The descriptions of sites, cores, and data included in these site reports were completed within one year of the cruise, but many of the topical chapters that follow were completed at a later date. More data were acquired and authors' interpretations matured during this interval, so readers may find some discrepancies between site reports and topical papers. The timely publication of the *Initial Reports* series, which is intended to report the early results of each leg, precludes incurring the delays that would allow the site reports to be revised at a later stage of production.

# 2. SITE 586: WESTERN EQUATORIAL PACIFIC<sup>1</sup>

Shipboard Scientific Parties of Legs 89 and 90<sup>2</sup>

# **HOLE 586**

Date occupied: 19 November 1982

Date departed: 19 November 1982

Time on hole: 15 hr., 52 min.

Position: 00°29.84'S: 158°29.89'E

Water depth (sea level; corrected m, echo-sounding): 2208

Water depth (rig floor; corrected m, echo-sounding): 2218

Bottom felt (m, drill pipe): 2223.1. Note: water depth of 2218 m from rig floor from 586C logs used as site datum.

Penetration (m): 39.3

Number of cores: 5

Total length of cored section (m): 39.3

Total core recovered (m): 38.98

versity of Rhode Island, Narragansett, RI 02882; Christopher C. von der Borch (Co-Chief Scientist), School of Earth Sciences, Flinders University of South Australia, Bedford Park, South Australia 5042; Paul A. Baker, Department of Geology, Duke University, Durham, NC 27708; Charles E. Barton, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI 02882 (present address: Bureau of Mineral Resources, Geology, and Geophysics, P.O. Box 378, Canberra, A.C.T., Australia); Anne Boersma, Microclimates, Inc., 404 RR1, Stony Point, NY 10980; Jean-Pierre Caulet, Laboratoire de Géologie, Muséum Na-tional d'Histoire Naturelle, 43 Rue Buffon, 75005, Paris, France; Walter C. Dudley, Jr., Natural Sciences Division, College of Arts and Sciences, University of Hawaii at Hilo, Hilo, Hawaii 96720; James V. Gardner, Pacific-Arctic Branch of Marine Geology, U.S. Geological Sur-vey, 345 Middlefield Rd., Menlo Park, CA 94025; D. Graham Jenkins, Department of Earth Sciences, Open University, Walton Hall, Milton Keynes, MK7 6AA, Buckinghamshire, Unit-ed Kingdom; William H. Lohman, Marathon Oil Co., Deaver Research Center, P.O. Box 269, Littleton, CO 80160; Erlend Martini, Geologisch-Paläontologisches Institut, Johann-Wolfgang-Geothe Universität, Senckenberg-Anlage 32-34, De6000 Frankfurt am Main, Fed-eral Republic of Germany; Russell B. Merrill, Deep Sea Drilling Project A031, Scripps Institu-tion of Oceanography, La Jolla, CA 92093 (present address: Ocean Drilling Project, Texas A&M University, College Station, TX 77843-3469); Roger Morin, Department of Earth and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA 02139 (present address: U.S. Geological Survey, Denver Federal Center, Denver, CO 80225); Cambell S. Nelson, Department of Earth Sciences, University of Waikato, Private Bag, Hamilton, New Zea-land; Christian Robert, Laboratoire de Géologie Marine, Centre Universitaire de Luminy, Case 901, 13288 Marseille Cedex 09, France; M. S. Srinivasan, Department of Geology, Ba-naras Hindu University, Varanasi 221 005, India; Rüdiger Stein, Geologisch-Paläontologis-ches Institut, Universität Kiel, 2300 Kiel, Federal Republic of Germany (present address: Institute of Petroleum and Organic Geochemistry (ICH-5), Kernforschungslage Jülich GmbH, P.O. Box 1913, 5170 Jülich, Federal Republic of Germany); Akira Takeuchi, Department of Earth Sciences, Faculty of Science, Toyama University, Gohuku 3190, Toyama 930, Japan.

Core recovery (%): 99.2

Oldest sediment cored:

Depth sub-bottom (m): 39.3 Nature: Foraminifer-bearing nannofossil ooze Age: Latest Pliocene Measured velocity (km/s): Not measured

Basement: Not encountered

Principal results: This was to be the first of two overlapping sets of cores obtained by the hydraulic piston corer (HPC) on the edge of the Ontong-Java Plateau. While we were attempting to retract the barrel of Core 6, the barrel broke and was left outside the bit, forcing early abandonment of the hole.

## HOLE 586A

Date occupied: 19 November 1982

Date departed: 20 November 1982

Time on hole: 1 day, 3 hr., 46 min.

Position: 00°29.84'S; 158°29.89'E

Water depth (sea level; corrected m, echo-sounding): 2208

Water depth (rig floor; corrected m, echo-sounding): 2218

Bottom felt (m, drill pipe): Not felt. Note: water depth of 2218 m from rig floor from 586C logs used as site datum.

Penetration (m): 305.3

Number of cores: 31

Total length of cored section (m): 260.9

Total core recovered (m): 257.03

Core recovery (%): 98.5

Oldest sediment cored:

Depth sub-bottom (m): 305.3 Nature: Nannofossil ooze and minor nannofossil chalk Age: Earliest late Miocene Measured velocity (km/s): 1.6

Basement: Not encountered

Principal results: Hole 586A was washed to the 39.3 m depth at which Hole 586 had to be abandoned. A Neogene section of foraminiferbearing nannofossil ooze was recovered. With depth, foraminifer content decreases. Below 260 m the first thin chalk beds appear and foraminifers are few. Fossils examined from this site show a mixture of two components: whole specimens whose age increases with core depth, and broken and corroded specimens reworked and transported to the site.

### HOLE 586B

Date occupied: 20 November 1982

Date departed: 22 November 1982

Time on hole: 1 day, 1 hr., 3 min.

Position: 00°29.84'S; 158°29.89'E

Water depth (sea level; corrected m, echo-sounding): 2208

<sup>&</sup>lt;sup>1</sup> Kennett, J. P., von der Borch, C. C., et al., Init. Repts. DSDP, 90: Washington (U.S.

Covt, Printing Office).
 <sup>2</sup> Holes 586, 586A, and 586C have been described by the Leg 89 shipboard scientific party, Hole 586B by the Leg 90 shipboard scientific party. Both are, therefore, listed here.

Leg 89: Ralph Moberly (Co-Chief Scientist), Hawaii Institute of Geophysics, University of Hawaii, Honolulu, HI 96822; Seymour O. Schlanger (Co-Chief Scientist), Department of Geological Sciences, Northwestern University, Evanston, IL 60201; Miriam Baltuck, Deep Sea Drilling Project, Scripps Institution of Oceanography, La Jolla, CA 92093 (present address: Geology Department, Tulane University, New Orleans, LA 70118); James A. Bergen, Depertment of Geology, Florida State University, Tallahassee, FL 32306; Walter Dean, U.S. Geological Survey, Denver Federal Center, Denver, CO 80225; Peter A. Floyd, Department of Geology, University of Keele, Keele, Staffordshire ST5 5BG, United Kingdom; Naoyuki Fujii, Department of Earth Sciences, Kobe University, Kobe 657, Japan; Janet A. Haggerty, Department of Geosciences, University of Tulsa, Tulsa, OK 74104; James G. Ogg, Department of Geology and Geophysics, University of Wyoming, Laramie, WY (present address: Scripps Institution of Oceanography, La Jolla, CA 92093); Isabella Premoli Silva, Istituto di Paleontologia, Milan, Italy; André Schaaf, Institute de Géologie, 67084 Strasbourg, France; Rainer G. Schaefer, Institut für Erdöl und Organische Geochemie, KFA Jülich, GmbH, Postfach 1913, D-5170 Jülich, Federal Republic of Germany; William V. Sliter, Branch of Paleontology and Stratigraphy, U.S. Geological Survey, Reston, VA (present address: U.S. Geological Survey, 345 Middlefield Rd., Menlo Park, CA 94025); Jill M. Whitman, Geological Research Division, Scripps Institution of Oceanography, La Jolla, CA 92093. Leg 90: James P. Kennett (Co-Chief Scientist), Graduate School of Oceanography, Uni-

#### **SITE 586**

### Water depth (rig floor; corrected m, echo-sounding): 2218

Bottom felt (m, drill pipe): At or above 2219.4. Note: water depth of 2218 m from rig floor from \$86C lose used

from 586C logs used as site datum.

Penetration (m): 240.3

Number of cores: 25

Total length of cored section (m): 240.3

Total core recovered (m): 234.93

Core recovery (%): 97.8

Oldest sediment cored:

Depth sub-bottom (m): 240.3 Nature: Foraminifer-bearing nannofossil ooze Age: Late Miocene

**Basement:** Not encountered

**Principal results:** (by Leg 90 shipboard scientific party): This hole duplicated the upper 240 m at Site 586. It is a continuous, uncomplicated section from Quaternary to early late Miocene age, differing only in details from descriptions of Holes 586 and 586A. However, unlike the findings reported for Hole 586, there is little evidence of extensive reworking or turbidite layers. The hole terminated after an equipment failure (HPC piston) at 240.3 m.

#### HOLE 586C

Date occupied: 22 November 1982

Date departed: 23 November 1982

Time on hole: 1 day, 8 hr., 2 min.

Position: 00°29.84'S; 158°29.89'E

Water depth (sea level; corrected m, echo-sounding): 2208

Water depth (rig floor; corrected m, echo-sounding): 2218

Bottom felt (m, drill pipe): Not felt; 2218 m by gamma logs

Penetration (m): 623.1

Number of cores: 1

Total length of cored section (m): 9.6

Total core recovered (m): 2.18

Core recovery (%): 23

Oldest sediment cored: Depth sub-bottom (m): 623.1 Nature: Nannofossil chalk and ooze Age: early Miocene Measured velocity (km/s): —

Basement: Not encountered

Principal results: Drilled to provide hole for logging thick section of carbonate ooze. Obtained suite of excellent logs.

#### **BACKGROUND AND OBJECTIVES**

The 1981–1983 Glomar Challenger drilling plan included three traverses designed to provide detailed information about Neogene paleoceanography and biostratigraphy through the recovery of sets of relatively complete and undisturbed cores of highly fossiliferous deep-sea sediment. The seafloor below areas of moderate to high productivity and above the carbonate compensation depth (CCD) allows calcareous foraminifers and nannofossils to accumulate and remain in a good state of preservation. Of the three traverses in areas of thick Neogene calcareous ooze, Leg 85 cored sites in the eastern equatorial Pacific, where cyclic productivity presumably controls cyclic sedimentation, and Leg 94 cored sites in the eastern North Atlantic to examine paleoceanographic changes across latitudinal belts.

A third series of sites extends across latitudinal oceanographic boundaries in the southwest Pacific. Broad areas of the seafloor elevated well above the CCD extend, with interruptions, from the Ontong-Java Plateau at the equator, past various rises between Melanesia and Australia, to the Bounty Trough, between Chatham Rise and Campbell Plateau, east of New Zealand. Boundaries of water masses may have shifted in response to changes in ocean circulation, owing to changing positions of land masses as the Australian lithospheric plate moved northward and the Melanesian island arcs evolved. Particular assemblages of fossil plankton characterize the various water masses between the equator and the Antarctic. Changes through time in the assemblages of ecologically dependent fossils at a drilling site are the records of past oceanographic changes there. The objective of Leg 90 was to use the HPC at several of these Neogene pelagic sites. JOIDES Planning Committee, however, assigned the northernmost site, SW-9, to Leg 89 to reduce the total amount of Leg 90 travel time.

SW-9 (Site 586) is the tropical end of the traverse. It lies on the northeastern upper slope of the Ontong-Java Plateau on a broad northeast-trending ridge between two swales that are the heads of submarine canyon systems. Although mass wasting at the plateau margins has been documented, and regional surveys suggest that a more complete section lies near the crest of the plateau 200 to 300 km to the southwest, Site 586 is located near existing DSDP Site 289 at 00°29.92'S, 158°30.69'E (Fig. 1). During Leg 30 that site was cored by a rotary bit continuously for 1262.5 m, with 56% average recovery, through Cenozoic and Cretaceous sediments into basaltic basement of Aptian or earlier age (Andrews, Packham, et al., 1975). The JOIDES Ocean Paleoenvironment Panel chose to schedule the HPC site at an existing continuously cored site in order to have a standard section that could be pieced together from the work of the two legs, rather than at spot-cored DSDP Site 64 (which



Figure 1. Regional bathymetry (fathoms) around Site 586, within one nautical mile of Site 289 on the northeast flank of the Ontong-Java Plateau. *Challenger* Leg 89 track shown; heavy portion locates water gun seismic profile illustrated in Fig. 2. Bathymetry after Mammerickx et al., 1974.

terminated in the Eocene) or at a new site that might not reach basement. Moreover, even though the Site 289 Neogene cores were disturbed and not complete in their recovery, so that HPC cores were needed for detailed work, they did not show any major discontinuities in the section above the lower Oligocene. The upper Oligocene and Miocene section is about 750 m thick at Site 289.

The principal aim at Site 586, therefore, was to obtain piston cores using the HPC to about 250 m depth or shallower, in the event that the resistance to shear by the sediment as it consolidated under burial increased to the degree that penetration died off significantly. Then, a second hole at the site was to be cored, offset slightly in distance and with the depth intervals of the second set of HPC cores adjusted so as to place the midpoints of the second set opposite the depths of the tops and bottoms of the first set. The pair of HPC holes, with overlapping cored intervals, was thereby expected to provide a continuous record: gaps in one set of cores should be filled by recovery in the other set. According to the Leg 30 paleontology report, 250 m depth would be within the upper Miocene, and it was expected that we would acquire a good record of late Neogene oceanographic events in the tropical belt of the western Pacific.

Of the lesser objectives for Site 586, the Leg 89 scientific party attempted as many as could be fitted into the time remaining for the leg. The cause for the widespread, closely spaced seismic reflectors (Fig. 2) common in the carbonate oozes and chalks of oceanic plateaus has been studied on the Ontong-Java Plateau (Winterer, Riedel, et al., 1971; Moberly and Heath, 1971; van

der Lingen and Packham, 1975) and elsewhere (Schlanger and Douglas, 1974). Laboratory studies of physical properties of Site 289 samples by Milholland et al., 1980 are the most refined ones to date. There was no logging, however, at Site 289, and for Leg 89 it was planned, if time permitted after the HPC, to drill into the ooze/ chalk transition and log that hole. Density and velocity logs would give the opportunity to relate the petrography and laboratory-determined physical properties of specimens with downhole measurements of their geophysical parameters. Further, the logs could be processed so that real reflectors could be distinguished from acoustic artifacts. By dating these reflectors paleontologically by their depths in Hole 289, it would then be possible to confirm or reject the hypothesis that reflectors represent paleoceanographic events.

Other objectives of secondary importance included sampling for organic geochemistry, for paleomagnetism, and for diatom biostratigraphy. Periodic use of the heatflow probe would allow a geothermal gradient to be determined. The origin of the Ontong-Java Plateau and of other oceanic plateaus remains controversial, and every type of high-quality geophysical information is of great value. Finally, if time remained during drilling of the logging hole, it was planned to take some cores from the lower Miocene interval to attempt to resolve a conflict between nannofossil and foraminifer correlations in the lower Miocene of the Pacific area.

Most of the detailed studies of Site 586 material have been made by the Leg 90 Scientific Party and appear in this volume of the *Initial Reports*.



Figure 2. Water gun seismic profile (Glomar Challenger) near Site 586.

## **OPERATIONS**

The Glomar Challenger's route southwest from Site 462 generally traversed the bathymetric slope that rises up from the Nauru Basin onto the Ontong-Java Plateau. Clear sight of Kusaie (Kosroe) Island and the profiler records of crossings of some of the distributary channels between the plateau and basin confirmed our conclusions about the sources of young ash and reworked Cenozoic fossils that are so abundant in the upper part of the Nauru Basin section at Site 462.

As we approached the position of Site 289 we slowed to 7 knots to improve the seismic reflection record (Fig. 2). There was no need to reoccupy the exact spot of the site, and so the beacon was dropped on a dead reckoning position at 0527 hr. on 19 November. The water depth, corrected from the PDR, was 2207 m. Later, satellite navigation fixes showed that Site 586 is about 1300 m westnorthwest of Site 289. The surveying gear was retrieved and the drilling crew commenced to assemble the components for using a variable length hydraulic piston corer (VLHPC) and lowering the drill string.

On the assumption that the seafloor was 2217 m from the drill floor, and taking into account the height of drill pipe joints above the rotary table (for ease in adding new lengths of pipe), the first core was triggered from 2214.8 m. When it was retrieved on board at 1420 hr., only the lower 1.3 m of the 9.6 m "shot" held sediment. The uppermost few centimeters of the core showed brownish colors, indicative of oxidation to the depth of burrowing at the seafloor, above the generally pale greenish colors of reduced pigment in the rest of that core (and of subsequent cores). The sediment/water interface would have been established at 2223.1 m below the drill floor (2213 m below sea level), but the PDR record already mentioned, the Core 586B-1 recovery, and Hole 586C logging indicate that 2218 m below drill floor (2208 m below sea level) is a more correct value for all holes at this site.3

Four more cores with virtually complete recovery (99.2%) were easily and speedily obtained from the foraminifer-bearing nannofossil ooze (Table 1). Only the upper half of the sixth core barrel, however, came back on deck, at 1919 hr. on the same afternoon. After the VLHPC inner barrel had been shot hydraulically from its core barrel housing down through the hole in the bit and out into the ooze, it broke off from the barrel and was lost in the sediment. The Von Herzen heat-flow probe with its miniaturized electronics and battery packages was left in the shoe of the lost inner barrel. Because that was the only remaining probe, the heat-flow program ended. The five cores recovered were not oriented, owing to malfunctioning of the Kuster single-shot system.

After that termination of Hole 586, the drill string was raised slightly, then lowered, and Hole 586A was started by washing to the 39.3 m total depth of the first hole. The broken VLHPC was repaired and put to use. The first 25 cores were retrieved from 586A at an aver-

Table 1. Coring summary, Site 586.

Core	Date		Der dri	oth from Il floor	Depth below seafloor	Length	Length	Dercentage
no.	(1982)	Time	Тор	Bottom	Top Bottom	(m)	(m)	recovered
Hole 586	5							
1	19	1420	2218	.0-2224.4	0.0-1.3	1.3	1.28	98.5
2	19	1527	2224	4-2233.9	1.3-10.8	9.5	9.52	100.2
3	19	1608	2233	.9-2243.4	10.8-20.3	9.5	9.44	99.4
4	19	1701	2243	9-2262 4	20.3-29.8	9.5	9.08	95.4
2	12					39.3	38.98	99.2
Hole 586	A (wash	to 39.3 r	n)					
1	19	2305	2262	.4-2272.0	39.3-48.9	9.6	9.45	98.4
2	19	2349	2272	.0-2281.6	48.9-58.5	9.6	9.44	98.3
3	20	0125	2291	2-2300.8	68.1-77.7	9.6	9.54	99.4
5	20	0155	2300	.8-2310.4	77.7-87.3	9.6	9.38	97.7
6	20	0237	2310	.4-2320.0	87.3-96.9	9.6	9.37	97.6
7	20	0316	2320	.0-2329.6	96.9-106.5	9.6	9.52	99.2
8	20	0400	2329	2-2348.8	116.1-125.7	9.6	9.50	99.0
10	20	0523	2348	8-2358.4	125.7-135.3	9.6	9.40	97.9
11	20	0602	2358	4-2368.0	135.3-144.9	9.6	9.52	99.2
12	20	0640	2368	.0-2377.6	144.9-154.5	9.6	9.56	99.6
13	20	0730	2377	0 2384.9	154.5-161.8	7.3	7.30	90.4
14	20	0900	2389	8-2309.8	166 7-175 7	9.0	9.03	100.3
16	20	0940	2398	8-2408.4	175.7-185.3	9.6	9.56	99.6
17	20	1022	2408	4-2418.0	185.3-194.9	9.6	9.44	98.3
18	20	1105	2418	.0-2427.6	194.9-204.5	9.6	9.48	98.8
19	20	1140	2427	6-2436.1	204.5-213.0	8.5	8.54	100.5
20	20	1230	2430	7-2455.3	222.6-232.2	9.6	9.84	102.5
22	20	1340	2455	3-2464.9	232.2-241.8	9.6	9.50	99.0
23	20	1430	2464	9-2474.5	241.8-251.4	9.6	9.57	99.7
24	20	1512	2474	5-2484.1	251.4-261.0	9.6	9.57	99.7
25	20	1607	2484	1-2493.7	261.0-270.6	9.6	9.47	98.6
20	20	1750	2493	7-2503.9	276.6-280.8	4.2	4.15	98.8
28	20	1908	2503	9-2508.3	280.8-285.2	4.4	4.26	96.8
29	20	1955	2508	.3-2513.3	285.2-290.2	5.0	5.08	101.6
30	20	2050	2513	.3-2518.3	290.2-295.2	5.0	5.15	103.0
31	20	2130	2518.	.3-2323.3	295.2-300.2	260.9	257.03	98.5
Hole 586	в							
1	21	0200	2210	4-2229.0	14-110	9.6	9.62	100
2	21	0320	229.	0-2238.6	11.0-20.6	9.6	9.49	99
3	21	0410	2238	6-2248.2	20.6-30.2	9.6	9.66	100
4	21	0500	2248	2-2257.8	30.2-39.8	9.6	9.31	97
5	21	0545	2257	8-2267.4	39.8-49.4	9.6	9.30	98
07	21	0715	2207	0-2286.6	59.0-68.6	9.6	9.10	95
8	21	0800	2286	6-2296.2	68.6-78.2	9.6	9.61	100
9	21	0840	2296	2-2305.8	78.2-87.8	9.6	9.64	100
10	21	0916	2305	8-2314.3	87.8-96.3	8.5	8.01	94
11	21	1025	2314.	0-2323.9	96.3-105.9	9.6	9.70	100
12	21	1110	2333	5-2343.1	115.5-125.1	9.6	9.69	100
14	21	1145	2343.	1-2352.7	125.1-134.7	9.6	9.63	100
15	21	1220	2352.	7-2362.3	134.7-144.3	9.6	9.47	99
16	21	1300	2362	3-2371.9	144.3-153.9	9.6	9.41	98
17	21	1348	23/1.	5-2381.5	153.9-103.5	9.0	9.05	100
19	21	1513	2391	1-2400.7	173.1-182.7	9.6	9.60	100
20	21	1550	2400.	7-2410.3	182.7-192.3	9.6	9.54	99
21	21	1628	2410.	3-2419.9	192.3-201.9	9.6	9.55	99
22	21	1710	2419	9-2429.5	201.9-211.5	9.6	9.63	100
23	21	1/49	2429.	1-2439.1	211.5-221.1	9.6	8.89	93
25	21	1910	2448.	7-2458.3	230.7-240.3	9.6	8.44	88
						240.3	234.93	98
Hole 586	C							
HI	22	1255	2218.	0-2831.5	0.0-613.5	9.6	2.18	23
14		1000			ALCONT OFFICE			
						9.6	2.18	23

Note: Data in this table have been corrected to accord with the water depth of 2218 m established by logging at Hole 586C.

age interval of 40 min. from these shallow depths. Virtually all of these cores attempted a full 9.6 m stroke and recovered a full barrel. By 270.6 m coring depth, the frictional resistance to withdrawal of the core barrel from the sediment reached 30,000 to 50,000 lb., and so

 $<sup>^3</sup>$  Note that prime data for Holes 586 and 586A collected aboard ship may reflect the originally established water depths and sub-bottom depths and may be in error by 5.1 m in the sub-bottom depths.

to lessen the risk of structural failure of the tool again, the driller shifted to the use of a 5-m-stroke HPC. The last four cores, ending with Core 31 at 300.2 m total depth, were so taken, with excellent results. Coincidentally, the Kuster system provided orientation data for the last cores. Overall there was 98.5% recovery from Hole 586A. The calcareous oozes and, below 230 m, a few thin chalk beds had cored easily. A few more cores probably could have been recovered, but the drill string was pulled up above the seafloor at 0008 hr. on 22 November to maintain the schedule for the site.

After redressing the VLHPC, the crew commenced coring Hole 586B, which was, as earlier noted, to be a duplicate of the 586–586A section, with overlapping depths of individual cores. The first core was shot from 2119.4 m depth, presumably slightly above the 2223.1 m seafloor, with the intention of recovering 5.9 m. The entire 9.6 m barrel, however, was recovered full of sediment, raising the question about the true depth of the seafloor. Again, coring proceeded quickly, with 25 cores obtained in a 17-hr. span. Actually, there were 26 wire line trips in that time; Core 2 had to be repeated when the core catcher failed to close. Orientation was good for these cores; except for the leakage of light, which fogged parts of the film, the Kuster device was working.

When the 25th core was brought on board during the evening of 21 November, it was discovered that the piston had jammed tightly inside the top of the core barrel, because the plastic core liner had collapsed. The lengthy process of removing the core from the barrel, and the additional time that would be needed to remove the piston and redress the tool, caused us to abandon Hole 586B at a total depth of 240.3 m. The average recovery was an excellent 97.8%. The drill string was recovered by 0008 hr. on 22 November.

Hole 586B cores were preserved uncut for the use of Leg 90 scientists. The admixture in the cores from Holes 586 and 586A of transported microfossil components dampened the interest of many of the Leg 89 scientists in using this site for detailed stratigraphy.

Hole 586C was spudded at 0541 hr. with a used bit and a hydraulic bit release in the bottom-hole assembly. More than 600 m of Neogene ooze and chalk were drilled nearly as fast as the pipe could be added to the string. The "wash" core barrel was retrieved with virtually nothing in it, and the only core from Hole 586C, 9.6 m long, with only 23% recovery, ended at 623.1 m total depth. In preparation for logging, the bit was released, and a slurry of fresh water and bentonite mud was pumped into the hole to displace the seawater. The drill string was pulled up close to the seafloor and the derrick was rigged for logging.

Three logging runs were made with the Schlumberger equipment. The logs appear to be excellent. The first run included measurements of sonic velocity, electrical spontaneous potential, electrical induction-spherically focused log, natural gamma radiation, and hole diameter by caliper. Then a second sonde replaced the first one. The other two runs were with that second sonde, but the final log was through a shorter interval and the sonde was pulled up the bore more rapidly. That sonde included measurements of formation density (compensated) and neutron porosity, along with a repeat of the gamma ray and caliper measurements.

All three gamma radiation logs showed, through the drill pipe, the increase above sediment background from <sup>234</sup>U and other short-lived isotopes immediately below the seafloor, and then a sharp drop in radiation as the tool was pulled up into seawater. The seafloor in 586C was at about 2218 m. In retrospect, it seems that the filling of Core 586B-1, the gamma ray logs, and the PDR depths were correctly identifying the seafloor at about 2217 or 2218 m from the drill floor (2207 or 2208 m from sea level), and that the 2223.1 m (2213 m from sea level) determination from Core 586-1 may have resulted from some fluke, such as partial loss of the core through a faulty core catcher, or spudding into a depression of the seafloor. A depth of 2218 m has been used for all holes.

After the logging was completed and its rigging removed, the drill string was retrieved and the ship made ready for sea. The ship got under way at 0810 hr. on 23 November, moving northward while streaming the geophysical gear. The *Glomar Challenger* then passed over the beacon, taking water gun records (Fig. 2). Three attempts to obtain ASPER records failed, because of sonobuoys that did not work. They had been stored for about 4 yr. in part of the ship's hold without temperature control; probably their batteries had died months before.

For the next several hours as the vessel crossed the Ontong-Java Plateau, the reflection profiles (e.g., Figs. 3, 4) showed some of the numerous fault scarps that expose older sediment and probably account for some of the sediment reworked into the sediments of Site 586. The vessel continued on a southward course toward the Solomon Islands and on to Noumea.

### LITHOLOGIC SUMMARY

Site 586 is located on the Ontong-Java Plateau within 1 nautical mile northwest of DSDP Site 289 at a water depth of 2207 m from sea level. Hole 586 was cored continuously to a sub-bottom depth of 39.3 m. Coring in Hole 586A began at 39.3 m and continued to 300.2 m. The sedimentary section from 0 to 240.3 m sub-bottom was collected again in 25 cores at Hole 586B. The lithostratigraphy of Hole 586B is described in a separate section by the Leg 90 scientists. A fourth hole, Hole 586C, was rotary-drilled for logging to a total depth of 623.1 m sub-bottom. The sediments recovered from Holes 586, 586A, and 586C comprise a single lithologic unit that consists of pale green to white foraminifer-nannofossil ooze and foraminifer-bearing nannofossil ooze and minor chalk of early Miocene to Recent age.

# Holes 586 and 586A

The Pleistocene to Recent part of the sedimentary sequence recovered at Site 586 (Cores 586-1 through 586-5) is 39 m thick and contains higher concentrations of foraminifers than the rest of the sequence. These foraminifer-rich sediments contain more than 20% and up to 60% foraminifers (Figs. 5 and 6) and are classified as foraminifer-nannofossil and nannofossil-foraminifer ooze.



Figure 3. Interpretation of seismic reflection profile at Site 586, northeastern Ontong-Java Plateau. See text for explanation. Source, 80 in.<sup>3</sup> water gun, 40-160 Hz filter.



Figure 4. Fault-scarp topography shown by seismic reflection profile near Site 586. Local elevations and slopes such as these may have provided the sediment mixed with the autochthonous sediment at Site 586.



Figure 5. Summary lithology column.

Texturally they are silty clay and sandy silty clay. Sediments recovered in Hole 586A (upper Miocene through Pliocene; 39-300 m sub-bottom) are composed of more than 80% nannofossils and less than 20% foraminifers, and are classified as foraminifer-bearing nannofossil ooze. Results of analyses of 38 samples for CaCO<sub>3</sub> range from 78 to 99% and average 93% (Table 2; Fig. 5). All other components in the sediments are minor (Fig. 6). Siliceous biogenic components, mainly radiolarians and diatoms, are present in minor amounts (up to several percent) throughout the section. They increase in abundance at the base of the recovered section (Figs. 5 and 6), but the total of siliceous biogenic components rarely exceeds 5%. Texturally, all of the upper Miocene to Pliocene sediments are clay or silty clay.

As a result of compaction, the ooze generally does become somewhat stiffer with depth, and nodules of chalk occur within stiff ooze in Cores 586A-25 through 586A-31. Soft, soupy ooze does occur, however, even between some of the chalk nodules in the lower part of Hole 586A. The single core recovered from the base of Hole 586C (613.5-623.1 m, lower Miocene) also consists of interbedded foraminifer-bearing nannofossil chalk and stiff ooze, although some of the ooze is still soft and soupy. The chalk undoubtedly occurs as continuous layers, and its appearance in the cores as nodules is a result of breaking and rounding of the harder chalk layers by the drilling process. There does not appear to be any systematic pattern to the occurrence of the chalk nodules (layers), although chalk nodules in Section 586A-

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#### **Dominant lithology**



Figure 6. Smear slide summary, Hole 586B.

Table 2. Carbonate bon	nb results,	Holes 586	and 586A.
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Core-Section (interval in cm)	Sub-bottom depth <sup>a</sup> (m)	% CaCO3	Lithology
Hole 586			
1-1, 31-32	5.89	84	Nannofossil-foraminifer ooze
2-3, 110-111	10.50	78	
3-3, 76-77	19.66	88	Forominifer nonnofossil ooro
4-4, 92-94	30.82	89	Forammiler-nannorossir boze
5-2, 105-106	37.45	89	
Hole 586A			
1-2, 79-80	45.69	88	
2-1, 75-76	54.75	88	
2-3, 70-71	56.70	88	
3-2, 69-70	65.79	86	
4-2, 48-49	75.18	89	
5-2, 75-76	85.05	90	
6-2, 29-30	94.19	90	
7-2, 35-36	103.85	94	
8-2, 31-32	113.41	85	
9-2, 27-28	122.97	99	
10-2, 30-32	132.60	95	
11-5, 100-101	147.40	97	
12-2, 64-65	152.14	96	
13-2, 60-61	161.70	99	m i 1 10 0 11
14-2, 24-25	168.64	95	Foraminifer-nannotossil ooze
15-2, 60-61	173.90	98	
16-2, 70-71	183.00	96	
17-6, 70-71	198.60	99	
18-2, 60-61	202.10	99	
19-3, 49-50	213.09	96	
20-2, 20-21	219.80	98	
20-2, 82-83	220.42	93	
21-4, 108-109	233.28	95	
22-3, 60-61	240.90	92	
23-5, 82-83	253.72	97	
24-6, 145-146	265.45	99	
25-6, 137-138	274.97	94	
26-3, 75-76	279.45	93	
27-2, 105-106	284.25	93 )	Foraminifer-bearing nanno-
28-4, 45-46	290.85	99	fossil soft ooze and chalk
29-3, 99-100	294.49	96	
30-1, 54-55	295.84	96	Foraminifer-bearing nanno-
31-1, 121-122	301.51	98	fossil ooze and chalk

<sup>a</sup> Sub-bottom depths reflect original shipboard calculations and may be in error by 5.1 m.

27-3 seem to occur with a rhythmic spacing of 15 to 20 cm.

The top 15 cm of sediment in Hole 586 has been oxidized to pale brown (5Y 8/1), and probably represents the depth of burrowing, but the rest of the sediments are reduced and have the general overall appearance of very pale green. Sediment colors from the Munsell color chart are white (N9 and 5Y 8/1), bluish white (5B 9/1), pale greenish yellow (5Y 7/3), light greenish gray (5GY 8/1), and various other subtle tints of pale green. Thin layers (mostly less than 1 cm) of slightly darker pale green, pale yellow, and light to medium gray are common above 135 and below 280 m, but mostly these slightly darker colors occur as mottles in highly bioturbated pale green ooze. Many of these darker layers feel somewhat coarser in texture, but textural differences usually cannot be resolved in smear slides. The gray color of some layers and burrow mottles apparently is due to the presence of pyrite, which occurs as small spherical framboids. Compositional differences between the slightly darker green and yellow layers and mottles and the dominant pale green ooze could not be resolved by smear slides, although some qualitative observations suggest that the darker materials may contain slightly higher concentrations of altered volcanic glass and, as mentioned earlier, they tend to be somewhat coarser. In addition to the overall pale green color of the sediment and presence of pyrite, the reduced nature of the sediment is indicated by the odor of  $H_2S$  emitted when the cores were opened.

# Hole 586B (by Leg 90 shipboard scientific party)

The section at Hole 586B is from one lithostratigraphic unit composed of foraminifer-bearing (5 to 25%) to foraminifer- (25 to 75%) nannofossil ooze (Fig. 6). The color of the major lithology varies from light gray (5Y 7/1) to light greenish gray (5GY 7/1) at the top, grading to very light gray (N8) to white (N9) at the bottom of the section. The recovered section is soft, grading to firm at about 100 m sub-bottom, but it is never firm enough to be classified as a chalk. In general, the sequence is intensely bioturbated. There are several sedimentary features related to the bioturbation including thin burrows (about 0.1 cm thick), larger mottles (about 0.5 cm diameter), and thin, but often very large-diameter (1-20 cm) burrow rinds of light gray (N5 to N7) color. The latter resemble Liesegang rings and probably result from the precipitation of iron sulfide minerals around preferred sites of sulfate reduction such as burrows rich in organic matter. Many of the burrows and other mottles also show color differences from the major lithology and tend toward yellowish grays (5Y 8/1). Blebs of fine-grained iron sulfide (?pyrite) are common throughout the entire section. Very subtle laminations less than 2 cm thick occur throughout the sequence, but in smear slides the lithologies of the laminae appear identical to the surrounding ooze. Numerous thin zones of foraminifer-rich facies were found in the top 45 m, apparently the results of current winnowing. Light greenish gray laminae (5GY 7/1) are common, especially in the top 100 m of the sequence. The greenish color of these laminae is due to disseminated authigenic minerals, among which glauconite was identified as neoformed fillings of foraminifer tests in the lowest core sections and (possibly) celadonite resulting from the diagenetic alteration of volcanic glass in the upper core sections, where trace amounts of volcanic glass also occur.

Severe coring disturbance occurs in Section 586B-3-4 through 586B-3,CC, Section 586B-7-3 through 586B-7,CC, Cores 9 and 10, and Section 586B-13-1 through 586B-13-3, 100 cm.

A comparison of Hole 586B with the shipboard descriptions of Hole 586A shows only minor differences, except for the absence of a near-surface oxidized layer at Hole 586B. Hole 586B did not reach the depth of the chalk nodules found in Hole 586A.

### BIOSTRATIGRAPHY

#### Summary

### Holes 586 and 586A

The almost 300 m of sediments recovered in Holes 586 and 586A span the time interval from Recent through

almost all of the late Miocene. The three major planktonic groups are well represented throughout and display a moderate to good state of preservation.

As shown by the foraminifer record, the sediments, which at first sight appear to display the sedimentological characteristics of a foraminifer-nannofossil ooze, were affected by mechanical transport, that caused (1) an accumulation of foraminifer tests within the range of the sand fraction and (2) an admixture of forms from different environments, ranging from shallow-water platforms to bathyal depths. Thus, the sediments encountered at this site are transported and are more properly defined as a graded foraminifer-nannofossil silty sand. Evidence of such transport is also shown by the radiolarian assemblages, which display a large variation in the size distribution of the microfauna.

In spite of these sedimentological characteristics, the sedimentary succession appears to be almost continuous, as revealed by the biostratigraphic record. A synthesis of the biostratigraphic succession based on the three fossil groups is shown in Figure 7, where the major events within the foraminifer faunas are also plotted against absolute ages. Some minor reworking of older nannofossils and radiolarians was detected in the upper half of the sequence.

The major biostratigraphic events from the three groups correlate well except for the interval from Cores 586A-3 to 586A-5. There, a major discrepancy concerns the location of the boundary between the early and late Pliocene according to the planktonic foraminifers and calcareous nannofossils. Following the planktonic foraminifers the early/late Pliocene boundary is equated by definition to the last appearance datum (LAD) of Globorotalia margaritae, which in Hole 586A occurs between the core-catcher samples of Cores 3 and 4. According to the nannofossils, the same boundary should occur between Zone CN11b and Zone CN12a, which occurs in Core 586A-5 between Sections 4 and 6. Further studies will clarify if such a discrepancy (1) is due to reworking of planktonic foraminifers in higher levels, (2) is related to an erroneous correlation between the two zonal schemes, or (3) is due to the erroneous positioning of the early/late Pliocene boundary with respect to the nannofossil zonal scheme by the nannofossil specialists. The same succession of biostratigraphic events among the planktonic foraminifers, such as the LAD of Dentoglobigerina altispira and the first appearance datum (FAD) of Globigerinoides fistulosus and of Globorotalia tosaensis, was described in the same order by Srinivasan and Kennett (1981) from Site 289 and by Vincent (1981) from Site 463. In addition, they occur within the same nannofossil biozone at the three sites. The third hypothesis of a mislocation of the early/late Pliocene boundary with respect to the nannofossil zonation becomes a real possibility.

### Hole 586C

The only core from Hole 586C yielded very well preserved and abundant radiolarian faunas, whereas planktonic foraminifers and calcareous nannofossils are very poorly preserved. All the three fossil groups speak for an early Miocene age. The zonal assemblages in the three groups, however, are not coeval. The possible interpretation is that the planktonic foraminifers are reworked, whereas the nannofossil assemblages are mixed with downhole contaminants. Thus the age based on the radiolarians is retained as the only valid one.

### Foraminifers

# Holes 586 and 586A

Planktonic foraminifers are abundant in the sediments recovered from Holes 586 and 586A. The washed residues obtained from the core-catcher samples, however, show clear evidence of mechanical transport in the accumulation of foraminifer tests >250  $\mu$ m, whereas the fraction <250  $\mu$ m contains a large amount of test fragments, sometimes up to 50% of the total fraction. Moreover, the amount of residue for the 250–150- $\mu$ m and 150–45- $\mu$ m fractions is one-half or one-third of the amount obtained from a typical pure nannofossil-foraminifer ooze. Thus, the sediments recovered at Site 586 might better be defined as a planktonic foraminifer silty sand.

Both planktonic and benthic foraminifers from the same sample show different preservation, the same species occurring with transparent and chalk tests. It is not clear if the best preserved tests indicate that the specimens are autochthonous or allochthonous.

In addition, each residue contains few to several specimens of *Quinqueloculina*, coarse agglutinated foraminifers, large nodosariids (one chamber was over 2 mm in size), and highly ornamented ostracodes indicative of an environment much shallower than the present water depth at Site 586 (2208 m below sea level) or than the estimated bathyal paleodepth based on the supposed autochthonous benthic foraminifers. It is worth mentioning that evidence of obvious reworking among planktonic foraminifers could not be detected in this preliminary study, although it cannot be ruled out. In spite of the mechanical transport and mixing of material from shallower depths, the biostratigraphic signal appears to be undisturbed.

The uppermost 39.3 m of the sequence was recovered in Cores 586-1 to 586-5. Below the mud line, the 1 m of Holocene sediments in Core 586-1 yielded a very rich planktonic assemblage. Abundant species include *Globigerina rubescens* (red), *Globigerinoides ruber* (red), *G. mitra* (red), *G. sacculifer, Globorotalia tumida, Pulleniatina finalis*, and *Neogloboquadrina dutertrei*. Traces of sulfur, pyrite, and organic matter partially coat or fill the planktonic foraminifer tests. The core-catcher sample of Core 586-1 belongs to the late Pleistocene Zone N23. The planktonic foraminifer assemblage consists of *G. truncatulinoides, G. crassaformis, G. crassula*, and *Globigerinoides conglobatus*, beside the species mentioned above. The tests of *Globigerina rubescens* and *Globigerinoides ruber* are still red in color.

From Core 586-2 to Section 586-5-6 planktonic foraminifer assemblages are early Pleistocene in age (Zone N22). Common to abundant species are *Globorotalia tumida* and *G. tumida flexuosa*, *G. truncatulinoides*, *Pul-*



Figure 7. Biostratigraphy of Holes 586 and 586A plotted against lithology and planktonic foraminifer biostratigraphic events calibrated to the absolute ages. Core recovery in black. A after core number indicates Hole 586A Cores.

#### **SITE 586**

leniatina obliquiloculata, Globigerinoides ruber (white), and G. sacculifer, among others. Few specimens of Globorotalia tosaensis and Globigerinoides aff. fistulosus and the unusual abundance of Streptochilus tokelauae in Sample 586-4,CC indicate early Zone N22. The late Pleistocene planktonic assemblage of Zone N21 occurs in core-catcher Sample 586-5, CC (the last core in Hole 586) and in Cores 586A-1 and 586A-2, where coring started at the same level at which Hole 586 was discontinued. This zonal assemblage is characterized by the occurrence of Pulleniatina obliguiloculata, Globorotalia tosaensis, T. tenuitheca, G. crassaformis, and by common to abundant Globigerinoides fistulosus and Streptochilus tokelauae. Accompanying species are Globorotalia tumida, G. tumida flexuosa, G. exilis, G. ungulata, sphaeroidinellids, Globigerinoides ruber, and rare G. extremus.

The core-catcher sample of Core 586A-3 yielded a planktonic foraminifer assemblage similar to those occurring in the overlying Cores 586A-1 and 586A-2 except for the occurrence of common, well-developed specimens of *Dentoglobigerina altispira*. According to Blow (1969) the latter taxon should not co-occur with *Globorotalia* tosaensis and *G. tenuitheca*, which are also present in Core 586A-3,CC. Further studies will clarify if the range of *D. altispira* in fact overlaps with that of *G. tosaensis* and *G. tenuitheca* or the occurrence of *D. altispira* in Core 586A-3,CC is anomalous and due to reworking. For the time being, Core 3 is attributed to Zone N20, the oldest zone in the late Pliocene.

The interval from Cores 586A-4 to 586A-8 is attributed to the early Pliocene Zone N19 on the basis of the occurrence of Globorotalia margaritae with Pulleniatina obliquiloculata, Dentoglobigerina altispira, Globorotalia tumida, G. tumida flexuosa, Neogloboquadrina humerosa, and Globigerinoides extremus, and including Streptochilus tokelauae, which was limited to core 586A-4. The planktonic foraminifer assemblages in Cores 586A-7 and 586A-8 are differentiated from those contained in Cores 4 to 6 by the occurrence of Globigerina nepenthes, Pulleniatina spectabilis, P. praecursor, and Streptochilus latum. Globorotalia margaritae is very rare in some samples. The boundary between Zones N19 and N18, still early Pliocene in age, is tentatively placed between Cores 586A-8 and 586A-9, based on a single specimen of Sphaeroidinella that occurs in Core 586A-8, CC. (Sphaeroidinellopsis and Sphaeroidinella are rare components of most of the assemblages recovered at Site 586.) The interval from cores 586A-9 through 586A-12 vielded a planktonic foraminifer fauna characteristic of Zone N18 of latest Miocene to early Pliocene age. The lower boundary of Zone N18 corresponds to the FAD of Globorotalia tumida in the evolutionary transition from G. plesiotumida, which occurs in Core 586A-12, CC. Two biostratigraphic events occur in this zone. The first is the FAD of Pulleniatina praecursor in Core 586A-10, an early Pliocene event, whereas the second event corresponds to the LAD of Globoquadrina dehiscens. The latter event is equated with the Miocene/Pliocene boundary (Berggren, 1977). Common species in Zone N18 are Neogloboquadrina humerosa, N. acostaensis, Globigerina nepenthes, Pulleniatina primalis, P. spectabilis, Globorotalia scitula, G. cultrata, Globigerinoides sacculifer, G. extremus, G. obliquus, D. altispira, G. baroemoenensis, and Streptochilus latum.

The interval from Cores 586A-13 to 586A-20 yielded a planktonic foraminifer assemblage characteristic of the late Miocene Zone N17, the lower boundary of which corresponds to the FAD of *Globorotalia plesiotumida* evolving from *G. merotumida*. The major biostratigraphic event within Zone N17 is the FAD of *Pulleniatina* s.l., which occurs in Core 586A-16. Rare specimens of *Globorotalia margaritae* are recorded from Core 586A-15 upward. Beside the events mentioned above, the assemblages of Zone N17 are similar to those of Zone N18.

The interval from Core 586A-21 to total depth (Core 586A-31) contains planktonic faunas attributable to the late Miocene Zone N16. Two major biostratigraphic events occur within this zone: the FAD of *Neogloboquadrina humerosa*, evolving from *N. acostaensis*, and of *Globigerinoides extremus*, that evolves from *G. obliquus* in Core 386A-27. Common species in this interval include the index species *N. acostaensis* and *Globorotalia merotumida*, *Globigerina nepenthes*, *Globorotalia cultrata* (which is very abundant in some samples), *Globigerinoides obliquus*, *G. sacculifer*, *Dentoglobigerina altispira*, *G. baroemoenensis*, *G. dehiscens*, and *Streptochilus latum*.

Globoquadrinids, *Globorotalia lenguaensis*, and *G. praelenguaensis* are particularly abundant in the two low-ermost cores.

### Holes 586C

Only one core was recovered from Hole 586C in addition to a washed core at the sub-bottom depth of 608 m. Planktonic foraminifers are abundant but very poorly preserved. Rare *Globigerinoides immaturus* and common *Globorotalia kugleri* and *G. pseudokugleri* are associated with large globigerinids, primitive *Dentoglobigerina altispira*, *Globoquadrina praedehiscens*, and very rare *G. binaiensis*. This assemblage is characteristic of the upper part of Zone N4, which is early Miocene in age. Reworked Oligocene faunas may be present.

### Nannofossils

### Holes 586 and 586A

Core-catcher samples from Holes 586 and 586A were examined to provide an outline of the nannofossil biostratigraphy. Smear slide preparations were made from intervals within cores when it was necessary to locate zonal boundaries and important datums. Nannofossils are abundant in every sample examined. A reduction in the nannofossil content was seen in samples from Core 586-4, the top of Core 586A-2, and the base of Core 586A-1. The preservation of assemblages fluctuates between moderate and good, although there was an overall decrease in the quality of preservation downhole. This deterioration in preservation is represented as overgrowths on the discoasters in lowermost Pliocene and upper Miocene sediments. Discoasters in samples from Cores 586A-12 through 586A-16 are slightly to moderately overgrown and those in sediments below these cores are moderately to heavily overgrown. Heavy overgrowths on certain species in Cores 586A-25 through 586A-31 made identification of these forms difficult. Placoliths are well preserved throughout and are only slightly etched in samples where the discoasters are overgrown. Sample 586A-28-4, 36-37 cm, in which there are over 10% diatoms, contains a well-preserved assemblage with little overgrowth of the discoasters. Samples above and below this level contain less than 1% diatoms. Thus, the amount of noncalcareous constituents in these samples may influence the extent to which diagenesis may alter the nannofossil assemblages. Problems in identification caused by these overgrowths led to uncertainties in the biostratigraphy in the bottom of the hole, because many of the discoasters are utilized as datums in the late Miocene.

Figure 8 shows the nannofossil datums, along with the zonation schemes of Okada and Bukry (1890), Ellis (1982), Martini (1971), and Gartner (1977), graphed in relation to the cores recovered in Holes 586 and 586A. The section appears to be continuous, as all the nannofossil zones from the Discoaster hamatus Zone through the Emiliania huxleyi Zone are present. The only reworking detected was in Cores 586A-7 through 586A-9, where some late Miocene discoasters were reworked into Pliocene sediments. Some of the zonal boundaries in the biostratigraphic zonations mentioned above could not be accurately determined. The first occurrence of Emiliania huxleyi could extend much lower than indicated, because this species is best identified on the electron microscope. If so, it is possible that a hiatus may be present within the upper Pleistocene sediments in Cores 586-1 and 586-2. The first appearances of Gephyrocapsa caribbeanica and G. oceanica, which are used as successive datums in the early Pleistocene by Okada and Bukry (1980) and Ellis (1982), are synchronous in this section, and the G. caribbeanica Subzone (CN13b/WPN30b) could not be recognized. It is more likely that this is a problem inherent in these stratigraphies rather than an indication of a hiatus in this section (see Gartner, 1977). There is, however, the possibility that part of Core 1 was lost through the core catcher (see Operations section).

Amaurolithus tricorniculatus did not occur in any of the samples examined. Both Okada and Bukry (1980) and Martini (1971) use the last occurrence of this species in lower Pliocene sediments to define a zonal boundary, and so some resolution is lost when applying these zonations to this section. Ellis (1982) also found this to be true in sediments from the Mariana Trench and used the acme of Sphenolithus neoabies to resolve the boundary problem between the Sphenolithus neoabies Subzone and Ceratolithus rugosus Subzone. The extinction of A. primus is used in conjunction with that of A. tricorniculatus in the Okada and Bukry (1980) zonation to define this same boundary. This species is restricted to the Amaurolithus primus Subzone in these cores, except for Sample 586A-9-4, 36-37 cm, into which it is reworked with other late Miocene species. The last occurrence of this species in upper Miocene sediments at Sites 541 and 542 in the equatorial Atlantic is further evidence that this early Pliocene datum is not reliable.

Problems were also encountered in locating the lower boundary of the Discoaster quinqueramus Zone. It has been placed within core 586A-24 at the first occurrence of Discoaster berggrenii because all three zonal schemes recognize this datum. The first occurrence of D. surculus, which is used in addition to D. berggrenii by both Okada and Bukry (1980) and Ellis (1982), is first seen in core 586A-26. The rarity of this species in Cores 586A-25 and 586A-26 and the overgrowths that obscure its bifurcate tips make this datum hard to locate. Ellis (1982) also recognized the extinction of D. bellus and D. neohamatus at this boundary. These two species, although rare, are found in Core 586A-23 above the first occurrence of D. berggrenii. The last common occurrence of D. bellus, however, is coincident to the entry of D. bergrenii.

A few specimens of *D. hamatus* (five rays) were found in Samples 586A-30, CC and 586A-31, CC, and these sediments are tentatively placed in the *D. hamatus* Zone. *D. neohamatus* is common in these samples, whereas *D. bellus* and *D. pentaradiatus* are rare. Ellis (1982) uses the first occurrence of *D. pentaradiatus* to mark the top of the *D. hamatus* Zone. Thus, it appears that the top of the *D. hamatus* Zone was reached in Core 586A-31, or it may be that these extremely rare specimens of *D. hamatus* are reworked. Species of the genus *Catinaster*, which are normally found in sediments of those ages, are not present.

### Radiolarians

For Site 586 one sample per section was studied for the first four cores; only the core-catcher samples were examined from Cores 586-4 to 586A-31 and 586C-1.

For the biostratigraphic zonation we followed Nigrini (1971) for the Quaternary, and Riedel and Sanfilippo (1978) for the remainder of the Cenozoic. The use of the evolutionary transition from *Lamprocyrtis neoheteroporos* to *L. nigrinae* instead of the upper morphotypic limit of *Pterocanium prismatium* is adopted here for the definition of the upper limit of the *Pterocanium prismatium* Zone. This change greatly reduces the range of the *Anthocyrtidium angulare* Zone. Because *Spongaster berminghami* is rare, we have adopted the first appearance of *P. prismatium* to define the base of the *Spongaster pentas* Zone. This datum is essentially synchronous with that of the standard zonation.

The preservation of the radiolarian fauna is moderate except for some levels where the specimens are broken (Cores 586-2, 586A-6, and 586A-13). The abundance of the fauna permits us to recognize three assemblages: (1) Core 586-1 with a common fauna; (2) Cores 586-2 to 586A-14 with a few to common fauna; (3) Cores 586A-15 to 586A-31 and 586C-1 with a common to abundant fauna, often accompanied by diatoms.

The uppermost Quaternary radiolarian zone, Buccinosphaera invaginata, was identified in Sample 586-1-1, 2-3 cm. Sample 586-1-1, 66-67 cm is related to the Collosphaera tuberosa Zone. Amphirhopalum ypsilon Zone extends from Samples 586-1, CC to 586-3-5, 37-38 cm. Some reworked specimens from the lower Pleistocene occur in Core 586-3. The Anthocyrtidium angulare Zone

Core	Datums	Okada and (1980)	Bukry )	Martir (1971	ii )	Ellis (1972, 1979)	Gartner (1977)
1	← Emiliania huxleyi(?)	CN15	-0.2-	NN21	-0.2-		0.27 G. oceanica
2	◄¬Pseudoemiliania lacunosa	01140	0.3	NN20		WPIN3TD	0.44
3							D. lacunosa/
4	Helicosphaera sellii /Gephyrocapsa oceanica.	CN14a		NN19		WPN31a	small Gephyrocapsa
-	G. caribbeanica Calcidiscus macintyrei	CN13	0.9			WPN30	C. macintyrei
5	Discoaster brouweri		1.8		1.8		1.65
1A		CN12d	2.0	NN18		WPN29d	
2A	1D. pernaradiatus	CN12c	1.605252	NN17		WPN29c	
3A	▪ D. surculus, D. variabilis	CN12b	2.1			WPN29b	
	<ul> <li>■ D. tamalis</li> </ul>	CN12a	2.5	NN16		WPN29a	
5A	✓ Sphenolithus abies, S. neoabies ✓ R. pseudoumbilica	CN11b		NN15		WPN28b	
OA	D. tamalis P. lacunosa Acme D. asymmetricus		3.5	?	1 1	W/DNI29a	
7A	Acme S. neoabies	CN11a/		NINI14/		WFINZOa	
8A		CN10c		NN13			
9A						WPN27c	
10A	Ceratolithus acutus C. rugosus	name and a	4.4	a			
11A	C. armatus	CN10b	5.0	NN12		WPN27b	
12A	Triquetrorhabdulus rugosus	CN10a	5.6			WPN 27a	
13A	➡ D. berggrenii						
144	Amaurolithus amplificus						
154	≺A. primus						
16A		CN9b				WPN 265	
174		0.100				1111200	
184	→ A. amplificus			NN11			
19A						1.2	
20A	20 a. 1990						
21A	A. primus						
22A						WPN26a	
23A	D. bellus	CN9a					
24A	→ D. neohamatus → D. berggrenii						
25A							
26A		CN8b					
27A	→ D. surculus(?)	W		NN10		WPN 25	
28A	ے۔ D. loeblichii			044486		20002/00/07477078	
29A		CNPa					
30A		GINGA					
31A	★ D. hamatus (very rare)	CN7		NN9			

Figure 8. Nannofossil datums, Holes 586 and 586A.

extends from Core 586-3-6, 36-37 cm to 586-4,CC; *Pterocanium prismatium* Zone from 586-5,CC to 586A-1,CC; *Spongaster pentas* Zone from 586A-2,CC to 586-9,CC; *Stichocorys peregrina* Zone from 586A-10,CC to 586A-17,CC; *Ommatartus penultimus* Zone from 586A-18,CC to 586A-23,CC; *O. antepenultimus* Zone from 586A-24,CC to 586A-29,CC; and the *Cannartus petterssoni* 

Zone was found below 586A-30,CC. Core 586C-1 is from the *S. wolffii* Zone. There is a large variation in the size of the microfau-

na. The size fraction > 150  $\mu$ m is large in some samples and small in others. For example, in 586A-8,CC less than 1% of the assemblage is > 150  $\mu$ m. A high percentage of small tests can be interpreted to result from an allochthonous, transported fauna; a high percentage of large tests indicates an autochthonous fauna.

## Summary, Hole 586B (completed by Leg 90 scientists)

The 240.3 m of sediments recovered in Hole 586B were dated as Quaternary to late Miocene. Although only a limited number of samples were examined, there appears to be no evidence of any stratigraphic break. The following groups of fossils were recorded: planktonic and benthic foraminifers, calcareous nannofossils, diatoms, silicoflagellates, and radiolarians.

No evidence of reworking was found in the planktonic foraminifers and only one specimen of displaced *Discoaster hamatus* was found in Sample 586B-21,CC.

### Foraminifers, Hole 586B

Planktonic foraminifers are both abundant and well preserved in samples from Cores 586B-2 through 586B-25. There is no evidence of reworking, which has been suggested for the faunas and floras of Holes 586 and 586A.

The Globorotalia truncatulinoides Zone (= N22) yielded a rich fauna, as, for example, in Core 586B-2, which included the zone fossil and the following index taxa: Globorotalia menardii (sinistral) (= G. cultrata), Pulleniatina obliquiloculata (dextral), Sphaeroidinella dehiscens, Neogloboquadrina dutertrei (d), and Globigerinoides ruber.

In Cores 586B-5-1 through 586B-8-5, the *Globigerinoides fistulosus* Zone (= N21) yielded the following index species: the zone fossil, *Globorotalia tosaensis*, *G. tumida* (s), *S. dehiscens*, *P. obliquiloculata* (d), and *Globigerinoides extremus*.

The Neogloboquadrina humerosa Zone (= N19-N20) was found in Cores 586B-8-6 through 586B-13-7; important species include Globoquadrina altispira, Globorotalia tumida, P. primalis, P. spectabilis, Globigerinoides extremus, Globigerina decoraperta, and Neogloboquadrina humerosa. No. Globorotalia margaritae were found in the samples.

The Globorotalia tumida Zone (= N18) was found in Core 586B-17; a relatively low diversity fauna yielded the following diagnostic taxa: the zone fossil, N. acostaensis, G. juanai, and P. primalis (s).

The *Pulleniatina primalis* Zone (= N17b) was encountered in Sample 586B-17-6, with the following diagnostic species: the zone fossil, *Globorotalia plesiotumida* (d), *Globoquadrina dehiscens*, and *Sphaeroidinellopsis paenedehiscens*.

The Globorotalia plesiotumida Zone (= N17a) was recorded from Section 586B-21-5 through 586B-25-5 with the zone fossil, Globoquadrina dehiscens, N. acostaensis, and S. seminulina.

Benthic foraminifers were examined from ten samples through cores 5 and 6; each sample was taken from a different lithology or colored interval in the two cores. The foraminifers, generally accompanied by radiolarians, were highly fragmented in samples from the green, tan, olive, and gray white intervals, whether of coarser of finer texture. Only the gray, fine-grained layers contain little evidence of fragmentation. Typical species are Uvigerina auberiana, U. proboscidea, Nonion barleanum, N. pompiliodes, Pullenia bulloides, Eggerella bradyi, and Pyrgo murrhina. Several broken specimens of Quinqueloculina were found only in the green layers, in which fragmentation is very intense. Other than the Quinqueloculina specimens, the benthic foraminifers appear to be in place.

### Calcareous Nannoplankton, Hole 586B

Core-catcher samples and enough other samples accurately to determine zonal boundaries were examined for calcareous nannoplankton. Hole 586B ranges in age from late Pleistocene to late Miocene and includes all the calcareous nannoplankton zones (NN21 to NN11a).

### Pleistocene

The occurrence of *Emiliania huxleyi* in Sample 586B-1, top, places this sample in the late Pleistocene *Emiliania huxleyi* Zone (NN21).

The late Pleistocene Gephyrocapsa oceanica Zone (NN20) occurs between the last occurrence of *E. ovata* in Sample 586B-1-5, 30-31 cm and the first occurrence of *E. huxleyi* and includes Samples 586B-1-3, 30-31 cm and 586B-1-4, 30-31 cm.

The presence of *E. ovata* and the absence of *Calcidiscus macintyrei* in Samples 586B-1-5, 30-31 cm to 586B-4-2, 30-31 cm place these samples in the upper subzone of the early Pleistocene *Emiliania ovata* Zone (NN19b). The lower subzone (NN19a) includes the interval from Samples 586B-4-3, 30-31 cm to 586B-5-2, 30-31 cm, above the last occurrence of *Discoaster brouweri* in Sample 586B-5-3, 30-31 cm.

#### Pliocene

The presence of Discoaster brouweri and the absence of D. pentaradiatus in Samples 586B-5-3, 30-31 cm to 586B-6-4, 30-31 cm places this interval in the late Pliocene Discoaster brouweri Zone (NN18). The presence of D. pentaradiatus and the absence D. surculus in Samples 586B-6-5, 30-31 cm and 586B-6-6, 30-31 cm places these samples in the late Pliocene D. pentaradiatus Zone (NN17). The interval from Sample 586B-6-7, 30-31 cm to 586B-8,CC, above the last occurrence of Reticulofenestra pseudoumbilica in Sample 586B-9, CC, is placed in the late Pliocene D. surculus Zone (NN16). The interval from Sample 586B-9,CC to 586B-13-7, 30-31 cm, above the last occurrence of Amaurolithus tricorniculatus in Sample 586B-13,CC, is placed in the early Pliocene Reticulofenestra pseudoumbilica Zone (NN15). The first occurrence of D. asymmetricus in Sample 586B-15-1, 30-31 cm places Samples 586B-13, CC to 586B-15-1, 30-31 cm in the early Pliocene *D. asymmetricus* Zone (NN14). The first occurrence of *Ceratolithus rugosus* in Sample 586B-15, CC places Samples 586B-15-2, 30-31 cm to 586B-15, CC in the early Pliocene *Ceratolithus rugosus* Zone (NN13). The interval from Samples 586B-16-1, 30-31 cm to 586B-17, CC, above the last occurrence of *D. quinqueramus* in Sample 586B-18-1, 30-31 cm, is placed in the early Pliocene *Amaurolithus tricorniculatus* Zone (NN12).

### Miocene

The presence of *Discoaster quinqueramus* together with *Amaurolithus primus* in Samples 586B-18-1, 30-31 cm to 586B-21-4, 30-31 cm places this interval in the upper subzone of the late Miocene *Discoaster quinqueramus* Zone (NN11b). The absence of *A. primus* and the presence of *D. quinqueramus* in Samples 586B-21-5, 30-31 cm to 586B-25, CC places this interval in the lower subzone of the *D. quinqueramus* Zone (NN11a).

### **Diatoms and Silicoflagellates, Hole 586B**

Diatoms were noted in low numbers in Samples 586B-4, CC through 586B-8, CC, of late Pliocene-early Pleistocene age. Among them the large diatom *Ethmodiscus rex* is present in Samples 586B-5, CC and 586B-8, CC. Rare to few diatoms were found in the lower lower Pliocene Samples 586B-14, CC through 586B-16, CC, and in the upper Miocene Samples 586B-22, CC and 586B-25, CC. In Samples 586B-4, CC and 586B-6, CC rare silicoflagellates were encountered.

### Radiolarians, Hole 586B

Radiolarian fragments were observed during smear slide analysis at various levels.

# SEDIMENTATION RATES

Sedimentation rates for Holes 586 and 586A are shown in Figure 9. In Figure 10 sedimentation rates for Hole 586C are shown from 305 m sub-bottom to total depth of 623.1 m. For the upper part, sedimentation rates are those from the previous holes, plotted at a different scale.

Accumulation rates vary consistently throughout the sequence drilled in the first two holes. The maximum rate occurred in the latest early Pliocene (from 3.7-3.2 m.y. ago) when sediments accumulated at a rate of about 54 m/m.y. A minimum rate of 13 m/m.y. occurred in the latest Miocene, between 8 and 5.2 m.y. ago.

In the younger part of the sequence sediments were deposited at rates ranging from 25 to 20 m/m.y. Rates of  $\sim 37$  m/m.y. were calculated for the remaining part of the early Pliocene and the early late Miocene.

The lower part of the sequence was deposited at an average rate of  $\sim 39$  m/m.y. (Fig. 10). Details cannot be determined because Hole 586C was washed nearly to its total depth.

### **ORGANIC GEOCHEMISTRY**

The organic carbon contents were determined for two samples from Hole 586 and 14 samples from Hole 586A,

covering the cored section down from 0 to 296 m below seafloor. For analytical details see the organic geochemistry section in the Site 585 summary chapter (Leg 89 Initial Report; Moberly, Schlanger, et al., in press). As obvious from the data summarized in Table 3, the organic carbon contents vary from 0.62% (based on dry sediment weight) to less than 0.01% (i.e., below detection limit). The higher values are found in the upper part of the section penetrated (mean value of 0.35% for Cores 586-1, 586-5, 586A-1 to 586A-8). An abrupt decrease in organic carbon contents occurs between Cores 586A-8 and 586A-9. From Core 586A-9 downward the values remain very low (0.03% and less) throughout the hole to total depth. The elevated organic carbon contents in the uppermost 115 m of this drill site exceed the minimum threshold value commonly required for petroleum source rocks of the carbonate or evaporite facies (0.3%). The organic carbon contents of these samples, however, should be verified by shore-based independent analyses. The discussion of analytical limitations of the CHN-Analyzer and sample pretreatment procedures in the Organic Geochemistry section of the Site 585 summary chapter should be noted (Moberly, Schlanger, et al., in press).

The elevated organic carbon contents found from 0 to 115 m depth are associated with relatively lower  $CaCO_3$  contents of the sediments (84–90%), as compared to Cores 586A-9 to 586A-30, where  $CaCO_3$  contents in excess of 93% (in some even 99%) were measured.

### **INORGANIC GEOCHEMISTRY**

Tables 4 and 5 and Figure 11 constitute this report; there is no text.

### PALEOMAGNETICS

### Hole 586B (by Leg 90 shipboard scientific party)

Holes 586 and 586A were subsampled for paleomagnetic analysis by Leg 89 personnel and have yet to be measured. NRM measurements have been made on two specimens per section from Hole 586B using a cryogenic magnetometer, with geometric mean intensity = 0.058  $\mu$ G; scalar mean inclination =  $-0.41 \pm 35.6^{\circ}$ s.d.; axial dipole inclination =  $-1.0^{\circ}$ ; and mean angle between repeat measurement =  $6.5^{\circ}$ .

A zone of relatively strongly magnetized sediment (2.5 to 7.5  $\mu$ G) occurs at the top of the sequence above 586B-1-6, 27 cm (7.77 m depth). Intensities drop rapidly to values of typically 0.05  $\mu$ G below the middle of Core 2. Fairly high intensity spikes are common, the most prominent being listed in Table 6. These spikes are not associated with any obvious macroscopic changes in the sediment.

Below the high-intensity zone in Core 1 directions become highly scattered. Inclination data cannot be used to infer polarity as the site is too close to the equator. Unfortunately, there were no orientation data for these cores. The random scatter in inclinations indicates that the primary remanence signal was not being observed. Declinations can be used to infer the presence of only



Figure 9. Sedimentation rates of Holes 586 and 586A. Data points according to planktonic foraminifers.

one polarity transition, the Brunhes/Matuyama boundary (0.73 m.y. ago) between Sections 586B-2-3 and 586B-2-4 (12.85-15.10 m).

### PHYSICAL PROPERTIES

Compressional wave velocity measurements ( $V_p$ ) were made on whole core samples in the liner for every section from 586A-22-5 to 586A-31-3 and for one section of each core from 586B-1 to 586B-25, after the temperature of the cores equilibrated with that of the core lab. These measurements are of the horizontal (parallel to bedding)  $V_p$ . Continuous GRAPE measurements were made on every other section of cores from Holes 586 and 586A, and on almost all sections from Holes 586B. Using samples taken with a minicore-sized metal cylinder, water content, porosity, and wet-bulk density were measured by means of the gravimetric method on one sample every other section in Hole 586A. All methods used in these measurements are described in Boyce (1976a).

All measured values except those of wet-bulk density by the continuous GRAPE are listed in Table 7. Values of wet-bulk density corresponding to the locations of velocity measurements are tentatively estimated from the hard-copy graphs of continuous GRAPE and used for the calculation of impedance. Figure 12 shows the variations of physical properties with depth for Site 586.

As the sediment layer down to the depth of 300 m at Site 586 consists of a single lithologic unit of foraminifer-nannofossil ooze and chalk, variations in physical properties are very small. Variations of compressional wave velocity in the horizontal direction range between 1.55 and 1.63 km/s, and show gradual increase with depth, with a gradient of 1.5%/100 m (Fig. 12). These properties are concordant with those previously obtained at Site 289 (Andrews, Packham, et al., 1975), which is located within 2 km southeast of Site 586.

Values of compressional wave velocity measured under laboratory condition are, however, considerably smaller than those obtained by the Schlumberger Borehole Compensated Velocity Log as shown in Figure 13, in which a fluctuated curve indicates the logging data. Relative differences of core-averaged values indicate nearly linear increase with depth from just below the bottom of the casing to 300 m sub-bottom depth (as shown in Fig. 13 at the right). This discrepancy can be explained



Figure 10. Sedimentation rates of Hole 586C from 300 m sub-bottom to total depth. The upper part is replotted from Figure 9 at a different (larger) scale.

Table	3.	Carbona	ate carb	on ar	nd or-	
ga Si	nic te :	carbon 586.	(Corg)	data	from	

Sample	CaCO <sub>3</sub>	Corg
(interval in cm)	(%)	(%)
Hole 586		
1-1, 31-32	84	0.36
5-2, 105-106	89	0.29
Hole 586A		
1-2, 79-80	88	0.29
2-3, 70-71	88	0.24
5-2, 75-76	90	0.28
8-2, 31-32	85	0.62
9-2, 27-28	99	< 0.01
12-2, 64-65	96	< 0.01
15-2, 60-61	98	0.02
18-2, 60-61	99	0.01
20-2, 82-83	98	0.01
21-4, 108-109	95	0.03
23-5, 82-83	97	< 0.01
26-3, 75-76	93	< 0.01
28-4, 45-46	99	< 0.01
30-1, 54-55	96	< 0.01

by porosity rebound, as pointed out by Boyce (1976b), Hamilton (1976), and Shepard et al. (1982).

For unconsolidated sediments, especially those which under laboratory conditions include gas bubbles, the release of pressure causes a considerable increase of porosity and decrease of velocity. The first appearance of tiny bubbles was at a sub-bottom depth of about 150 m after the cores were equilibrated with room temperature. During the velocity measurements, effects of bubbles on the weakening of signal amplitude were noticeable only for the sections indicated by "Gas" in the Remarks column of Table 7. To estimate in situ values by using laboratory measurements, it is necessary to know either the amount of dissolved gas components in pore water at depth or volume fractions of gas bubbles under laboratory conditions. It is recommended that a technique be developed to measure physical properties of unconsolidated sediments under bubble-free conditions in the shipboard laboratory.

### LOGGING AND DOWNHOLE MEASUREMENTS

Two complete logging runs were made in Hole 586C, covering the interval from the mud line to a total depth

Table 4. Shipboard inorganic chemistry summary, Site 586.

Laboratory sample no.	Sample (interval in cm)	pН	Alkalinity (meq/l)	Salinity (‰)	Calcium (mmol/l)	Magnesium (mmol/l)	Chlorinity (‰)
Surface seaw	ater	7.13	2.97	34.1	10.69	51.38	19.44
Hole 586							
1	2-2, 140-150	7.31	4.10	34.9	11.01	52.79	17.05
Hole 586A							
2	2-5, 140-150	6.83	4.93	34.9	11.10	54.59	20.02
3	7-5, 140-150	7.12	5.432	34.9	11.70	49.40	19.92
4	14-5, 140-150	7.18	5.906	33.6	13.35	47.86	21.67
5	21-5, 140-150	7.10	6.29	34.1	15.08	46.50	19.88
6	28-2, 140-150	7.07	5.804	34.6	15.98	43.17	20.25
IAPSO stand	lard			0.7500			
						10.33	52.32
19.24							

Table 5. Titration summary: Ca, Mg, Cl, Site 586.

Sample	A. ml titrant	B. Std. conc.	Factor C- $\beta/A$
Calcium	0.525/0.526	10.55 mM/l	20.10
Magnesium	1.125/1.126	64.54 mM/l	57.37
Chlorinity	0.576/0.577	19.375 %	

	Calcium			Magnesium	Chlorinity		
Sample (interval in cm)	ml E.G.T.A.	X factor 20.10	ml E.D.T.A.	X factor 57.37	minus Ca	ml AgNO3	X factor 33.70
Surface seawater	0.532	10.69	1.082	62.07	51.38	0.577	19.44
Hole 586							
2-2, 140-150	0.548	11.01	1.112	63.80	52.79	0.506	17.05
Hole 586A							
2-5, 140-150	0.552	11.10	1.145	65.69	54.59	0.594	20.02
7-5, 140-150	0.582	11.70	1.065	61.10	49.40	0.591	19.92
14-5, 140-150	0.664	13.35	1.067	61.21	47.86	0.643	21.67
21-5, 140-150	0.750	15.08	1.089	62.48	46.50	0.590	19.83
28-2, 140-150	0.795	15.98	1.031	59.15	43.17	0.601	20.25
IAPSO	0.514	10.33	1.091	62.65	52.32	0.571	19.24

of 623 m in the hole. Strata at that depth are nannofossil chalks of early Miocene age. The first log run included caliper, gamma ray, resistivity, and sonic velocity; spontaneous potential log (SP) was taken but not printed. The second run included gamma ray, formation density compensated log (FDC), compensated neutron log (CNI), and caliper. A third, a repeat run, was made following the second run. (See Figs. 14 and 15.) Shorebased work in the future will include an impedance log to be made by combining sonic velocity and density logs. From this log a synthetic seismogram will be generated and compared to the air and water gun profiles made during the leg (see Operations section; Schlanger, pers. comm., 1984).

The logs will also be used as comparative material with which to evaluate shipboard velocity and porosity measurements (see section on Physical Properties). Finally when the log data are combined with paleontological data (see Biostratigraphy section) the numerous reflectors seen on seismic profiles across the Ontong-Java Plateau may be realistically interpreted in terms of their nature, origin, and relationship to paleoceanographic events.

### SEISMIC STRATIGRAPHY

Seismic profiles that are run across oceanic areas in which thick caps of relatively pure nannofossil- and foraminifer-rich oozes, chalks, and limestones have accumulated generally display numerous, closely spaced reflectors that persist laterally for tens of miles or more. The "signature" and spacing of these reflectors change, of course, with the seismic source and the filter bandpass settings used for recording. The development or expression of these reflectors is particularly marked on oceanic plateaus such as the Ontong-Java Plateau (Fig. 3) and the Magellan Rise, among others. These reflectors



Figure 11. Interstitial water chemistry, Holes 586 and 586A.

Table 6. Locations of the most prominent high-intensity spikes in Hole 586B.

Core-Section (level in cm)	Depth (m)	Intensity (µG)	Core-Section (level in cm)	Depth (m)	Intensity (µG)
3-4, 100	24.70	0.298	4-2, 25	30.55	0.382
4-4, 100	34.30	0.500	5-2, 25	40.15	0.368
7-1, 25	57.85	0.480	8-5, 25	73.45	0.127
11-2, 27	96.67	0.169	14-3, 102	127.72	0.174
15-3, 25	136.55	0.184	16-5, 105	149.95	0.527
17-3, 25	155.75	0.747	17-5, 28	158.78	1.022
19-1, 98	172.68	0.299	21-4, 25	195.65	0.216
22-2, 100	203.00	0.270	22-4, 100	206.00	0.160
23-4, 100	215.60	0.165	23-6, 100	218.60	1.177

have intrigued many stratigraphers since the early legs of the DSDP (Winterer, Riedel, et al., 1971; Moberly and Heath, 1971).

Drilling at such DSDP sites as 64, 288, and 289 on the Ontong-Java Plateau produced an enormous amount of physical properties data which, when combined with paleontological and, in some cases, drilling rate data, resulted in attempts to date and explain the origin of the reflectors (e.g., van der Lingen and Packham, 1975). It had become clear by the middle 1970s that, although the source of the reflectors lay in subtle acoustic impedance differences between carbonate layers, it was not obvious if these impedance differences were due to some combination of sedimentation rate changes, variations in microfossil content, and diagenetic effects. If a section of pure carbonate of invariant texture simply underwent compaction, no marked impedance differences would develop in the column and so there would be no reflectors. One problem that arose early in the interpretation of the origin of the reflectors was derived from the fact that the acoustic velocities and density values measured aboard ship showed very little variation downhole, particularly in the upper several hundreds of meters.

The discovery, by drilling, that chalk layers could be interbedded with relatively uncemented oozes led to the idea that cementation within these carbonate columns was not strictly depth-dependent but might be a function of the original composition of the layers, which, in turn, might be a function of paleoceanographic conditions. Schlanger and Douglas (1974) applied these ideas to the development of a model for the carbonate oozechalk-limestone transition and related certain reflectors to paleoceanographic events such as glaciations.

All of this history is built into the interpretation of the seismic stratigraphy of the Site 289 area shown on Figure 3. What is new about this version is that logging was carried out to a depth of 623 m in Hole 586C (see sections on Physical Properties, Logging and Downhole Measurements). The sonic velocity log showed that *in situ* velocities are considerably higher than those measured aboard ship. A preliminary impedance log showed significant vertical variation.

The interpretation shown on Figure 3 is based on:

1. The sonic velocity, formation density, and compensated neutron logs.

2. Data from the drilling of Site 289 on Leg 30.

3. Paleontological data from Site 289.

4. Paleontological and sedimentation rate data from Leg 89.

This interpretation is provisional and it is planned to revise it after the logs run in the hole are processed ashore, at which time a refined impedance log will be provided as well as a reflection coefficient log; these could then be used to produce synthetic seismograms which, it is hoped, would eliminate most acoustic artifacts (Schlanger, pers. comm., 1984).

### SUMMARY AND CONCLUSIONS

### Holes 586, 586A, and 586C

Site 586 was planned by the JOIDES Ocean Paleoenvironment Panel essentially as a redrilling, by use of the hydraulic piston corer, of the upper section of DSDP Site 289, which was originally drilled on Leg 30 to a

Table 7A. Physical properties of sediments, Site 586: Porosity, wet-bulk density, water content, and grain density.

Sample (level in cm)	Sub-bottom depth (m)	Porosity (%)	Wet-bulk density <sup>a</sup> (g/cm <sup>3</sup> )	Water content (%)	Grain density (g/cm <sup>3</sup> )
Hole 586					
2-1, 60	6.0	66.0	1.47	44.8	2.39
2-3, 75	9.2	48.6	1.49	32.6	1.95
2-5, 75	12.2	64.4	1.47	43.7	2.34
4-3, 75	29.2	60.0	1.55	38.6	2.38
4-5, 75	32.2	63.0	1.59	39.7	2.59
5-1, 70	35.6	66.1	1.60	41.4	2.76
5-3, 71	38.6	63.5	1.54	41.2	2.49
3-3, 73	41.7	67.9	1.58	43.0	2.81
Hole 586A					
1-1, 71	45.1	58 54	1.48	39	2.16
1-5, 71	51.1	64	1.53	42	2.49
2-1, 71	54.7	63	1.49	43	2.30
2-3, 71	51.7	57	1.60	36	2.39
3-3, 75	67.4	63	1.54	41	2.45
3-5, 75	70.4	64	1.56	41	2.53
4-1, 70	73.9	68	1.56	44	2.71
4-3, 70	76.9	69	1.55	45	2.74
5-1, 70	83.5	68	1.58	43	2.78
5-3, 70	86.5	62	1.56	40	2.50
5-5, 70	89.5	70	1.61	44	2.99
6-4 70	94.6	68	1.63	44	3.25
6-6, 70	100.6	64	1.64	39	2.68
7-1, 70	102.7	67	1.65	40	3.00
7-3, 70	105.7	62	1.50	41	2.37
7-5, 70	108.7	65	1.61	40	2.75
8-3, 70	115.7	64	1.58	41	2.58
8-5, 70	118.3	65	1.62	40	2.79
9-1, 70	121.9	87	1.71	51	1.49
9-3, 70	124.9	31	1.28	24	1.41
10-1.70	131.5	55	1.40	34	2.39
10-3, 70	134.5	58	1.55	37	2.32
10-5, 70	137.5	61	1.62	38	2.59
11-1, 70	141.1	59	1.51	39	2.21
11-5, 70	147.1	58	1.51	38	2.40
12-1, 70	150.7	57	1.46	39	2.06
12-3, 70	153.7	50	1.29	39	1.57
12-5, 70	156.7	62	1.71	36	2.85
13-1, 70	160.3	65	1.25	38	2 72
13-5, 70	166.3	61	1.51	40	2.31
14-1, 70	167.6	47	1.25	38	1.45
14-3, 70	170.6	63	1.62	39	2.64
15-1, 70	182.5	59	1.65	30	2.58
15-5, 70	178.5	51	1.45	35	1.89
16-1, 70	181.5	63	1.66	38	2.77
16-3, 70	184.5	56	1.57	36	2.30
16-5, 70	187.5	70	1.64	43	3.11
17-1, 70	191.1	71	1.07	40	3 74
17-5, 70	197.1	54	1.46	37	1.97
18-1, 70	200.7	54	1.56	34	2.24
18-3, 70	203.7	62	1.69	37	2.81
18-5, 70	206.7	53	1.57	34	2.21
19-3, 70	213.3	58	1.64	35	2.53
19-5, 70	216.3	53	1.54	34	2.17
20-1. 70	218.8	51	1.52	34	2.03
20-3, 70	221.8	59	1.54	38	2.59
21-3, 71	228.4	57	1.62	35	2.46
21-5, 70	231.4	52	1.55	34	2.15
21-7, 70	234.4	66	1.58	42	2.72
22-1, 70	238.0	58	1.66	35	2.61
22-5, 70	244.0	55	1.52	36	2.15
23-1, 70	247.6	56	1.52	37	2.17
23-3, 70	250.6	57	1.61	35	2.43
23-5, 70	253.6	58	1.64	35	2.53
24-1, 70	257.2	55	1.58	34	2.30
24-5, 70	263.2	58	1.65	35	2.54
25-1, 70	266.8	57	1.62	35	2.44
25-3, 70	269.8	56	1.50	38	2.12
25-5, 70	272.8	58	1.63	36	2.51
26-2, 71	277.9	72	1.57	46	3.04
26-3, 71	279.4	34	1.24	27	1.37
27-1, 71	282.4	62	1.62	38	2.65
27-3, 71	285.4	59	1.50	39	2.21
28-3, 71 29-1, 71	289.0	49	1.36	36	1.72
29-3, 71	294.0	53	1.49	36	2.04
30-1, 71	296.0	54	1.48	37	2.02
30-3, 71	299.0	54	1.56	34	2.24
31-1, 71	301.0	52	1.48	33	2.00

Table 7B. Physical properties of sediments,	Site 586: Compressional
wave velocity, wet-bulk density, and impe	edance.

Sample (level in cm)	Sub-bottom depth (m)	Compressional wave velocity (km/s)	Wet-bulk density <sup>a</sup> (g/cm <sup>3</sup> )	Impedance <sup>b</sup> (10 <sup>5</sup> g/cm <sup>2</sup> s)	Remarks <sup>c</sup>
Hole 586A				<u> </u>	
22-5, 50	243.8	1.62			
22-5, 100	244.3	1.62			
22-6, 50	245.3	1.63			
22-6, 100	246.3	1.62			
23-1, 100	247.9	1.61			
23-2, 50	248.9	1.61	1.77	2.85	
23-2, 100	249.4	1.62	1.75	2.84	Gas
23-3, 50	250.4	1.59			Gas
23-4, 50	251.9	1.60	1.76	2.82	
23-4, 100	252.4	1.59	1.76	2.80	
23-5, 50	253.4	1.61			
23-6, 50	254.9	1.60	1.77	2.83	
23-6, 100	255.4	1.61	1.77	2.85	
24-1, 50	257.0	1.60			
24-1, 100	257.5	1.61	1.75	2.80	
24-2, 100	259.0	1.58	1.75	2.77	
24-3, 50	260.0	1.58			
24-3, 100	260.5	1.58	1.73	2 73	
24-4, 50	262.5	1.59	1.73	2.75	
24-5, 50	262.5	1.58	0.000		
24-5, 100	263.0	1.59			
24-6, 50	264.0	1.59			
24-6, 100	266.6	1.61			
25-1, 100	267.1	1.60			
25-2, 50	268.1	1.61	1.76	2.83	
25-2, 100	268.6	1.59	1.76	2.80	
25-3, 30	209.0	1.60			
25-4, 50	271.1	1.60	1.72	2.75	
25-4, 100	271.6	1.60	1.73	2.77	
25-5, 50	272.6	1.61			
25-6, 50	274.1	1.61			
25-6, 100	274.6	1.63			
26-1, 50	276.2	1.62			
26-1, 100	276.7	1.62	1.80	2.93	
26-2, 30	278.2	1.64	1.77	2.90	
26-3, 50	279.2	1.66			
27-1, 50	282.2	1.62			Gas
27-1, 100	282.7	1.61	1.74	2.80	Gas
27-3, 100	284.2	1.60	1.74	2.78	Gas
27-3, 50	285.2	1.58			Gas
28-2, 50	286.6	1.60			
28-2, 100	287.9	1.60	1.73	2.77	
28-3, 100	288.4	1.61	1.73	2.79	
28-4, 50	289.4	1.62			
29-1, 50	290.8	1.60			Gas
2-2, 50	292.3	1.59	1.77	2.81	Gas
2-2, 100	292.8	1.59	1.75	2.78	Gas
2-3, 50	293.8	1.62			Gas
2-3, 100	294.3	1.61			
30-1, 100	296.3	1.61			
30-2, 50	297.3	1.62	1.75	2.84	
30-2, 100	297.8	1.62	1.73	2.80	
30-3, 50	298.8	1.61			
31-1, 50	300.0	1.60			
31-1, 100	301.3	1.59	1.73	2.75	
31-2, 50	302.3	1.60	1.76	2.82	
31-2, 100	302.8	1.60	1.75	2.80	
31-3, 100	304.3	1.60	1.77	2.83	
Hole 586B			1000	121-222-0	
1-4, 50	10.1	1.55	1.60	2.48	
1-4, 100	10.6	1.56	1.62	2.55	
2-4, 100	16.5	1.56	1.62	2.53	
3-4, 50	25.6	1.59	1.65*	2.62	
3-4, 100	27.1	1.56	1.65*	2.57	
4-4, 50	33.2	1.57	1.05	2.50	

Note: Sub-bottom depths are based opon original shipboard calculations and may be in error by 5.1 m. a Measured by the gravimetric method.

Table 7B. (Continued).

Sample (level in cm)	Sub-bottom depth (m)	Compressional- wave velocity (km/s)	Wet-bulk density <sup>a</sup> (g/cm <sup>3</sup> )	Impedance <sup>b</sup> (10 <sup>5</sup> g/cm <sup>2</sup> s)	Remarks <sup>C</sup>
Hole 586B (C	ont.)				
4-4, 100	35.7	1.56	1.65	2.57	
5-4, 50	44.8	1.54	1.65	2.54	
5-4, 100	45.3	1.57	1.63	2.56	
6-4, 50	54.4	1.56	1.67	2.61	
6-4, 100	54.9	1.60	1.63	2.67	
7-4, 50	64.0	1.55	1.65*	2.56	
7-4 100	64.5	1.53	1.65*	2.52	
8-4, 50	73.6	1.58	1.65*	2.61	
8-4 100	74.1	1.57	1.65*	2 59	
9-4. 50	83.2	1.55	1.60	2.48	
9-4. 100	83.7	1.56	1.63	2.54	
10-4 50	92.8	1.58	1.67	2 64	
10-4, 100	93.3	1.58	1.68	2.65	
11-4.50	101.3	1.57	1.69	2.65	
11-4 100	101.8	1.57	1.70	2.67	
12-4 50	110.9	1.57	1.70	2.67	
12-4 100	111.4	1.58	1 70	2.69	
13-4 50	120.5	1.59	1.74	2 77	
13-4 100	121.0	1.56	1 74	2 71	
14-4 50	130 1	1.57	1.68	2.64	
14-4 100	130.6	1.57	1.70	2.67	
15-4 50	139.7	1.59	1.68	2.67	
15-4 100	140.2	1.56	1.65	2 57	
16-4 50	149 3	1.58	1.73	2 73	
16-4 100	149.8	1.58	1 74	2 75	
17-4 50	158.9	1.61	1.72	2.77	
17-4 100	159.4	1.58	1.68	2.65	
18-4 50	168.4	1.58	1 71	2 70	
18-4, 100	169.0	1.57	1.70	2.67	
19-4 50	178 1	1.59	1 72	2.73	
19-4 100	178.6	1.58	1.72	2.72	
20-4.50	187.7	1.60	1.71	2.74	Gas
20-4, 100	188.2	1.61	1.70	2.74	
21-4 50	197.3	1.60	1.70	2.72	Gas
21-4, 100	197.8	1.59	1.72	2.73	Gas
22-4 50	206.9	1.62	1.75	2.84	Gas
22-4, 100	207.4	1.62	1.73	2.80	Gas
23-4, 50	216.5	1.60	1.70	2.72	Gas
23-4, 100	217.0	1.59	1.72	2.73	Gas
24-4, 50	226.1	1.58	1.73	2.73	
24-4, 100	226.6	1.60	1.75	2.80	
25-4, 50	235.7	1.60	1.76	2.82	
25-4, 100	236.2	1.61	1.78	2.87	

Note: Sub-bottom depths are based upon original shipboard calculations and may be in error by 5.1 m.

<sup>a</sup> Measured by continuous GRAPE.

<sup>b</sup> Calculated from wet-bulk density measured by continuous GRAPE.

<sup>c</sup> "Gas" indicates the noticeable weakening of acoustic signals by gas bubbles.

depth of 1262.5 m, bottoming in Aptian limestones underlain by basalt. Details of the original results can be referred to in Andrews, Packham, et al. (1975). The purpose of reoccupying Site 289 was to obtain a detailed Neogene sediment record to understand better the paleoceanographic history on an equatorial shallow-water rise which had accumulated almost pure foraminiferal and nannofossil carbonates at high sedimentation rates. Site 586 is the northernmost of a series of HPC sites, the rest of which were drilled on Leg 90 in the southwest Pacific.

Four holes were drilled at Site 586; Hole 586 ended when a core barrel sub broke at 39.3 m depth; Hole 586A was continuously cored between 39.3 and 300.2 m; Hole 586B penetrated to 240.3 m sub-bottom. The entire section consists of foraminiferal and nannofossil ooze which became chalky at a depth of approximately 260 m. In Hole 586A the oldest sediments cored are of late Miocene age in the N16 foraminifer Zone, the CN7 nannofossil Zone, and the *C. pettersoni* radiolarian Zone. A fourth hole, 586C, was washed to a depth of 613.5 m and a single core was taken at 613.5–623.1 m in the *S*. wolffii radiolarian Zone of early Miocene age. The purpose of this hole was to create an opportunity to log the pure carbonate section known to exist from Leg 30 data so as to acquire logs which would enable us to (1) compare shipboard physical properties data with *in situ* data on sonic velocities, densities, and impedance contrasts and (2) be better able to interpret the seismic stratigraphy of the Ontong-Java Plateau. To these ends the logging program was successful. Sonic velocities measured in the hole are significantly higher than shipboard measurements. These data combined with paleontological data allowed a new reinterpretation of the seismic reflectors (see section on Seismic Stratigraphy).

The paleontological studies of the Leg 89 group indicate that the carbonate section on the Ontong-Java Plateau is not the product of a purely pelagic "rain," but that the sediments probably contain allochthonous elements, as discussed later.

As shown by the foraminifer record, the sediments, which at first sight appear to display the sedimentological characteristics of a foraminifer-nannofossil ooze, were affected by mechanical transport, that caused (1) an accumulation of foraminiferal tests within the range of the sand fraction and (2) an admixture of forms from different environments, ranging from shallow-water platforms to bathyal depths. Thus, the sediments encountered at this site are more properly defined as a graded foraminifer-nannofossil silty sand.

Both planktonic and benthic foraminifers from the same sample show different preservation, the same species occurring with both transparent and chalky tests. It is not clear if the best preserved tests are autochthonous or allochthonous.

In addition, each residue contains specimens of *Quin-queloculina*, coarse agglutinated foraminifers, large no-dosariids (one chamber was over 2 mm in size), and highly ornamented ostracodes indicative of an environment much shallower than the present water depth at Site 586, 2208 m (below sea level), or than the estimated bathyal paleodepth based on the supposed autochthonous benthic foraminifers. It is worth mentioning that evidence of obvious reworking could not be detected in this preliminary study, although it cannot be ruled out.

There is a large variation in the size of the radiolarian microfauna. The size fraction greater than 150  $\mu$ m is large in some samples and small in others. For example, in 586A-8,CC less than 1% of the assemblage is greater than 150  $\mu$ m. A high percentage of small tests can be interpreted to result from an allochthonous, transported fauna; a high percentage of large tests indicates an autochthonous fauna.

Sedimentation ratios at the site varied considerably through time from a low of 13 m/m.y. in late Miocene time to a high of 54 m/m.y. in mid-Pliocene time, 3 to 4 m.y. ago.

### Hole 586B (by Leg 90 shipboard scientific party)

The Leg 90 scientific team split, described, and dated the sequence at Hole 586B (Ontong-Java Plateau) collected during Leg 89, with 98% recovery. This appears to be a continuous, uncomplicated section from Quater-

	86A	86B	Ve	elocity (km	/s)	Wet- density	·bulk (g/cm <sup>3</sup> )	Porc	sity (%)	(10 <sup>5</sup> g/c	ance cm <sup>2</sup> s)
	e 5	6 5	1.4	1.6	1.8	1.5	1.7	40	70	2	4
	P	Hol	1		÷.	1		4			
0-	E	1		•			•	GRAPE		٠	
	2	2		•		0	• 00	Grav.	0	•	
	3	3					•				
	4	4				0			O		
	5	-		10.00 20		0			0		
-	1	5		•		0	•		0		
50-	2	6		•		0	•		0	•	
	3	7		•		0	•		0	•	
	4	8		•		0	•		0	•	
	4	9				0				•	
	5	10		•		0			0		
-	6	11				9	•		0	•	
100-	7	12				0			0		
	8	12				3	o •		0		
	9	13				(0)			(0)		
	10	14		•			•		0	•	
	11	15		•		0	•		0	•	
150-	12	16		•		,	•		0	•	
150	13	17		•		~	•		0	•	
	14	18				v	•		0	•	
	15	19					•		0		
	16	20					•		0		
	17	21				0			0		
200-	18	22					•		0		
	19			•			•		0		
	20	23		•		0	•		0	•	
	21	24		•		0	•		0	•	
	21	25		•			•		0	•	
	22			•			<u> </u>		5		
250-	23			•		(	•		0	•	
	24			•			•		0	•	
	25			•		c	•		0		
	26			•			•	0		•	
	28	1		:		00	:		0	:	
ų,	30			:		0			0	:	
200	131	1 1				0		14	0		

Figure 12. Variations of physical properties with depth at Site 586.

nary to early late Miocene age. Cores are generally of good quality except for severe disturbance within five of the cores. Hole 586B differs only in details from descriptions of Holes 586 and 586A. All major calcareous and siliceous microfossil groups are represented. The section is from one lithostratigraphic unit, composed of foraminifer-bearing to foraminifer-nannofossil ooze. The sequence is intensely bioturbated, with numerous sedimentary features related to bioturbation. The upper 45 m of the section is marked by numerous thin, foraminiferrich zones that apparently resulted from winnowing. Unlike the report for Hole 586, there is little evidence of extensive reworking or turbidite layers.

#### REFERENCES

Andrews, J. E., Packham, G. H., et al., 1975. *Init. Repts. DSDP*, 30: Washington (U.S. Govt. Printing Office).

- Berggren, W. A., 1977. Late Neogene planktonic foraminiferal biostratigraphy of DSDP Site 357 (Rio Grande Rise). In Supko, P. R., Perch-Nielsen, K., et al., Init. Repts. DSDP, 39: Washington (U.S. Govt. Printing Office), 591-614.
- Blow, W. H., 1969. Late middle Eocene to Recent planktonic foraminiferal biostratigraphy. Proc. 1st Int. Conf. Planktonic Microfossils (Vol. 1): Leiden (E. J. Brill), 199-422.
- Boyce, R. E., 1976a. Definitions and laboratory techniques of compressional sound velocity parameters and wet-water content, wetbulk density, and porosity parameters by gravimetric and gamma ray attenuation techniques. *In* Schlanger, S. O., Jackson, E. D., et al., *Init. Repts. DSDP*, 33: Washington (U.S. Govt. Printing Office), 931-958.
- \_\_\_\_\_\_, 1976b. Sound velocity-density parameters of sediment and rock from DSDP Sites 315–318 on the Line Islands Chain, Manihiki Plateau, and Tuamotu Ridge in the Pacific Ocean. In Schlanger, S. O., Jackson, E. D., et al., Init. Repts. DSDP, 33: Washington (U.S. Govt. Printing Office), 931–958.
- Ellis, C. H., 1982. Calcareous nannoplankton biostratigraphy—Deep Sea Drilling Project Leg 60. In Hussong, D. M., Uyeda, S., et al.,

Init. Repts. DSDP, 60: Washington (U.S. Govt. Printing Office), 507-536.

- Gartner, S., 1977. Calcareous nannofossil biostratigraphy and revised zonation of the Pleistocene. Mar. Micropaleontol., 2:1-25.
- Hamilton, E. L., 1976. Variations of density and porosity with depth in deep-sea sediments. J. Sed. Petrol., 46:280-300.
- Mammerickx, J. L., Chase, T. E., Smith, S. M., and Taylor, I. L., 1974. Bathymetry of the South Pacific. IMR Technical Reports, Scripps Institution of Oceanography, La Jolla, California.
- Martini, E., 1971. Standard Tertiary and Quaternary calcareous nannoplankton zonation. Proc. II Planktonic Conf., Roma: Rome (Ed. Tecnoscienza), pp. 739-785.
- Milholland, P., Manghnani, M. H., Schlanger, S. O., and Sutton, G. H., 1980. Geoacoustic modelling of deep-sea carbonate sediments. J. Acoust. Soc. Am., 68:1351-1360.
- Moberly, R., 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, Pt. 2: Washington (U.S. Govt. Printing Office), 977–986.
- Moberly, R., Schlanger, S. O., et al., in press. *Init. Repts. DSDP*, 89: Washington (U.S. Govt. Printing Office).
- Nigrini, C., 1971. Radiolarian zones in the Quaternary of the equatorial Pacific Ocean. In Funnell, B. M., and Riedel, W. R. (Eds.), *The Micropaleontology of the Oceans:* London (Cambridge Univ. Press), pp. 443-461.
- Okada, H., and Bukry, D., 1980. Supplementary modification and introduction of code numbers to the low-latitude coccolith biostratigraphic zonation (Bukry, 1973, 1975). *Mar. Micropaleontol.*, 5: 321-325.

- Riedel, W. R., and Sanfilippo, A., 1978. Stratigraphy and evolution of tropical Cenozoic radiolarians. *Micropaleontology*, 23(1):61–96.
- Schlanger, S. O., and Douglas R. G., 1974. The pelagic ooze-chalk transition and its implications for marine stratigraphy. *In* Hsü, K. J., and Jenkyns, H. (Eds.), *Pelagic Sediments on Land and under the Sea.* Int. Assoc. Sed. Spec. Publ., 1:117-148.
- Shepard, L. E., Bryant, W. R., and Chiou, W. A., 1982. Geotechnical properties of Middle America Trench sediments, Deep Sea Drilling Project, Leg 66. In Watkins, J. S., Moore, J. C., et al., Init. Repts. DSDP, 66: Washington (U.S. Govt. Printing Office), 475-504.
- Srinivasan, M. S., and Kennett, J., 1981. Neogene planktonic foraminiferal biostratigraphy and evolution: Equatorial to subantarctic, South Pacific. *Mar. Micropaleontol.*, 6:499-533.
- van der Lingen, G. J., and Packham, G., 1975. Relationships between diagenesis and physical properties of biogenic sediments of the Ontong-Java Plateau (Sites 288 and 289, Deep Sea Drilling Project). *In* Andrews, J. E., Packham, G., et al., *Init. Repts. DSDP*, 30: Washington (U.S. Govt. Printing Office), 443-482.
- Vincent, E., 1981. Neogene planktonic foraminifers from the central North Pacific, Deep Sea Drilling Project Leg 62. In Thiede, J., Vallier, T. L., et al., Init. Repts. DSDP, 62: Washington (U.S. Govt. Printing Office), 329-353.
- Winterer, E. L., and Riedel, W. R., et al., 1971. Init. Repts. DSDP, 7: Washington (U.S. Govt. Printing Office).

Date of Acceptance: 12 January 1983



Figure 13. Variations of compressional wave velocities from shipboard measurements and velocity logs with depth at Site 586. Relative differences between these as a function of depth are shown at the right.



Figure 14. Logging results, Hole 586C, showing caliper, gamma-ray, resistivity, and sonic velocity.



Figure 14. (Continued).



Figure 15. Logging results, Hole 586C, showing caliper, gamma-ray, formation density compensated log, and compensated neutron log.



Figure 15. (Continued).

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~	PHIC	1	F	OSSI	L				Γ							
TIME - ROC	BIOSTRATIGRA	FORAMINIFERS	NANNDFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOG	IC DES	CRIPTI	DN	
cene inveginala (R)	ia huxleyi zone (N)	AG (8) asovedu	AG	CM		1	0.5 -			the state of the	• • •	Y 8/1 GY 7/1 FORAMINIFER INIFER OOZE Oxidized (pale bi Y 8/1 Dark gray (N3) n	NANNO own) to	DFOSSII p 15 cm	, and N/ ; shades through	ANNOFOSSIL FORAM of pale green. sut.
olo	(Intern	1 21		~			1	++++++		8		GY 7/1				
	Em	Colfosphae		Cm			-				•	Y 8/1 Texture:	1,6 D	1,50 D	1,75 D	CC, 23 D
	(N)	AG	AG	CM FM		cc	1.0			*****		Silt Clay	30 35	40	30 40	40 50
Histocene	n (R) a oceanica											Composition: Volcanic glass Zeolite Foraminifers	- 65	- <1 50	<1 - 60	50
late Pl	hum ypailio phyrocaps											Calc, nannofossil Radiolarians Sponge spicules	35 - <1	50 <1 <1	40 <1 <1	50 <1
	Ge											Silicoflagellates	-	<1	-	<1
	Amphich N23 (F)											ORGANIC CAR	30N AN 1, 3 0.3	ID CARI 1-32	BONATE	: (%):

SITE	58	6	HOL	.E	_	CC	RE 2	CORED	INTE	R	AL.	6.4-15.9 m s	ub-bottom; 2224.4-	2233.9	m be	low rig	floor	
×	PHIC	_	F	RAC	TER													
TIME - ROC UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIAMS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY	STRUCTURES	SAMPLES		LITHOLOG	IC DES	CRIPT	ION		
	6			см		1	0.5		1 1 1 1 1 1 1 1			5Y 8/1 5G 5/2 5Y 8/1	FORAMINIFER-N FOSSIL-FORAMI Mostly shades of several brighter y cated; dark gray 5/2) bands general SMEAR SLIDE SL	IANNO NIFER pale gn neen (g (N3) m ly coars	FOSSI OOZE een; do rayish ottles er, moi ty (%):	L OOZI green (i through re foram	E with minor NJ color = white (5' 5G 5/2)) bands a jut; darker, green inifer-rich.	ANNO- Y 8/1); ni indi- er (5G
	53 (1						1.14		П.					1, 44 M	1, 1;	30 2,68 M	5, 140 D	
te Plaistocene	SN (		AG	см		2	in the second						Texture: Sand Silt Clay Composition:	15 40 45	2 30 68	7 45 48	2 28 70	
2	oceanics (N						1 CT L			:	TW	5G 5/2	Volcanic glass Zeolite Carbonate unspec. Foraminifera	<1 <1 55	<1 - 15 15	2	<1 - 3 27	
	(H)						12	E+±+±	11.	٩ſ		5G 5/2	Calc. nannofossils	45	69	46	70	
	lion						1		11.		Г		Sponge spicules	<1	-	<1	<1	
	tyde sd/t						1	+ + + +		ł			Silicoflagellates	-	-	<1	-	
	opalum 1 G			EM		3	1.1			1	F	5G 5/2	ORGANIC CARBO	3, 11	0 CAR	BONAT	E (%):	
	Amphirh								; ;	-	•		Organic carbon Carbonate	- 78				
							-			1	F	5G 5/2						
							1		11	1	F	5G 5/2						
	5 (E)						-	++++			F	5G 5/2						
	N2:		AG	RP		4	-		11	1	F	5G 5/2						
	(N)						-	+++++	1	1	F	5G 5/2						
	andes						-			2								
oene	hyro					1	-			9		5G 5/2						
leisto	1 Gep						1 5	++++	1		F							
ely P	/smail								1	1								
	nota				11	5		+++++++++++++++++++++++++++++++++++++++			ſ	5G 5/2						
	lacu			FP		1	1				F	5G 5/2						
	tiani									3								
	oem							H		1								
	2 Servo							타파파		3								
	1	1								1								
								<u></u>		, ,								
				FP		6		HI-I-I-I		1								
								<u>+++</u> ++		55								
						1		HITH		k								
		AN	AG	ED		-	-	+++++++++++++++++++++++++++++++++++++++		.:								
_	_	I.	1.10	1.	11	lee	1	H-,,	1	4				_				

Information on core description sheets, for ALL sites, represents field notes taken aboard ship under time pressure. Some of this information has been refined in accord with postcruise findings, but production schedules prohibit definitive correlation of these sheets with subsequent findings. Thus the reader should be alerted to the occasional ambiguity or discrepancy. SITE 586

	C DES	SCRIPTI	ON	
FM 0.5 FM	ANNO NIFER white [5G 7 gray ser that	DFOSSIL 1 OOZE 10 (5Y 8 7/2]) as (5Y 7/2 an the do	OOZ (1) with indicat (2) and sminant	E with minor NANN th faint, coarser gree ted and minor layers a gravish yellow (5Y 8 t white (5Y 8/1).
SMEAR SLIDE SU	I 7	RY (%):	3.91	1 6 57
	D	M	M	M
CM Texture: Sint Sint	5 35	15 35	10 25	12 15
	60	50	65	83
SG 7/2 Composition: SG 7/2 Volcanic glass SG 7/2 Pyrite	_1	<1	1	12
Carbonate unspec.	2	10	5	-
E DG //2 Foraminifers	35	40	28	5
Radiolariant	2	<1	1	<1
5G 7/2 Sponge spicules	<1	<1	-	<1
		maxer		TE IN .
3	3.7	D CARE 6-77	TANUB	E (16/1
G Organic carbon	-			
g g G 5G 7/2 Carbonate	88			
5G 7/2				
x = 5G 7/2				
<sup>3</sup> / <sub>2</sub> = 5G 5/2				
§ 5 5 8/4				
§ 5 5 7/2				
8 CM				
5 5Y 8/4				
8 6 <del>1 1 1 1 1 5</del> 5 7/2				
AM AG CM CC				

LITHOLOGIC DESCRIPTION       UNITABLE ALL STATES       UNITABLE A	×	CHIC		F	OSS	L TER						
FM         OS         FORALINITER NANNOFOSSIL ODZE Duminante color is white (04 cm) of pais gent (56 727) dotty the mottle of pais gent (57 72) dotty and good that see some course; 56 727 add the and space mainly is gree throughout; many are very fait and space mainly is gree space; 56 727 add the and space mainly is gree throughout; many are very fait and space mainly is gree space; 56 727 add the and space mainly is gree throughout; many are very fait and space mainly is gree space; 56 727 add the and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; and main mottle (16 20). The space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throughout; many are very fait and space mainly is gree throut; fait and space mainter space mainter space mainter throughout	TIME - ROC UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
Light of the manual state of the manual sta					FM		,	0.5				FORAMINIFER-NANNOFOSSIL OOZE Dominant color is white (5Y 8/1) with mottles of pale yellor (5Y 8/3); thin bads. ( $<1$ cm) of pale green (5G 7/2) occu throughout; many are very faint and appear mainly as green tinges; 5G 7/2 and 5Y 7/3 layers and mottles are somewho coarser; blebs and small mottles (mostly $<1$ cm) of dark gree (N3) pyrite-bearing material are common throughout.
(1)       CM       FM       2       1       1       1       1       1       1       2       3         (1)       CM       FM       2       1       1       1       1       2       3         (1)       FM       2       1       1       1       1       2       3         (1)       FM       2       1       1       1       1       2       3         (1)       FM       2       1       1       1       2       3							H	-				SMEAR SLIDE SUMMARY (%):
3000       M       1       15       2       3         100       10 <td< td=""><td></td><td>-</td><td></td><td>CM</td><td>EM</td><td></td><td></td><td>1</td><td>++++</td><td></td><td></td><td>1,83 2,58 4,116 6,32 M D M D</td></td<>		-		CM	EM			1	++++			1,83 2,58 4,116 6,32 M D M D
Still         16         35         372           FM         3         10         15         38         572           Composition:         22         1         1         1         1           FM         3         1         1         1         1         1           State         16         50         15         28         72           Distores         1         -         -         -         -           State         1         -         -         -         -           State         1         -         -         -         -         -           State         1         -         -         -         -         -         -           State         3         -		2 (F		-				3	+++++			Sand 1 15 2 3
FM         3           FM         3           FM         3           GM         FM           3		N2					2	-				Silt 15 35 13 25
Image: Solution of the								1				Clay 84 50 85 72 Composition:
Image: Second and Sec	1	- 0						1 2				Zeonte – <1 – – Foraminifers 16 50 15 28
Image: State of the state o							H	-			1	Calc. nannofossils 84 50 85 72
(N) HOUSE HEAR CARBON AND CARBONATE (N): 4, 02-94 (N) HOUSE HEAR CARBON AND CARBONATE (N): 4, 02-94 (N) HOUSE HEAR CARBON AND CARBONATE (N): 4, 02-94 (N) HOUSE HEAR CARBONATE (N): 4, 02-94 (N)								-				Diatoms <1
(1) and provide the second sec					FM			-				Hadiolerians <1 <1 Spope inicialer <1 <1 -
CM FM CM FM CM FM CM FM CM CM FM CM CM FM CM		- 1						-	+++++			Silicofiagellates <1
(N) HOU HOU HAND CARBONATE (N): 4, 92–94 (N) AND CARBONATE (N): 4, 92–9							3	-	++++			Pteropod <1
CM FM 4 C FM 6 FM 6 FM 6 FM 7 C FM 7 FM 7 FM 7 FM 7 FM 7 FM 7 FM		ŝ					1	1	+++++			OPCANIC CARRON AND CARRONATE WIL
CM FM C FM C M F		2						-				4.92-94
Carbonate 89		2			1		11	-			1	Organic carbon -
		Nde										Carbonate 89
	-	20C						-				
		(H)		СМ	EM			1				
		210		840	1			-				
Conception         Amplify           Amplify		Ynda						1				
		In al					4	-				
		diur					11	-			•	
Concellent mediatory (0)         Automatic concellent           Participation         Participation           Partin         Participation		yrt a						1	-++-+-+			
Background         Control         Background         MO           Background         Background         Background         MO           Background         Background         Background         Background	Ц	than.						12				
		Ani					H	1	-++-+			
		ndo						-	+ + +			
		Pase							+++++++++++++++++++++++++++++++++++++++			
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CM AM AG FM			10						OG			
Competence and the second seco		N)					H					
Time sweetdoorgingi To the sweetdoorgingi AMM AG FM		DONE							+++++			
		NIN 2		CM				-				
		ntyr a se		-76				-				
		haer					6	-				
		ns n			0.0		1000	-				
		ilisci lelici						-				
		McKo H						1				
		3							-+-+-+			
		-					7	10	+++++			
		1	AM	AG	FM		CC	-				

SITE 586

SITE	586		HOL	E.		CC	RE	5 CORED	INTE	RVAL	34.9-44.4 m sub-bottom; 2252.9-2262.4 m below rig floor
×	APHIC		CHA	OSSI	TER						
UNIT - HOC	BIOSTRATIGRI	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE DISTURBANCE SEDIMENTARY	STRUCTURES \$AMPLES	LITHOLOGIC DESCRIPTION
	N22 (F)					1	0.5		001		FORAM-BEARING NANNOFOSSIL OOZE Dominant color appars as very pale green (about white [5Y 8/1] to pale greenist valiow (10Y 8/2]) with mottles of pal- yellow (5Y 7/3); thin layers (most <1 cm) of darker gree (pale green [5G 7/2] to paryish green [5G 5/2]) occur through out - most are very faint and appear as more or less dation color tinges in paler green background oze. Dark gree (beta and small mottles (<1 cm) also occur throughout and prob ably represent burker (01).
			AG			2	a state state of the state of t		1 1 1	•	SMEAR SLIDE SUMMARY (%): 4,90 6,63 D M Texture: Sand 2 1 Sint 18 18 Clay 80 81 Composition:
arly Pleistocene						3	and the set of a set of a				Pyrite – 2 Zoolite – 1 <1 Foraminifers 20 17 Calc. nanofossils 80 81 Radiobairans <1 <1 Sponge spicules – <1 Pieropods <1 – ORGANIC CARBON AND CARBONATE (%):
			cg			4	and so all so all so all so				Organic carbon 0.29 Carbonate 89
	(R) Calciditcus macintyrel zone (N					5					
	Pterocaniun prismatium		СМ			6					
Pliocen	N21 (F) CN12d (N)	АМ	AG	FM		cc			1		

TE	586	-	HOL	Ε /	4	00	RE	CORED	INT	ER	VAL	L 44.4-54.0 m sub-bottom; 2262.4-2272.0 m below rig floor
e	APHIC		F	RAC	TER							
UNIT UNIT	BIOSTRATIGRU	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY		STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
			АМ			1	0.5		0000			FORAMINIFER.BEARING NANNOFOSSIL OOZE Dominant color is white (5Y 8/1) and pale greenish gray (10Y 8/2) with very indistinct layers of light greenish gray (5GY 8/1); gray burrow mottles (slightly pyrtiiferous) N7N3 throughout; SMEAR SLIDE SUMMARY (%): 2, 80 - 3, 88 - 3, 82 D M M Texture:
						F				11		Sand 8 3 12 Silt 12 10 3
						2	1 - F - F - F - F		1			Clay 80 87 85 Composition: Volcanic glass – <1 – Pyrite – 1 – Foraminiters 10 10 15 Cole, neurofossik 86 89 82
									i			Diatoms 1 <1 1 Radiolarians 2, <1 1
						F			1	11		Sponge spicules <1 - 1 Silicoflagellates <1 - 1
	N21 (F)					3	in transfer		1		••	ORGANIC CARBON AND CARBONATE (%): 2, 79–60 Organic carbon 0.29 Carbonate 88
							-		1			
late Pliocene						4	a travel a trave					
										111		
	CN12d (N)					5						
							-					
	(H) (H)									5		
	oum prismatiu		СМ							1111		
	Pterocal					0				1		
						7				1		
		AN	CM	FN		co		臣幸幸		ß		

	PHIC		CHA	OSS	TEF	2						
TIME - ROCH	BIOSTRATIGRA ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS		SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
tare Plocens	Sponywater penter (R) N21 (F) CN12c (N) CU12d (N)		CM AG				1 2 3 4 5 5	0.5			•••	FORAMINIFER-BEARING NANNOFOSSIL DOZE         Dominant color is "pale green" – approximately white (5Y 8/1) to light greening grav (507 8/1).         Mottles of pale green (56 7/2) occur throughout.         Dark grav (N3) burrow mottles scattered throughout.         Thin 4          Only a few are very distinct; most are very fistinct and appearmantly as lightly greener tings in pale green dominant occu.         SMEAR SLIDE SUMMARY (%): $1, 76 2, 50 3, 70$ Texture:         Sand       18         Sand       19         Ordennic glass       1         Carbonate unspec.       1         Radiotations       1         Baldomin       1         Baldomines       1         Diatoms       1         Site Carbonate unspec.       1         Baldomines       1         Baldomines       1         Baldomines       1         Baldomines       1         Browner sciences       3, 70–71         Carbonate       3, 70–71         Baldomines       1         Baldomines       1         Baldomines       1         Baldomines       1         Baldomines       1         Baldomines
		AM	AG	FM			cc			11		

S	
Ξ	
Ch I	
86	

SITE 586 HOL	EA (	CORE 3 CORED INTERVA	L 63.673.2 m sub-bottom; 2281.6-2291.2 m below rig floor	S	ITE	586	HOLE	A	C	ORE	4 CORED	INTERV	AL 73.2-82.8 m sub-bottom; 2291.2-2300.8 m below rig floor
TIME - ROCK UNIT BIOSTRATIGRAPHIC ZONE NAMINIFERS	OSSIL RACTER SWEILTONDEN	GRAPHIC GRAPHIC UITHOLOGY GRAPHIC UITHOLOGY GRAPHIC UITHOLOGY	LITHOLOGIC DESCRIPTION		TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FO CHAF	RADIOLARIANS TO TEST	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	LITHOLOGIC DESCRIPTION
Sponguater perintal [7] CM12b (N) CM12c (H) W N20 (F) N20 (F) CM20 (H) W D			PORAMINIFER-BEARING NANNOFOSSIL DOZE         Dominant color is white (SY 8/1) to light granish gray (IGSY 0.1).         Who the or pair velow (SY 7/3) throughout. Burrow motitie, dark gray (NG3) throughout.         Wrowybuit, mott appears only slightly greener tinges in dominant 'pair greener' ozc.         SMEAR SLIDE SUMMARY (SHE $2/0$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $100$ $3.66$ $1000$ $1.66$ $1000$ $1.66$ $1000$ $1.6$ $10000$ $1.6$ $100000$ $1.6$ $10000000$ $1.6$ $1000000000000000000000000000000000000$		early Princeres early Princeres (names)-tate Princeres	2 CM24.(N)   CM26.(N) N19.(F) > 2	AG M AG	FM		0.5       1.0       2       3       5       5       7			FORAMINIFERABEARING NANNOFOSSIL CO2E         Dominant color is white (5Y 8/1) to light greenith gay (5G/7)         Drin of color is white (5Y 8/1) to light greenith gay (5G/7)         This beds (mostly <1 cm) of pale green (5G/72) material for open as tight greener material in light greener materin the greener material in light greener material in

1	200	Г	F	OSS	L	Т		U CORED	T	TT				
TIME - ROCK UNIT	IGRAPH	ERS	CHA	HARACTER			ERS	GRAPHIC	ACE RV					
	BIOSTRAT	FORAMINIS	NANNOFOS	RADIOLAR	DIATOMS	SECT	MET	LITHOLOGY	DISTURBAN	SAMPLES				
						1	0.5-				FORAMINIFERA-BEARING NANNOFOSSIL OOZE Dominant color is white (SY &/11 to light greenish gray (5G' 8/1). Mottles of pale vellow (SY 7/3) occur throughout. Burron mottles of dark gray (N3) common throughout. Thin beds (mott)<51 cm) of pale green (5G 7/2) materi throughout; most appear as slightly greener material in ligh green occut that is dominant librology.			
						H					SMEAR SLIDE SUMMARY (%):			
						2					4,59 D Texture: Sand 10 Sit 3 Ciay 87			
						-			1		Composition: Carbonate unspec. 3 Foraminifers 11 Catc. nannofosalis 84 Diatoms Tr			
	N19 (F								ļ		Radiolarians Z Fish remains Tr			
V Pilocene						3			1111		ORGANIC CARBON AND CARBONATE (%): 2,76–76 Organic carbon 0,28 Carbonate 90			
						F			1					
(nannos)		AM	AG			4				•				
liocene	2a (N)													
e   tate P	I CN1													
early Pliocer	CN11b (N)													
	(B)		AG			6								
	ster pentas						-			1				
	Spong	44	CM	EM		7								

SITE 586
SITE	580	-	HOI	LE	A	CC	DRE	CORED	INT	ER	VAL	<ul> <li>102.0—111.6 m sub-bottom; 2320.0—2329.6 m below rig floor</li> </ul>
×	APHIC		CHA	RAC	TER							
TIME - ROC UNIT	BIOSTRATIGR/	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					FORAMINIFER-BEARING NANNOFOSSIL DOZE Dominant color is white (5Y 8/1) to light greenish gray (5GY 8/1) with abundant mottles of pale vellow (5Y 7/3) and burrow mottles of dark gray (N3) throughout. Thin beds of pale green (5G 7/2) are present throughout but
							1.0			8		most are too faint to distinguish.
						F		****		11		4, 10 4, 105
			AM				1 2	++++++			•	Texture:
							1	소소소		8		Sand 14 B Silt 5 7
						2	- 3	++++++		.1		Clay B1 85 Composition:
							12	++++++		33		Carbonate unspec. 4 2 Ecraminitera 16 10
	(H) 8						- 5	++++				Calc. nannofossils 78 86
	ž							++++++		ä		Sponge spicules <1 -
							1	+++++		**		ORGANIC CARBON AND CARBONATE (%):
							1.1	++++++		54		2, 35–36 Ormanic carbon –
ocen						3	1			<u>B</u>		Carbonate 94
IA bi							1					
n ear	1						- 2	+++++		33		
liace							3				*	
<u>a</u>			AG				1 3	+++++		8		
	1 a						-	++++				
	/CN1					4		+++++		13		
	N S	AM					-	소 소 소		£2	•	
	CN10						1 3			8		
	Ť					H	-	****		•		
							- 2	777				
							1			3		
						5	1			3		
							- 4	++++++		14		
							- ÷	****		11		
						$\vdash$	-	+,				
								++++++	1	-		
			AG				-			33		
	tus (F					6		+++++++++++++++++++++++++++++++++++++++		33		
	beral						4	****		11		
	gaster						1.8	+++++++++++++++++++++++++++++++++++++++		11		
	Spon					1	-	+++++++++++++++++++++++++++++++++++++++		11		
	3					7	-	++++		11		
		AM	CG	FM		CC	-	+++++		22		

ΤE	586		HOL	E.	A	CC	RE 8	CORED	INTER	VAL	111.6-121.2 m sub-bottom; 2329.6-2339.6 m below rig floor
	PHIC		F	RAC	TER						
UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				FORAMINIFER-BEARING NANNOFOSSIL DOZE Dominant color is white (SY 8/1) to light greenish gray (SGY 8/1), with abundant mottles of pale yellow (SY 7/3) and burrow mottles of dark gray (N3) throughout. Thin beds of slightly darker pale green ISO 7/2) occur throughout dominant soze but most are too faint to distinguish clearly.
						+					SMEAR SLIDE SUMMARY (%):
	6 (F)		AG			2	and a set of the set			•	Carbonate unspec. 2 Foraminifers 20 Carbonate 3 Carbonate 2 Carbonate 3 Carbonate 3 Carbon
	BLN						1		1		Radiotarians 1 Sponge spicules <1
	•					3					ORGANIC CARBON AND CARBONATE (%): 2, 31–32 Organic carbon 0.62 Carbonate 85
2	1					H			33		
early Plioce	1a (N)		AG			4			1		
	10c/CN1	AM									
	C					1					
							1.1.1				
						5	10.560				
	1						107.0				
						F					
	er pentas (R)		AG			6					
	Spongast						1.00				
						7					
		Al	AN	FM		C	2	12:12:12			

SITE 5	86	HOLE A	CORE 9	CORED INTERVAL	121.2-130.8 m sub-bottom; 2339.6-2348.8 m below rig floor	SITE	586	HOL	LE A	co	RE 10 CORED IN	TERVAL	130.8-140.4 m sub-bottom; 2348.8-2358.4 m below rig floor
TIME - ROCK UNIT BIOSTRATIGRAPHIC	ZONE	FOSSIL CHARACTER BIOLABIOLABIANS CHARACTER SILISON CHARACTER SILISON SILISON CHARACTER	SECTION	GRAPHIC LITHOLOGY WWW.058 JOWENTWOBS	LITHOLOGIC DESCRIPTION	TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	OSSIL RACTER SNUIANOID	SECTION	GRAPHIC LITHOLOGY W	DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION
aufy Pliceane	Sponyaster periods (N)	AG AG AG CM	2 2 3 4 5 5		PCRAMINIFER-BEARING NANNOFOSSIL CO2E         Deminant color is white (SY 8/1) to light greening ary (EGY 6/1) with montles of dair green (EG 7/2) and pale yellow (SY 7/3).         Direction of color green (EG 7/2) and pale yellow (EY 7/3).         Direction of pale green (EG 7/2) and pale yellow (EG 7/2).         Direction of pale green (EG 7/2) and pale yellow (EG 7/2).         Direction of pale green (EG 7/2).         Directi	early Pilocene	Stichocorys pereovine (R) N18 (F) CN106 (N) ( CN106 CN11a (N)	AM AM AG	См	1 2 3 4 5 6 7 7 CCC			FORAMINIFER-BEARING NANNOFOSSIL OOZE         Dominant color is white (NB and SY &(1) to light greenish grey (GY &/1) with months of pale green (SG 7/2) material (lighty course) door throughout but most are too faint to be clearly distinguished and appaar mainly a faint, slightly darker green tinges and mottles in dominant white to pale green ooze.         SMEAR SLIDE SUMMARY (%):       3,74         Texture:       3,74         Sand       14         Sitt       4         Clay       82         Composition:       7         Print:       3         Sand       14         Sitt       4         Clay       82         Composition:       7         Print:       3         Sand       14         Sitt       4         Clay       82         Composition:       7         Print:       18         Curbonate unspect       3         Sorgensition:       7         Distorm       2         Operation:       7         Clay:       82         Orgen:       2         Orgen:       2         Orgen:       2         Orgen:       2         Orgen:       2

SITE 586	HOLE A	COR	E 11 CORED	INTERVA	AL 140.4-150.0 m sub-bottom; 2358.4-2368.0 m below rig floor	SITE	586	HO	LE A	C	ORE	12 CORED	INTERVA	L 150.0-159.6 m sub-bottom; 2368.0-2377.6 m below rig floor
TIME - ROCK UNIT BIOSTRATIGRAPHIC	FORAMINIFERS CHARACTER RADIOLARIANS PLATOMS RADIOLARIANS	SECTION	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENYARY STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION	TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	USSIL RADIOLARIANS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENYAŘY STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION
serity Pilocene Stórbocoryz peregrina (R) CN10a (M) CN10b (N) Z N16 (F) M N16 (F)	ам ам ам	1 1 2 3 4 5 6 7 CC			FORAMINIFER BEARING NANNOFOSSIL ODZE         Section 1 to Section 5, 35 cm: cominant color is white (b7 bit of bit with pure or matter of medium gray (b3 d). Material is entirely biotropia gray (b3 d) and is diptripiate of pairs grave (16 d). There are no clearly distinguitable bed of or matterial.         Bearing Core. There are no clearly distinguitable bed of or non-material.         Section 1 to Dettom: homogeneous white (b8 to 5Y 8/1) core.         Section 2 to bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 b bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 b bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 b bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 b bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 b bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: homogeneous white (b8 to 5Y 8/1) core.         Section 3 to 1 bottom: for a section 3 to 1 bottom: for a secore.         Sect	Late Miccene early Pilocene	Stichocopys prinsprins (R) CM9b (N) CM9b (N) CM9b (N)	MA	M FM		4 5 7 7			FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (BY 8/1) to lipty greening pray (BG) 8/1). Entirely bioturbated with burrow mottes of medium gray (MS) and slightly darker pair green (BG 7/2) than the dom- inant pair green occ. There are no clearly distinguishable beds. SMEAR SLIDE SUMARY (M): Sand 2 Sind 8 Clay 0 Clay 0 Cla

×	PHIC		CHA	OSS	TER							
TIME - ROC UNIT	BIOSTRATIGR/	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
late Miceane TIM	CN96-IN) N12 (F)	FORM	AM	habit	piato	3	0.5				Ideas .	FORAM-BEARING NANNOFOSSIL OOZE Dominant color is white (5Y 8/1) to light greenith gray (5GY 8/1). Extensively bioturbated with burrow fill material of medi- um gray (NS) and slightly darker shades of pale green (5G 7/2) than the dominant "pale green" background coze. No clearly distinguishable beds. SMEAR SLIDE SUMMARY (%): 
		AM				5	the second s					

SITE 586 HOLE A CORE 13 CORED INTERVAL 159.6-166.9 m sub-bottom; 2377.6-2384.9 m below rig floor

×	PHIC		F CH4	OSS	TER						
TIME - ROCI	BIOSTRATIGRA ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	CENTION	METEDO	GRAPHIC LITHOLOGY	SEDIMENTARY SEDIMENTARY STRUCTUDES	SAMPLES	LITHOLOGIC DESCRIPTION
late Miocene	CN95 (N) N17 (E)	AM	AG	FM			0. 1 1. 2				FORAMINIFER-BEARING NANNOFOSSIL OOZE         Dominant color is white (SY 8/1) with burrow mottling of light to medium gray (NS-N5) and very slightly derker pale green and pale yellow (SY 7/3).         SMEAR SLIDE SUMMARY (%):         2, 57         Texture:         Sand       1         Silt       90         Composition:       2         Zeolfie       1         Foraminifers       10         Calc, nenorossils       90         Radiolarians       1         Silicolfagellates       1         Silicolfagellates       1         Silicolfagellates       1         Silicolfagellates       1

m below rig floor SITE 586 HOLE A CORE 14 CORED INTERVAL 166.9-171.8 m sub-bottom; 2384.9-2389.8 m below rig floor

SITE 586 HOLE	A CORE 15 CORED INTERVAL	171.8-180.8 m sub-bottom; 2389.8-2398.8 m below rig floor	 SITE 5	86	HOL	A	C	ORE	16 CORED	INTERVAL	L 180.8-190.4 m sub-bottom; 2398.8-2408.4 m below rig floor
TIME - ROCK UNIT BIOSTRATIGRAPHIC ZONE KANNOFOSSILS RADIOLARIANS BADIOLARIANS	IL TTER NOLLJBS SHOLLUNG SHOLLDBS SHOLLDS SHOLLD	LITHOLOGIC DESCRIPTION	TIME - ROCK UNIT BIOSTRATICRAPHIC	ZONE	FO CHAP	SIL ADIOLARIANS A CLE	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION
Inter Micocine Inter Micocine W12 (1) W12 (2) W12 (2)		FORAMINIFER-BEARING NANNOFOSSIL OOZE         Dominant color is while (5Y 8/1) with light to medium gray (N2-N5), pair velow, and pair graen burrow motiles through- out. Outlines of burrow motiles are inditunci.         SMEAR SLIDE SUMMARY (%):         3.60         Texture:         3.61         Color is a strain of a strain of the strain of the strain of the strain strain of the strain	late Micenee CNB6 INI	(4) (4) (4) (4) (4) (4) (4) (4) (4) (4)	M AG	CP	3 3 4 5 7 7 7	0.5 1.0-		₩9.040. *** *** *** **** **** **** **** *** **	FORAMINIFER.BEARING NANNOFOSSIL OOZE         Dominant color is white (NB and 59 6/1) and light greenish gray         (GOY 8/1). Internetly bioturbated throughout with burrow         motties of pale yellow (V7 7/3), medium gray (NB) and pale         green (SG 7/2) material.         SMEAR SLIDE SUMMARY (%):         2.65         D         Sint       10         Clay       88         Composition:       Volcanic glass         Volcanic glass       <1

SITE	586	HOLE A	š	CO	RE	17 CORED	INT	ER	VAL	. 190.4-200.0 m sub-bottom; 2408.4-2418.0 m below rig floor	-	SITE	586	
	PHIC	FOSSIL	ER										PHIC	Γ
TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS NANNOFOSSILS RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION		TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS
late Miccene	Skichocorys pengyrina. (8) CMBb (N) N17 (F) N17 (F)	Δ.		1 2 3 4 5 6 7	0.5					FORAMINIFER BEARING NANNOFOSSIL COZE         Dominant color is white (N9) to bluich white (58 9/1) with burrow motifiago of pale yellow (87 7/3), medium gary (N8), and pale gares (50 7/2) alkowidaet throughout.         SMEAR SLIDE SUMMARY (8):       6,70         D       D         Terture:       8,70         Sitt       10         Camposition:       Volamic (11 alkowidaet throughout.         Volamic (12 alkowidaet throughout.       8,70         D       D         Camposition:       0         Volamic (12 alkowidaet throughout.       73         Orgonic (13 alkowidaet throughout.       74         Volamic (13 alkowidaet throughout.       75         Orgonic (14 alkowidaet throughout.       77         Volamic (13 alkowidaet throughout.       71         Orgonic (14 alkowidaet throughout.       70         Volamic (13 alkowidaet throughout.       71         Orgonic (14 alkowidaet throughout.       70         Orgonic (14 alkowidaet throughout.       70		Late Miscome	Ormatarus perutrinus (R) U17 (F)	АМ
		AM AM CM		CC	-	++++++		31						AN

SITE	586		HOI	E.	A	CC	RE 1	8 CORED	INTER	VAL	200.0-209.6 m sub-bottom; 2418.0-2427.6 m below rig floor
	PHIC		F	OSS	IL						
TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluich white (58 0/1) with abundant burrow montlings of pala yellow (5Y 7/3), medium gray (N5), and pale green (5G 7/2) material throughout. SMEAR SLIDE SUMMARY (%): 2, 0 D Texture:
			АМ			2			****	••	Sand 8 Silt 12 Clay 80 Composition: Carbonate unspec, 5 Foraminifiers 15 Calc, nanofossils 79 Diatoms <1 Radiolaritans 1 Sponge spicules <1
	(N) (F)					3	ursel event error				ORGANIC CABBON AND CARBONATE (%): 2, 60–61 Organic carbon Carbonate 99
late Miocr	CN95 N17	АМ	АМ			4	n ni kan hana				
						5	rafami				
	Ommatantus penultimus (R)					6	in on the line of		11 III III III III		

SITE	586	3	HOL	E	A	co	RE	19 CORED	INTER	VAL	209.6-218.1 m sub-bottom; 2427.6-2436.1 m below rig floor
	PHIC		F	OSS	L						
TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (NB) to bluish white (5B B/1). Intense bioturbation throughout with burrow mottling of pale yellow (5Y 7/3), medium gray (NS), and pale green (5G 7/2). SMEAR SLIDE SUMMARY (NS): 3,50 D Texture: Sand 8
						2	o d o o tro				Silt 10 Clay 82 Composition: Carbonate unspec. 2 Foraminifers 10 Cabe. nanofossils 87 Diatoms <1 Radiolarians 1 Sponge spicules <1
tate Miocene	CN9b (N) N17 (F)					3	and a set of a set of		11	•	ORGANIC CARBON AND CARBONATE (%): 3, 49–50 Organic carbon – Carbonate 96
		АМ				4	the second s				
	mus (R)					5	second second second				
	Ommatartus penulti					6	and a second				
		AM	AM	CM		CC	- 1	1++++++	1 1		

ITE	586	1	HOL	E	A	 COF	RE	20 CORED	INT	ER	VAL	218.1-227.7 m sub-bottom; 2436.1-2445.7 m below rig floor
×	APHIC		F	OSS	TER	T			IT			
TIME - ROC UNIT	BIOSTRATIGR/ ZONE	FORAMINIFERS	NANNOFOGSILE	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5					FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluish white (58 9/1). Intensely biotru/bated throughout with burrow mottles of pale yellow (5Y 7/3), medium gray (N5), and pale green (5G 7/2). SMEAR SLIDE SUMMARY (%): 2, 80 D
			АМ			2	ered with farm					Texture: Sand 3 Silt 12 Clay 85 Composition: Volcanic glas <1 Cathonate unpace. 3 Foreminifies 12 Cate. Canatorospile 83 Radiolarians 1 Scores proces 3
aue	(N)					3	terlandran.					Silicoflagellates <1 ORGANIC CARBON AND CARBONATE (%): 2, 20–21 2, 82–83 Organic carbon 0.01 – Carbonate 98 93
late Mioce	CN95 (1 N17 (F	АМ	AM			4	or direction of the second					
						5	mentioner from					
	mmatartus penuitimus (R)					•	and see from the second					
	0					7						
		AM	AM	CM		cc		1		31		

IIE.	900	-	HOL	.E.	~	CC	RE	ZI CORED	INT	ER	VAL	227.7-237.2 m sub-bottom; 2445.7-2455.3 m below rig floor
LIME - HOCK	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS NO	SWOLVIG	SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE	SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
	a (N) CNBb (N)					1	0.5	Void	1			FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluish white (58 9/1). Intensi bioturbation throughout, with burrow mottles of pale yellor (57 7/3), light to medium gray (NS-NS), and pale green (57 7/2). Nota: Section 1 is an extra piece found in the barrel after th liner had been removed and sectioned. It was added on as Sec tion 1.
	CN9		АМ			2	The second se			**		SMEAR SLIDE SUMMARY (%): 4, 110 D Texture: Sand 2 Silt 10 Clay 88 Composition: Zeroite <1 Ecomposition:
MIOCEINE	r (F)					3			     			Calc. namofosilis 88 Radiolarians <1 Scores spicules <1 Silicorlagellates <1 ORGANIC CARBON AND CARBONATE (%): 4, 108–109 Organic carbon 0.03 Carbonate 95
	CIN I	АМ	АМ			4	indianalana i		1	11 11 11 11 11 11 11 11 11 11 11 11 11	•	
						5	or the states of					
	uttimus (R)					6	the state of the state					
	4) Onimertartus penu					7	and contract		1			
	CN9a (N N16 (F)	AN	AM	CM		8 CC						

	PHIC	Γ	F	OSS	IL CTER			CORED		cri	T	201.0-2-10.0 III 20090(1011), 2400.0-2404.0 III 001011 (§ 1100)
TIME - ROCK UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
Th	81031	FORA	NANN	RADIO	DIATO	1	1.0			250 M 252 252 252 252 252 252 252 252 252 2	-	FORAMINIFER-BEARING NANNOFOSSIL OOZE 0-50 cm: soupy: flow-in; homogeneous white (NB to 58 9/1 ooze. Rest of core: dominant color is white (NB) to bluich whit ISB 9/1). Intensely bloutbated throughout with burrow with to medium gray (N7-NS) material. SMEAR SLIDE SUMMARY (N): 4, 80 0 Texture: Sand 2 Sint 12 Clay 86 Composition: Zeolite <1 Foraminifers 14 Calc. namofossils 86 Radiolariant <1 Sponge sploules <1 SilicoTagellates <1 ORGANIC CARBON AND CARBONATE (%): 3, 60-81 Organic carbon - Carbonate 92
late Miocene	CNBa (N) N16 (F)	AG				4	The second se					
						5						
	Jonnartartus ponultimus (R)					6	the second second second					
	0	AN	MA	CA		7	-		1	31		

TE 58	36	-1	HOL	EA	<u>ا</u>	CO	RE 2	CORED	INTER	VAL	256.5-266.1 m sub-bottom; 2464.9-2474.5 m below rig floor
CIHON	NILLAN		CHA	RAC	L						
UNIT	ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMFLES	LITHOLOGIC DESCRIPTION
						1	0.5				FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluish white (58 g/1). Intensel bioturbatish throughout with burrow notices of light to medium gray (N7–N3), pale green (5G 7/2) and pale yellow (5Y 7/3) latter being most abundant and forms dominant material in a few parts of core (see SS 3, 20).
						H	-	****			SMEAR SLIDE SUMMARY (%): 3, 20 5, 80
			АМ			2	and and and and				M D Texture: Sand 2 2 Silt 14 14 Clay 84 84 Composition: Volcanic glas <1 - Pyrite <1 - Zenite (1) (1)
									111		Foraminifers 15 16 Calc. nannofossils 84 84
							4		11		Radiolarians 1 <1 Sponge spicules <1 <1 Silicetoenderse <1 -
						3					ORGANIC CARBON AND CARBONATE (%): 6, 82–83 Organic carbon 0 Carbonate 97
late Miocene	CN84 (N) N16 (F)	AM	AM			4	the second s				
						5	and reading			••	
	(B)		AM			F			11		
	mmetartus peru/timus					6	over extine				
	6					7					
		AM	AM	CM		cc		±+±+±			

SITE	586		HOL	.E	A	CC	RE	24 CORED	INT	ER	VAL	256.5-266.1 m sub-bottom; 2474.5-2484.1 m below rig floor
×	PHIC		F	RAC	TER							
TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY	<b>SAMPLES</b>	LITHOLOGIC DESCRIPTION
						1	0.5					FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluish white (58 9/1). Intenset bioturbated throughout with burrow mottles of light to mediun gray (N° to N5), pale green (5GY 8/1), and pale yellow (5Y 8/3) materials. SMEAR SLIDE SUMMARY (%): 4, 145 6, 145
			AM			2	and a second second			time time 2		M D Testure: Sand 4 1 Silt 12 12 Clay 84 87 Composition: Pyrite 30 – Zeolite 1 <1 Carbonate unspec. 1 1 Foraminifers 10 13 Cal. manofesils 58 86
late Miccene	N16 (F)					3	A DESCRIPTION OF A DESC					Radiolarians – <1 ORGANIC CARBON AND CARBONATE (%): 6, 145–146 Organic carbon – Carbonate 99
		АМ	AM			4	2012/01/2020/01/2020			tine teast east		
	CNBh (N) CNBa (N)					5					•	
	Ommartatus antepenultimus (R)		АМ			6					•	
		AM	AM	СМ		7		建载				

Non- training straininin straining straining straining straining strainin		200	1	HOL	E /	۹	CC	DRE	25 CORED	INTE	ER	VAL	266.1-275.7 m sub-bottom; 2484.1-2493.7 m below rig floor
Status     Status <td>PHIC</td> <td>CHIC</td> <td>1</td> <td>FO</td> <td>RAC</td> <td>L</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	PHIC	CHIC	1	FO	RAC	L							
woony or in the second secon	UNIT UNIT	ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	STRUCTURES.	SAMPLES	LITHOLOGIC DESCRIPTION
	Late Micenne CNBB.IN) BII	hepenutrimus (R) UNB (F) UNB (F)	AM.	AM AM	RA	00	3	0.5				54 	FORAMINIFER-BEARING NANNOFOSSIL COZE         Dominant color is white (N9) to build white (55 8/1). Internate bioturback throughout, with burtow mottling of light to me um gray (N7—N5), pale vellow (5Y 8/3), and pale green (5C 8/1)         SMEAR SLIDE SUMMARY (%):       6, 137         0       0         Texture:       6, 137         0       0         2001te       1         Sint       10         Chronate unspec.       1         Portune:       1         Sold B       1         Dominant (Sint)       10         Clay       89         Composition:       2         Zoolite       1         Sonop spiculus       1         Diatoms       1         Sonop spiculus       21         Carbonate unspec.       6, 137–138         Organic carbon       94
		mmartatus antepo					0						e e

16	000	<u> </u>	HUL	.E	<u></u>	T	INC 4	CORED	INTER	TT	275.7-261.7 m sub-bottom; 2483.7-2488.7 m below ng hoor
	THU		CHA	RAC	TER			[-			
UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC	DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES	LITHOLOGIC DESCRIPTION
late Miocane	Nultimus (R) CN8b (N) N16 (F)	AP				1	0.5				FORAMINIFER-BEARING NANNOFOSSIL OOZE Dominant color is white (N9) to bluich white (55 9/1). Sic turbated throughout with burrow mottling of light-gray (N7-M5) pale yellow (SY 6/1), and light gravs (SQY 8/1) material SMEAR SLIDE SUMMARY (%): 3, 75 D Texture: Sand 1 Sit 10 Clay 89 Composition: Zeolite <1 Carbonate unspec. 10 Foraminifers 11 Calc.namofossib 79 Distoms <1 Rediotrians <1
	Ommartatus antepen	AM	AM	СМ		3 CC	The set of set			••	Sponge spicules <1 Silicotisgellates <1 ORGANIC CARBON AND CARBONATE (%): 3, 75-76 Organic carbon 0 Carbonate 93
TE	586		но	LE	A	C	ORE	27 COREL	INTE	RVA	281.7-285.9 m sub-bottom; 2499.7-2503.4 m below rig floor
	HIC	Γ	~	FOS	SIL.				TT		
LIND	BIOSTRATIGRAP	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE SEDIMENTARY	STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION
						1	0.5				FORAMINIFER-BEARING NANNOFOSSIL STIFF OOZE T CHALK Sections 1 and 2 are mostly ooze. By Section 3, chaik "noduler occur about every 15–20 cm with firm ooze between, Dominant color is white (N9) to bluish white (58 9/1).
									山		1, 83 2, 34 2, 108 3, 74 CC, 8
											5WEAH SLIDE SUMMART (%): 1,83 2,34 2,108 3,74 CC,8 D M D M D Texture:
00E		At	4								SMEAR SLIDE 1.0847 (%): 0.083, 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Site 5 2 2 5
Miocene	Bb (N) 116 (F)	A	4								SINEAR SLIDE JUMINARY (%): 1,83 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Silt 5 3 2 5 3 Clay 87 92 88 82 87 Companying 87 92 88 82 87
late Miocene	CNBb (N) N16 (F)	A	4			2					SimEAR SLIDE JOMMAAR (%): 1,83 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Silt 5 3 2 5 3 Clay 87 92 68 82 87 Compatition: Clay - 6 3
late Miocene	CNBb (N) N16 (F)	A	4			2					SINEAR SLIDE SUMMARY (%): 1,83 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Silt 5 3 2 5 3 Clay 67 92 88 82 87 Comparition: Clay - 6 - 3 Volcanic glass <1 <1
late Miocene	CNBb (N) N16 (F)	A	4			2				•	Sint AR SLIDE JUMINARY (%): 1,63 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Silt 5 3 2 5 3 Clay 87 92 88 82 87 Composition: Clay - 6 3 Volcenic glas 1 1 Printe 2 1
late Miocene	(R) CNBb (N) N16 (F)	AJ	4			2				•	Sincark SLIDE JUMINARY (%): 1,83 2,34 2,108 3,74 CC,8 D M D M D Texture: Sand 8 5 10 13 10 Silt 5 3 2 5 3 Clay 67 92 88 82 87 Composition: Clay 67 92 88 82 87 Composition: Clay 67
late Miocene	nus (R) CNBb (N) N16 (F)	AM	×			2				•	SMMEAR Y (%):           1,83         2,34         2,106         3,74         CC,8           D         M         D         M         D         M         D           Texture:         Sand         8         5         10         13         10           Silt         5         3         2         5         3         Clay         6         -         -         3           Clay         87         92         88         82         87         Comparition:         Clay         -         6         -         -         3         Volcanic glass         -         -         -         1         <1
late Miocene	ultimus (R) CNBb (N) N16 (F)	AJ	v			2					SMEAR SLIDE SUMMARY (%):         1.83         2.34         2.108         3.74         CC, 8           D         M         D         M         D         M         D         M         D           Texture:         Sand         6         5         10         13         10           Sit         6         3         2         5         3         Clay         67         92         88         82         87           Composition:         C         Clay         6         -         -         3         Volcanic glas         -         -         -         1         1         Privite         -         1         -
late Miocene	spenultimus (R) CNBb (N) N16 (F)	Al	v			2				• •	Sint R SLIDE SUMMARY (%):         1,83         2,34         2,108         3,74         CC, B           0         M         D         M         D         M         D         M         D           Texture:         5         0         13         10         Silt         5         3         2         5         3           Clay         87         92         88         82         87         Composition:         Carbonate unspec.         6         -         3         10         Silt         5         3         2         5         3         Clay         6         -         3         10         Silt         5         7         10         10         Silt         5         7         7         10         9         Foraminifers         12         10         13         15         15         Calc. nanorfossils         80         66         74         72         67         71         10         9         Diatoms         1

Ommartatus a WW BC W

cc

SITE 586

ORGANIC CARBON AND CARBONATE (%): 2, 105-106 Organic carbon -Carbonate 93

<u> </u>	PHIC		F	OSS	TER	Τ			Π	Π	
TIME - ROCI	BIOSTRATIGRA ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE DISTURBANCE SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
	artatus antepenultimus (R)					1	0.5	Void			FORAMINIFER-BEARING NANNOFOSSIL FIRM OOZE AND CHALK Dominant color is white (NB) to bluish white (5B 9/1). Bioturbated throughout but not as much as above cores. Burrow mottles of light to medium gray (NZ-MS), pale yellow (SY 8/1), and light greenish gray (SGY 8/1) are common, but distinguish- able, continuous layers of these colors also are common.
	(F) Omm		АМ			2			11 11 11		SMEAR SLIDE SUMMARY (%): 4,45 D Texture: Sand 10 Siit 3 Clary 87 Composition: Carbonate unspec. 3 Foraminifers 10 Calc.nanofesils 85 Diatemest 5
late Miocene	N16					3	the familiant				Radiotarians 2 ORGANIC CARBON AND CARBONATE (%): 4,45-46 Organic carbon 0 Carbonate 99
	CN8b (N)	AM	AG			4	11111111		*		

	PHIC		F	OSS	TER					Π	
TIME - ROCI	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLABIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
late Miocene	artatus antepenultimus (R) N16 (F) N16 (F)		АМ			1	0.5		51 55 55 55 55 55 55 55 55 55 55 55 55 55		FORAMINIFER-BEARING NANNOFOSSIL STIFF OOZE AN CHALK Deminant color is white (N9) to bluich white (BB 9/1). Bioturbased throughout, Burrow motiles of light to medium gra (N7–NS), pale vellow (10Y 8/2), and greenish gray (5G 6/ are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 are common, Continuous layers of gray and greenish gray (8 Stat 4 Clay 81 Composition: Composition: Composition: 15 Sit 4 Clay 81 Composition: 2 Caton 15 Sit 5 Sit 5 Distorn 5 Fish remains 6 Fish remains 5 Contoc 2 Carbonate 96
	Ornmart	A	AM			4					

SITE 58	86	HC	LE	A	CC	RE	30 CORED INTERVAL	295.3-300.3 m sub-bottom; 2513.3-2518.3 m below rig floor
APHIC		СН	FOSS	CTER				
TIME - ROC UNIT BIOSTRATIGR	ZONE	PORAMINIFERS NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY DNITING DNIT	LITHOLOGIC DESCRIPTION
Late Miccone Late Miccone La	C CN7 (N) N16 (F)	AN AN AN	1 1		1 2 3 4 <u>CC</u>	0.5		FORAMINIFER-BEARING NANNOFOSSIL STIFF OOZE AND CHALK Dominant color is white (N9) to bluish white (58 9/1). Bioturbated throughour, with burrow mottler of light to medium gray (N2-N5), pale greenish yeaves of greenish gray and gray also are common. SMEAR SLIDE SUMMARY (%): 1, 55 0 Texture: Sand 13 Sint 4 Clay 83 Composition: Carbonate unspec. 2 Foraminitars 12 Colc, namofossilt 83 Distors <1 Rediolariana 3 Sponge spolater <1 ORGANIC CARBON AND CARBONATE (%): 1, 54–85 Organic carbon 0 Carbonate 96

NANNOFO RADIOLAI	DIATOMS	SEC	ME	DRITCING	DISTURBA SEDIMENT SAMPLES		
			0.5			FORAMINIFER-BEARING NANNOFOSSIL STIFF OOZE CHALK Dominant color is white (N9) to bluish white (58 9/1).	AND
		1	1.0			Bioturbated throughout, with burrow motifies of light to me gray (N7-N5), pale greenish yetlow (5Y 8/2), and gre gray (5G 8/1). Continuous layers of greenish gray and gray are common.	dium enish r also
			-			SMEAR SLIDE SUMMARY (%):	
AM			1			1,55	
			-			Texture:	
						Sand 13	
			-		-101	Silt 4	
		2			481	Clay 83	- II.
			-		111	Composition:	
		1.1			- 81	Carbonate unspec. 2	
			-	+++++++	-181	Foraminifars 12	
			1	+++++++++++++++++++++++++++++++++++++++		Calc, nannofossils 83	
			-			Diatoms <1	
		1.1	1 2	+++++	-101	Radiolarians 3	
11			1		311	Sponge spicules <1	
			-			ORGANIC CARBON AND CARBONATE (%)	
		3	-			1,5455	
			1 3	+++-++-	399 1	Organic carbon 0	
			-	+++++++++++++++++++++++++++++++++++++++		Carbonate 96	
			1	+++++++++++++++++++++++++++++++++++++++	181		
			-	+++++++++++++++++++++++++++++++++++++++			
AM		-	-	+++++++			
			1	+++++++++++++++++++++++++++++++++++++++	- 13		

	PHIC		F	OSS	TER	T	T			Γ	ĪĪ	
TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING	SEDIMENTARY	SAMPLES	LITHOLOGIC DESCRIPTION
Late Miccene	Cannartus peteresoni (R) CNT(2) (N) NIE (F) NIE (F)	AM	AM AM	АМ		3	0.5- 1 1.0- 2 2 2 4 4			and		FORAMINIFER-BEARING NANNOFOSSIL STIFF OOZE AND CHALK Dominant color is white (N9) to bluish white (58 9/1). Biotur- bated throughout but not as much as above cores. Burrow mod- tiles of light to medium gray (N7-N8), pale greenish yellow (10Y 67), and greenish gray (S6 67) material are common. Continuous layers of gray, and greenish gray also are common. SMEAR SLIDE SUMMARY (%): 1, 20 Texture: Sand 15 Siit 4 City 81 Composition: Carbonats unspec. 2 Foraminifers 15 Cale. namoforsills 77 Distoms <1 Radiolarian 6 ORGANIC CARBON AND CARBONATE (%): 1, 121–122 Organic carbon — Carbonate 98

2510 2 2522 2 - Lala

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HOLE A

100 m m 21

SITE	586	1	IOL	E	в	CC	RE	1 CORED INTE	RV	/AL 1.4-11.0 m							S	TE	586		HOL	E	В		OR	E
~	PHIC		FO	ACT	ER														PHIC	3	FO	OSSI	L			
TIME - ROCI	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIA LUNS	SECTION	METERS	GRAPHIC LITHOLOGY WILLITHOLOGY	STRUCTURES	SAMPLES	LITHOLOGIC DI	ESCRIP	TION				THE DOOL	UNIT - HOUP	BIOSTRATIGRA ZONE	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	CELEVIAN	OEU I IVII	METEHS
	NN21		A			1	0.5		11 11	- 5GY 6/1	FORAMINIFER-B gray (5Y 7/1), sol various subtle that The famina appear fied volcanic ash. (5B 4/1) frambioi throughout core. I out. Gai pockets?	EARING to be of Streaks ds of pr Burrowi appear	S NAN lamina senish g eladoni and b yrite an ng com in Sect	NOFOS less tha ray (5G te(?) rep lebs of d hydro mon bu ion 4.	SIL O( n 1 cm Y 6/1) resenti dark b trollite t subtle	DZE, light h thick of to 5G 7/2. ng devitri- luish gray scattered through-			N22	A					1	.0
							-		25	Julia	SMEAR SLIDE SU	JMMAR	Y:			1000								F	+	-
							-		22	5 5 GY 6/1		1,79 D	1,23 M	1, 141 M	2, 39 M	2,93 M										
							-		3	- 001 0/1	Texture:		2													
						2	1	F	ii.		Sand	c	R	č	A	c			~					1	2	
	_						1		-	• - 5G 6/1	Clay	D	D	D	A	A			N2:	A						
							12	ビーボーナー			Composition: Mica			-	-	т										
							1	+			Heavy minerals	-	т	+	8	-										
							-	+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$			Clay Volcanic glass	-	Ŧ	_	T	н								F	+	-
			A				-		=	6 5G 7/2	Foraminifers	C	c	C	ċ	C										
							1	F-+			Calc, nannofossils	D	D	D	A	A										1
						3	-		12	1	Radiolatians	Ť	R	-	R	R			N22	A				13		
							1		8		Sponge spicules	-	=	-	т	-			1					12	<u>' </u>	
	NZO						1			*	Other	T.	-	-	-	-										1
	z						1		đ	- 5G 5/2	SMEAR SLIDE SI	JMMAR	Y:													
Cian (						-	-		11			3.22	3, 67	3, 118	4,2	6, 71								Ł	+	_
ator							1.3		53		Texture:	M.	N	M	101	ha		ver.				- 1				
8			A				1.62		15	- 58 4/1	Sand	R	R	-	-	c		ater								
							1.2		22	- 58 4/1	Silt	H	C	R	C	C		9								6
	1					4	1.5		11		Composition	5			U	· · · · ·			52	A					4	
				1			1 3		16	EP A/1	Pyrite	-	Т	т	R	-			-			- 1				
	-	1					1.8		22	56 W/1	Foraminifers Cela associated	R.	C	R	C	C										
				1					8	Contractor of Contractor	Radiolarians	T	T	T	т	R						- 01				
	N19								25	- 5B 4/1						1.001								H	+	-
	z								35	- 5GY 7/1																
										- 5GY 7/1												1				
			A		1		1.5		8										55	A						
				- 1		5			-	5GY 7/1									6						5	
							12		2	and the second																27
									N	- 5GY 7/1																
									11	- 5GY 7/1																
								+																E	T	-
								7-1-1																		
							-		5																	÷.
						6	1.2	T-L_L]	8	*														1.		
						1			-	- 58G 4/1									122					1	2	
							1		8										1°	A						1
									8	5BG 4/1																
							-																			
	NN					7			-	-5GY 7/1									IN18					E	7	
						ce		누구나고	3										1 4					F	-	-
-	1	11				1.0	1		1.1						_				L		A			14	- Million	- 6

SITE	586		HOL	E	В		co	RE	2	CORED	INT	ER	VAL	11.0-	20.6 m				
×	APHIC		F	RAC	TER														
TIME - ROC UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS		SECTION	METERS	GRA LITHO	PHIC DLOGY	DRILLING	SEDIMENTARY STRUCTURES	SAMPLES			LITHOLOGIC DE	SCRIP	TION	
	N22	A					1	0.5						5GY 7/1 ¦ 5G 6/1 N8 → 5G 6/1		FORAMINIFER-Bi greenish gray (5G' by Section 5, soft 5G 7/1) scattered from devitrified v Biebs and streaks of tered throughout. mm diameter nodul	EARIN Y 7/1) t lamin throug olcanic of pyrit Faint t le at Se	G NAN grading a of gr hout. A ash. V te, gree burrow ction 5,	NOFOSSIL OOZE, light to very light gray (N8) eenish gray (56 6/1 and poper to be celadonite(?) fary subtle color cycles, nish gray (58G 5/1) scat- motiling common. Eight 8 cm.
						Ī			구난			1		- 5GY 7/1		SMEAR SLIDE SU	MMAR 2 98	Y:	6 116
	N22	A					2	ed an ed a						- 5GY 7/1 5GY 8/1		Texture: Sand Silt Clay Composition: Miss	D	M A A	
								free o						- 58G 5/1 - 58G 5/1		Volcanic glass Foraminifers Calc. nannofossils Radiolarians Sponge spicules	C D T T	A A T T	T C D R
	N22	A					3	terin Terina						- 58G 5/1 - 58G 5/1 - 58G 7/1 - 5G 7/1					
Queternery	N22	A					4	Terreferen						5GY 7/1					
								1000				-		NB					
	N22	A					5	a Daraw Ser											
	N22	A					6	structure en						N8 - 5G 8/2 - 5G 6/2 5GY 7/1					
	0							4	구리			22							
	NN						7	-	Voic	ا ب ـــــــ									
	L	L	~	L	1				IT-	مادر مه									

SITE	586	HOLE B		co	RE	CORE	D INTERVA	L 20.6-30.2 m		SITE	586	HOI	EB	c	ORE	4 CORED	NTERV	L 30.2-39.8 m		
TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS CHARVOFOSSILS RADIOLARIANS PLADIOLARIANS	ER	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES		LITHOLOGIC DESCRIPTION	TIME - ROCK	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	RADIOLARIANS BIATOMS DIATOMS DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES		LITHOLOGIC DESCRIPTION	
Quaternary	61MM	Α.		1 2 3 3 5 6 7 7				N8 - 5GY 7/1 N8 - 5GY 7/1 N8 - 5GY 7/1 N8 - 5GY 7/1 N8 to 5GY 7/1 - 5G 6/2 - 5GY 7/1	FORAMINIFER NANNOFOSSIL OOZE, very light gray (N8) grading to light greenish gray (ISY 7/1), soft, lamina of light greenish gray (ISY 8/1) common, Subta lamina of vellowish gray (ISY 8/1) common. Badly disturbed by drilling below midSection A. SMEAR SLIDE SUMMARY: 1, 122 D Texture: Sitt A Composition: Mica T Foraminifer A Cala: annofossits A Diato: T Radiolarians R	Outcomery	GINN			3 3 4 5 6	0.5			- 56 7/2 - 57 7/2 - 57 7/2 - 57 7/2 - 57 7/2 - 57 8/7 - 57 8/1 - 56 7/2 - 56 7/2 - 56 7/2 - 56 7/2 - 56 7/2 - 56 7/2 - 57 8/1 - 57 8/1 - 56 7/2 - 56 7/2 - 57 8/1 - 57 8/1 - 57 8/1 - 57 8/1 - 56 7/2 - 56 7/2 - 56 7/2 - 57 8/1 - 57 8	FORAMINIFER NANNOFOSSIL (SY 7/1), soft, with lamins (<1 c (SY 7/2) and light gray (SY 6/1) ( (SY 6/1) burner morts are comm of vary dark gray (SY 3/1) printe green lamins may be calcidonic(2) f ash. Graded or winnowed interbed 50 cm. SMEAR SLIDE SUMMARY: 1,38 1,56 : M D 4 Texture: Sand – – 4 Sit A A Carpopliton: Mica – T Voltanic glass – – Foraminifer T A / Cale, nanoofosiis A A / Diatom – T Radiolarians – R 1	OOZE, light gray mtick) of pale green roughout. Light gray on. Streaks and blebs ) very common. Pale mdevitrified volcanic occurs at Section 3, 86 4

SITE	586	HO	LE B		CO	RE	5 CORE	D INTERV	AL 39.8-49.4 m		SITE	586	HOL	E B	C	ORE	6 CORED I	NTERV	AL 49,4-59,0 m	
TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	FOSSIL ARACTE SWOINUNO	R	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES		LITHOLOGIC DESCRIPTION	TIME - ROCK	BIOSTRATIGRAPHIC ZONE	NANNOFOSSILS H	RADIOLARIANS	CELTION	METERS	GRAPHIC LITHOLOGY	DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES		LITHOLOGIC DESCRIPTION
late Pilocene	NNIS NNIS NVIS NVIS NVIS NVIS				1 2 3 4 5 6 7 7 7		레베라다다다는 다.		- 5Y 8/2 - 5GY 7/1 - 5GY 7/1 - 5GY 7/1 - 5GY 7/1 - 5GY 7/1 - 5GY 7/1 - 5Y 8/2 - 5Y 8/1 - 5Y 8/2 - 5Y 8/2	FORAMINIFER-BEARING NANNOFOSSIL ODZE, veh lowish gray (SY 971), oft, with Iamina of light greenish rath. Burrow motified of dark gray (N4) abundant through out, Graded or winnowed interbad at Section 2, 50–60 orm and Section 3, 55–700 cm. An interbad oran. The antire core has subcle color motile. Streaks and bleak of pyrife(?) commonly occu. SMEAR SLIDE SUMMARY: <u>12, 3, 108, 5, 20, 6, 99</u> <u>0, M, M, M, M, Statu, C, A, C, C, R, Statu, C, A, C, C, R, Clay, D, A, D, L, Clay, D, A, D, L, Clay, D, A, D, L, Clatomin, T, T, T, T, Sponge spicules, T, T, L, Sponge spicules, T, T, L, T, T, Sponge spicules, T, T, L, T, T, Stillcoffagellates, L, L, T, T, T, Sponge spicules, T, T, L, T, T, Stillcoffagellates, L, L, T, T, T, Stillcoffagellates, L, L, T, T, T, T, Sponge spicules, T, T, L, T, T, Stillcoffagellates, L, L, T, T, T, T, Stillcoffagellates, L, L, T, T,</u>	Lete Pricerne	NN16 1 N21 NN17 1 NN18	A A A			1 0.4 1 1.0 2 2 3 3 4 5 5 6 6 7 7 5			5Y 8/1 - 5GY 7/1 - 5GY 7/1 - 5Y 8/2 5Y 7/1 - 5Y 7/2 - 5Y 7/2 5Y 7/2 5Y 7/2 5Y 7/2 5Y 7/1 5Y 7/1 5Y 7/1 5Y 7/1	FORAMINIFER-BEARING NANNOFOSSIL 002E, yel- lowish gray (SQY 8/1), sot, with lamina of light greenin gray (SQY 1/1 to SQY 8/2) celatonite(7) of disinitied volcanic and Burrow motiling common with subtle color differences, Blebs and streaks of pyrite common. SMEAR SLIDE SUMMARY: 2,31 5, 115 6, 91 0 D D Texture: Sand R R R Sitt C C C Clay D D D Composition: Foraminifers C C C Calc, namotalit D D D Rediolarians T T T Sponge spicules T - T

SILE	500	1	HOL	EI	0	 CO	RE	/ CORED	INTER	AVA	L 59.0-68.6 m			5 - 3	SITE	586		HOI	.E	B
×	THIC		F	RAC	TER											PHIC		CHA	OSS	TE
TIME - ROC UNIT	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY	SAMPLES		LITHOLOGIC D	ESCRIPTION		TIME - ROCH	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOME
Late Philosene	NIIB				F	1 2 3 4 5 6 6	0.5				- 5Y 8/1 5Y 8/1 - 5Y 8/1	FORAMINIFER-B light gray (NB), beds (<3 en) gray (N4) service gray (N4) service Sind Status Composition: Volcanic glas Pyrite Foraminifers Cale, namofosult Distoms Radiolarians	ARING NANNOFOSSIL ODZE, very soft, burrows, laminae, and thin inter- ry vellowich gray (BY 871). Medium dark and belus of pryvie(7) corromo. Entim urband and subtility laminated. Seven below Section 3, 06 cm. XMMARY: 1,29 D C D R T C A R R		lata Piloane	N20 N21 N21 N21	A A A			

	HIC		F	OSS	L	T							
UNIT UNIT	BIOSTRATIGRAP	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES		LITHOLOGIC DE	SCRIPTION
	N21	A					1.0-		4 4 4		5YR 6/1 -5YR 6/1 -5YR 6/1 -5Y 7/1 -5Y 7/1 -5Y 4/1 - N4	FORAMINIFER N (N8), soft, with th of subtle shades of borownish gray (5' increases in defini pyrife(?) common throughout. Light thick) of celadonis in Sections 4, 5, an SMEAR SLIDE SU Texture:	IANNOFOSSIL OOZE, very light gray in jaminas and interbeds ( < 1 cm thick) light greenish gray (SGY 8/1) and light (R 6/1). Burrow mortling subtle but tion with depth. Streaks and blobs of throughout. Cycles of color occur generist gray (SG 7/1) layer I < 1 cm e(7) from altered volcanic glass apparent of. MMARY: 4, 59 D
												Sita Clay Composition: Volcanic glass Pyrite	C D T T
sene											- 5GY 8/1 5GY 8/1	Foraminifers Cale, nannofossils Radiolarians Sponge spicules	A R T
lata Plioc							-				-56 6/1 -56 6/1 -56 6/1 -57 7/1 -5Y 7/1 -58 6/1 -59 7/1		
	N21	A									- 5G 6/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1		
	N20	A					5				- 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1 - 5G 7/1		
	NN16				F		7				5G 7/1 5G 7/1 5G 7/1		

-	J		
C			

SITE 586 HOLE	B CORE 9 CORED INTERVAL	78.2–87.8 m	SITE	586 H	OLE B	COR	E 10 CORE	INTERVAL	L 87.8–96.3 m
TIME - ROCK UNIT UNIT BIOSTRATIGRAPHIC FORAMINIFERS RAMNOFOSSILS RAMNOFOSSILS	ER SPJ AWY2 SPHILL NOLDSY SPHILL SPHI	LITHOLOGIC DESCRIPTION	TIME - ROCK UNIT BIOSTRATIORADHIC	FORAMINIFERS	HARACTER HARACTER BIATOMS	SECTION	GRAPHIC LITHOLOGY	DRILLWO DISTURBANCE SEDIMENTARY STRUCTURES SAMPLES	LITHOLOGIC DESCRIPTION
anty Placere anty Placere VIIS		FORAMINIFER NANNOFOSSIL OOZE, very light gray (NB), soft, badly disturbed by coring throughout. Pumior pebble (0.5 cm diameter) at Section 2, 140 cm.	early Pilocree	SIN	A	3 4 5 6			FORAMINIFER NANNOFOSSIL DOZE, very light gray (NB), soft. Severe coring disturbance throughout:

SITE 5	86 HOLE B	CORE 11 CORED INT	ERVAL 96.3-105.9 m	SITE 586 HOLE B CORE 12 CORED INTERVAL 105.9-115.5 m
TIME - ROCK UNIT BIOSTRATIGRAPHIC	20NE CHARACTER NANNOFOSSIL RADIOLARIANS MANNOFOSSILS	BECTION RECTION METERS CHONN METERS CHONN CONTINUE CONTIN	LITHOLOGIC DESCRIPTION	TINU UILIANCE
early Pilocene	WHIS X		- 50 8/1       - 50 8/1       FORAMINIFER NANNOFOSSIL COZE, light greenish grav (50 8/1), or sufficient (-1 cm) interbads of suffic color shades of light greenish grav (50 8/1), medium blain grav (150 8/1) interbads of pyrits(?) are common. Light greenish grav (50 8/1) interbads in a subte but capacent. Strakes and blas of pyrits(?) are common. Light greenish grav (50 8/1) interbads in a subte but capacent. Strakes and blas of pyrits(?) are common. Light greenish grav (50 8/1) interbads in a subte but capacent. Strakes and blas of D M M D T seture:         *       56 8/1       SMEAR SLIDE SUMMARY:       1,28 2, 67 3,114 4,55 D M M D T seture:         *       Sand       R T       - C Siti C A - A         Clay       D A       - A         - 57 8/1       Compatition:       Foraminifiers A A A Diatoms R T D - Pyrite T Foraminifiers A A A Diatoms A A A - Diatoms R T T - SY 8/1         - 56 8/1       Wice       T R - R - R - R - R - R - R - R - R	View         1

SITE 586 HOLE B	CORE 13 CORED INTERVA	L 115.5-125.1 m	SIT	E 58	6 H	OLE I	В	CORI	E 14 CORED INTER	IVAL 125.1-134.7 m	
TIME - ROCK UNIT CHARATIGRAPHIC FORAMINIFERS NAMNOFOSSILS RADIOLARIANS RADIOLARIANS DIATONS	R GRAPHIC GRAPHIC LITHOLOGY GRAPHICS GRAP	LITHOLOGIC DESCRIPTION	TIME - ROCK	BIOSTRATIGRAPHIC	FORAMINIFERS	FOSSIL ARACT SINGUARING	ER	SECTION	GRAPHIC UTHOLOGY SWITTING SWITTING	STANFLES	LITHOLOGIC DESCRIPTION
ANTB-20 MILE-20 MILE-1 INTIS-20 > >		<ul> <li>FORAMINIFER NANNOFOSSIL OOZE, very light gray (NB), firm. Bioturbation very common with yellowish gray (SY 8/1) mottles. Minor pyrite/12) processes in occurrence with depth. Pyrite/12) increases in occurrence with certain apparent. Bioturbatic apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in antensity with depth. Pyrite/12) increases in occurrence with certain apparent biotectrases in apparent biotectrase in apparent biotectrases in apparent biotectrases in apparent biotectrase in apparent biotectrase.</li> <li>Set apparent biotectrase in apparent bio</li></ul>	early Plicene	N18 N18	A	~	8	2 3 4 5 6 7 CC			FORAMINIFER-BEARING NANNOFOSSIL 002E, we light gray (N8), firm, interes bioturbation, rind burrow prominant. Lamines of yellowich gray (DY Br1) common Subte light year (N7) laminations. SMEAR SLIDE SUMMARY: 2,70 S, 17 D Texture: Sand R R Sith C C Calc. namofossile D D Rediolarians T T Rediolarians T T

SITE	586	HOL	ΕB	CC	RE	15 CORE	DINTERVA	L 134.7–144.3 m	SITE	586	HC	LE B	i	COR	E 16 CORED II	NTERV	AL 144.3-153.9 m	
TIME - ROCK	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	RADIOLARIANS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES SAMILES	LITHOLOGIC DESCRIPTION	TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE	FORAMINIFERS	FOSSIL ARACTE SNVIJUOIDU	R	SECTION	GRAPHIC LITHOLOGY	DISTURBANCE SEDIMENTARY STRUCTURES	112	LITHOLOGIC DESCRIPTION
	*INN EINN	A A		1	0.5		1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	FORAMINI FER-BEARING NANNOFOSSIL OOZE, very light gray (NB), firm, abundant yellowih gray (5Y 8/1) motties, pryite(?) bibbi and streaks abundant. Faint laminee of light gray (N7), Rind burrows common. SMEAR SLIDE SUMMARY: 2,110 3,77 D M Texture: Sand — — -N7 Sitt C — Clay A — Composition: Foraminifers C C Cale, nanofossils A A Diatoma — T Radiolarians T T -N7		NN12				0. 1 1, 2		220 T22 22, 333 522 322 322 322 322 322 322 322 322	N7 58G 7/2	PORAMINIFER-BEARING NANNOFOSSIL OOZE, very light gray (N8) grading to white (N9) in Section 2 grading to yellowish gray (SY 8/1) in Section 3 to white (N9) in Section 6, firm, interestly biorurbated throughout, pyrite(?) blebs and streaks common. Light gray (N7) laminae common in Section 5. *Note: Artificial void due to excessive core handling. No sediment is missing: sediment has been compressed. SMEAR SLIDE SUMMARY: 6, 62 D Composition: Pyrite T Foraminiters C Calc. nanofossilis A Radiolerians T Sponge spicules T
early Pliceme	N18	A		3			r de la construction de la constru La construction de la construction d	- N7 - SY 8/1 - N7 - SY 8/1 - N7 - SY 8/1 -	early Plocene				-	3 4 5 6				
	ELNN	A	F	7				5Y 8/1		NN12	A			7 CC			- 5Y 8/1 - N7	

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SITE	586		HOL	E	в	cc	RE	17 CORED	INTER	VA	L 153.9-163.5 n	1						
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TIME - ROCI	BIOSTRATIGRA	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES	SAMPLES		LITHOLOGIC DE	SCRIPT	ION				
						1	0.5		o 1		- N5 - N5 - N5	FORAMINIFER M MINIFER-BEARIN gray (N8), firm, B ations of medium yellowish gray (5Y *Note: Void due compressed.	ANNO G NAN oturbati gray ( 8/1), to exce	FOSSIL NOFO on com N5) an	. OOZ SSIL C imon ti d abui ore ha	E ANC OZE, v hrougho idant n ndling:	) FOR very lig ut, lami nottles sedime	A- ht of
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	N18	A				2	- trut			•	→ N5	Texture: Sand Silt Clay Composition:	R A A	R D	C A A	A A	AA	C A C
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							-	+-+-+-	11		- N5	Foraminifers	A	R	A	A	A	c
							=	+++++++++++++++++++++++++++++++++++++++	55		- 5Y 8/1	Calc. nannofossils Radiolariant	A	D	A	A	<del>A</del>	A
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UNIT UNIT	BIOSTRATIGR	FORAMINIFERS	NANNOFOSSILS	RADIOLANIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURIANCE	STRUCTURES SAMPLES			LITHOLOGIC DE	SCRIPT	TON		
	LINN		A			1	0.5				- 5Y	8/2	FORAMINIFER-BI FORAMINIFER N (N8), soft, intens medium gray (N5 yellowish gray (5Y laminae occurs in S	EARING IANNOF biotur ) occur 8/2) abu	3 NAN FOSSIL rbation. s throug undant.	NOFOS OOZE, Very ghout o Greenis	SIL OOZE and very light gray faint laminae of ore, Burrows of h gray (5GY 6/1)
								+++++					SMEAR SLIDE SU	MMARY	6		
						-		++++++		3				1,35 D	3, 126 M	4, 147 M	6, 74 D
							- 2	+++++++++++++++++++++++++++++++++++++++		5	1		Texture:				
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						1	- 3	++++++					Pyrite	Ξ.	т	-	-
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ΓE	586	_	HOL	.E	В	C	ORE	19 CORE	DINT	ERV	AL 173.1-	182.7 m			_			
	APHIC		F	OSSI RAC	TER													
UNIT	BIOSTRATIGR	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	sameres		LITHOLOGIC DE	SCRIPT	ION			
						1	0.5-			*********	*		FORAMINIFER-B (N9) to very ligh specks, blebs, and medium gray (N5 spicule-bearing into	EARIN t gray ( streaks ). Pyrit erbeds a	G NAN N8), so of yel e(?) co t Sectio	NOFOS ft. Bur lowish mmon. ri 3, 59	SIL OC row mi gray (5 Conce -62 cm	DZE, white attled with Y 8/1} and ntration of
							1.0-			#	- N5 - N5		SMEAR SLIDE SU	MMAR	Y:	1.65	3.61	5 118
						H				8			Texture:	D	M	D	M	D
										11	-5Y 8/1		Sand Silt	c	c	Ξ	c	c
								****	4	18	- 5Y 8/1		Clay Composition:	D	D	17-	D	D
- 2					1	2			4	"			Volcanic glass	_	-	-	-	т
								+_+_+		R			Foraminifers	c	c	c	c	c
									4	12			Calc. nannofossils Radiolarians	DT	D	D	D	D
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SILE	586	-	HOI	E	В	-	CO	RE	20 CORED	INTE	RVA	L 182.7-192.3 m		-		
×	PHIC	- 1	CHA	RAG	TER											
UNIT UNIT	BIOSTRATIGRA ZONE	FORAMINIFERS	NANNOFOISSILS	RADIOLARIANS	DIATOMS		SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY	STRUCTURES SAMPLES		LITHOLOGIC DE	SCRIPT	ION	
late Miccene						-	1 2 3 4 5	0.5				- N5 5 y 8/1 - N5 - N5 - N5	FORAMINIFER-B (N0) to very ligh strake, bibb and medium gray (N5) ooze. * Note: Artifical voi SMEAR SLIDE SU Texture: Sand Silt Cary Composition: Glauconite Pyrite Foraminifers Cale, nanofosils Radiolarians Sponge spicules	EARINCI turay ( spots c ooze w d due to MMAR 1,30 M R C D T T T T T	S NANN N8), wild if yello ish diff handlir r: 1,43 D  C D  C D 	NOFOSSIL DOZE, wh ft, burrowmottled wish gay (5Y 87) a use boundaries into h ng. 4, 143 M R C D - C C C C D - -
							6	a harden dar				- N5				
	LINN					Ì	7				1	Void				

SITE 586	HOLE B	CORE 21 CORED INTE	RVAL 192.3-201.9 m	SITE 586 HOLE B CORE 22 CORED INTERVAL 201,9-211.5 m	
TIME - ROCK UNIT BIOSTRATIGRAPHIC ZONE	FOSSIL CHARACTER NANNOFOSSILS RADIOLARIANS NANNOFOSSILS RADIOLARIANS PIATONOS	SECTION METERS MOTONIC ADDINATAV SIGNATAV SIGNATAV	LITHOLOGIC DESCRIPTION		LITHOLOGIC DESCRIPTION
Late Milocene N17A N17A		1     1 </td <td>- N5         FORAMINIFER REARING NANNOPOSSIL OCZE, white H01 lowery light grav (NS) with grav (NS) occe sams and lamina and light greenish grav (SGY 8/1) burrows.           - N5         * Note: Void due to handling.           - N6         SMEAR SLIDE SUMMARY:           - 10         I.08           - N6         SMEAR SLIDE SUMMARY:           - 10         I.08           - 0.0         M           - 0.0         Heavy minerals           - 0.0         D           - 0.0<!--</td--><td></td><td>FORAMINIFER-BEARING NANNOPOSSIL DOZE, while (N9) to very light gray (N8), toft, burrow-mottled common throughout core. *Note: Void due to handling. SMEAR SLIDE SUMMARY: 2, 38, 4, 28, 6, 75 M D M Texture: Sand — — — — Sit C C C C Ciay D D D Composition: Pyrite — — — T Foraminifers C C C C Calc, nanrofstill D D D Radiolarians — T T Sponge spicules — — T</td></td>	- N5         FORAMINIFER REARING NANNOPOSSIL OCZE, white H01 lowery light grav (NS) with grav (NS) occe sams and lamina and light greenish grav (SGY 8/1) burrows.           - N5         * Note: Void due to handling.           - N6         SMEAR SLIDE SUMMARY:           - 10         I.08           - N6         SMEAR SLIDE SUMMARY:           - 10         I.08           - 0.0         M           - 0.0         Heavy minerals           - 0.0         D           - 0.0 </td <td></td> <td>FORAMINIFER-BEARING NANNOPOSSIL DOZE, while (N9) to very light gray (N8), toft, burrow-mottled common throughout core. *Note: Void due to handling. SMEAR SLIDE SUMMARY: 2, 38, 4, 28, 6, 75 M D M Texture: Sand — — — — Sit C C C C Ciay D D D Composition: Pyrite — — — T Foraminifers C C C C Calc, nanrofstill D D D Radiolarians — T T Sponge spicules — — T</td>		FORAMINIFER-BEARING NANNOPOSSIL DOZE, while (N9) to very light gray (N8), toft, burrow-mottled common throughout core. *Note: Void due to handling. SMEAR SLIDE SUMMARY: 2, 38, 4, 28, 6, 75 M D M Texture: Sand — — — — Sit C C C C Ciay D D D Composition: Pyrite — — — T Foraminifers C C C C Calc, nanrofstill D D D Radiolarians — T T Sponge spicules — — T

SITE 586 HOLE B	CORE 23 CORED INTERVAL 211.5-221.1 m	SITE 586 HOLE B CORE 24 CORED INTERVAL 221.1-230.7 m
TIME - ROCK UNIT CHARATIGRAPHIC ZONE FONAMINIFERS RADIOLARIANS RADIOLARIANS RADIOLARIANS	NOLD38 GRAPHIC STATUTOLOGY STATUTOLOGY LITHOLOGIC DESCRIPTION	POSSIL CHARACTER UNIT UNIT UNIT UNIT UNIT UNIT UNIT UNIT
La Mocree NNT1 >	0.5	Note:     10     1     1     10     1     10     <

SITE	586	HOLE	В		ORI	E 25 CO	RED INTE	ERVA	AL 230.7-240.3 m	1		1	SITE E	86	HOLE	C	COR	E 1	CORE	DINTE	RVAL	613.5–623.1 m sub-bottom; 2831.5–2841.1 m below rig floor
TIME - ROCK UNIT	BIOSTRATIGRAPHIC ZONE FORAMINIFERS	FOCHAR	DIATOMS BIANS V	eerton	SECTION .	GRAPHI LITHOLO	A A DRILLING DISTURBANCE	SAMPLES		LITHOLOGIC DESC	RIPTION		TIME - ROCK UNIT	SIUSTRATIGRAFHIC ZONE FORAMINIFERS	FOR A NANNOFOSSILS CHARA	SIL CTER SWOLDIG	SECTION	MEIEHS	GRAPHIC ITHOLOGY	DRILLING DISTURBANCE SEDIMENYABU	STRUCTURES	LITHOLOGIC DESCRIPTION
late Nicerne	NI1 NI7A VII7A VII7A				3 4 5 6 7 7	$= \begin{bmatrix} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1$			5Y 8/1 N5 GY 8/1 Void <sup>+</sup> N6 5Y 8/1 5Y 8/1 5Y 8/1 5GY 8/	FORAMINIFER-BEL (N9) to very light of gray (N5) ring bands. + Note: Vold due to ha *+ Note: Vold, unidentil SMEAR SLIDE SUM Composition; Foraminifers Cale, nanotosils Sponge spicules	ARING NANNOFOSSIL OQZ ray (NB), soft, abundant bur undling. fied cause. MARY; 5, 20 D. C D. T	CE, white rows and	early Miscene	M4.4 (F) Sheboconys working (R)	AP AP CM AP CC							PORAMINIFER-BEARING NANNOFOSSIL OOZE AND MINC CHALK Dominant color is white (N9) to bluich white (58 9/1) and homogeneous throughout. Chalk occurs mainly as nodules and brecciated pieces that t doubtedly were continuous layers that were broken during t drilling process. SMEAR SLIDE SUMMARY (%): 1, 100 D Texture: Sand 10 Sitt 2 City 88 Composition: Pyrite <1 Carbonarts unspec. 9 Foraminifers 10 Calc, nanofossili 81 Rediolariam <1 Sponge spicules <1







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			1	14 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							-	
-	AL.	A.		Call .					10.00 C		-	1.1.1
	1.1.1	*	130								1. A. T.	
			- D A							a training	1	
-	How we have	and the second		Constants of the second		F. S. S.				ALL A	1	1 the
	A CONTRACT	2	and and a second se		Jerry Control					The second		
		the second		The second					-	7	N. A. A.	
-	And March	the second		and the second	the state of the s					A.	1000 A	10
-150		14.		and the	an ann a' star					Nº 1	ALC: NO	

## SITE 586 (HOLE 586A)

-0 c	2-5	2-6	2-7	3-1	3-2	3-3	3-4	3-5	3-6	3-7	4.1	4.2
L	Sal.	170 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	and the second		the set		and the	A.14	(CONTRACTOR)		S.6.	
	the so	a la serie	1	1					- Simula		20. 43	a sea
F	the second	A Starting	""	121		12. 4	100			1	20	the states of th
F	NY 1	A	12	18-	1	1-1-1-1		ET THE		ALF MAN	at 1	
F	A.	100	5	W.C.	1.000		nerver a			3.5	1	21
	in the	1 per	12 14	1			No.	and the second	12 开始。	1.1.1.1	P	100
-25	1	1	Contraction of the	X SI	The st			and the second	4	1.10	1 pm	Cri
+	a last	and the second	An mail	E.C.	0	1 A A	ALC: N	1	1.2.3	4ª 3	4.251	21
F	all as a	1420 3	(Hereiter)	1 Part			E (	1923	10	1		AN
				The.		1.	1	2 - 4	ale in		1 S	本語し
F	A. Start	1 4 4	Energy	-	and a	75					E S	in the second
F		(	1000	1824	14.3	in mater	and a second				Contraction of the	1
-50		A P		( )	1			27.00		1044 C. 10		- 1
L	10.10			下词	1					and the	1.5	
	12	1	2,CC	7-2	120			Re-	4.5		Ser .	1.1
F	1 Dar	11.4		1000	12.0	1.	184	1	1	1.74	1 5	
+	1	1 1		Car		1	and the	21	French al		121	
F	and a second			183		a think	1.1	535	ne taya	3,CC	a total	1
	2.	1.00		Bernd	and in	The s	and Na		The a		Name of Street	1000
-/5		- Paril		6.1		1010	- week	E. h			and the state	
-				1 best	and and			5	1		2	
F		A STREET		00	後年で		1	123	A.S. F.		1300	2.6
		The second		105	1. C.L.	Contraction of the second	Conne 1	*	1		12.	P P R
Γ	and the second	Then		191	the start		14 miles	10-00			2-7-	
F	1000	The second		15	No.			1	12:50			
-100	10	10		4	1478			1200	2000		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Frid
		har and			1		17				16 V 20	3.3
Γ	行为	and the		-		See.	14.25	15	1.5.5		学生	and the state
F	No. Con	1.		1.4	A second second		1.5%		1 martin		1	5
-	A	196 - W	1	a series		10 10 10 10 10 10 10 10 10 10 10 10 10 1	14		1		1	
L		14.37	1	1.		1	Con a	1	12.3			
		2.55	1	Chair I		and a	TE STR	den contrate	- and			No. and
-125		and the set		-,1	C. C. C.	E.E. Said	10		A SHE B		14.3	1
-	<b>第一</b>	4 3	.	崔.	-	3. 4	10					No. 2
L	14°	13 1 1		1	15.3		Carl I					
	Con the	The second	ł	1 the	3		1421		and and and			144 A
F		3.70		4		1	a straight		- with		-	
F		Contraction of the second	0			200	5 24 -				1415	- 19ª
L_150		4			TR A	cherry !	and		All and a second			



-0 cm 6-1	6-2	6-3	6-4	6-5	6-6	6-7	7-1	7.2	7-3	7-4	7-5
	1			S. F.	1. A. F.			-100	a su		Dian
[ ]	Track &	Lon 2	and the second	5	1		6	Tries!	An p	1.1	in the
-							-	New of State			
		18 . Tom -		ELD .	s. P	and the second	a lost it	3 - And	in the second		
150	And a second	10.21	L'HE - SA		4.	ada -	Carlos a	the and	Hur I	1000	and the second
		The state	a shine -	Sec. 1	415-57			the second	1017 1 T	antitet .	26
-25	100				2. 312.		A CAR	1 1-	and the second		6
		- 13						2 Sec.		Service Service	1
		1.00		1995		and the second	Car I	- 1		- 11/2 V	
1		and the	254	115-15-1	1	ap-		I.	and the	1000	S. F.
		S.C.	der er		in 1	-	14.2	Cara Ja	the set	Part	
-		1.5	1-1-	1000		CHIEF .	100	15 m 12	1. 1		× -
-50	5	2 realized	1,330	*	And the	1 30	124	beer 1	1. Surger Ma	1.5.5	
-50	123			1720-1		6,CC	1.3	and the second	6.1		- And
-	Set.	191.9	S.	1	1342		Cr.	- 6-11	1 - and	Sec. 1	1
- V.		-		diam'r a	A. Same		Bank pr		1. 1. 1.	10 20	- E
			192-ja	1	1 AP		1.50	always said	and a state	and the second	1.3
	223			10 10	11.3		A star	1		a W	and a
-		15.33	1.0	245			1 ft	C.	and the	12 5 4	
-75	5	1 and the second	1.	1	- P			1 and		1. 1. 2. 1	1. 21
1.00	2		16	201	1-25		1.5.4	1	18-11		A
- 18 S	1 52 4	-18		1 10	1		and the second	と見て	1.1		1
-	· 22.4		Contraction of the second		11-		1 1	1	1 End	1.1.22	Start a
198		1.0		-	1.19		and the second	the second	10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	en.	-
1.00	Bior	19			1. 1.		-	1 14 2	A.		
-1		Stor	2 January	1	6-1-2		A MA IN	-1	Terry	1-2-2	
-100	24	Provide Las		Pall?	Sec. 1		1 .		1		
- 183	and the	ar si		24-1	1.500		1 Sector	THE T	11. 12		1.4
100		1.20		1.600	1000		A. C.	200	the state	1	the state
	a second	and the second	ALL COM		1		1		1	17.53	1
-		10 m		ST.	- Law		and the second	it and the second	The second se	Contraction of the	
- 1000	Sac 1	1.41.000	1 2	pite.	1. 1.		1477	f.	(and	1.4-1.	ant's
-125	200-0						1745		12-2-5	and the second	2014
	in St		140	3.8			are pr	Star Mark	<b>深竹</b>	Sectory.	in a serie
S.P.	- <u>E</u>		1.269	221	ALC: N		1 A	- D	the star	the state	A COL
	121		and a star	10			and a	1.2	· *	M	25-24
1334				ALC IN	5. 1-		1		and the	1	the los
- all	THE STATIST		en el	and the second			A REAL	A State - M	195	St. 1	
100	and a			A Partie	103-05		The second		a the set		
-150	A		1 start	WE- Car	Contra de		and the second	and a	A DE	Ser Long	





	the second secon
	1
	1
	and the second
	A.
	and the second
	4
-50 - - 11,CC	1
-50 - -	4.27
	122
- 11,CC	
11,CC	1 des
11,CC	325
CARDINE CONTRACT LANCE A CONTRACT A CONTRACTACTACTACTACTACTACTACTACTACTACTACTACTA	2.2
	and a
	1 Salt
-75	1.33
	2.33
	A. Car
	201
	44
	1
-100	15
	14 · 14
	RO
	Series !!
	1.57
	250
	7. 8
	-33
	- Tra
	Ser.
	14
	4
	Concernance of the
-150	A.A.

## SITE 586 (HOLE 586A)

-0 cm	12-7	13-1	13-2	13-3	13-4	13-5	14-1	14-2	14-3	14-4	15-1	15-2
	4	-	and the second	-		1	· · ·		-	1	and the second	
F	" will's	1 for	A.	1	- 3° 40		i Hand				192 W	
	AL 16 3	Pil	1. The	and see	Simol	Fan	States 1	5.5		1.5.2.1	and the	2015
F	3	1.55	The second	100	1.2012	1.7	and the second s	1. 33		-	p A	61.27
L	1.1		1	100 - 4		A. S.	100	NTN.	1		- 10.9	12.2.13
Г	1.	5		The last	1.50	4 N	TRACT I	1 1 3		1	and a	1.5
-	1000		Teres			- A	140	1000			1.14	
	2.1.	1	- marine	要会问	12 190	al ar 1	100		1. 1		C. Star	
-25		1	11	in all	1. 2. 1.	Santa		1. 54 2	4	10 300		and l
	1		te		12.5	-	all and	1 mg +			and the second	
F	1.3.0	1.	( Second	1	100	1.18	the second		2.24.03	-	(samp)	1 dial
	1		14		( and	4 4	Carlos Carl	14	1	A.R.		4.1.2
F	15-1	The second		10 6	in the	and the second		1200	1.33	100	( 1. C.)	
L	1. 2.	4		1000	1 420	100	1997 - T	1			22.5	- (Te )
	- Cal	-		AL ST		200	1.5	1 1	-		- 14-	A. R. C.
F		100	s the second	1.81		100	1000	1301	1	14.00		Sec. 2
	10000	he as	France .	1				10.1	-	14,00		the sector
-50			State Seal	1.	120	1.49	172	45	1			and i
	2	1.35	10.00	1.5	1.5	Sec. 14	1	1	1		1 BT - 1	the second
F	1	13.7		18 20	1.1.1.2	200.29	100	1	1		1.503	
	1	1. 19200 -	The second	12 million	1.20	25.5	Pr F	T	1 - 1		3 6 1	the second
F	1000	1.18	1.00	201	1000	Sec.		1.4.3	1		136-3	
		- in it	1.1 A 1.	28 1	distributed -	1-	124	1133			2	and the second
Г		A side	A COL	AND N	200	100	1. 20. 1		1.2 3		1973	1 marsha
L	37 1.0	Call of	Sec. 2	100		(the)	C. Cont		1240		1.00	and the second
	12,CC	1. 4	Carles I	Para .	No.	1. 19.11-		10.000	1 1		1995 - T-1	Service -
-75		there is		the local	an Ga	24		1				119.18
		* - · · ·	1.2		100	201	1.1.1	4 1			100	44
F		2.00	a state	1000	13015		122		1.8.2		1.50	× 11
		Friday	F	1 time and	2.50	Y	7	1.11	1		1. 2. 2. 3	6.00
F		1	Nº 3	1.14	1.00		1		1. 11		and a l	1.000
L		6	10.00	1.		1	1 1 1	Sec. 1	1		14	4
Г		in the M	1.5	Printer .			j)				the second	
L		State.	1-2011	1. Section	Sec. Sec.	12 million	111	1993			1200	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		1		1 James	and and	and the	Sec. 24	1	1		100	2.31
-100				1.00.2		0.51	240	2.1	1 8		19.94	·
		340 20	1. Bint			Card	1.1.1		X		and the second	and a
F		3.3	ALC: NO	1.8	The for	114	13	- Care	1		2123	
		12	10 M 10 M 10	- 12		Sec.	18 2 5	415	-1-		1535	12 24
F			M. P. C.		15.23		二度, 1)	1. 14	1 - 1		1.24	+
		Ser .		5. 1	1. SPE	200	in the	1	1 -1 -1			1000
Г		Eller Ser		175.34	100	Sister-Cal	1711		1.4-11		and the second	and the
L		SE.	10.00	625	1. 3. 3	Constanting of the second	21	1 1			C.C.C.	124
1		S. A.	63	1	1.5		1	1000				1.3.1
-125		- mel	15	and the second second	1		15 14	31-1	14 60			5405
		AL PRO	1. 1	and the second	195	100	Est all	- Course	18		and -	19-11
F		1	12.19	100	- 1	in the	1	( all and a	1.5		the .	
		and it	14-44	Balan	The second	the set	1. 1. 1.	and all			1.1	38 O H
F		-	*	State and	1				2 2 3		1 = *	
		1 martin	mar 1	the state	Barris	Contraction of	1	1973	TA.		Current of	12.8
F		and the second second	auto	The second	1	- CAR	12 11	And a second second	The second			
L		the second	1	121212	1		Sec. 1		- 1		a starting	See. 1
1		R. C.	4 E	200	17 40	13,CC	19		1			440-14
L_150		Separate -	E Version	STR.	No THE				. And		4.	E-Marth
<b>—</b> 0 cm	15-3	15-4	15-5	15-6	15,CC	16-1	16-2	16-3	16-4	16-5	16-6	16-7
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L			5		1 26		-		R		1	
		AL STREET,			100	-	100	Stat and	and a	7 54	- march	2 date
t i		24-5		1	1		all a	4. S. S.	1	1	5	
F	1	No. 10	2.5	a diala		Int -			4-4-	-	1.20	
F	P.	2.25	C.A.	and a	1	12:20	in the		and in		1-57	Sec. 1.
	e ?)	243	Sec.	× 3			1254	· Series	E I		1	2 2
-25		and the	200	1.2		ales-mark	alle car	and the second		1		1-1-1
F	6.57	1.100	6273	1		1 5	all and	1	-	and the second		125
F		int.		·			and a	が言葉	4	1		
1		- Carol	an h	3		1				- 7		0
Γ	191	Red.	Sec.	1990 - 14		Contraction of the second	1		Service 1	States -		
F	1	11 - 1 <sub>16</sub>	. the	1.3.5			Ser 1	and the second			*	
-50	1.19	1	12 and 12	1. 3		Ser !!		and the second	1.20	S MA	A.	
L	La.	-	1.4	1		1977 - 1988 1977 - 1988		Parts 1		10 m	2	
	1	-	The state	1		The line	2 4 A	17-1-1×	1 State		1.45	C alla
F	1	67.272		12		2007-13	1-2-1	at an	C. V.S.			· · · · · ·
F	· .	1-Aug	14.1	( A ( )		1. 1. M.	1	and the second		~	194	1
L		14 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Page 1	1.10				401.4	1	A.P.		
		1	100	-			- Agen	1000	-	-		
-75	244	at the	4 m 4	30.0		ALL ALL	2-10	1.41	me ?	100	Celler .	
-	a start i	10		Stor A		1	82. 	- and	The second second	-	25	16,CC
L		1.402	to says	1.		The second	1	1200	-inger	A.L.		
		1 34		1		A. A.	1.		and the second	12.1		
F		1.		in			1	a land the	19-1-1-1 1-2-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		- 4	
+	A. mar	8.5	. e	1. A.		and the	£. 1	2 0	No Martin	and a	1000	
-100				- marine		1000	4	1.	- 10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	and a second	1	
100		-	19 - 19 - 10 - 10 - 10 - 10 - 10 - 10 -	12 -		Nº O	1000 - 3	13.23	1 20-1	the s		
F	1200	200		Charles In		1	13.4				· 新	
F	2.1	1 - Arra	-	1 mil				200	1.1.1.1.1	2 × 11 - 5	21.3	
L		1.52	100	10,00			1000		Serie 1	-198-	7.52	
	均 ,		2			1. 18	1.2	Sa sat	Bran Har	and for	1	
F	and so the	and the	Se	5.5		1	1000	1 State	1442	1.11	*	
-125	1.2	20				NOT !!	and I	the steel		17-6-57	1	
L		-		5 1		and a	1.200	480	-	1 Section	1.00	
	Same a	3.00				The state	1	LONG.	142 8		len .	
F	1	200		1.82				11.000	E.	2	1.1	
-	15-1	and the second				1	- again	- A.	唐代	SALE .		
L		1-14					1 and the	(Marine)	And I wanted	15	2155 · · · ·	
Γ	1	A 1					and the second	And the second	and the	* *	and the	
-150	1000	Nº 10 CONTRACTOR					And the second second	1.	No. Stand	E.S. Tol. H	1000	

-0 cm	17-1	17-2	17-3	17-4	17-5	17-6	17-7	18-1	18-2	18-3	18-4	18-5
	- starty	2. 1.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			Der De Cal			1	12	all a	10.00
F		1.1	1	and the second	+ +	1	1		1	244	生ま	1997
-	Service of	1 1			1.10		di san	1	100	and the second	-	
		( B ]	# 19	heil	and a	2.1	1. 2.	1	AND ST			a gil
Γ		- 25	the state	the state	2000			Pir	ale a star	a film	A. C.	A.C.
-	10.18	7 1	17.55				-	in a	- sector		Cheff and	. East
- 25	1	-	1.1.1	1.1.1	1 4 4		Let y		tinen.		North I	
<b>C</b> <sup>25</sup>		1		5	1.11	En la S	-	19 19	-mite	and the second	Carton -	1
-	- Seal	Yelle	*		and they are	11.4	41	1.43	1		197 H	6.2 18
	1-24/2	1	and the second	C'in				- Creat	1000	1	1000	1
Γ		and and	1.5	1.2	du -		STREET.	244 2019		and is	and the	
-		-	1475	No.	and the		The seal	C.	2	and the second	AT DA LET	3
				1	1.	and the	121 14	100	1-19	- 11		and the
Γ	2032	and the second	14. J	Carlos -	1	12		14	-	ever i		1.1
-50	1	The state	1/3	and the second	and the second	100	) to set of	2.1	1000		24	10 A.
L	y	1000	22.4	-1	A					1. 2.	1000	the second
	100	190.0	近代	2 mail	a h	R. C.	1-11-11			100 100 100 100 100 100 100 100 100 100	No an	1. 1. 1
-			4			- 11	A.	200	7.5	1		
	1 M	23.	32.1	- 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994	1. A. A.	111 3	17.CC	and the second	1.		APRIL 1	And a state
Γ	1		1 and	f*	- h	1.00		100	2	1.20	int a	The second
-		1.2.3	1.	100	112			1.1	2		6 - 19	-200
75	1.1		-	1.1	And	24.2		-X-1				5 500
Γ′°				1000		1.		- 1-2			Same and	1.2
-		-1-1	8	1.5	1.					1		
	1	and she	36.1	(trans)	4.	1		1 Da	51.5	En al		1
Γ	1	135	Sec. 41		1 to and	an R.		16		and and	1.50	
-	***	1.34		f.	The series	19		S. L	140	17.74	13.45	
	3		The second		at	1		6	25	12 1	1.00	
Γ	1.1	- Carton	1.1	1.04.	1 to a	1- 1		S.F.	Sec. 1	-	12	
-100	K ROLE	f i set	10.00	1 SAC	1100-201	201		3		1. Sec	1.1.1	
	123	E	An and a second	1053 h	2.2	18 1.97		-1	100		2400	
Г			253		100	1 martin		100	Torre .		1242	
-		Later 27	6.3.53	10.0	1			12121	1.5	12	- 21	
	4				Antes -	1 4		28.1	#	1 2		1.3
Γ	3	- THE ST	-		1	i.="			and and	1 Maria	and the	123.12
-	a set	A.	C.C.	1 de com	6	1-1-1-1		12 mm	and the second	and the	13-04	E STATE CO
105	*	in the		and the second sec	1. 19	A.			Start .	Sal Sal	6.2	
-125	1	Section 2	4	6.44		E tran I		The second				
-	6.2.3	The set is	- Cart	1. 2	10.7	and the		1.200	1 per	12.20	24	
	the second second	and the second	E sel	1	1 P	4		1 2	1 13	hay		
F			Star and	1		1		174	10月1日	Ser.	The second	
-	and the	1	AST OF	1	1	1		. F	30 mil	C. Sis		
	0	The second	17.3	a. Sam		412 33			the state	1. E	No.	
F	5 2		4.3		bill Part	200		and the	25.24		2	
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		1	Real a	2 that	100 Mint		The Second	state "	155	30.CC		2	State B
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		and the state	-	1. B			黄松 一		the second			ALC: NOT THE OWNER OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE OWNER OW	
	F			the second se	K. Art		well at	3 × 1	1000			Constant of the	武法外广
			1. Star 1		pc+		Ser -	4	No.		-	S S Longe	
	-			1000	and the second s		Star .				-	Star 1	· 建筑
		1 - Arg	251010				35.003	A CONTRACT				1400-	and the
	L .	3.5 - 3		are			mer a m	All and	2 7 6				to note
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	Г		ACCES-	R AR	The second		E Same	ALC: NOT THE					
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-0 cm	1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5
- - -			14.2	1. S. J. S. S.		Martin Star	Samples -		「小学院		The .	a
- 25	T	「「「「		1 . A.	A Star					144	1	. AN
-		A DECEMBER		*							a start	The state
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L <sub>150</sub>	200	and a	1	Ser.	1.44	N.S.		1	The Cas	7.4	1.	



-0 cm	4-4	4-5	4-6	4-7	5-1	5-2	5-3	5-4	5-5	5-6	5-7	6-1
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Г	1332 11- 7	Res Ro	12000	- ALT	12.	and the second s	Sec. T	Sec. Strip	15.66	1000	12234	Sec. 1
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	1	1.146		and the second second	12 47	marian Re	Sec.	- Frank	A COLOR	1. 100		1975-1975
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F	and the	CONT. DO	and the second		10.00	1000	Sec. 3	100.004	ALC: NOTE:	1	( Section and	B. A.C.
	F. 33	- <i>t</i>			be well	1. 1. 1. 1. 1.	Listers .	B. Fry	1-2-2	12. 6		Sec. 14.
-25	1. 2. 2.	1.000	140	1000	an analysis	·	1 there	8 m	1	1	And the second s	Call Y
25	1. 200	Section		1.000	Sec. Se	and the second of	Sec. Sec.	Section 1		Sugar.	and a state of the	Carlot in
	S. Taba	Providence in	1.00	1. 1.	A Dist.	1.1	1-95 - 3Q	S. Com	1	1-1-12	736 E.C.	. 2 .
-	1	Atra	N. Alartan			Contraction in the	201 100 1	and the		1. 20	10 5	Serie Mrs
	10.1	-	- your	1 10 10	1 -00		1. Territ	ar.		ab.C	1	1
-	11	20.25		Transfer of the	AL ST	1	Description.	a service	1	1.82	the work	1000
	1. Mar. 1940	225	1.0	Provide La	and the second	2		122.2	the second	1.1.1.1	1	Sec. Mile
F		18 .		STATISTICS.	1 1000 m	and the second	1. 1. 1.	STATE BY	Chine .	Sec. 1	S. W.S.	anti ()
	141	1	đ	4.CC	1.	10 20	100	1. 1.	1	10.00	and the second	115° 8
	1.1	1.18		.,	1. 200	1		a the	1	1.00	State 2	\$10 ST \$
	1.1	12.54	1.33		6 . 21	1 2	2.2	and a	1.1		5.CC	1212
		the state	621-12		2	1	Seren and	424	1.1.1.1	and the second		1.000
-50	1.80	1.1.2.2	1.5		Suma.	A. Contraction	10000	1000	- Ber	1.6.8.5		S. Tak
		1	125.1		104	645-214	1.24	1 1 3	1 2 -1	1.6		10,00
F		41	10.4		1 .	1.000		1. 1.	2 1	1.1		1 Same
		1.0	4.1		1.	S. A	8	Sec. 1	Sec.	1		1 7 -
L		1.1.1			1	Carlor Mar	a la de las	-	Carles .	15181.5		and the second
		127.93	See 2		1000	1	1. 1. 1.		Alt - Ad	and the second		1.4
1		and the second second			1. 1.		ALC CARLE	and the second	1810	· · · · · · · ·		1224
F		1.52	San Street of		1.1.1		Faller Cont	Mitchen	1. 1. 2.	1.442		1 1 1
	1	14 1 1			1.00	1	Miles-	1	- Aler	141 5		12.310
F	A 121 (111)	120	*e		1.0		100	1.1		2 miles		CO-M
1		1			the second second	1.00	21.00	Sale S	1.2	101412		16-20
-75	1.4	Contraction of the	39 T."		1.4	1.1.1	And a second second	and the	1	1.0		Sec. in
	4111	2.4.14	to at an		21 270	1	1 7 4	161	10000	175 KE		1 section 2
	1.001	0.00					an an	Lange Contract	and the	- 5 C -		1 1 2 1
Г	·		Pai		1.1.1	1. 1	1.2	1.5	and a	124.00		Les T
1	1.200	1.	1.2				1000	1	1000			Sever and
F	1. 12	12	and the second		1.1	5 - C	5 M 4	1.1		Contraction of the		1. 19
	# 1	and in the	FI				60 m	in and	1 12	1.4		F 101 .
F	1	· · ·			1.11	S. 1-3		1. 1.	1.			Personal
1	421	at 1	6		2.0	1	1.	ter.	1.00	Acres		La F
F	*	1	100		1.1		and the second	1. 1. 1.	Sec. 2	1. 2.		5.5
	1. 1. 1. 1.	× *			/	Sec. 30	1 . 10	1.00	10 m	6 IAC.		See.
-100	1. 1.	0.5	10000		1.1	1 1 1 1 1	1.15	5 6	8. 1. F. M.			marcher
L-100		1.1			1		A Start	ALC: NO	1.5	12 11 1		+12-15=
	0	Saint	and the second		i de	24. 1	Contraction of the second	1000	1 - 1	1. 199		Sec. 2
t i	A.S.	1.17.1	1949		1 2		12	1000	1	1.000		10.0
	- when	A The	S		Sec. 1 Th	in the	A. South	144	Sec. 2	1200		
F	1.1.1	19 million (11)	Discon		10	1.	A MARY PROPERTY.	10.000				2.90
	1		Sec. 24			1	in the second	A.S.		par - Capping		and the second
	1 20	1	and the		1000	1.4.	Distant	C.S. S.M. T	1994 BAS 5	1.756.		a state of
	1. 小型	in the second	1000		1.180	Land Br		11- 7 M	Sec. Statistics	1 million		
	35	1	distant.				a second	ALC: DEG	a fairt and	-349		12.8
Г	1.1	12.00	2.13.184		See.	100	3	1. 1. 1. 1.	Print and	S 128		
	- 3	2-6.82	5.00			1.1	addresses-	1.00 48	1	1200		O' Chil
-125	AR. S.				10.00	1.00	1.8.3	Stary St.				ALTIN SHE
	1 Same		100 -		1.	in the second	100 100	C. Parts	10 10	at 1		1. 1. 3
L	- Salt - B	25.5.4	10.00		2. Parcel	1. 6.	235	- AP	A	S. Land		1000
	Constant and	100			- Aller	100	Salar Salar	Street .	1.000	S. 7.		1.1999
L	14 - A - A	642	10.20		· · · ·	-3-"	and a	A COMPART	1-20	1.100		the second
Г	Y KTHE	-			1.11	A art.	A PORT	24.28	1.0	199		1 dillo
	and a	Car Si	12-14		1	億米の	Sec.	C 18 18 18	12394	1.00		11
F	1000	-	5		1010 f	1000	1 21	1	199.5	e a te		10,18,4
	243	10 200	Sec. 24			and the second sec	A COMPANY	1		1744E3*54 1		14. 16
-	State -	1 × 1	Presentes		1.1	1º 10 kg	AR. Salar	17.23	100	1 and the		10
	2 8 3	in anna	a set		much	245 14	10.2.2	the second		Cine 1		1
L_150	And the second	1 Star	14		Y 9.	1200	1000	T AB	and the second	- 79407 C		STRANG

-0 cm 6-2	6-3	6-4	6-5	6-6	6-7	7-1	7-2	7-3	7-4	7-5	7-6
U CITI	1	The second second second second	P.S. Barrie	1.000		Con The	1000	F	1	There	m ta Mil
-	1.68	1. 755	Contra 1	al and	第一日日	1.	5.5		1-14	2.25	
Property in			1. 1.1.	The state	14 21	191	a cite	1 ACTION	10.14	and the second	A R
- 1.	and the second second	1	And F	2.2	1. 2. 1	1 Acres	R.E.	1	1		all a
	21.102	1.48		1.11	Sec.	and the		100 M	Sec. 2. 40.	1	1. 1. 1. 1.
- C.S.S.		Sec. 4	a line	R 6	1993	3 4	1.00	a second	and the		-lat
1000		Ser.	12 14	1	dist.	Sec. Car	and and	and the second sec			de la
	( N.	1.	See. B	C.	15		1	100	Sec. 1		9-31-0
-25	a state		12.2.3		142	R. S.	148 P. 1	2	13-25		1.20
	+ Fat			E.	and the	A LICE	1. 21	Street Street	もの素が		M. Car
		13.63			and the second	1	14 24	1.44	to kit in	1 1	12 20
Provide State	1 Sugar	a manager	1 1 m		PERE	1.10		10.00	1.	1 . M	Se all
-	and the	all a star	19.3	13.3	The start of	19-341	1.16		a set		13.2
2 22 3	a come	and and the	14	a par	1	in 14	14.5	P. A. THE		45.0	5.11
- 10 X	5 ( t. ) Sel.		1 2 9 4	VERS		E. C	y . 34.	1 m		5	ALC: NO
North State	and the second second	1. C. Mart	3	1.	L. 1	1 and the	2.54	10	1.1	3.26	18-14
	S BEER		115352	1.1		1 - Co		Same.	N- 13	1.1.1	1. 19
-50	1 A. C. A.	10.02	1	and a	-			A State	1. 17.20 ml		
00	1 12 12	1.14	1.	A.	E-THE	C. Link		a and	LONG ST	6.41	1.00
- 603	00.52	1. 32	Sec.	1.		1-		2	1	0.00	17.201
and the second s	13.3	10.00	A 1-5 1	1.1	-	North Contraction	1000		(学)中(在)	117 1	Print St.
-	1 1 1 1	, C. '	Star In	1 1	and the second	3-26	Contractor of	Sec.	1.15	13-32	We and
and a second	Sec. 6	1 .	151	12 80		13.14	1. 1. 1. 1.	at and	1000	2. 4. 19	1 State
-	1	1	and the second	1. 1. 1.	Det. 1	14 A	Farmer	an Same			1.2.1
19.000	3	1264	14 80	in .	and the second	15 1	Ster.	floor "	1000	11	
6.41	4	S. Sant	- 6 -	S . I.Y	6.CC	1 Carl	Water or	and the		in march	1 Card
75		S	3.00	14 12	-,	Contraction of the	F. T. A	Sign to	1 Bal	AL LAS	in the
C/8	200	18 3	1.0	1.00		也想了	1	18	4		1.1.1.1
and the second sec	1.36%	12	1	21/		2	Berning P	1 34	1.80	PAGE.	1 AN
and the	1.840	A Server	and the	154		and an	Econord			Sec.	51-12
- Call	1. 3	1000	1	tio		建建		1 1.24		1.	
Sec. 1	a b the	S. m.	10 M	1.17		AT HERE	128	No. Co	Sec. 16		5.60
-	a series	1.1.14	30	1.		1.5	1200 - PAL	1 Parts		141.0	1
	3.00	12 14 (23)	1 . 71	1.93		10	E Star	1350		1.22.	220
Chinese .	a land	123.00	Ste Mart	5.24		1- 24	Let.	A COMPA	Beach	1.1.1	1 Tarres
Real of	i in	· · · · ·	15 1			Ener	1. 19	1. 2.		1. 1. 1. 1.	E Styl
-100	3 11	- Tage 1	and the second	11-12-4			to low	50.23	A Street Start A		State.
124.0	1 1 1 1	and an				SAM	15 Miles	1.64.9		5.11-1	Sec. 12
12.00		1.5	14	1. A		and the	11111		1	1913	
-	and the second	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 the	1.25		12961	622.53	1000	Sec.		2112
R.S.	* (A - 0)	- HO	Lin See	1 3		The part	Service Barris	1 22		35.5	1950
-		C. St.	E. Yes	1 Acres 1		all an		1.19		S. S. S.	1-16-171
17.5	Ta president	A. States	C. TROL	100		6-12			12.2	100	See.
- 12503	11	Contraction of the	1 million	A AND		1 131	175	1. 20	a series	-	PETT
15.3	5 102.00	1. 1.	1. 22	1.177			1	44		1 de la	La sua
-125	- Press	1999	Let and	1-15-1		CITY OF STREET	1.25		1. 25	AP	3 3 3
6.4	N 262	and the set	and the second	1		23-4-101			O China	15 12 1	Est -
- Pat A			the state	- 307		and the second		A.S. M.	12-101		NEC S
1 EVE	1	A.S.	Harris and	Store State			Q.A. TAT	N. C.	1		c
- Sec. No.	1 12-5	State of	and a set	Sec. of		See The	A P	17 40	1	A CONTRACT	1200
E FOR	- Barth	12		17.6		三百合.	ATTACK .				1284
1.19	7 Parker	1 22	in the	6.5		5 - 1		NE Faid	110	1.1	
- 673	Page .	- Alt	1 tol	1.20		5	pr E X	NA CA	150.2	1	Calles.
Conservation of the		1.192.2	613	in the		2.84	R-SICO		10		St. Mar
L_150	A STATE OF S	120421	14.2.3			12	Televine C	BALL COLO	100004275	THE CASE	





-0 cm 11-4	11-5	11-6	11-7	12-1	12-2	12-3	12-4	12-5	12-6	12-7	13-1
	-	Designed.	Color 1	-		1.00		Sec. 1	Bring and		
510	1.00	and the				2.00	Tel-ca.	Contraction of			arren a
	at a second	1. 1. 1	1.000	CAN I	125	200	1	Sec. 1	Mr.		And and
	19 1 17	1	1	1.1	A COLOR	and the second	Sec. 1	19-1-1		Same.	Cart a
-	6.313		-	-	T.	8	S. S. I		1. Car		Mail S
- 10	11 1		~ 9	1.1		1.00	100	(altre 1	See.	and a	a setto
in l		2-3	1		all start	San B	C.	Ea.P	1	3.5.	250
-25	8 1	2 ins	- 10	1 2 3		1223	and the		*		1. C. L.
-	1		1. 18 43	1	1-1-2-	the second second	1.1	dot 1	5	我们的	1100
2.2	- 3	55		1	1.5 - 200	1	fait -	Print 1	2.14	20	2
		inda S	14	1	Land and the	Sec. 25	and the second	1	in Ball	同一 (中)	1
1.4		- 84 · · · ·	1317	1. 16-3		1 TEL		12年1	1. 2. 2	14 Tan	" play"
and the second	1.20	- 11 B		r la	1 Carrow	1000		and the second	· Art	-1	S. Carlo
-	2.5	10 No 1	4	19 6	the second	Provide State			And	1	a start
-50	20-30			and the	Wine.			1410	1. 3	-9	
50			The second second		100	1.1	12 -2	1	1	Sectored in	
-		1	1. 1912	in the	1.			a y z	1		1.
1-			- 1	Ser all the	12.	2.81		- 51	and a	1	1000
	1-22		2.1	N. A. Mary	and the			1 the second		14	183.7
-	100	N and	+	There a	100	13-1-1	1. 1976	L'INC S	100	2 3	
and the	and the	21.32	-		State and	1. Jan	Sec. Sec.	1 1	inda i	1	13.2
-	1			- Santa	A. A.	1 475 - 1	Sec.	1.1	A. A.	and the	
-75	· Constant	ALC: NO	11,CC	Settion	les o	R. S.	and the second	1	1	2	02.02
15.0	The state	1 Same				1 3		1 1	11 5	12,CC	12
- And					14 mil	12		1	N. F.K.		100
10 11	1			12 - 1	11	To and	1.1.1	his	al an		18-16
- State	1. a	1. 1. 1. 1. 1.		1 Carl	1 1-	A STATE	a se	J. S. Car	A I THEAD		. Sector
-	I want a	1-1-1-1			H.		1 the	and the	- Sector		1. 1. 1. 1. 1.
				1 the second			den's	Star (B)	in the state		12.00
F				100	1 2 4	E marine	- 1-		and a state of the		and.
-100	100			Lo BP		1	- Alter		1. 496		-15
2.4	10 3	A STATE OF		13		1.12	1º	100 Par 100	Sec. 1		19 11 11
	1. 1-41			1 and	1-1-2	S. Sugar	-	1-5-1995) 1992	1		5
- 1	and the second	1		Sugar 1	10 000	1. 6		2 x	13 117		1
4	all is	1 c.		-MC M	1 ×	Amer		T.C.	Ser. St.		· · ·
10.5	100			in the second	in the second	- in the	1. 5. 1	in the second	24-21-27		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
	Cash	S		Ru.		The A St	11.2	a sure	13.50		2-15-5
100 12	Sec.	-		1000	1999	See.	10 A.	1	1/2 mil		S. A.
-125	1. A.	- + - +		See and the	Same?	the .	Carlo	a set	and the second		St. K.
	1	1		2000	-	- of the	ALL P	and the second	in the second		No.
State 5	"net	-			6 Part C	Fritz S	a hard a	2 3 3	E Common		A NEW
	and the second	P. C.		- internet	Carl S	an and	and and		and the second		and the
E REAL	5. 7	1		-m-I	4		EN PHY	Province in			- Aller
					A STATE	Longth	and the	Line sol	5		
ALC: NOT	書いた	J. 12		2 Sta	15 Side	- IP - Star	1 - mil	1	5.0		4 . VI
150	10. C			Start A		alter Bra	the second	No.	and a state		1 14
		1.0.0		the second second second	And the second second	- 6 2 2 3	Contraction of the local division of the loc	1	Party and a state of the state		Part and

-0 cm	13-2	13-3	13-4	13-5	13-6	13-7	14-1	14-2	14-3	14-4	14-5	14-6
	Sec. 1	7 13	ALC: NO	-	1.10	100		12.5		1.7		10 4
F	Sec. 8	* 30 T	200		1	Sec.	1999			1	-2	n n
F	1.1	188		100	1	424 B		1.1	1-1-2 P	Dana_		-+ -
	121	-	1 · · ·	1.	1			1.2	English (	Same 1	1.1	12
-	1000		No.	1.5	1.50	The state	1963	1 A 50	1.1		1.174	2. 44
	and!			9.4	100.000	30	Terres	Contract of		1. 2. 2. 2.	1. 4.2	1. 17
	1		55 . 2-	1. 1. 2	1.79	100		10	Contract of the		and the	12
-25	1 2 2	5.285	5.1	1000	1.2	1	1	Sec. 2	12		Sert 1	19-1-1-14
	1-ton	1220	-	22.74	**************************************	5 22	-			10 1	1. 1. 1.	1 1 m
<b>T</b>	1	2	14	344	200	2	1. 2	1000	1		1000	1 11 20
-	17			1 4 1	1.5	1. 1. 2	1	1		1		1. 1.
	Sec. A.	122	1.0.6	12 6	6-1-5-1	1.1.1	100	State	2		1000	1.1.44
F	15 20	201	- 1	235	100	The C	2	1000	5	in an		2.
L	4	1.1	•Subst	4.11		1200		Sec. 4-1		1.1		and a second
<b>F</b>	12.24	1. 8	1.50		Sec.	War Cal	18	4-11-	1	1. 1.4		A Silat
-50	E. F.	15- 14	1.17	14.5	11 2		1. 1.	101	When the		200	0.0
		47	5.1	. A.	5.51	1		P	1	1.0	12	See.
F	all and	Store .	A. C.	1.10		and a	4	1.1.2	1	11	1.20	AT COM
L	1.5	Select.		1380	3 11			6.00	1.1	1.2	Sec. 140	1
	14.35	10 8	2.2.8	1	4 - 24	Constant of the local division of the local	100	A	with the	100	1. avi	S. Let
F	1000	See	- Sect			-	7.	1	1111	4	- Landard	1. 1. 19
	1	1.00	10	3.84	N. 199	13	- 1	1	100	14.1	6 3	2 . 31
F	1	1.1	40	1.50	~	~ in	1.16			1.	1 Acht	Frank
-75	1723	12	Same and	1.200			1000	1	in mark	211	1	a real
	1.	1000	1.000	1912	12	12.00	10.2	17 -	× . [	1.34	1 600	1
F	1	15	1001	10.00	1450	13,00		Kan	12.27	No.	1 and the	M
L		22	1	d	1.57		1.2.3	1-1-1	1987 M.			2.38
		1.20		A	1		( trans	biner .	Committee I	Sec. 1	de la	Nr.
F	1.2	Contract of	1	-Inc. No.	1-1-1		1 10	1.1	See 1	1.1	- de	1/3
	1.5.65	1.34	1 mar	1.	1.1		- dife	1.00	Sec. 3	1.1	1. 44	1. 1. 1
F	X man	1 2	1. T. L.	~****	Carlos and			1 1	STER.	1 1		and some
-100		Sec.3	1	1	and a star		Frank	142.5	1.1.1.1		1	E Star
	(四里)	1300	14	128.4	14 1 mil		the second	in the	N. Carol	27	3 -	
F	P	1.3.3	11.64	- 11	-		C. Manager	1	100		100	
L	15 2	1.1.1	Sol 1	1000			47.	1	1.1	The second	142	a state
Г	Sec. B.	de la companya de la	1		- 1		See.	P. 4-1-1	Barra	1	Sec. Sec.	1.1.1
-	tras the	Some?	1.10	11.11	21		Cord )	14	7-12-74	1200	1923	1.1.1.1
	1.1	15.6	Ent an	1.1	131			Sec. 15	P. P. S.	1.00	di shira	1.1.1
-	1 20	7.088	Ster.	2	1 Martin		5	2 3 15	Sec 1	1.1	1 Bart	No. C. State
-125	5.11	1757	123	all the set	der.		1	10th	Contract of	1. 1.	1.00	2 224
125		We have	1 60	They are	1.1		Acres 1		The state		P-12	13.2
F	1		173				1.1	1.1	1000	1 - m	1.13	5. 5. 1
	64 3	S.A.	hi 1	1	1.00		1.27		( CA)	1. 50	1.12	6 2 3
Γ	3:35	14.1	1.1.1	1	1.3		1.019	provide to	The second		1000	
F		State of	1.197	1.	TA		14	1.1	and the			State -
	Start .	他们是	122	2.7.8	hand !!		Test .	Sec. 1	hours	Pre 218	and the second	152.70
F	Talka a		4	11	AL		1.0	- ANY	1.2.85	1	1	- 1
L_150	Callen South	Peret.	484	Section	and and		and a	No. of Concession, Name	U. Array	13.2	1 sta	Sugar .

-0 cm 14-7	15-1	15-2	15-3	15-4	15-5	15-6	15-7	16-1	16-2	16-3	16-4
	-	No. Sal	and the second	1000			1	Call Sec.	1	1622	The set of
- 80		1. 11	dittanti.		Constant .	Section	1. 1. 10	Arris 1	9-23	- B	2011
	1	11	13.2	and the second	1		and the	54.5	1.12.	13	28 2
-	1 2 .	att the	1200	1.24	03/12		A	14	1		Citation
10 201	10 · · · ·	122	15-1	See 8	a lating	Sec. 2		39: N. F. S		- C	1 3
- Sector	11	3-14-1	1. 1. 1.	100	41.14	0.67.96	11		1 3 2	in .	1
1.1	1000	2 12	Tree 1		Second a	S. S. C.	1219	and the second	11	A 22	11
10 m	A REAL	12.3	1. 10		1. 4.	18 6-51	Sol.		1 - 1	ALC: NO	1
-25	1 25	S april 1		Sel St	Se let	100		1000	1	17 J. 44	1-13
	the suite i	and the second	1. 1	at the t		S.M.S.	- 1	2. 300	A Property	indian.	1
-	Sector Sec-	1.1.1	1 The set	gent -	C. Name	-	19	and the part	1.50	1 1	Ser store
1000	t set	E M		1	3 19	的中心		1000	Star 1	1	
-	2	1.42.01	1.1.1.1	and the second	1. 100	UPQ.		1	to a	1 1.	2012
	Arr T	Stre -	A. S. S.	C C S	1.50	25 -		1	A	a sea	
	Sen e .	1 - The second	6 · · · ·	1 1 1 1 1	. 3	C. Marine		112	11.12	1	123
- marked	2	122	from the	1 mill	an alle	1	1.	and the second	-	and the	1722
	En 19	The second	an North	1200	100 2 1	1 Er		144	19 74		1.1.1
-50	r,	1.23	1.1	1000	1. 1.	11	=	Garage a	20 - 2	0.002.723	201- 22
	Nont in	Contraction of the second	7.2.1	4 Line	P	12.2		1. 1. 1.	Et al	and a	1 September
-	1 1	and the	1.753	they been	Constant of	10 10	2	- Million	12.2	And the second	1 Va
and the second	A Ta	1.	in the		196.7	181	01			1 .	weight V
	Charles.	14-25		A TEL	and a second second	1. 12	1.89	in the second	C	- 15- 15	Winter .
1. A.	1. 200	and?	1-424		+ (RG*)	1.100	15.00	and and	1	and the second	I and it
-	5 5	al and	DI	10-10-14C	1.5	A 24	15,00	1	130	Prane !!	- and the second
-	2000	ALC: NO	Part Sal	-4-2-2	17	Bar -		A The se	100	1.3 713	20.00
	Sol Mar	1 " · · ·	15	the E	The second	1.12		123			AL PROPERTY
-75	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1. 35	ALC: NO	mal they	1.101.11		N. Har	4		1 site
14,CC	1 mill	No.	6 mil	20 mg	×	1.		-A-	1		14
+	12	1 miles	a series	4	1	File		75 - 24	1.200	Par Star	194
	1 9	Sec. 2	Section of the	a top -	11.7	1 3ª			C 1	100 2 3	1
	Ser. 3t	144	a series and	G. A.S.	1. 28	1 11		M. Se	12 -10	200	1 4
		14 1 4	St. and	100	5 20 1	40		The state		artal	13 100
Г	1	192.00	Dates -	20 AV	in 12	1. 12		A PART	States.	Sec. Sec.	1 miles
F	1. 7.	1		SINC	nr. d. S	AL TAK		10.3	1	1. 1. 1.	ALC: THE
	in the	11 814	5. 1.	and a state		181		1 - Same	1 H - 2	15 3	and a second
-100	210			1	20.12	an and the		the setter		A state	17 1-1
	1.22	14.2.53	1	Tratis	Ser E	1		and the second	S. Charles	1	5
-	- 2.	and the second	Sine al	Solida S	an and				1.		1 200 3
	1.42		Ser 19	and a start	1997			18.35	1163	14. 4	P. Yours
Г		1.3011	AL S	7- 32		in strength		17 2 M		2	4 . 4
L	and the	I State		1.3.57	¢.	in the set		12.10	1 -	1	-
	and an	111	and Dates	1.	1100	and the		12 12	1.		
-	6	A. C. C.	in a	5 4 64	Se . 8-	+ in the		1.000	Control 1	and the second	and the
	and a		and the	27.22	1	-		1 9.	The states		13 - 22-
-125	F. A.	int and	Printer 1	The states	1	Sec. 2			Car 1	11.	
	1200	No. No.	2.2	and the second		HI-MAN			1	1	Car Spa
F	Sec. 1		a formation	Contra a	1.	14 mg		37.37	5 11 243	1.1.1	Star Mar
	· ···	State of	in the second	2 A. 1.	and the second	- CA			14.14	57.16	
Г	11101	the start of	88 C.	E Part		To and		A CONTRACT	S. Art	A STA	wie .
L	10-5	A Company	1-1-1	1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 . 1 .	the second second	S-R		E CAR	The Ind		and the second
	Pur and the		1.55	·	a state	A.S.		manufi	and the second	1447	133
F	155		35- 2	1999	Walting "	in ter		the main		St.F.	The state
		and the set	and the second		- 3	Start B		1	1.00	Street :	123
L-150	and the second	Sand Street or other	281 N	A. 33	12.00			Contract of the		C.	

-0 cm	16-5	16-6	16-7	17-1	17-2	17-3	17-4	17-5	17-6	17,CC	18-1	18-2
1 10000	and the second	VARIAN.	ALC: NO	- Martin	State of State			T		-		-
F	**	1 27 -	- 4.2%	1	St. ret	1. 1. 1. 1.			5.00		2	S. Star
L	Swell 1		71	-	de 1	1.		1.30	124	4	7 1-	1 - 1
Γ	1000	· · · ·	150	the	al dear	and a star of	1.196	1.	5.51	1	1.2.	
-	Safe S	- **		-	1913		10 100	The l	1 4 1		in the	
	1	C. Seed	10 K 7		Sec. all	1000	in the	35		All and	1	ATT STREET
F	Re al	15-1	1. 1.	Sp. Cale	14		- Aller	6	See. See		J.	1-1
-25	1	1	C.	1.255	(cones)	a bij	19-04	4	a			1. 1
	2-17	- Barton			1		6.3	-				
F		a de			1 comments	Mar of	1314		1000		g	27. 2
	Calen		-		lite .	Fard and	1000		120		1	1
Г	1000	2 10	ALC: NOT	a strange	121-12	Fist.	6.11	1	Sec.		2	at the
-	The second	1		and the second	1	17	then I		一個調查		1	Charles and
	aller.	Contraction of the	in all			1	-	4 4.1	A Press		いた。	10.42
F		·	STR. St.		1.2	1.44	1+ ····		1 Carton		a chart	13-5-1
-50	and a	1. 4.	-	1000	The state	Constant of	1	13			The Water	1
50	College	1 Y TAR		1.1	1 2 1		1.	1000	1.20		main's	and the second
-	a starter		1.5	Conserved and	A	1.1	1. 1. 1.	1.000	1.000			
	1. 1. 1.		1253	10.00			A	Pro-Come a	1.1			in the
F	12 × 1-1	1 2	16,CC		1.21	1	Part of	EN	15		1 4	
L	Ser Co	1 mil		a fri	27.35.40	1	Jac -	1			the -	
	Salar .			· Geod	1.194		1	Ches?	1000		Concerne of the second	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
-		1		1. 100	E 2.		100 1000	1-1-2				and C
-75	Puit			63323	1.0.0		1	12.13	Sec.		an a	
/5	Pro alle			22.	1 miles	11. A.	11-20	Section of				-12-5
-	120	33		100	1 4	in the	1	Part of	1.11		45	1
	Se the			125	1. 2.		1		1		di ne	1 haven
F	i.				Sugar.		1	1			1.1	1
F	antipes ?				1	See.	a const	19 3	. 1 -		The Part	
	1. 23			S.L.	2.	1.	1 7 30		- 1		a series	Sec. 1
-		e de		1 . H		P. Sale	1.1.1	1	3,000		A-THE	
L_100	Ten 1			1	4-11	1/	- 311	+ 2	a diana			
<b>_</b> <sup>100</sup>	11. 10	10				1 st		in the second	A		- F - 3	39.00
-	har is	1 1 1 1		20	1	1					PLEAS RES	A
	Car B	A. Cak		12 Ser			1 0-4		10- mail		1 4 7	
F	in the second	1 × 1 +		1	the for	1.4.1	The la	- 24	1.1.2		Control of	and the second
L		Ser.			19.13	1	10.000	100	12 13			- Marian
	11	100		Sier		1. IN	1	34	Carlos Carlos		1	1.1.1
-	10.100	1 Carlor		4 1 4	1	2	1	1.00	1. 1. 1. 1. 1.			and the
105	1 1	11		1.5.5%	1.1.1		and the second	1 acres	1.3		all so	Stars
<b>-125</b>	a de la	1			C. T	1.1. 1.	1	1	5		1. 2. 3	2024
-	1				144	1000	11		· *****		1000	
	5	1.1.1		34	- 35			ter.	A STATE		Nor ye	122
F	A	Ter.		mar	1	and the		and the	100		Top man	1
	65 - AN	子教法		125		-		1.	Sec. 1		5	Store -
	1	A Car		The state	80 19	The same		1 ×	1. T. 1		Artin	1 2
F	1 mail	14		A STATE			and the	4	and the		1	Ser.
150	-			A TH	5-2-1		1 Save	-	283		130-	25
-150											Concerne of the second	

-0 cm	18-3	18-4	18-5	18-6	18-7	19-1	19-2	19-3	19-4	19-5	19-6	19-7
	-				1000			1	(Canada and			all support
F					. Carry	(Inclusion)	Sugar Straft		the and	1 and	and a strength	1997
	199				The second		4.4 . 1.44	Lines -	1	13.25		a start
Г	1.1.1.1	S. Oak	1000	1.	and a st	Norme .	-Je.		1 - F		in the second	Tala in a
F	N CLASS	1.5			- A Part	and the	1000	(Charles of	E-n-F-1	1000		a pla
	(14年5)			2	and the		1. 18	The state		the for	No. Com	1
F		1. 生命		and the second	0.	and the second	1.2.31	T. m	Provide and	200	AN INTERN	1 24
L 25	1.1.1.2	1	1.2.2		1 and the second		Ser. 3	and the		N. T.	Sec. 1	A.C.
<b>2</b> 5	100				St. F	Start !		1				
-	1212	14		and the s	1		19-24	2-1	13	a sta	H.	and a
			1.1	and strong	12.13		1 mar	1 (1274)	104		18	Section 1
	5 10-		17 1		Sec. 1	1 4 1 4	and the second		Ŧ	1.2	1. 1. 1.	1 more
L	~	ar y		100	Constant of the	and the	Sec. 1	interes .	a larger of		1-there are	COLUMN ST
	1		14		T. Lin		· ····		( Sand			1.1.1.1
F	1.50		n 31	- 10	1-1-1		124	A	1	1.8	1000	. A
	1000	1	1.1				1000	Same		1.	Sec. 3	1
-50			1.1	1		1	100 -	- and	12 March	in the	the state of the s	
L	-	1.1.2.5	14 Catholic				States.	X. Tall	Sec. S.	2.14	and a	
	10	2.00	1.2	- Jako	1000	1		0. 20	1 + 1	and and	H. Com	1
-	A B	1223	and the	2	-	1.1	1000	Jack Street		1.	2724	
	1 1	1.1	1.1	1.1.5	Section of		22.400	and a l	1000	100		
-	1		2.24	1-1-1		Sec.	Cart C	Sec. 1	-1. 12	14	" 为有利	100.0
L	-	6.00		-	ALC: NO.	terit	B	57 P	1 1	+	10.25	and the second s
Г		1.	- 9	1 2		1 Tom	Say See		4 .	and so the	S Sale	1000
-75	P. C.		100	3 3	100.00		and the second	Soliter.	18 5	4	- Aller	Contra l
	1 20	100			1	Section .			1 10	the.	and the	ten S
F	1	Mint	15 4	1000	18,CC	Sec.	1	Free	1.	20.3	100	and the second second
	10- 10		- Langert	1 21		100			1	1.50	- 10 E F.	-
Г	1	1.1	1. 1				1220000	1	1407 2	Sec.	1. The seal	
F	1	Q. 19	12-			2. 18	1 3				1	200
	1.	1. 1. 1.	1.41	1 m		1 and	1111	Louis Co	1.	tente antes	1	19,CC
F	1.20	3 -	123	15		Chine State		-	17 . 1	2 20	1.15	
L_100	100		and the second	1.56		( + ) L.	Pre C.	Game	1 24	10	· ·····	
<b></b>	1	a state	1	. the		2		No.	1. Sech	+	19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
F	1	1	1	and the second			- · · · ·		157			
	11.3	122	12.23	1000		1.1		and a	1835			
F	1200	8	E MAN	Phase T			Contraction of		1- 11	1 Carl	Parket ?	
	1.1.1	SVIII.	Series 3	1		S and	Stores.	1 - 5-22	1.7	17 Mar.	and and	
Г		1.1	873	1.1.1		1.	A State	Spe ma	Ale		a same	
F		180	17.1	Salation of		5 - 4	and the second	-3-	Street 1	135-3	1	
	12	111	23	1		1.	r - r -	and the	1	Co. f.	1997	
-125	1	1		5-57		111	the state		- A	1		
1	* * · · ·		- Ser	1-2-12		5 1	14	1915		E dia in	3	
F		1	1	Star 2"		1 Aug	Car -	6 29	and the second	- fra	- The second	
L	Ser al	inter 1	P.F.	4227			Print .		Care Server	1.1	and a	
	1		1.10	in the second			24	34 32	1	China La	1. 1. 1	
F		2		29191			A Car	10	1	in the	A REAL	
1	11	to No	and sent .	1				1	N. TANK	2		
F		min	1200	1		the second	The	Constitute -	ADA ST	-	- Sail	
L_150		Ŧ	×	and the second		EPT T	- Martin	16. 16	Williams .	Janan		



-0 cm	21-6	21-7	22-1	22-2	22-3	22-4	22-5	22-6	22-7	23-1	23-2	23-3
	and the second second	-	470	and the second	Series and	10	1 T		+ . 1	Contraction of		4.7
Γ	a weight	1		1	A REAL	1 20		10 mar 1	J	Star 14		Sage 1
ł	- Al	-		1	A.	AL.		The second	i l'un	and the second	1.1	
F	and they	and the second	The same		5	14-2-1-1	and the second	to-		1		1 - Tak
F	1.2		Care .		1	pt -		100		and the	the sector	and the second
-25	The state	1	1.	No.	「「	10.10	200		- 1990 1997			A Carton
L		and the second se			2	15.00	Tel al			er a		
		and the	st.			-	-	Later the		- Marine	9	and the second
F	an the		To a	A		1	harra		4	24	i tart	See 1
F		a series	Desi-	17 15 m	- Fr	9	1	and all		76	2	En T
F	and the second				to and	-	1.	1. 1	100	to	A way	T
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