate unspec.	7	10
Calc. nannofossils	T	T
Plant debris	–	T
Altered minerals	7	4

SITE 623 HOLE CORE 10H CORED INTERVAL 3271.4–3276.3 mbsl; 83.4–88.3 mbsf



LITHOLOGIC DESCRIPTION

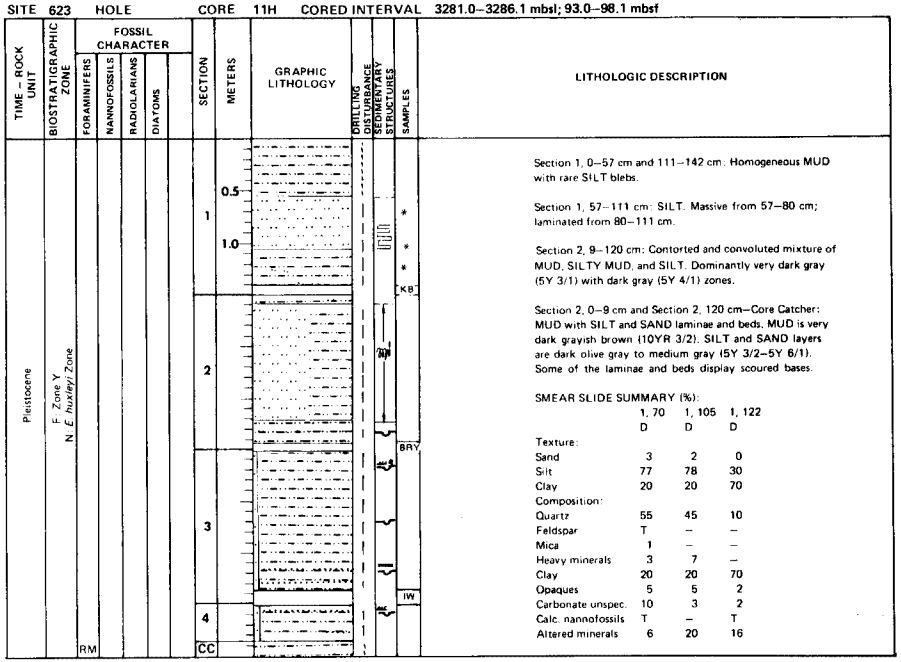
Contorted and folded MUD and SILT. MUD is very dark gray–dark olive gray (5Y 3/1–5Y 3/2) and includes SILT blebs and laminae. Laminae are irregular and contorted. SILT is very dark gray–dark gray (5Y 3/1–5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	1, 126 D
Texture:	
Sand	0
Silt	95
Clay	5
Composition:	
Quartz	65
Feldspar	3
Mica	1
Heavy minerals	2
Clay	5
Carbonate unspec.	5
Foraminifers	2
Calc. nannofossils	T
Plant debris	2
Altered minerals	15

CARBONATE BOMB DATA:
• CC, 0–1 cm = 14%

SITE 623 HOLE CORE 11H CORED INTERVAL 3281.0–3286.1 mbsl; 93.0–98.1 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–57 cm and 111–142 cm: Homogeneous MUD with rare SILT blebs.

Section 1, 57–111 cm: SILT. Massive from 57–80 cm; laminated from 80–111 cm.

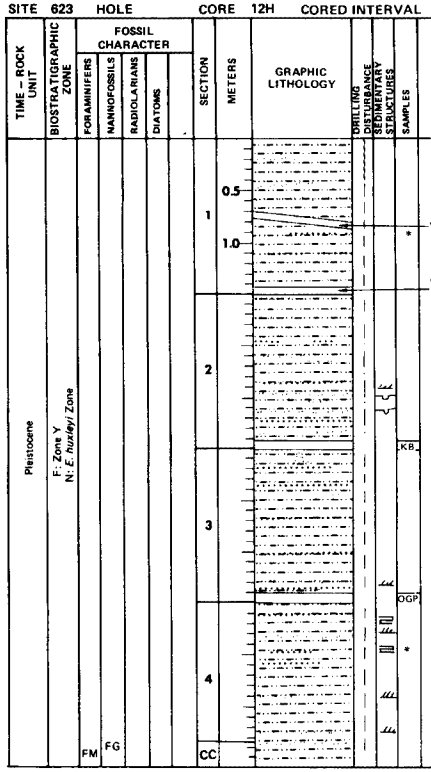
Section 2, 9–120 cm: Contorted and convoluted mixture of MUD, SILTY MUD, and SILT. Dominantly very dark gray (5Y 3/1) with dark gray (5Y 4/1) zones.

Section 2, 0–9 cm and Section 2, 120 cm–Core Catcher: MUD with SILT and SAND laminae and beds. MUD is very dark grayish brown (10YR 3/2). SILT and SAND layers are dark olive gray to medium gray (5Y 3/2–5Y 6/1). Some of the laminae and beds display scoured bases.

SMEAR SLIDE SUMMARY (%):

	1, 70 D	1, 105 D	1, 122 D
Texture:			
Sand	3	2	0
Silt	77	78	30
Clay	20	20	70
Composition:			
Quartz	55	45	10
Feldspar	T	–	–
Mica	1	–	–
Heavy minerals	3	7	–
Clay	20	20	70
Opaques	5	5	2
Carbonate unspec.	10	3	2
Calc. nannofossils	T	–	T
Altered minerals	6	20	16

SITE 623 HOLE CORE 12H CORED INTERVAL 3290.6–3297.1 mbsl; 102.6–109.1 mbsf



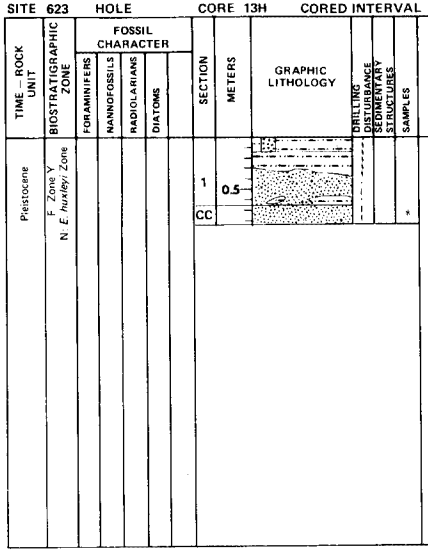
LITHOLOGIC DESCRIPTION

Stiff MUD with SILTY SAND clasts, lens, and fragments, and with SILT laminae and blebs. Sedimentary structures are occasionally preserved in the SILTS and SILTY SANDS, but they typically occur as irregular inclusions with no preferred orientation. MUD is very dark gray (5Y 3/1) (very dark olive gray [5Y 3/2] in the Core Catcher). SILT laminae are dark olive gray–gray (5Y 3/2–5Y 5/1); SILTY SANDS are dark olive gray (5Y 3/2). Section 4 contains an oxidized zone at 119–130 cm.

SMEAR SLIDE SUMMARY (%):

	1, 90 D	4, 45 M
Texture:		
Sand	0	58
Silt	40	40
Clay	60	2
Composition:		
Quartz	26	78
Feldspar	1	2
Mica	T	3
Heavy minerals	4	2
Clay	58	2
Volcanic glass	T	3
Carbonate unspec	2	–
Foraminifers	T	–
Calc. nannofossils	2	T
Plant debris	3	–
Altered minerals	4	10

SITE 623 HOLE CORE 13H CORED INTERVAL 3300.0–3301.0 mbsl; 112.0–113.0 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–15 cm: Very deformed mixture of SILT, SAND, and MUD. Deformation probably due to core disturbance.

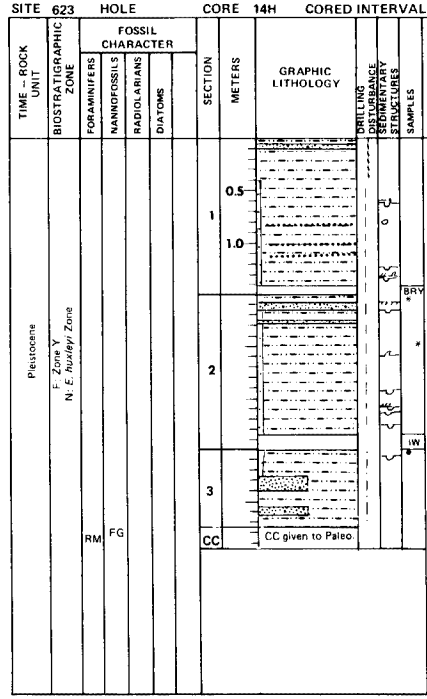
Section 1, 15–30 cm: Homogeneous, very dark gray (5Y 3/1), very deformed MUD.

Section 1, 30 cm–Core Catcher: Dark olive gray (5Y 4/2), structureless SILTY SAND. Several MUD balls occur at Section 1, 60–65 cm.

SMEAR SLIDE SUMMARY (%):

	CC, 10 D
Texture:	
Sand	50
Silt	30
Clay	20
Composition:	
Quartz	60
Feldspar	T
Clay	20
Volcanic glass	T
Opaques	5
Carbonate unspec.	3
Altered minerals	12

SITE 623 HOLE CORE 14H CORED INTERVAL 3309.6–3313.2 mbsl; 121.4–125.2 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae and SILTY SAND beds.

MUD is very dark gray (5Y 3/1) and stiff. There are very subtle color bands throughout the MUD, especially in Section 2.

SILT laminae are gray/medium gray (10YR 6/1) and very thin. Laminae occasionally show scoured bases and micro-cross laminations. SILT laminae are most abundant in Section 2.

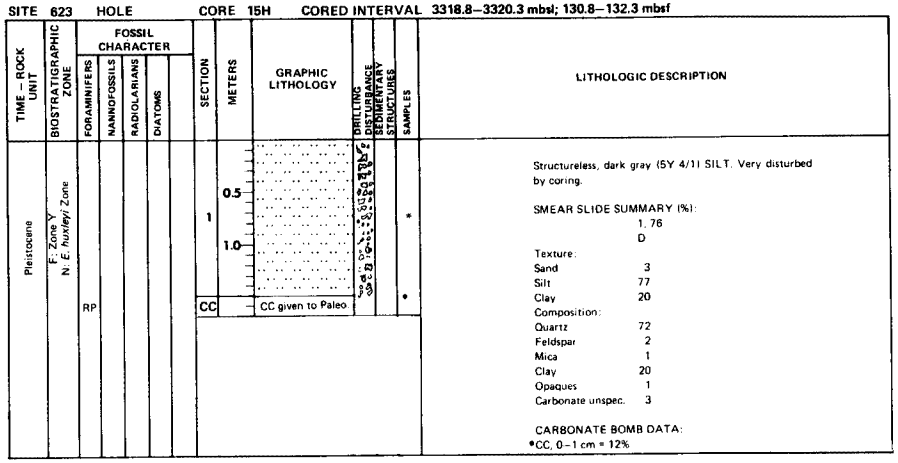
SILTY SAND beds are dark gray–dark olive gray (5Y 4/1–5Y 4/2) and range from 1–10 cm thick; "beds" in Section 3 are quite contorted.

SMEAR SLIDE SUMMARY (%):

	2, 9 M	2, 50 D
Texture:		
Sand	65	0
Silt	34	50
Clay	1	50
Composition:		
Quartz	70	25
Feldspar	1	T
Mica	2	1
Heavy minerals	2	7
Clay	1	45
Volcanic glass	–	2
Micronodules	–	13
Calc. nannofossils	–	5
Altered minerals	24	2

CARBONATE BOMB DATA:
*3, 1–3 cm = 12%

SITE 623 HOLE CORE 15H CORED INTERVAL 3318.8–3320.3 mbsl; 130.8–132.3 mbsf



LITHOLOGIC DESCRIPTION

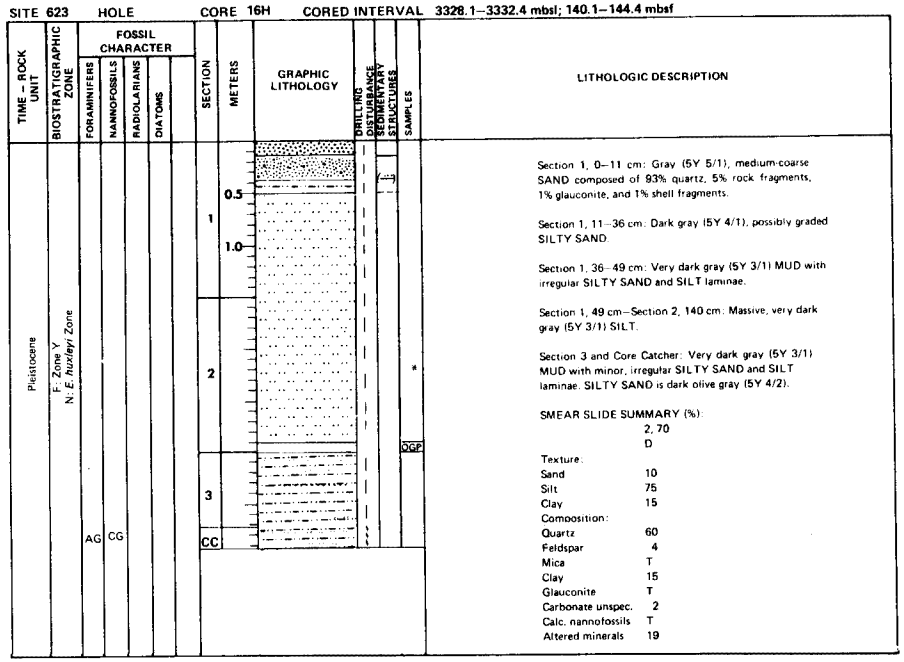
Structureless, dark gray (5Y 4/1) SILT. Very disturbed by coring.

SMEAR SLIDE SUMMARY (%):

	1, 76 D
Texture:	
Sand	3
Silt	77
Clay	20
Composition:	
Quartz	72
Feldspar	2
Mica	1
Clay	20
Opaques	1
Carbonate unspec.	3

CARBONATE BOMB DATA:
*CC, 0–1 cm = 12%

SITE 623 HOLE CORE 16H CORED INTERVAL 3328.1–3332.4 mbsl; 140.1–144.4 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–11 cm: Gray (5Y 5/1), medium-coarse SAND composed of 93% quartz, 5% rock fragments, 1% glauconite, and 1% shell fragments.

Section 1, 11–36 cm: Dark gray (5Y 4/1), possibly graded SILTY SAND.

Section 1, 36–49 cm: Very dark gray (5Y 3/1) MUD with irregular SILTY SAND and SILT laminae.

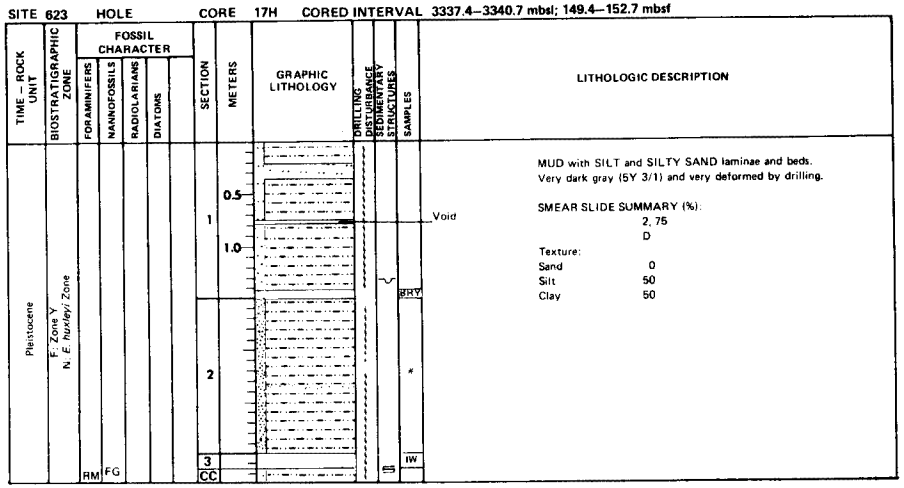
Section 1, 49 cm–Section 2, 140 cm: Massive, very dark gray (5Y 3/1) SILT.

Section 3 and Core Catcher: Very dark gray (5Y 3/1) MUD with minor, irregular SILTY SAND and SILT laminae. SILTY SAND is dark olive gray (5Y 4/2).

SMEAR SLIDE SUMMARY (%):

	2, 70 D
Texture:	
Sand	10
Silt	75
Clay	15
Composition:	
Quartz	60
Feldspar	4
Mica	T
Clay	15
Glauconite	T
Carbonate unspec.	2
Calc. nannofossils	T
Altered minerals	19

SITE 623 HOLE CORE 17H CORED INTERVAL 3337.4–3340.7 mbsl; 149.4–152.7 mbsf



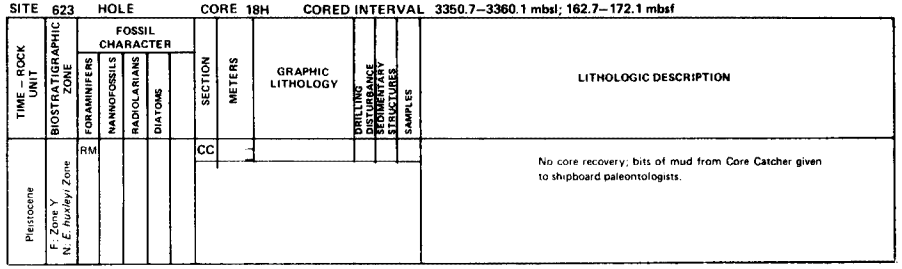
LITHOLOGIC DESCRIPTION

MUD with SILT and SILTY SAND laminae and beds. Very dark gray (5Y 3/1) and very deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	2, 75 D
Texture:	
Sand	0
Silt	50
Clay	50

SITE 623 HOLE CORE 18H CORED INTERVAL 3350.7–3360.1 mbsl; 162.7–172.1 mbsf



LITHOLOGIC DESCRIPTION

No core recovery; bits of mud from Core Catcher given to shipboard paleontologists.

SITE 623 HOLE CORE 19H CORED INTERVAL 3360.1–3360.3 mbsl; 172.1–172.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone	RP	FG			CC					*	MUD with rare SILT laminae and blebs. Very dark gray (5Y 3/1). Sediment was recovered in the Core Catcher; rest of the core was empty.

SMEAR SLIDE SUMMARY (%):

	CC, 5 D
Texture:	
Sand	1
Silt	30
Clay	69
Composition:	
Quartz	21
Mica	4
Heavy minerals	4
Clay	68
Pyrite and opaques	1
Carbonate unspec.	1
Calc. nannofossils	1
Plant debris	T

SITE 623 HOLE CORE 20H CORED INTERVAL 3379.0–3379.2 mbsl; 191.0–191.2 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Pleistocene	F: Zone Y N: *E. huxleyi* Zone		FG			1						Core was EMPTY, but drillers say interval cored was probably coarse-grained (sandy). Bits of material in core liner given to shipboard paleontologists.

SITE 624

HOLE 624

Date Occupied: 3 November 1983, 0339 LCT

Date Departed: 4 November 1983, 1525 LCT

Time on Hole: 1 day, 12 hr.

Position (latitude; longitude): 25°45.24'N; 86°16.63'W

Water depth (sea level; corrected m, echo-sounding): 3183

Water depth (rig floor; corrected m, echo-sounding): 3193

Bottom felt (m, drill pipe): 3198.2

Penetration (m): 199.9

Number of cores: 23

Total length of cored section (m): 109.8

Total core recovered (m): 75.32

Core recovery (%): 69

Oldest sediment cored:

Depth sub-bottom (m): 199.9

Nature: clay and mud

Age: Pleistocene (Ericson Zone Y)

Measured velocity (km/s): N/A

Basement: N/A

SITE 624

HOLE 624A

Date Occupied: 5 November 1983, 0210 LCT

Date Departed: 6 November 1983, 2100 LCT

Time on Hole: 1 day, 19 hr.

Position (latitude; longitude): 25°45.24'N; 86°16.63'W

Water depth (sea level; corrected m, echo-sounding): 3183

Water depth (rig floor; corrected m, echo-sounding): 3193

Bottom felt (m, drill pipe): 3198

Penetration (m): 207.6

Number of cores: 22

Total length of cored section (m): 103.7

Total core recovered (m): 86.76

Core recovery (%): 84

Oldest sediment cored:

Depth sub-bottom (m): 197.1

Nature: sand and clay

Age: Ericson Zone Y (upper Wisconsin glacial)

Measured velocity (km/s): N/A

Basement: N/A

Principal results:

Site 624 was located on the lower fan, about 3 miles west of Site 623. Good core recovery was obtained to a depth of about 55 m, using the Hydraulic Piston Corer. Below that depth recovery decreased irregularly and below 135 m sub-bottom core recovery was very poor. A well log run was made between 52.5 and 197.0 m sub-bottom on Hole 624A because of a stuck extended core barrel in Hole 624. Drilling was terminated at a depth of 199.9 m sub-bottom.

The principal findings at this site were:

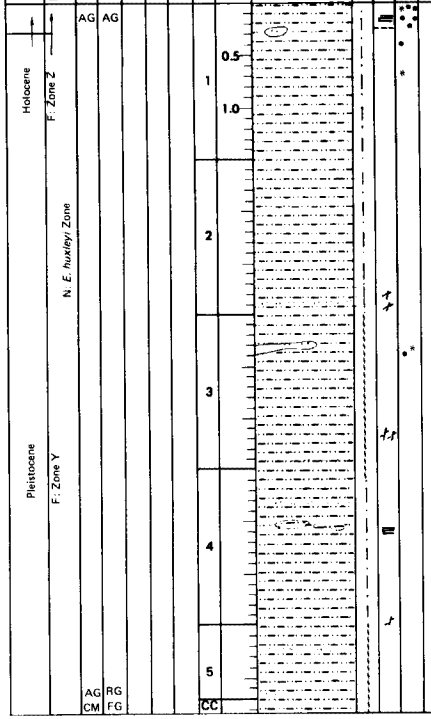
1) The cored and logged sediment section basically represents one indistinct upward-fining sequence with many small perturbations,

2) We can interpret the section as consisting of overbank deposits with several indistinct thin channel fills,

3) The conclusion reached at Site 623 that this area of the lower fan is more characterized by one active channel that occupies different sites for short periods of time rather than being in a stable position or being migratory, is still valid.

4) Accumulation rates are high: 731 cm/1000 yr. for the late Wisconsin glacial stage (Ericson Zone Y) and 12.5 cm/1000 yr. for the Holocene (Ericson Zone Z).

SITE 624 HOLE CORE 1H CORED INTERVAL 3198.2–3205.1 mbsl; 0.0–6.9 mbsf



LITHOLOGIC DESCRIPTION

Entire core consists of color-banded MUD with rare SILT laminae. Section 1, 0–22 cm is brown (10YR 4/3), grading in color to the underlying section. Section 1, 22–150 cm is dark grayish brown (10YR 4/2) with minor dark reddish gray (5YR 4/2) and brown (7.5YR 4/2) color bands. Section 2 is dark brown (10YR 3/3) with dark reddish brown-reddish brown (5YR 4/2–5YR 5/2) color bands. Rest of core (Section 3, 4, 5, and Core Catcher) is dark gray (5Y 4/1) changing downcore to dark olive gray (5Y 3/2), with abundant dark reddish gray (5YR 4/2) color bands throughout. MUD is dominantly structureless; color bands range from finely laminated on scale of mm or less to thin bedded. Color band contacts range from sharp to gradational. Locations of thin SILT laminae are shown in "Graphic Lithology" column.

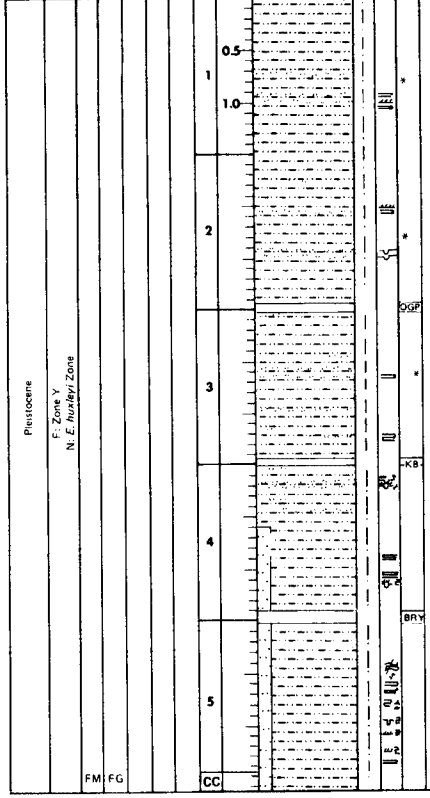
SMEAR SLIDE SUMMARY (%):

	1, 6 M	1, 16 M	1, 70 D	3, 38 M
Texture:				
Sand	0	0	0	T
Silt	45	30	35	95
Clay	55	70	65	5
Composition:				
Quartz	30	22	19	81
Feldspar	2	1	4	1
Mica	3	1	3	5
Heavy minerals	3	3	3	5
Clay	54	70	64	–
Volcanic glass	T	T	–	–
Glauconite	–	–	T	–
Pyrite and opaques	–	T	1	1
Micronodules	1	T	T	T
Carbonate unspec.	4	3	5	7
Foraminifers	2	–	–	–
Calc. nannofossils	1	–	1	–
Radiolarians	T	–	–	–
Sponge spicules	–	T	T	–
Plant debris	–	–	T	–

CARBONATE BOMB DATA:

- 1, 2–3 cm = 11%
- 1, 5–6 cm = 8%
- 1, 10–11 cm = 15%
- 1, 17–18 cm = 2%
- 1, 19–20 cm = 1%
- 1, 25–26 cm = 1%
- 1, 41–42 cm = 3%
- 3, 41–42 cm = 5%

SITE 624 HOLE CORE 2H CORED INTERVAL 3205.1–3214.7 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae.

MUD is very dark grayish brown (2.5Y 3/2) in Section 1 and dark olive gray (5Y 3/2) in the rest of the core.

SILT laminae are dark olive gray (5Y 3/2) and subtle variations on that color.

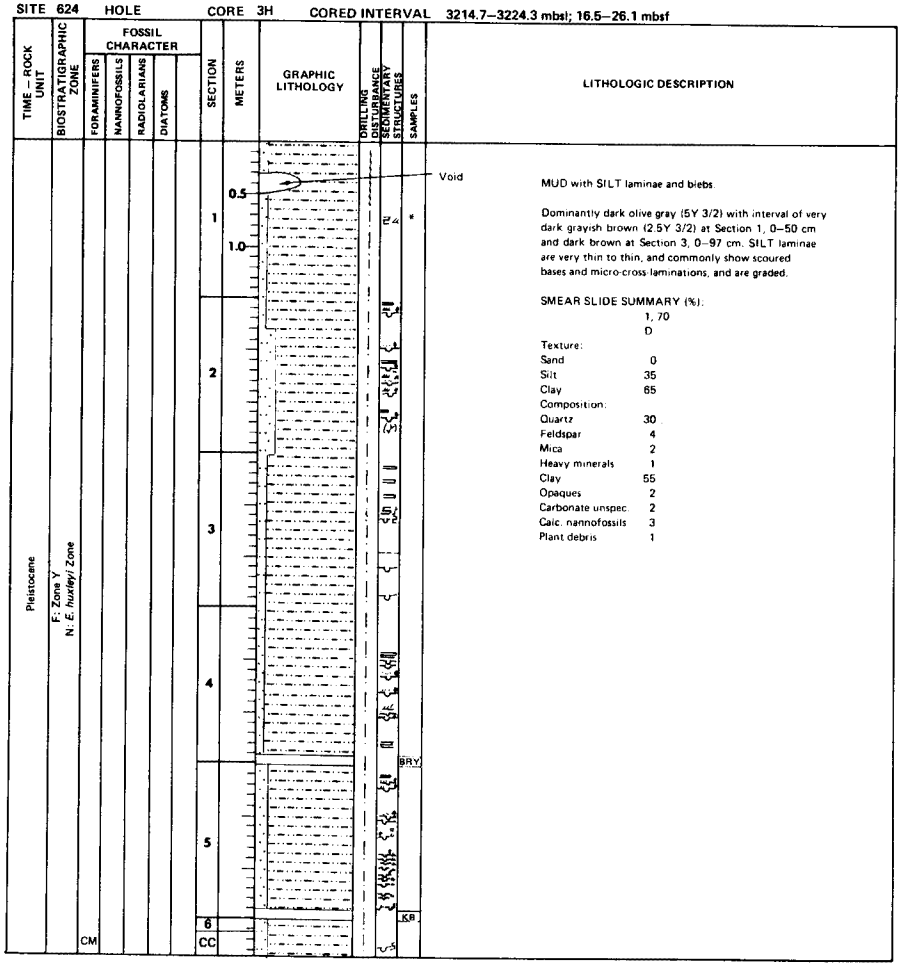
MUD is somewhat color banded, but color variations are subtle and decrease in abundance downcore.

SILT laminae are very thin to thick, are often micro-laminated and crossbedded, and commonly have scoured bases. No grading was observed. Abundance of SILT laminae increases downcore; those in Section 4, 60–142 cm and Section 5 and Core Catcher are too numerous to draw in individually on "Graphic Lithology" column.

SMEAR SLIDE SUMMARY (%):

	2, 80 D	3, 63 M
Texture:		
Sand	0	0
Silt	40	75
Clay	60	25
Composition:		
Quartz	35	59
Feldspar	5	10
Mica	4	4
Heavy minerals	T	1
Clay	48	15
Opaques	1	2
Carbonate unspec.	6	7
Calc. nannofossils	1	1
Plant debris	T	1

SITE 624 HOLE CORE 3H CORED INTERVAL 3214.7–3224.3 mbsl; 16.5–26.1 mbsf



LITHOLOGIC DESCRIPTION

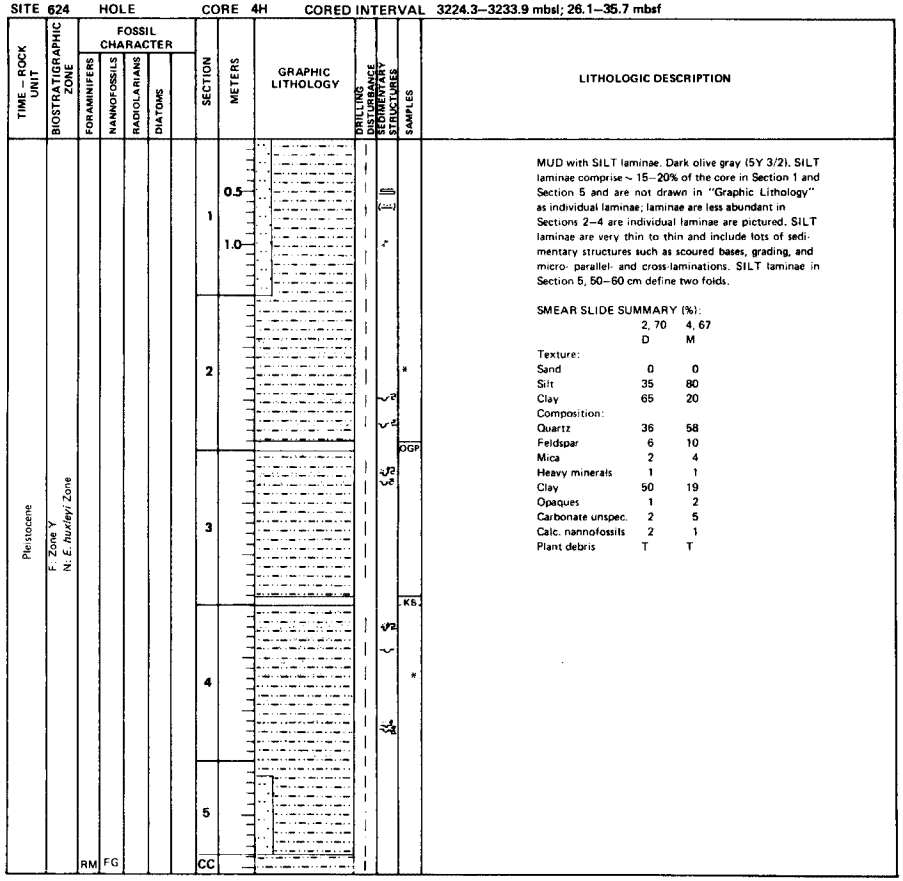
MUD with SILT laminae and blebs.

Dominantly dark olive gray (5Y 3/2) with interval of very dark grayish brown (2.5Y 3/2) at Section 1, 0–50 cm and dark brown at Section 3, 0–97 cm. SILT laminae are very thin to thin, and commonly show scoured bases and micro-cross-laminations, and are graded.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	30
Feldspar	4
Mica	2
Heavy minerals	1
Clay	55
Opaques	2
Carbonate unspec.	2
Calc. nannofossils	3
Plant debris	1

SITE 624 HOLE CORE 4H CORED INTERVAL 3224.3–3233.9 mbsl; 26.1–35.7 mbsf



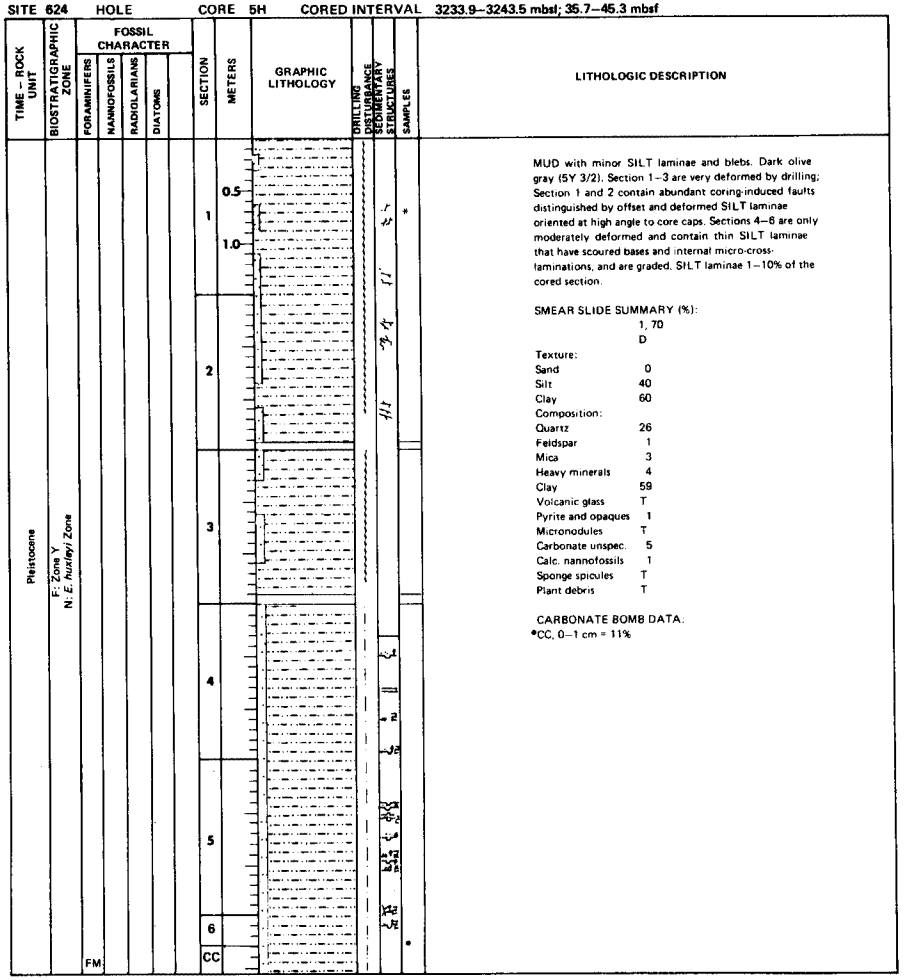
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. Dark olive gray (5Y 3/2). SILT laminae comprise ~ 15–20% of the core in Section 1 and Section 5 and are not drawn in "Graphic Lithology" as individual laminae; laminae are less abundant in Sections 2–4 are individual laminae are pictured. SILT laminae are very thin to thin and include lots of sedimentary structures such as scoured bases, grading, and micro- parallel- and cross-laminations. SILT laminae in Section 5, 50–60 cm define two folds.

SMEAR SLIDE SUMMARY (%):

	2, 70 D	4, 67 M
Texture:		
Sand	0	0
Silt	35	80
Clay	65	20
Composition:		
Quartz	36	58
Feldspar	6	10
Mica	2	4
Heavy minerals	1	1
Clay	50	19
Opaques	1	2
Carbonate unspec.	2	5
Calc. nannofossils	2	1
Plant debris	T	T

SITE 624 HOLE CORE 5H CORED INTERVAL 3233.9–3243.5 mbsl; 35.7–45.3 mbsf



LITHOLOGIC DESCRIPTION

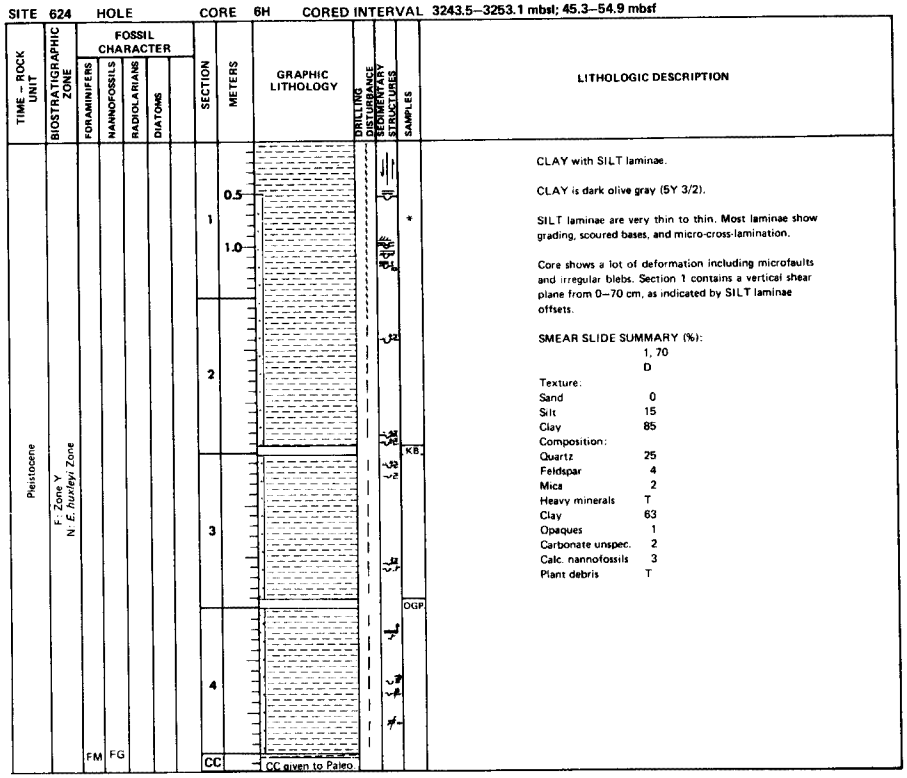
MUD with minor SILT laminae and blebs. Dark olive gray (5Y 3/2). Section 1–3 are very deformed by drilling; Section 1 and 2 contain abundant coring-induced faults distinguished by offset and deformed SILT laminae oriented at high angle to core caps. Sections 4–6 are only moderately deformed and contain thin SILT laminae that have scoured bases and internal micro-cross-laminations, and are graded. SILT laminae 1–10% of the cored section.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	26
Feldspar	1
Mica	3
Heavy minerals	4
Clay	59
Volcanic glass	T
Pyrite and opaques	1
Micronodules	T
Carbonate unspec.	5
Calc. nannofossils	1
Sponge spicules	T
Plant debris	T

CARBONATE BOMB DATA:
•CC, 0–1 cm = 11%

SITE 624 HOLE CORE 6H CORED INTERVAL 3243.5–3253.1 mbsl; 45.3–54.9 mbsf



LITHOLOGIC DESCRIPTION

CLAY with SILT laminae.

CLAY is dark olive gray (5Y 3/2).

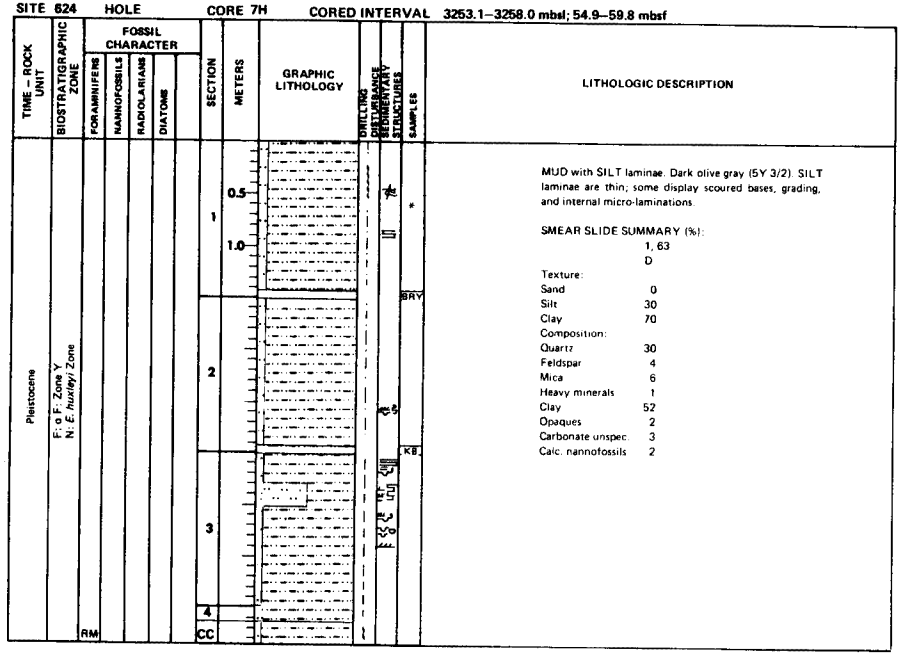
SILT laminae are very thin to thin. Most laminae show grading, scoured bases, and micro-cross-lamination.

Core shows a lot of deformation including microfaults and irregular blebs. Section 1 contains a vertical shear plane from 0–70 cm, as indicated by SILT laminae offsets.

SMEAR SLIDE SUMMARY (%):

	1, 70 D
Texture:	
Sand	0
Silt	15
Clay	85
Composition:	
Quartz	25
Feldspar	4
Mica	2
Heavy minerals	T
Clay	63
Opaques	1
Carbonate unspec.	2
Calc. nannofossils	3
Plant debris	T

SITE 624 HOLE CORE 7H CORED INTERVAL 3253.1–3258.0 mbsl; 54.9–59.8 mbsf



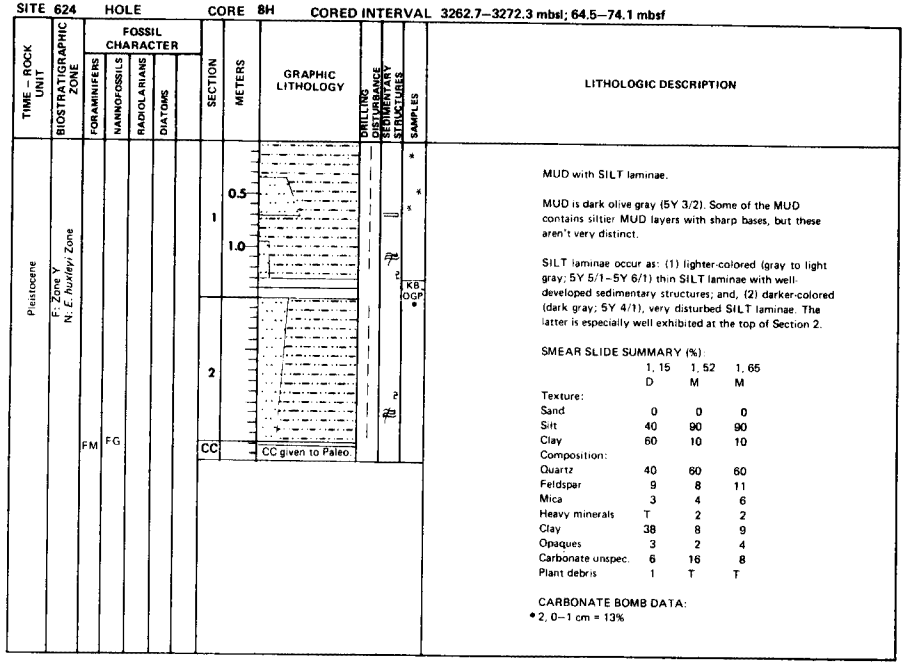
LITHOLOGIC DESCRIPTION

MUD with SILT laminae. Dark olive gray (5Y 3/2). SILT laminae are thin; some display scoured bases, grading, and internal micro-laminations.

SMEAR SLIDE SUMMARY (%):

	1, 63 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	30
Feldspar	4
Mica	6
Heavy minerals	1
Clay	52
Opaques	2
Carbonate unspec.	3
Calc. nannofossils	2

SITE 624 HOLE CORE 8H CORED INTERVAL 3262.7–3272.3 mbsl; 64.5–74.1 mbsf



LITHOLOGIC DESCRIPTION

MUD with SILT laminae.

MUD is dark olive gray (5Y 3/2). Some of the MUD contains siltier MUD layers with sharp bases, but these aren't very distinct.

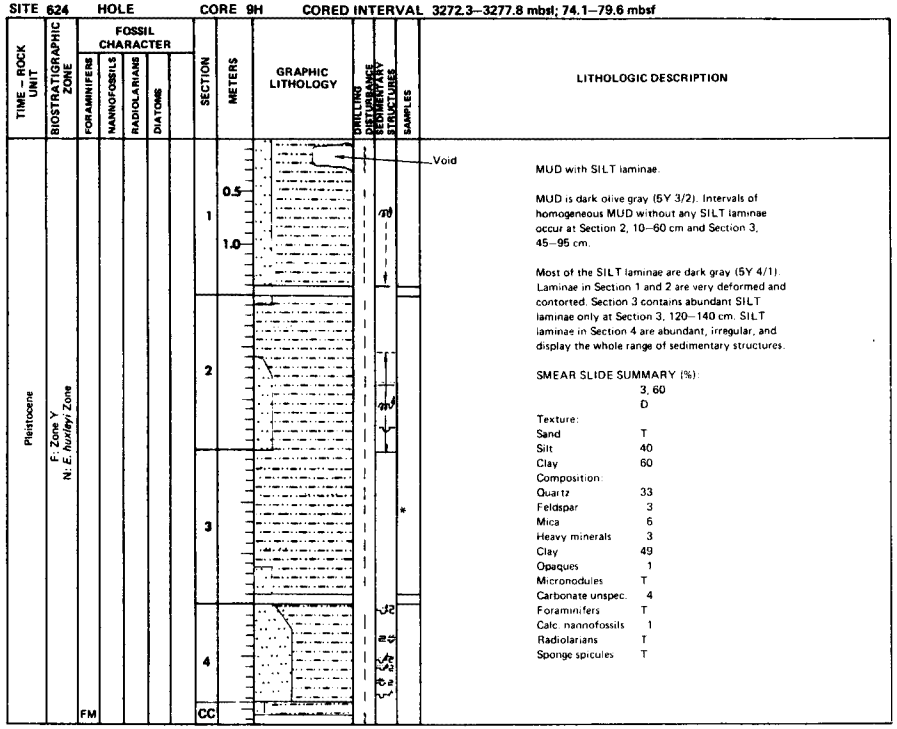
SILT laminae occur as: (1) lighter-colored (gray to light gray; 5Y 5/1–5Y 6/1) thin SILT laminae with well-developed sedimentary structures; and, (2) darker-colored (dark gray; 5Y 4/1), very disturbed SILT laminae. The latter is especially well exhibited at the top of Section 2.

SMEAR SLIDE SUMMARY (%):

	1, 15 D	1, 52 M	1, 65 M
Texture:			
Sand	0	0	0
Silt	40	90	90
Clay	60	10	10
Composition:			
Quartz	40	60	60
Feldspar	9	8	11
Mica	3	4	6
Heavy minerals	T	2	2
Clay	38	8	9
Opaques	3	2	4
Carbonate unspec.	6	16	8
Plant debris	1	T	T

CARBONATE BOMB DATA:
• 2, 0–1 cm = 13%

SITE 624 HOLE CORE 9H CORED INTERVAL 3272.3–3277.8 mbsl; 74.1–79.6 mbsf



MUD with SILT laminae.

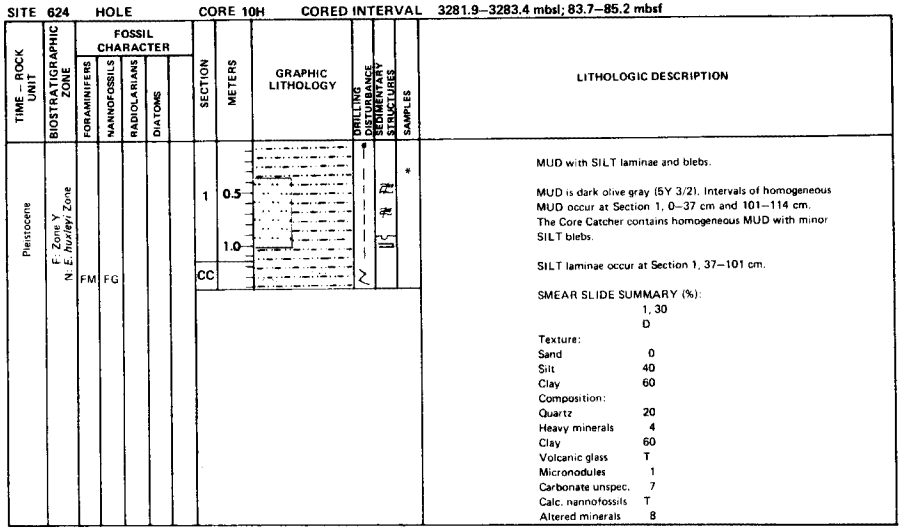
MUD is dark olive gray (5Y 3/2). Intervals of homogeneous MUD without any SILT laminae occur at Section 2, 10–60 cm and Section 3, 45–95 cm.

Most of the SILT laminae are dark gray (5Y 4/1). Laminae in Section 1 and 2 are very deformed and contorted. Section 3 contains abundant SILT laminae only at Section 3, 120–140 cm. SILT laminae in Section 4 are abundant, irregular, and display the whole range of sedimentary structures.

SMEAR SLIDE SUMMARY (%):

	3, 60 D
Texture:	
Sand	T
Silt	40
Clay	60
Composition:	
Quartz	33
Feldspar	3
Mica	6
Heavy minerals	3
Clay	49
Opaques	1
Micronodules	T
Carbonate unspec.	4
Foraminifers	T
Calc. nannofossils	1
Radiolarians	T
Sponge spicules	T

SITE 624 HOLE CORE 10H CORED INTERVAL 3281.9–3283.4 mbsl; 83.7–85.2 mbsf



MUD with SILT laminae and blebs.

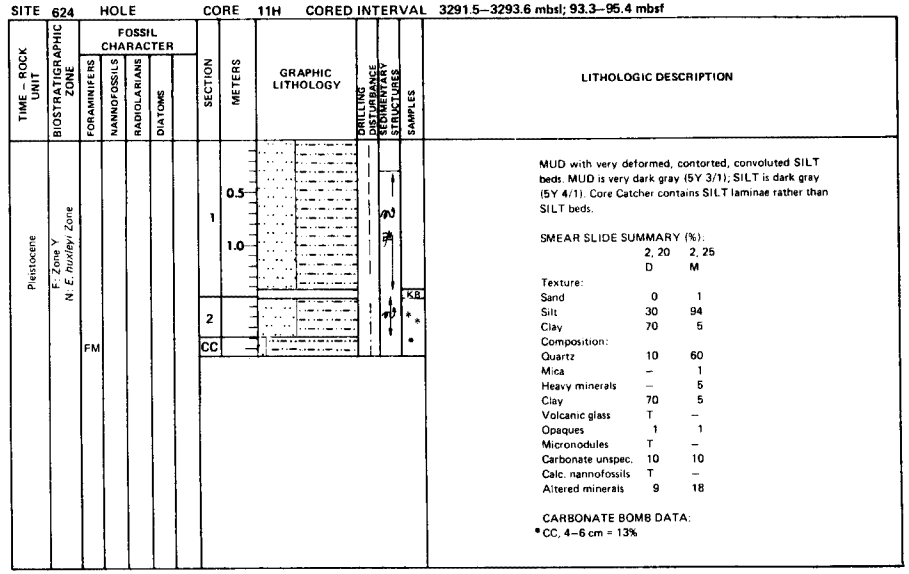
MUD is dark olive gray (5Y 3/2). Intervals of homogeneous MUD occur at Section 1, 0–37 cm and 101–114 cm. The Core Catcher contains homogeneous MUD with minor SILT blebs.

SILT laminae occur at Section 1, 37–101 cm.

SMEAR SLIDE SUMMARY (%):

	1, 30 D
Texture:	
Sand	0
Silt	40
Clay	60
Composition:	
Quartz	20
Heavy minerals	4
Clay	60
Volcanic glass	T
Micronodules	1
Carbonate unspec.	7
Calc. nannofossils	T
Altered minerals	8

SITE 624 HOLE CORE 11H CORED INTERVAL 3291.5–3293.6 mbsl; 93.3–95.4 mbsf



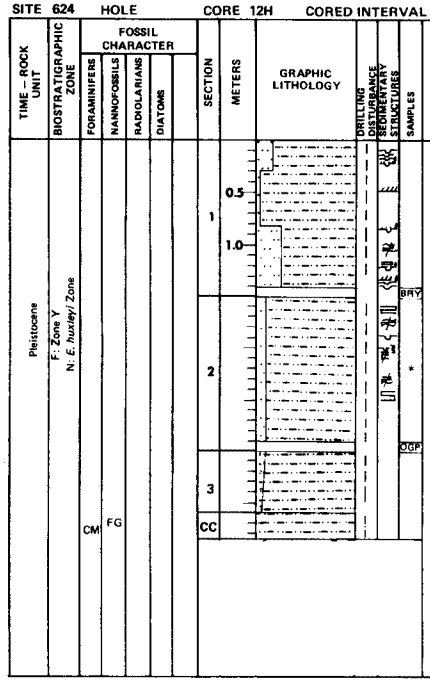
MUD with very deformed, contorted, convoluted SILT beds. MUD is very dark gray (5Y 3/1); SILT is dark gray (5Y 4/1). Core Catcher contains SILT laminae rather than SILT beds.

SMEAR SLIDE SUMMARY (%):

	2, 20 D	2, 25 M
Texture:		
Sand	0	1
Silt	30	94
Clay	70	5
Composition:		
Quartz	10	60
Mica	–	1
Heavy minerals	–	5
Clay	70	5
Volcanic glass	T	–
Opaques	1	1
Micronodules	T	–
Carbonate unspec.	10	10
Calc. nannofossils	T	–
Altered minerals	9	18

CARBONATE BOMB DATA:
• CC, 4–6 cm = 13%

SITE 624 HOLE CORE 12H CORED INTERVAL 3300.9–3304.9 mbsl; 102.7–106.7 mbsf



LITHOLOGIC DESCRIPTION

MUD/CLAYEY MUD with SILT laminae.

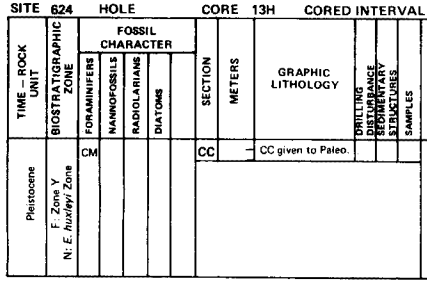
MUD is very dark gray (5Y 3/1–5Y 3/1.5) in Section 1 and 3; dark olive gray (5Y 3/2) in Section 2 and Core Catcher. Core Catcher contains a very dark grayish brown (10YR 3/2) oxidation zone at 13–20 cm.

SILT laminae are very thin, and range from very dark gray–dark gray (5Y 3/1–5Y 4/1). The lighter-colored laminae (5Y 4/1) contain a higher percent of $CaCO_3$. Laminae in Section 1 and 2 commonly have scoured bases, and are internally laminated; some of them are graded.

SMEAR SLIDE SUMMARY (%):

	2, 75 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	14
Feldspar	1
Mica	T
Heavy minerals	3
Clay	65
Micronodules	10
Carbonate unspec.	T
Foraminifers	T
Calc. nannofossils	T
Sponge spicules	T
Plant debris	2
Altered minerals	5

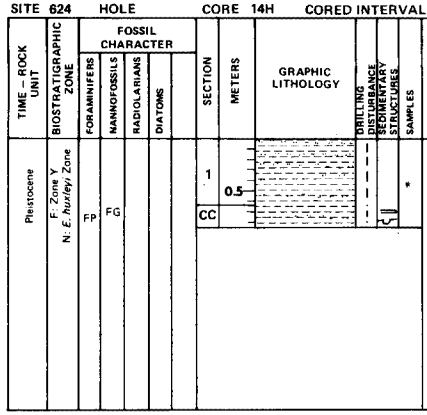
SITE 624 HOLE CORE 13H CORED INTERVAL 3310.3–3311.0 mbsl; 112.1–112.8 mbsf



LITHOLOGIC DESCRIPTION

No core recovered. Tiny bit of sediment recovered in Core Catcher given to shipboard paleontologists.

SITE 624 HOLE CORE 14H CORED INTERVAL 3316.0–3317.0 mbsl; 117.8–118.8 mbsf



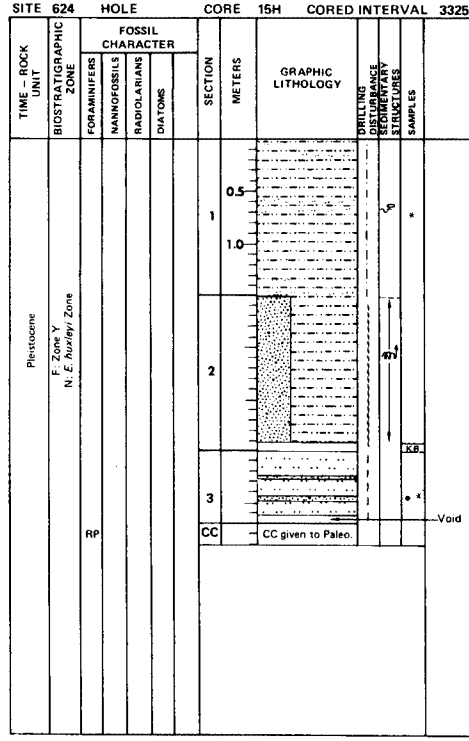
LITHOLOGIC DESCRIPTION

CLAY, with minor, discontinuous and continuous SILT laminae as shown in "Graphic Lithology" column. CLAY is dominantly dark olive gray (5Y 3/2).

SMEAR SLIDE SUMMARY (%):

	1, 45 D
Texture:	
Sand	0
Silt	20
Clay	80
Composition:	
Quartz	5
Clay	80
Carbonate unspec.	3
Calc. nannofossils	1
Altered minerals	11

SITE 624 HOLE CORE 15H CORED INTERVAL 3325.3–3329.1 mbsl; 127.1–130.9 mbsf



LITHOLOGIC DESCRIPTION

Section 1: MUD with rare SILT laminae, as shown in "Graphic Lithology" column. MUD is very dark gray (5Y 3/1); SILT laminae are dark gray (5Y 4/1). SILT laminae are very thin to thin; SILT is slightly coarser than in the previous cores.

Section 2: MUD with deformed SANDY SILT layers. MUD is very dark gray (5Y 3/1). SANDY SILT layers are dark gray (5Y 4/1), convoluted and contorted, and make up about 30–35% of the section.

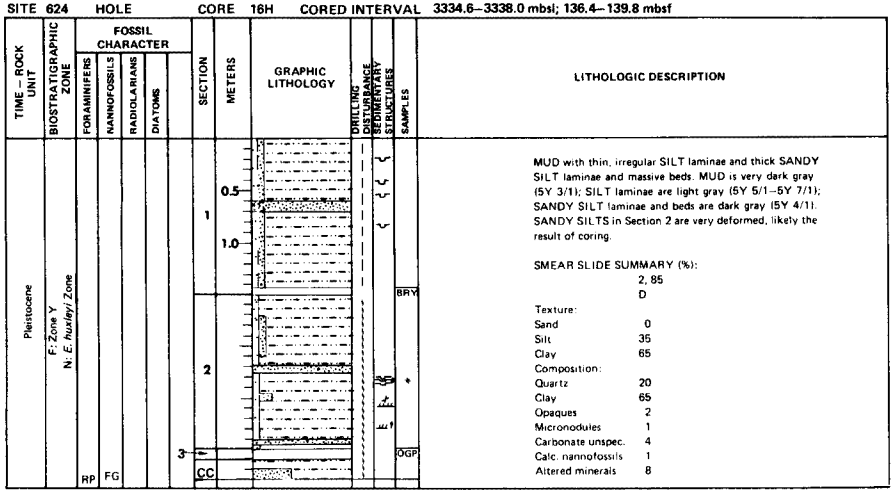
Section 3: Homogeneous SILT with coarser SANDY SILT layers are Section 3, 27–29 and 43–48 cm. SILT is very dark gray (5Y 3/1); SANDY SILT is dark gray (5Y 4/1).

SMEAR SLIDE SUMMARY (%):

	1, 75 D	3, 45 D
Texture:		
Sand	0	35
Silt	40	62
Clay	60	3
Composition:		
Quartz	24	82
Feldspar	2	1
Mica	1	1
Heavy minerals	5	2
Clay	59	3
Volcanic glass	1	2
Carbonate unspec.	T	2
Foraminifers	1	T
Calc. nannofossils	1	T
Sponge spicules	T	T
Plant debris	4	2
Altered minerals	2	5

*CARBONATE BOMB DATA:
3, 47–49 cm = 7%

SITE 624 HOLE CORE 16H CORED INTERVAL 3334.6–3338.0 mbsl; 136.4–139.8 mbsf

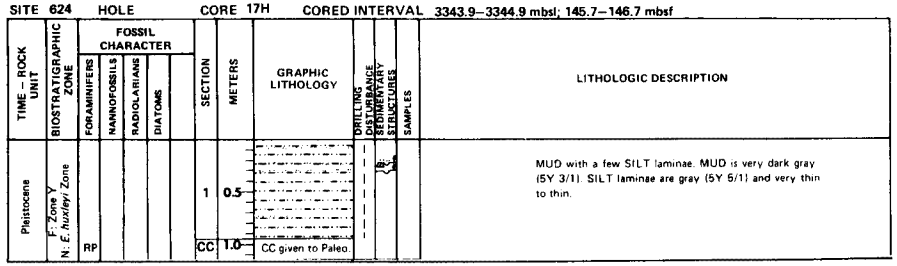


MUD with thin, irregular SILT laminae and thick SANDY SILT laminae and massive beds. MUD is very dark gray (5Y 3/1); SILT laminae are light gray (5Y 5/1–5Y 7/1); SANDY SILT laminae and beds are dark gray (5Y 4/1). SANDY SILTS in Section 2 are very deformed, likely the result of coring.

SMEAR SLIDE SUMMARY (%):

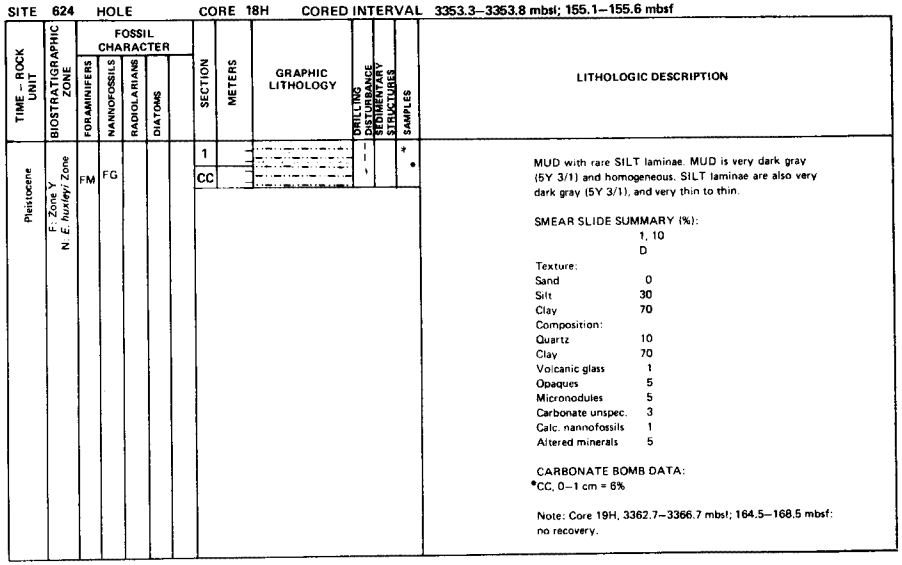
	2, 85 D
Texture:	
Sand	0
Silt	35
Clay	65
Composition:	
Quartz	20
Clay	65
Opaques	2
Micronodules	1
Carbonate unspec.	4
Calc. nannofossils	1
Altered minerals	8

SITE 624 HOLE CORE 17H CORED INTERVAL 3343.9–3344.9 mbsl; 145.7–146.7 mbsf



MUD with a few SILT laminae. MUD is very dark gray (5Y 3/1). SILT laminae are gray (5Y 5/1) and very thin to thin.

SITE 624 HOLE CORE 18H CORED INTERVAL 3353.3–3353.8 mbsl; 155.1–155.6 mbsf



MUD with rare SILT laminae. MUD is very dark gray (5Y 3/1) and homogeneous. SILT laminae are also very dark gray (5Y 3/1), and very thin to thin.

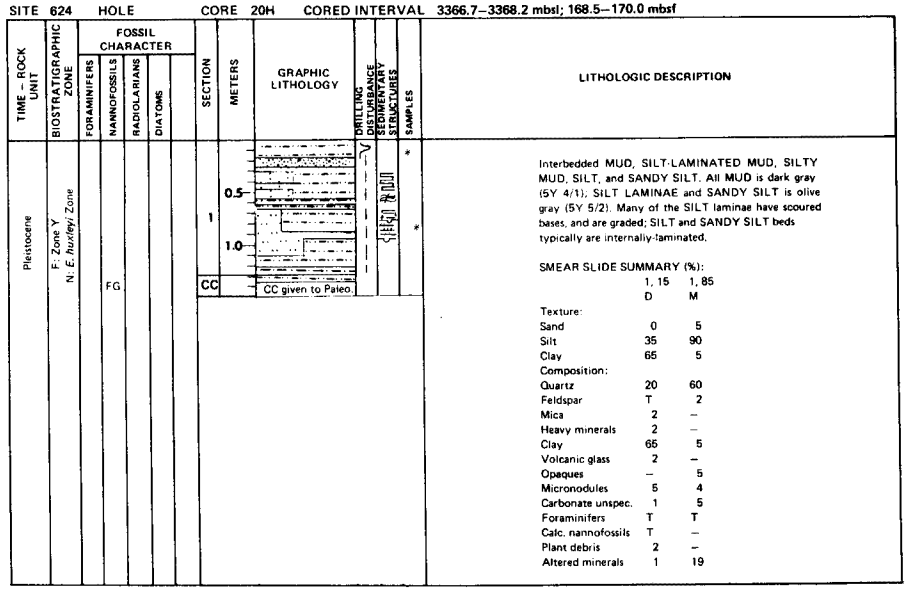
SMEAR SLIDE SUMMARY (%):

	1, 10 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	10
Clay	70
Volcanic glass	1
Opaques	5
Micronodules	5
Carbonate unspec.	3
Calc. nannofossils	1
Altered minerals	5

CARBONATE BOMB DATA:
*CC, 0–1 cm = 6%

Note: Core 19H, 3362.7–3366.7 mbsf; 164.5–168.5 mbsf: no recovery.

SITE 624 HOLE CORE 20H CORED INTERVAL 3366.7–3368.2 mbsl; 168.5–170.0 mbsf

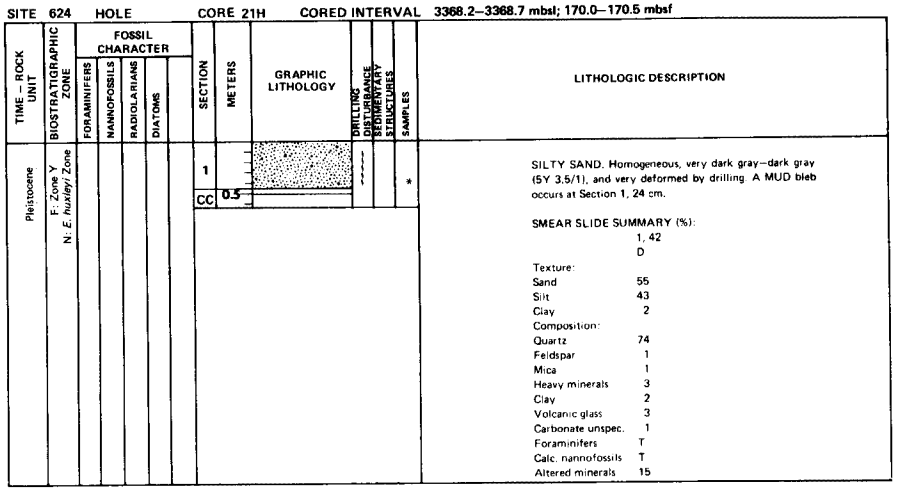


Interbedded MUD, SILT-LAMINATED MUD, SILTY MUD, SILT, and SANDY SILT. All MUD is dark gray (5Y 4/1); SILT LAMINAE and SANDY SILT is olive gray (5Y 5/2). Many of the SILT laminae have scoured bases, and are graded; SILT and SANDY SILT beds typically are internally-laminated.

SMEAR SLIDE SUMMARY (%):

	1, 15 D	1, 85 M
Texture:		
Sand	0	5
Silt	35	90
Clay	65	5
Composition:		
Quartz	20	60
Feldspar	T	2
Mica	2	–
Heavy minerals	2	–
Clay	65	5
Volcanic glass	2	–
Opaques	–	5
Micronodules	5	4
Carbonate unspec.	1	5
Foraminifers	T	T
Calc. nannofossils	T	–
Plant debris	2	–
Altered minerals	1	19

SITE 624 HOLE CORE 21H CORED INTERVAL 3368.2–3368.7 mbsl; 170.0–170.5 mbsf

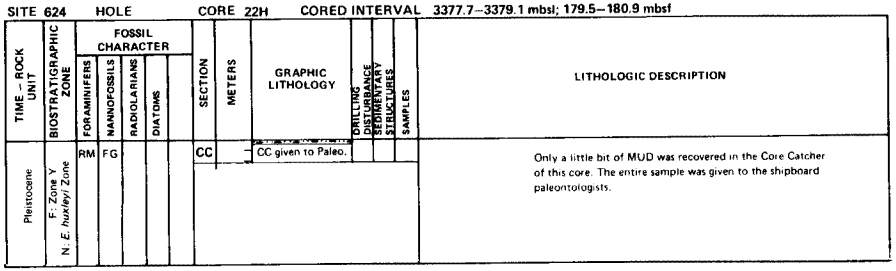


SILTY SAND. Homogeneous, very dark gray–dark gray (5Y 3.5/1), and very deformed by drilling. A MUD bleb occurs at Section 1, 24 cm.

SMEAR SLIDE SUMMARY (%):

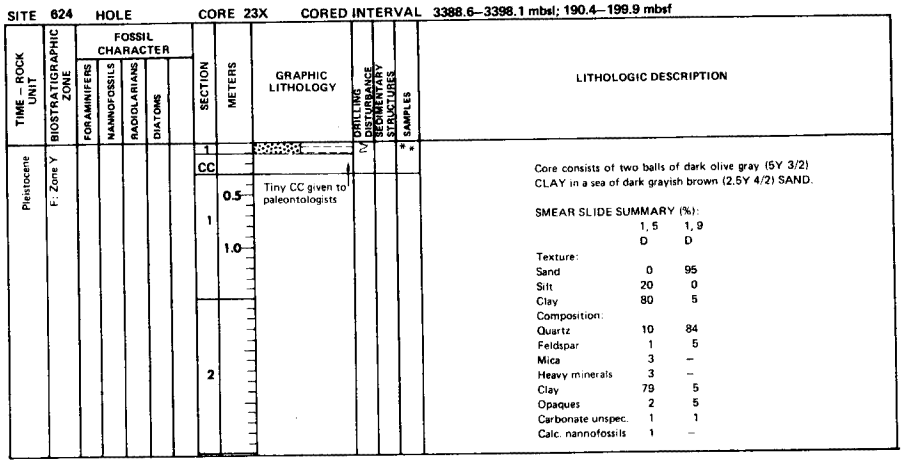
	1, 42 D
Texture:	
Sand	55
Silt	43
Clay	2
Composition:	
Quartz	74
Feldspar	1
Mica	1
Heavy minerals	3
Clay	2
Volcanic glass	3
Carbonate unspec.	1
Foraminifers	T
Calc. nannofossils	T
Altered minerals	15

SITE 624 HOLE CORE 22H CORED INTERVAL 3377.7–3379.1 mbsl; 179.5–180.9 mbsf



Only a little bit of MUD was recovered in the Core Catcher of this core. The entire sample was given to the shipboard paleontologists.

SITE 624 HOLE CORE 23X CORED INTERVAL 3388.6–3398.1 mbsl; 190.4–199.9 mbsf

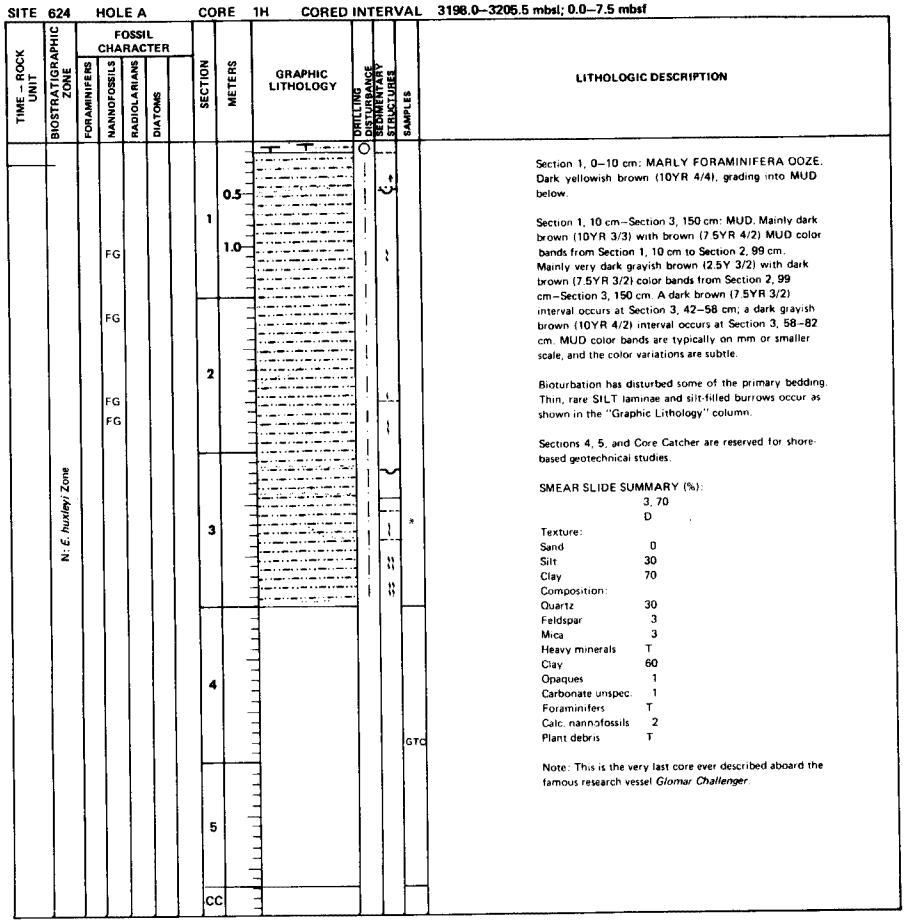


Core consists of two balls of dark olive gray (5Y 3/2) CLAY in a sea of dark grayish brown (2.5Y 4/2) SAND.

SMEAR SLIDE SUMMARY (%):

	1, 5 D	1, 9 D
Texture:		
Sand	0	95
Silt	20	0
Clay	80	5
Composition:		
Quartz	10	84
Feldspar	1	5
Mica	3	–
Heavy minerals	3	–
Clay	79	5
Opaques	2	5
Carbonate unspec.	1	1
Calc. nannofossils	1	–

SITE 624 HOLE A CORE 1H CORED INTERVAL 3198.0–3205.5 mbsl; 0.0–7.5 mbsf



LITHOLOGIC DESCRIPTION

Section 1, 0–10 cm: MARLY FORAMINIFERA OOZE. Dark yellowish brown (10YR 4/4), grading into MUD below.

Section 1, 10 cm–Section 3, 150 cm: MUD. Mainly dark brown (10YR 3/3) with brown (7.5YR 4/2) MUD color bands from Section 1, 10 cm to Section 2, 99 cm. Mainly very dark grayish brown (2.5Y 3/2) with dark brown (7.5YR 3/2) color bands from Section 2, 99 cm–Section 3, 150 cm. A dark brown (7.5YR 3/2) interval occurs at Section 3, 42–58 cm; a dark grayish brown (10YR 4/2) interval occurs at Section 3, 58–82 cm. MUD color bands are typically on mm or smaller scale, and the color variations are subtle.

Bioturbation has disturbed some of the primary bedding. Thin, rare SILT laminae and silt-filled burrows occur as shown in the "Graphic Lithology" column.

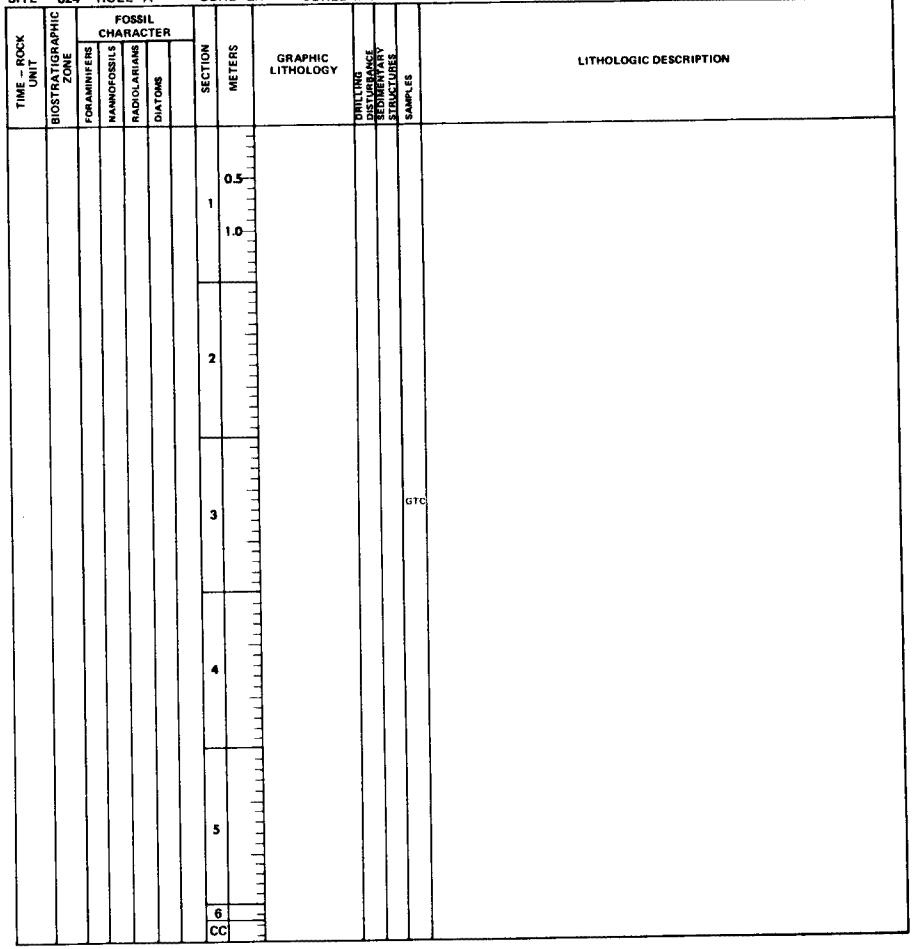
Sections 4, 5, and Core Catcher are reserved for shore-based geotechnical studies.

SMEAR SLIDE SUMMARY (%):

	3, 70 D
Texture:	
Sand	0
Silt	30
Clay	70
Composition:	
Quartz	30
Feldspar	3
Mica	3
Heavy minerals	T
Clay	60
Opaques	1
Carbonate unspec.	1
Foraminifers	T
Calc. nannofossils	2
Plant debris	T

Note: This is the very last core ever described aboard the famous research vessel *Glomar Challenger*.

SITE 624 HOLE A CORE 2H CORED INTERVAL 3205.5–3215.1 mbsl; 7.5–17.1 mbsf



LITHOLOGIC DESCRIPTION

SITE 624 HOLE A CORE 3H CORED INTERVAL 3215.1–3224.7 mbsl; 17.1–26.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0					
						2						
						3					GTC	
						4						
						5						
						CC					GTC	

SITE 624 HOLE A CORE 4H CORED INTERVAL 3224.7–3234.3 mbsl; 26.7–36.3 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0					
						2					GTC	
						3						
						4						
						5						
						CC					GTC	

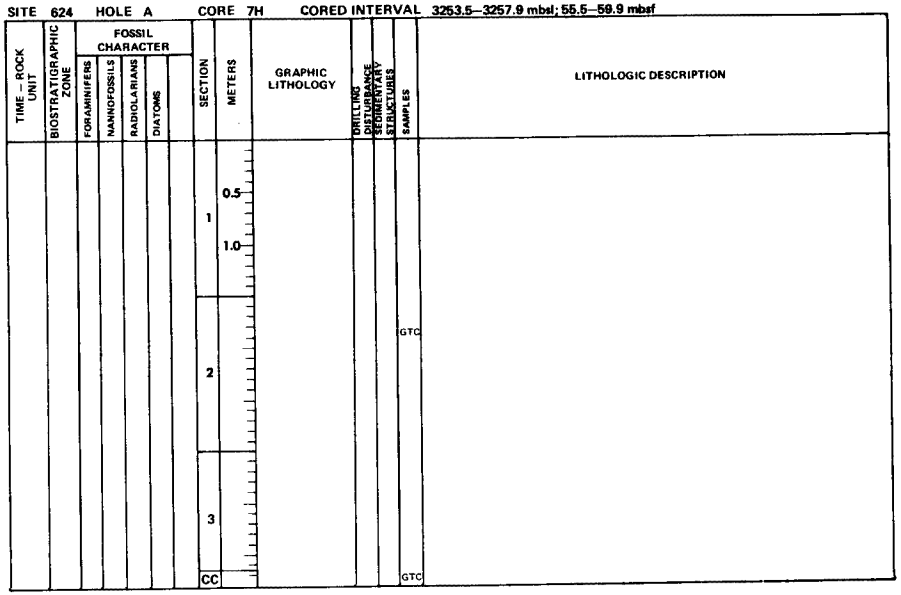
SITE 624 HOLE A CORE 5H CORED INTERVAL 3234.3–3243.9 mbsl; 36.3–45.9 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0					
						2						
						3					GTC	
						4						
						5						
						CC					GTC	

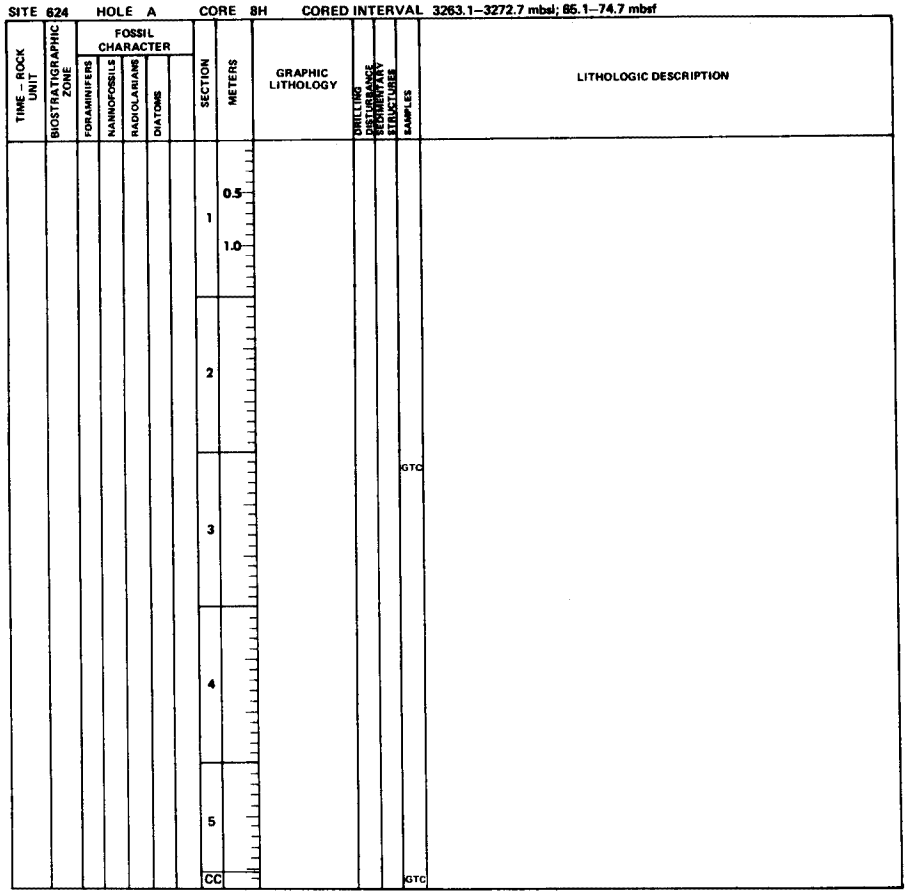
SITE 624 HOLE A CORE 6H CORED INTERVAL 3243.9–3253.5 mbsl; 45.9–55.5 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0					
						2						
						3					GTC	
						4						
						5						

SITE 624 HOLE A CORE 7H CORED INTERVAL 3263.5–3257.9 mbsl; 55.5–59.9 mbsf



SITE 624 HOLE A CORE 8H CORED INTERVAL 3263.1–3272.7 mbsl; 65.1–74.7 mbsf



SITE 624 HOLE A CORE 9H CORED INTERVAL 3272.7–3277.9 mbsl; 74.7–79.9 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5 1.0					
						2					GTC	
						3						
						4						

SITE 624 HOLE A CORE 10H CORED INTERVAL 3282.3–3286.6 mbsl; 84.3–88.6 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5 1.0					
						2					GTC	
						3						
						CC					GTC	

SITE 624 HOLE A CORE 11H CORED INTERVAL 3291.7–3295.7 mbsl; 93.7–97.7 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5 1.0					
						2					GTC	
						3						
						CC					GTC	

SITE 624 HOLE A CORE 12H CORED INTERVAL 3301.1–3303.0 mbsl; 103.1–105.0 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				GTC	
							1.0					
						2						
						CC					GTC	

SITE 624 HOLE A CORE 13H CORED INTERVAL 3310.5–3314.2 mbsl; 112.5–116.2 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0					
						2					GTC	
						3						
						CC					GTC	

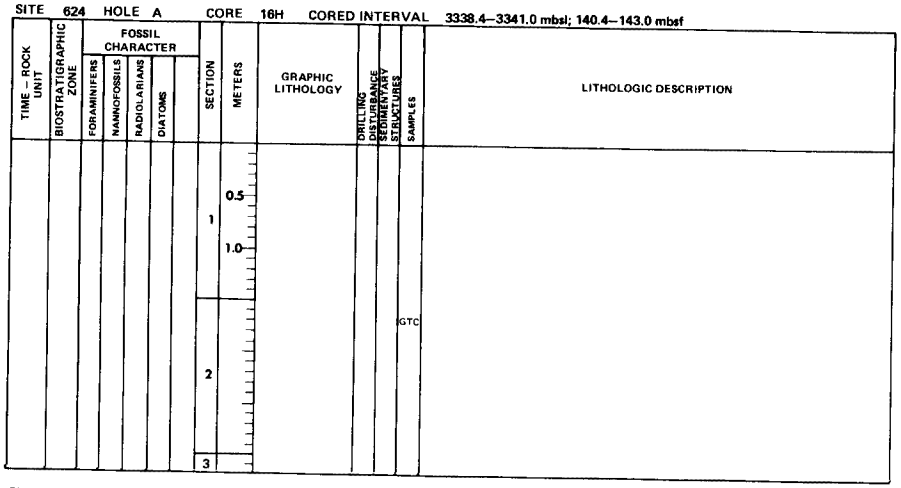
SITE 624 HOLE A CORE 14H CORED INTERVAL 3319.8–3322.8 mbsl; 121.8–124.8 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0				GTC	
						2						

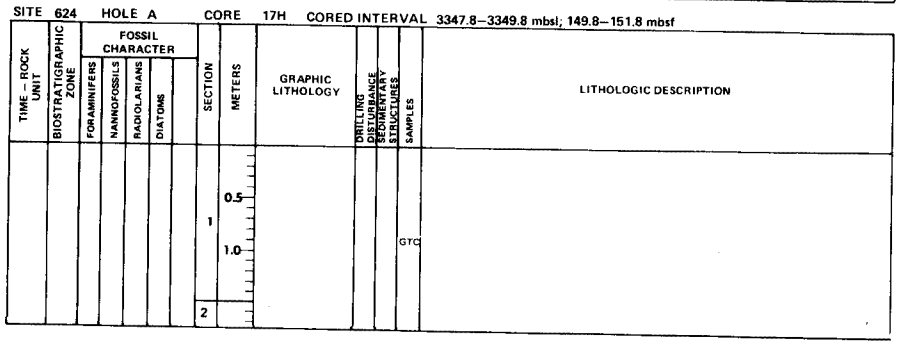
SITE 624 HOLE A CORE 15H CORED INTERVAL 3329.1–3331.1 mbsl; 131.1–133.1 mbsf

TIME – ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER: FORAMINIFERS	FOSSIL CHARACTER: NANNOFOSSILS	FOSSIL CHARACTER: RADIOLARIANS	FOSSIL CHARACTER: DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					
							1.0				GTC	
						2						
						CC						

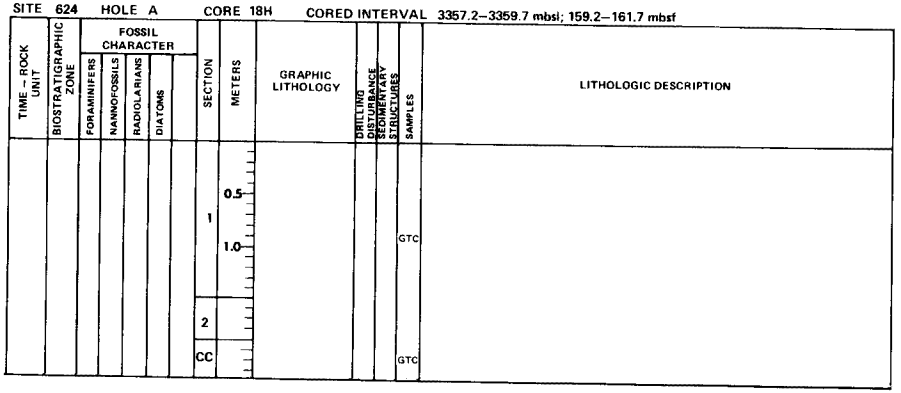
SITE 624 HOLE A CORE 16H CORED INTERVAL 3338.4–3341.0 mbsl; 140.4–143.0 mbsf



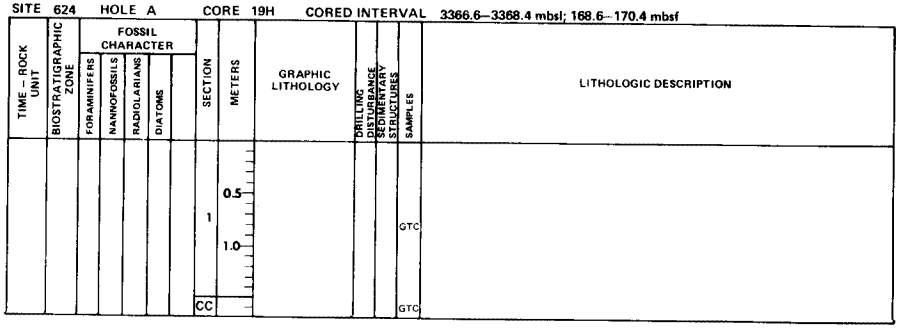
SITE 624 HOLE A CORE 17H CORED INTERVAL 3347.8–3349.8 mbsl; 149.8–151.8 mbsf



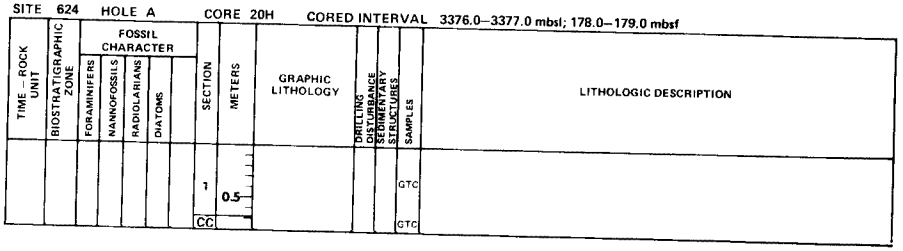
SITE 624 HOLE A CORE 18H CORED INTERVAL 3357.2–3359.7 mbsl; 159.2–161.7 mbsf



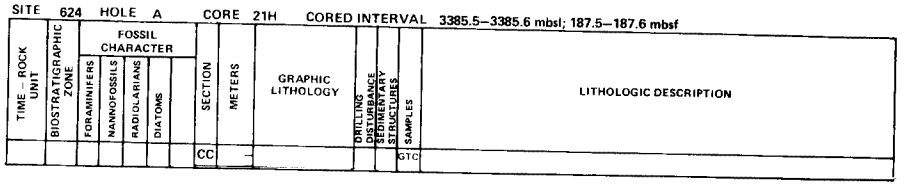
SITE 624 HOLE A CORE 19H CORED INTERVAL 3366.6–3368.4 mbsl; 168.6–170.4 mbsf



SITE 624 HOLE A CORE 20H CORED INTERVAL 3376.0–3377.0 mbsl; 178.0–179.0 mbsf



SITE 624 HOLE A CORE 21H CORED INTERVAL 3385.5–3385.6 mbsl; 187.5–187.6 mbsf



SITE 624 HOLE A CORE 22H CORED INTERVAL 3395.0–3395.1 mbsl; 197.0–197.1 mbsf