5. SITE 335

The Shipboard Scientific Party[1]

SITE DATA

Date Occupied: 18-21 July 1974

Position: 37°17.74'N, 35°11.92'W

Water Depth (sea level): 3188 meters

Number of Holes: 1

Penetration: 562.0 meters

Number of Cores: 16

Total Core Recovered: 59.3 meters

Oldest Sediment Cored Above Basement:
Depth: 450 meters
Nature: Foram-bearing nannofossil ooze
Age: Middle Miocene

Acoustic Basement:
Depth Subbottom: 454 meters
Nature: Pillow basalt
Velocity: 5.95 km/sec at 0.5 kbar

SUMMARY

Acoustic basement underlies a 454-meter thick sequence of foram-bearing nannofossil ooze. The sediments are white to light gray calcareous oozes with occasional thin purple layers and rare pyrite nodules. An average composition is 95%-97% nannofossils, 2%-4% foraminifers, and traces of Radiolaria, sponge spicules, and volcanic glass. A few layers containing over 50% foraminifers are present.

The oldest cored sediment is a foram-bearing nannofossil ooze which has been assigned to foraminiferal Zone N14 and nannoplankton Zone NN7, suggesting a middle Miocene age of approximately 13 m.y.

Acoustic basement consists of a very uniform sequence of pillow basalts with numerous glass rinds and intercalations of nannofossil chalk. The basalts are aphyric to sparsely phyric with 1-5 modal percent of plagioclase and olivine phenocrysts. Sparse crystals of green clinopyroxene are present in a few specimens. Chemically, the basalts have moderate LIL-element compositions (TiO_2 is about 1.11 wt%) compared to basalts from other Leg 37 sites. Cr contents are relatively high compared to noncumulate magmas at other sites for equivalent MgO content. The basalts are very uniform in composition suggesting that they are comagmatic.

Stable natural remanent magnetization, with a well-defined mean inclination of -63.5 ±1.1° (S.D. of the mean) after remanence cleaning, dominates the magnetization of the pillow sequence recovered at this site. Formation of the sequence during a single eruption, or series of eruptions with durations of less than 100 yr, is required by the small scatter of inclinations.

Generally well-developed alteration by seawater at close to ocean bottom temperatures has strongly influenced the magnetic properties of the pillow basalts, with Curie points, *Q* ratios, and mean demagnetizing field now relatively high, and remanence intensity, initial susceptibility, and saturation magnetization now relatively low. Basalt compressional wave velocities, averaging 5.95 km/sec are unexceptional for Leg 37 sites.

Indications of present-day subbottom water flow are evident from in-hole temperature measurements. Horizontal flow of water at 10°C must be taking place at close to the base of the 454-meter-thick sediment section in order to explain the temperature profile in the section. Furthermore, the lack of water temperature rise, following the cessation of drilling and forced circulation, at close to 100 meters subbasement indicates that water was flowing rapidly down the hole and into a permeable horizon in the basalts near the bottom of the hole.

BACKGROUND AND OBJECTIVES

Site 335 is located on a sea-floor spreading flow line extending from the median rift of the Mid-Atlantic Ridge through Sites 332, 333, and 334 (Figure 1). The principal objective was to investigate possible temporal variations in the character of basement rocks along this line.

The location of Site 335 with respect to the linear anomaly pattern is not known with certainty. If spreading is assumed to have been constant at 1.17 cm/yr from 20 to 10 m.y.B.P., that is at the same rate as between 10 m.y. and the present, the age of Site 335 would be about 16.5 m.y. (Figure 2). However, the assumption of continuity between Sites 334 and 335 may not be correct since Howe and Miles (this volume) find from paleontological evidence that a best estimate

[1]F. Aumento, Dalhousie University, Halifax, Nova Scotia (Co-chief scientist); W.G. Melson, National Museum of Natural History, Smithsonian Institution, Washington, D.C. (Co-chief scientist); H. Bougault, Centre Océanologique de Bretagne, Brest, France; L. Dmitriev, Academy of Sciences of the U.S.S.R., Moscow, U.S.S.R.; J.F. Fischer, The University of Texas at Arlington, Arlington, Texas; M. Flower, Ruhr-Universität Bochum, Bochum-Querenburg, West Germany; J.M. Hall, Dalhousie University, Halifax, Nova Scotia; R.C. Howe, Indiana State University, Terre Haute, Indiana; R.D. Hyndman, Dalhousie University, Halifax, Nova Scotia; G.A. Miles, University of Oregon, Eugene, Oregon; P.T. Robinson, University of California, Riverside, California; T.L. Wright, U.S. Geological Survey, Washington, D.C.

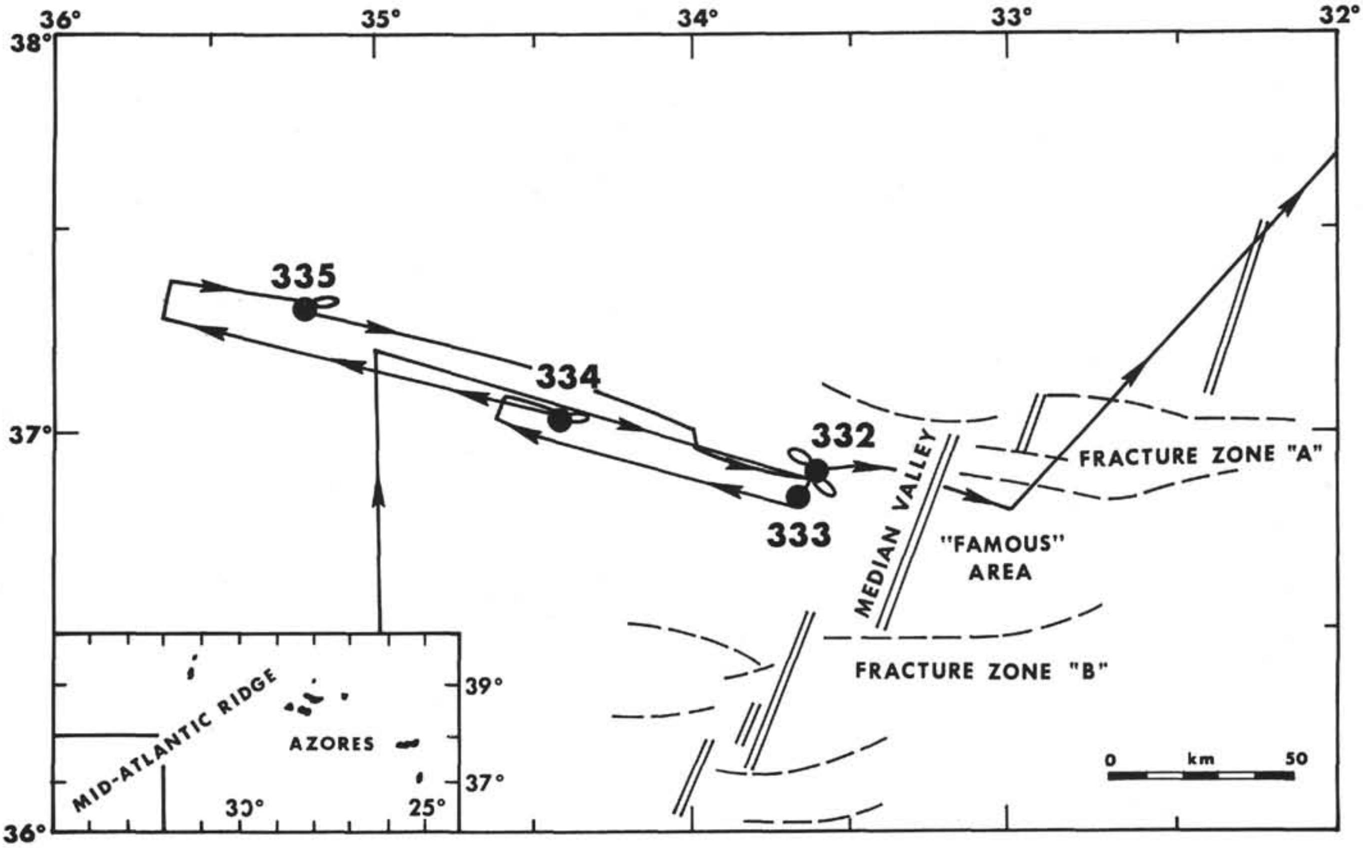


Figure 1. *Index map showing Leg 37 drilling sites.*

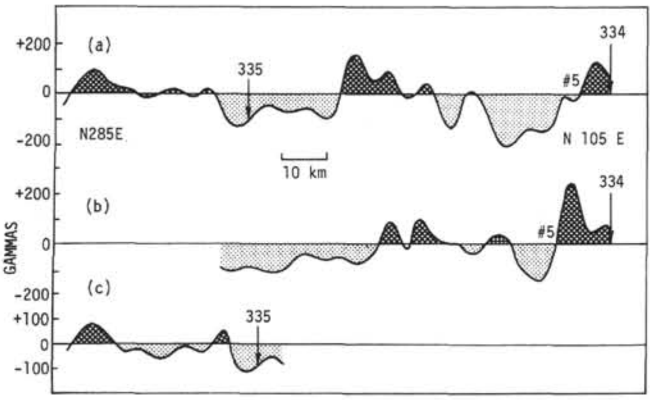


Figure 2. *Magnetic anomaly profiles along three* Glomar Challenger *tracks linking the vicinities of Sites 334 and 335.*

of basement age for this site is approximately 13 m.y.B.P. The difference in these apparent ages may be due to the presence of a transform fault between Sites 334 and 335, or to a higher spreading rate than 1.17 cm/yr for the time interval in question.

In any case, material from Site 335 represents the oldest basement sequence sampled along the FAMOUS traverse, the other sequences being at 0 m.y. in the Median Valley (sampled by dredging and by submersibles), 3.5 m.y. at Sites 332 and 333, and 9.5 m.y. at Site 334.

OPERATIONS

When *Glomar Challenger* left Site 334 on a west-northwest line, the specific location of Site 335 was not known, but it was decided to look for a suitable location with an apparent age at least 5 m.y. older than that of Site 334. Somewhere in the vicinity of 15-20 m.y. was thought suitable. *Glomar Challenger* sailed some 60 miles on a west-northwest course, passing over a site 43 miles from Site 334 which was correlated with magnetic anomalies thought to be about 16 m.y. old. This was chosen as Site 335. *Glomar Challenger* returned along an east-southeast track 5 miles north of the outgoing track, relocated the site, and passed over it again going due west (Iuliucci and Aumento, this volume). The beacon was dropped at 0005 hr 18 July.

The basement reflector as seen on the profiling gear was rather confused, both by multiple echoes and by very steep reflectors near the base (Figure 3). Some 600 meters of sediment were thought to occur at the site. A subsequent sonobuoy record showed that an 1100-meter thickness was more likely.

The mud line was found at 3108 meters. The sediments were washed to 87 meters subbottom where the first core was taken (Table 1). The sediment section was then alternately washed and cored with a core being taken every 95 meters. Heat-flow measurements were made at 3198, 3294, 3427, and 3522 meters below sea level, and sediment cores were taken at those depths for thermal conductivity measurements.

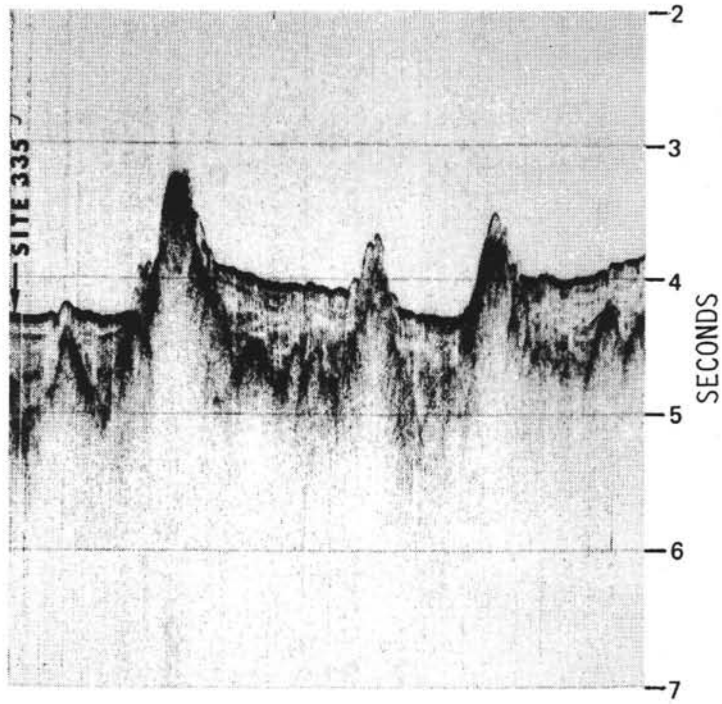


Figure 3. *Subbottom acoustic profile showing location of Site 335.*

TABLE 1
Coring Summary, Site 335

Core	Date (July 1974)	Time	Depth From Drill Floor (m)	Depth Below Sea Floor (m)	Cored (m)	Recovered (m)	Recovery (%)
1	18	1155	3285.0-3294.5	87.0-96.5	9.5	5.9	62
Heat Flow							
2	18	1445	3323.0-3332.5	125.0-134.5	9.5	6.6	69
3	18	1700	3418.0-3427.5	220.0-229.5	9.5	1.8	19
Heat Flow							
4	18	2040	3513.0-3522.5	315.0-324.5	9.5	3.5	37
Heat Flow							
5	19	0140	3646.0-3655.5	448.0-457.5	9.5	3.1	33
6	19	0530	3655.5-3665.0	457.5-467.0	9.5	7.27	77
7	19	0810	3665.0-3674.5	467.0-476.5	9.5	3.3	35
8	19	1135	3674.5-3684.0	476.5-486.0	9.5	4.45	47
9	19	1515	3684.0-3693.5	486.0-495.5	9.5	5.2	55
10	19	2012	3693.5-3703.0	495.5-505.0	9.5	5.6	59
11	19	2250	3703.0-3712.5	505.0-514.5	9.5	2.2	23
12	20	0140	3712.5-3722.0	514.5-524.0	9.5	3.1	33
13	20	0400	3722.0-3731.5	524.0-533.5	9.5	3.1	33
14	20	0700	3731.5-3741.0	533.5-543.0	9.5	3.7	39
15	20	1025	3741.0-3750.5	543.0-552.5	9.5	0.1	1
16	20	1650	3750.5-3760.0	552.5-562.0	9.5	0.35	4
Total					152.0	59.27	39

Basement was encountered unexpectedly at 3652 meters, after only 454 meters of sediment. Basement basalt was cored continuously at a steady, slow cutting rate with occasional bit plugging requiring 100/75 mud.

Basalt recovery was exceptionally high at 37.7%, until at 543 meters subbottom, recovery suddenly dropped to less than 1%. High bit torque was also experienced between 543 and 560 meters. Simultaneously the core diameter dropped to below 5.5 cm suggesting a damaged bit. The last 2 meters were drilled very slowly with very little torque and no recovery and the hole was terminated at 562 meters. When the bit was pulled it was found to be in good condition; apparently an abrupt formation change occurred which was misinterpreted as bit failure. Unfortunately, no cores were recovered from this material.

Prior to extraction of the bit the hole was flushed and filled with 250/75 mud. Three consecutive heat-flow measurements were run to determine the rate of return to equilibrium temperature after drilling had ceased. Unfortunately, the mud acted as a good thermal insulator, and all three measurements recorded the mudline temperature only.

Glomar Challenger left Site 335 and commenced an east-southeast profile to the Median Valley along a track parallel to previous *Challenger* and *Hudson* tracks to provide more data along the FAMOUS traverse. After crossing the Median Valley, *Challenger* turned northeast enroute to Dublin.

LITHOLOGY

At Site 335, the oldest site drilled on Leg 37, acoustic basement is overlain by 454 meters of sediment. The sedimentary sequence was alternately cored and washed with only five cores being taken in the sedimentary material.

Sediments

Despite the range in age of the cored sediments (0-13 m.y.), all of the recovered material is very similar. The sediments consist chiefly of stiff, white (N9) to light gray (N8), foram-bearing nannofossil ooze with an average composition of 95% nannofossils, 4% foraminifers, and trace amounts of Radiolaria, sponge spicules, and pyrite.

Core 1 is well stratified with numerous purple (5P 4/2) and yellowish-gray (5Y 8/1) layers interbedded with the grayish-white ooze. Core 2 has occasional thin (up to 0.5 cm) purple layers especially in Section 5. A 2.5-cm-long pyrite nodule coated with foraminifers is present in Core 1, and pyrite-bearing patches occur in Cores 3 and 4.

Evidence of burrowing is abundant in Core 5, and a purple spot in Core 3 is probably a filled burrow.

Basement

Acoustic basement consists of a uniform sequence of pillow basalts with numerous glass rinds and sedimentary interbeds. There are about 130 glass rinds in 41.5 meters of basalt recovered from a drilled thickness of 108 meters, suggesting that the average pillow thickness is less than 1 meter. Only one lithologic unit has been recognized.

The glass is primarily dark brown to black sideromelane, with yellowish-orange palagonite rinds on surfaces and along fractures. Spherulites occur at the inner margins of the glass rinds, becoming larger and more abundant inwards until they coalesce into a variolitic texture.

The basalts are uniformly aphyric to sparsely phyric with 1-5 modal percent of phenocrysts, mostly plagioclase with lesser amounts of olivine and green clinopyroxene. Lack of consistent large-scale variations in the section suggests either thorough mixing before eruption, or eruption of magma that did not undergo extensive shallow-level fractionation. Variations of phenocryst content within single pillows indicate some crystal settling during the short time in which the pillows congealed.

Plagioclase phenocrysts range from An_{86} to An_{90}. They average 3-4 mm in length, but vary between 0.4 and 10 mm. Most are somewhat rounded and have a narrow sodic rim. Olivine phenocrysts are quite uniform in composition (Fo_{85-87}). Some crystals are small and euhedral, others large and well rounded suggesting that they may be xenocrysts. Some of the latter also have well-developed kink bands. The clinopyroxene crystals are green, glassy, and anhedral. These too may be xenocrysts but evidence is lacking. They are optically similar to high Mg, Cr-deficient pyroxenes from the bottom of Hole 332A.

The groundmass is uniformly fine grained and variolitic. Olivine is present in most of the rocks but is conspicuously absent in a few, perhaps because of alteration. The olivine occurs both as small equant crystals which probably started growing before quenching took place, and as elongate swallow-tailed skeletal crystals, commonly intergrown with plagioclase of similar morphology. These two minerals are surrounded by arborescent intergrowths of pyroxene, plagioclase, and glass, with minor magnetite and sulfide. The glass is commonly dark brown to reddish-brown and appears to be isotropic. Magnetite is in small (about 5-10 μm) cruciform, skeletal crystals. Sulfides are rare, occurring in round globules usually less than 5 μm across. Red magnesiochromite is an uncommon constituent in some of the rocks. It is most abundant in clay-filled amygdules close to the corroded olivines.

Most of the rocks contain 5%-15% of interstitial smectite, occupying space that is elsewhere occupied by variolites. In some rocks the olivine is fresh, even where in contact with interstitial smectite; elsewhere it is completely altered. Groundmass glass is commonly isotropic and always filled with small magnetite crystals. Other alteration minerals include hematite, phillipsite, and carbonate.

Major element compositions of the basalts are given in Tables 2A and 2B (at end of text) and trace element compositions in Tables 2C and 2D. Compared to other sites drilled on Leg 37, the lavas are remarkably uniform in composition. Only one chemical group has been recognized and the entire drilled section may be the result of a single eruption.

The sediments intercalated with the basalts are uniformly white to light gray nannofossil chalk or limestone. They are completely mixed with fragments of volcanic glass and palagonite.

PALEOMAGNETISM

Paleomagnetic data for basement rocks from Site 335 are given in Table 3. The basalts all have stable, strong reverse magnetization and a close grouping of inclinations averaging approximately 65°. This value is close to the present dipole inclination for the site of +56°. The reverse polarity is consistent with the location of this site within a negative anomaly.

TABLE 3
Magnetic Measurements for Basement Rocks from Site 335

Sample (Interval in cm)	Cation Deficiency	Curie Temp	Rock Magnetic Data				Q (F = 0.45)	Paleomagnetic Data					Stable		Micro Data		Sample Depth (m)
			JSAT	SUS	SUS/ JSAT	NRM/ JSAT		J (0)	I (0)	D (0)	J (200)	MDF	Inc	Dec	Content	Size	
5-2, 36-38	0.78	310	0.388	320	0.284	3.3	25.7	3698	-56.9	33.4	2961	313.6	-57.4	35.3	1.00	2.50	449.86
5-3, 55-57 (2)	0.71	290	0.247	320	0.447	8.1	40.4	5824	-59.4	259.0	4903	402.8	-58.5	259.5			451.55
6-1, 5-7	0.85	341	0.223	180	0.278	6.8	54.4	4408	-67.9	87.7	3881	550.3	-67.6	86.4			457.55
6-1, 53-55	0.82	326	0.294	200	0.235	3.3	31.4	2827	-58.7	1.0	2497	441.6	-58.3	2.1			458.03
6-1, 62-64	0.80	322	0.291	220	0.261	2.6	22.0	2181	-56.8	25.7	1686	287.1	-55.7	29.4			458.12
6-1, 75-77	0.75	300	0.290	130	0.155	6.3	89.9	5262	-60.0	77.7	4891	476.7	-59.6	78.8	0.10	1.50	458.25
6-1, 83-85	0.85	336	0.490	160	0.113	2.9	56.6	4075	-62.1	77.0	3324	371.3	-61.7	78.6			458.33
6-1, 89-91	0.71	285	0.268	190	0.244	3.2	28.8	2459	-58.4	84.0	1891	334.9	-57.7	84.6			458.39
6-1, 94-96	0.87	347	0.366	240	0.226	3.1	30.7	3319	-61.7	84.4	2506	301.9	-61.4	84.2			458.44
6-1, 99-101	0.82	330	0.288	180	0.216	3.5	36.4	2948	-59.2	76.3	2593	354.3	-57.5	78.5			458.49
6-1, 105-107	0.73	295	0.299	160	0.185	1.8	22.0	1585	-66.0	77.6	1018	288.2	-66.0	78.7			458.55
6-1, 112-114	0.71	290	0.363	135	0.128	7.2	124.7	7577	-65.6	74.1	5131	278.0	-64.6	71.4	0.60	2.30	458.62
6-1, 122-124	0.71	290	0.271	150	0.191	5.9	68.3	4611	-66.6	77.9	4247	401.1	-66.2	78.7			458.72
6-1, 129-131	0.71	285	0.269	120	0.154	4.8	69.7	3764	-66.3	96.2	3358	420.6	-66.2	95.9			458.79
6-2, 5-7 (2)	0.71	290	0.243	200	0.284	7.4	58.2	5242	-63.7	159.4	4655	438.9	-64.0	160.3			459.05
6-2, 10-12	0.73	296	0.250	93	0.128	4.4	76.0	3181	-62.9	162.7	3060	582.9	-62.4	162.3			459.10
6-3, 49-51	0.75	300	0.210	140	0.230	10.1	97.4	6138	-62.2	111.0	5741	503.8	-61.6	111.8	0.10	1.10	460.99
6-3, 108-110 (2)	0.71	286	0.308	170	0.190	6.8	79.8	6108	-69.5	125.2	5317	390.7	-70.2	125.3			461.58
6-6, 75-77	0.80	321	0.268	190	0.244	4.9	44.2	3782	-72.9	171.8	3376	407.7	-72.9	172.1			465.75
6, CC (2)	0.76	308	0.179	100	0.193	9.4	108.0	4862	-67.0	7.4	4699	573.5	-67.2	5.3			466.87
7-2, 10-12 (2)	0.73	299	0.239	160	0.231	7.1	68.3	4914	-70.1	308.8	4528	532.3	-69.8	309.8			468.60
8-1, 121-123	0.73	294	0.353	220	0.215	4.5	46.5	4605	-55.2	310.0	3852	317.8	-55.4	310.2	0.20	1.40	477.71
8-3, 79-81	0.82	328	0.343	170	0.171	5.7	74.0	5664	-67.9	293.1	5257	479.1	-67.1	291.8			480.29
8-4, 40-42 (2)	0.57	244	0.609	400	0.226	6.0	59.3	10676	-59.4	214.2	4022	163.9	-59.6	214.2			481.40
9-1, 11-13	0.80	324	0.163	75	0.159	7.6	107.1	3616	-71.2	64.4	3549	624.4	-71.3	65.5			486.11
9-1, 26-28 (2)	0.87	351	0.154	100	0.224	2.8	27.4	1235	-70.7	328.2	1140	559.9	-70.4	332.6			486.26
9-5, 94-96 (2)	0.85	340	0.236	200	0.292	4.2	31.8	2860	-69.9	321.2	2559	379.2	-69.2	321.1	0.20	1.10	492.94
9-5, 99-101	0.82	330	0.294	210	0.246	4.1	37.3	3521	-68.5	310.6	3110	357.2	-68.7	310.2			492.99
10-2, 37-39 (2)	0.78	315	0.219	185	0.291	4.8	36.6	3046	-70.7	43.9	2420	421.8	-68.9	44.3			497.37
10-3, 76-78 (2)	0.89	357	0.238	175	0.254	6.0	53.0	4172	-61.6	65.6	3996	425.5	-61.3	64.9			499.26
11-1, 13-15 (2)	0.78	312	0.239	165	0.238	8.2	76.8	5700	-67.8	41.6	4316	318.6	-67.4	42.5			505.13
12-3, 115-117	0.92	377	0.342	240	0.242	3.6	33.2	3581	-56.1	30.4	2504	339.5	-55.8	29.8	0.10	1.70	518.65
12-3, 146-148 (2)	0.76	306	0.238	155	0.225	5.9	58.4	4073	-59.3	84.4	4023	431.3	-59.0	84.0			518.96
13-2, 13-22 (2)	0.92	372	0.124	135	0.375	4.4	25.9	1576	-78.9	265.4	1367	399.2	-69.0	269.6			525.63
13-3, 24-26 (2)	0.78	311	0.325	200	0.212	3.2	33.5	3018	-70.1	75.1	1875	255.3	-69.1	76.1			527.24
13-3, 117-119	0.82	326	0.343	165	0.166	3.3	43.6	3237	-59.1	275.7	2939	429.5	-59.5	275.5			528.17
14-2, 108-110	0.69	281	0.275	210	0.263	2.9	24.3	2301	-63.2	314.1	1880	345.2	-63.6	312.8	0.20	1.80	536.08
14-3, 131-133 (2)	0.71	290	0.234	135	0.199	7.2	80.1	4866	-57.9	232.7	4257	410.3	-57.5	233.3			537.81
14-4, 63-65	0.89	353	0.494	490	0.202	2.0	22.1	2879	-52.3	315.0	2153	279.4	-52.1	314.1			538.63
14-4, 130-136 (1)	0.23	150	0.451	263	0.201	4.3	47.2	5590	-57.0	156.9	1990	140.0	-57.0				539.30
14-4, 130-136 (2)	0.62	256	0.590	187	0.109	1.8	35.7	3000	-53.9	105.8	2060	270.0	-54.0				539.30
14-4, 130-143	0.35	182	0.755														539.30
16-1, 22-24 (2)	0.78	310	0.229	145	0.218	4.8	49.2	3209	-62.1	249.7	2612	353.1	-60.9	252.2			552.72

Note: J (0) and J (200), intensity of natural remanent magnetism and NRM intensity after AF demagnetization in 200-oe field, respectively; JSAT, saturation intensity; SUS, magnetic susceptibility; Q, Königsberger ratio; I (0), inclination; D (0), declination; MDF, median destructive field. From Hall and Ryall, this volume.

TABLE 3 – *Continued*

Sample (Interval in cm)	χ	Q NRM/.45 susc	$J(0)$	$I(0)$	MDF	J_{100}/NRM (or J_{max}/NRM)	Change in Direction (°) at MDF
8-2, 94-96	5000	3.2	7200	-57	>400	0.83	5*
8-4, 20-21	3500	2.2	3500	-61	275	0.93	5
10-3, 100-102	9700	2.9	12500	-56	>500	1.0	3
10-6, 4-6 (a)	3600	2.9	4600	-58	–		
10-6, 4-6 (b)	6200	2.1	4500	-58	325	0.96	8
11-1, 62-64 (a)	2400	4.0	4400	-67	–	0.95	
11-1, 62-64 (b)	2600	2.8	3400	-65	>400		4
12-2, 139-141	2800	1.7	2200	-59	450	1.04	8

Note: $J(0)$, natural remanent magnetization intensity in units of 10^{-6} emu. cm^{-3} (average for sample where bracketed); *x*, susceptibility in units of 10^{-6} emu. cm^{-3}. oe^{-1} (average for sample where bracketed); *Q*, Königsberger ratio; $J(0)$, inclination of NRM; J_{100}/NRM, residual NRM fraction after 100-oe AF cleaning; J_{max}, maximum intensity reached during AF demagnetization; MDF, mean destructive field; U, divided by undemagnetized NRM; this volume.

Sample (Interval in cm)	$J(0)$	$I(0)$	$D(0)$	$J(200)$	MDF	Stable I	Stable D	TRM	SRM[b]	SRM(h)[c]
6-1, 53-55	4990	-50	08	4430	410	-53	09	8300	213	241
6-1, 62-64	3000	-56	29	2010	270	-60	15	18400	277	1132
6-1, 75-77	3260	-63	72	3180	600	-63	74	16000	151	790
6-1, 83-85	3650	-63	77	3040	390	-68	72	19500	191	983
6-1, 89-91	3480	-56	78	2900	370	-63	84	19900	218	1160
6-1, 94-96	3930	-63	83	2760	310	-65	87	16100	264	1210
6-1, 99-101	2540	-65	76	2290	350	-68	72	22600	236	1462
6-1, 105-107	2670	-67	76	2080	360	-67	89	18900	259	1058
6-1, 112-114	7370	-63	68	6100	360	-56	75	33000	388	1812
6-1, 122-124	6300	-68	69	5660	380	-70	73	22000	265	1341
6-1, 129-131	6320	-54	88	4550	340	-70	90	8660	222	690
6-2, 5-7	4550	-67	176	4290	460	-75	175	11000	226	714
10-1, 33-35	3270	-69	26	2800	390	-71	24	14300	219	878
10-5, 43-45	7290	-67	13	5790	330	-68	16	21300	288	910
13-1, 78-88	10400	-68	183	9720	420	-63	180	19900	325	1040
13-3, 100-111	3510	-65	40	2930	370	-72	41	9050	194	410

Note: $J(0)$, intensity of magnetization in emu/cc, for natural remanent magnetization; $J(100)$, intensity following 100-oe demagnetization; $I(0)$, inclination of NRM; $D(0)$, declination in degrees; MDF, median destructive field; TRM, laboratory thermoremanence acquired in 0.5 oe from an unspecified temperature; SRM, saturation remanence in natural state; SRM(L), saturation remanence after laboratory thermoremanence acquisition. From Carmichael, this volume.

TABLE 3 – *Continued*

Sample (Interval in cm)	D	I	$J_n \times 10^3$ (Gauss)	$k \times 10^3$ (Gauss/oe)	Q_n	Q_t
6-1, 53-55	180	-59	1.90	0.198	21	
6-1, 62-64	206	-59	2.56	0.234	24	41
6-1, 75-77	258	-59	4.57	0.196	52	
6-1, 83-85	263	-63	4.19	0.181	51	
6-1, 89-91	275	-60	2.66	0.222	27	
6-1, 94-96	264	-63	3.95	0.259	34	
6-1, 99-101	257	-61	4.09	0.210	43	
6-1, 105-107	256	-67	3.25	0.170	42	
6-1, 112-114	245	-68	3.11	0.194	36	
6-1, 122-124	261	-66	4.00	0.088	101	
6-1, 129-131	268	-70	4.63	0.157	65	
6-2, 5-7	341	-67	4.67	0.185	56	
10-1, 33-35	221	-72	2.14	0.118	40	
10-5, 43-45	192	-63	5.51	0.136	90	47
13-1, 78-88	13	-67	10.1	0.137	163	
13-3, 100-111	209	-73	4.23	0.213	44	

Note: D, declination, degrees, I, inclination, degrees, positive downward: J_n, intensity of magnetization: k, initial susceptibility measured in 0.31 peak oe field: Q_n, Königsberger ratio $Q_n = J_n/kH$, where H = 0.45 oe, the present in situ field: Q_t, ratio J_t/k_tH, where J_t is the thermoremanence (TRM) and k_t is the initial susceptibility measured at 20°C after heating the sample to 630°C and cooling it in a field H = 0.45 oe which is equal to the in situ field. From Deutsch et al., this volume.

Sample (Interval in cm)	Natural Remanent Magnetization Dec.	Inc.	Int. (× 10^4 emu/ce)	Curie Temperature °C
6-1, 53-54	276	-56	31	400
6-1, 62-64	305	-57	15	370
6-1, 75-77	349	-63	35	400
6-1, 83-85	347	-61	22	400
6-1, 94-96	352	-61	18	360
6-1, 99-101	348	-58	15	345
6-1, 105-107	356	-65	17	350
6-1, 112-114	340	-66	18	370
6-1, 129-131	3	-68	22	322
6-2, 5-7	67	-63	26	600

Note: From Schwarz and Fujiwara, this volume.

TABLE 3 – *Continued*

Sample (Interval in cm)	$J_{nrm} \times 10^{-4}$	D_{nrm}	I_{nrm}	$J_{100} \times 10^{-4}$	D_{100}	I_{100}	$J_{200} \times 10^{-4}$	D_{200}	I_{200}	J_{100}/J_{nrm}	J_{200}/J_{nrm}
7-1, 85	23.04	60.8	-59.1	22.27	57.9	-58.9	18.17	61.4	-57.3	0.97	0.79
8-2, 24	17.25	276.6	-58.2	16.37	280.4	-56.5	12.27	284.2	-55.5	0.95	0.71
8-2, 94	31.23	220.8	-62.9	27.08	213.4	-60.3	21.75	217.7	-58.7	0.87	0.70
8-4, 20	18.28	150.7	-58.5	15.61	149.6	-58.6	8.75	151.1	-59.6	0.85	0.48
10-3, 100	44.82	201.7	-58.0	44.50	202.8	-58.4	41.22	204.0	-57.0	0.99	0.92
10-6, 4	58.13	152.8	-57.0	52.37	154.3	-56.8	29.77	156.1	-55.6	0.90	0.51
11-1, 62	44.61	45.6	-67.3	40.90	44.7	-65.7	34.19	43.7	-65.0	0.92	0.77
12-2, 139	20.20	278.5	-64.8	20.16	283.5	-62.6	14.98	278.6	-61.8	1.00	0.74

Note: J_{nrm}, J_{100}, and J_{200}, intensity of magnetization in emu/cc for natural remanent magnetization, and following 100 oe and 200 oe, demagnetization treatment, respectively; corresponding direction given by D and I where D, declination in degrees east of an arbitrary zero azimuth; I, inclination in degrees with respect to the horizontal, negative above the horizontal, J_{100}/J_{nrm} and J_{200}/J_{nrm} are simple magnetic stability indices. The present mean inclination of the geomagnetic field at Hole 332B and Sites 334 and 335 = ±59°; axial dipole inclination = ±56.5°. From Ellwood and Watkins, this volume.

Sample (Interval in cm)	Depth (m)[a]	Intensity (10^{-4} emu/cc) NRM	Intensity (10^{-4} emu/cc) 100 oe	Direction NRM Dec.	Direction NRM Inc.	Direction Stable Dec.	Direction Stable Inc.	H^b	k^c (10^{-4}emu/cc/oe)	Q'_n [d]	MDF[e] (oe)
6-5, 33	10	41.3	39.8	106	-63	106	-62	400	1.65	25.0	447
9-4, 58	37	24.3	23.9	236	-61	236	-59	200	1.99	12.2	370
10-3, 76	45	31.1	30.8	63	-65	61	-62	200	0.95	33.1	383
13-2, 13	72	27.1	28.8	269	-70	264	-70	400	1.13	24.0	511

[a]Approximate subbasement depth in meters.
[b]H is the AF demagnetizing field for each stable direction.
[c]k = initial susceptibility.
[d]Q'_n = NRM intensity/susceptibility.
[e]MDF = median destructive field of NRM. From Kent and Lowrie, this volume.

Unlike other sites drilled on Leg 37, the high core-length average vertical intensity of magnetization at Site 335 indicates that the sampled section contributes significantly to the observed surface anomaly. The close grouping of inclinations suggests that the basalts were erupted during a single secular variation cycle of the geomagnetic field representing a time span between 10 and 1000 yr.

PHYSICAL PROPERTIES AND HEAT FLOW

Shipboard determinations of physical properties and seismic velocities of Site 335 basalts are given in Table 4. The mean bulk density of 15 measured basalts is 2.810 g/cm^3, the mean resistivity of 5 samples is 394 ohm-m, and the mean compressional velocity of 15 samples at 0.5 kbar is 5.95 km/sec. The physical properties and seismic velocities of Leg 37 rocks are discussed in detail by Hyndman and Drury and Hyndman, this volume.

Three sediment temperature measurements were attempted at this site yielding two good determinations and one approximate temperature. The average heat flow for the site is 0.48 $\pm$0.05 μcal/cm^{2}sec.

BIOSTRATIGRAPHY

General

At Site 335, five cores were collected intermittently in the sediments above basement. Planktonic foraminifers and calcareous nannoplankton are abundant and well preserved in these cores. Radiolaria are present in Cores 1 and 5, but are absent from the core-catcher samples of Cores 2, 3, and 4.

Core 1 and Sections 1, 2, and 3 of Core 2 are late Pliocene in age, whereas the lower part of Core 2 and all of Core 3 are assigned to the early Pliocene. Core 4 is late Miocene in age, and Core 5, which was recovered immediately above basement, contains fossils which indicate a middle Miocene age.

Veinlets and interbeds of highly indurated calcareous sediments are present in nearly all cores recovered from basement. Calcareous nannofossils are absent from all of these sediments except Sample 335-6-2 (#8), which contains rare coccoliths. No other microfossils were recovered from the basement sequence.

Planktonic Foraminifers

Core 1 and Sections 1, 2, and 3 of Core 2 are assigned to Zone N21 based on the presence of *Globorotalia miocenica* and the absence of *Sphaeroidinella seminulina* and *S. subdehiscens*.

Zone N20 is either absent or represented by a short interval. Several specimens of *Sphaeroidinella seminulina* and *S. subdehiscens* appear in Sample 335-2-4, 50-52 cm, which is questionably assigned to Zone N20. However, the next downhole sample, 335-2-4, 125-127 cm, contains several specimens of *Globorotalia margaritae* and is assigned to Zone N19. If Zone N20 exists at Site 335 it must have a thickness of less than 1.5 meters.

The lower part of Core 2, from Samples 335-2-4, 125-127 cm to 335-2, CC, and all of Core 3 are placed in Zone N19. These sediments contain common *Globorotalia margaritae* and some *Globigerina nepenthes*, but lack characteristic Miocene species.

Core 4, which was recovered approximately 85 to 95 meters below Core 3, contains foraminiferal faunas of late Miocene age which are assigned to Zone N17.

Three samples were examined from Core 5, Section 1. The faunas of this interval include *Globigerina nepenthes, Globigerinoides mitra, Globoquadrina advena, Globoquadrina dehiscens, Globorotalia continuosa, Globorotalia siakensis*, and *Globorotalia* sp. The co-occurrence of *G. nepenthes* and *G. siakensis* places Core 5 in Zone N14.

TABLE 4
Physical Properties and Seismic Velocities for Rocks from Site 335

Sample (Interval in cm)	Depth Below Bottom (m)	Depth Below Top Basalt (m)	Bulk Density (g/cm^3)	Ham. Frame (km/sec)	Resistivity (ohm-m)	Velocity (P) 0.5 kbar (km/sec)	P (2.0) (km/sec)
5-2, 27	455	0	2.866	5.96	1030	6.22	6.29
6-1, 6	459	5	2.822	5.60	413	5.94	5.98
6-3, 45	461.0	6.9	2.800	5.58	285	5.87	5.90
6-4, 24	464.2	8.2	(2.519)*	5.17	(64.9)[a]	(5.33)[a]	(5.40)
6-6, 76	465.8	11.8	2.789	5.67	317	5.90	5.95
6, CC	459	4	2.753	5.52	247	5.78	5.82
7-2, 38	468.9	14.9	2.879	6.15		(6.35)[b]	
8-1, 122	477.7	23.7	2.869	5.86		(6.06)	
8-3, 80	480.3	26.3	2.762	5.49		(5.69)	
9-1, 12	486.1	32.1	2.878	6.09		(6.29)	
9-5, 100	493.0	39.0	2.815	5.68		(5.88)	
10-5, 102	502.5	48.5	2.767	5.40		(5.60)	
11-1, 77	505.8	51.8	2.851	5.80		(6.00)	
12-3, 116	518.7	64.7	2.781	5.77		(5.97)	
14-2, 109	536.1	82.1	2.799	5.80		(6.00)	
14-4, 64	538.6	84.6	2.725	5.57		(5.77)	
Mean	(omitting) sediment)		2.810	5.73	394	5.95	5.99

[a]Sediment sample.

[b]Hamilton frame at 1 atm + 0.20 km/sec assumed for 0.5 kbars.

The absolute age of the sediment-basement contact at Site 335 is approximately 11.5 to 12.0 m.y.B.P.

Radiolaria

Core-catcher samples from Cores 1 through 4 and two samples from Core 5, Section 1, were examined for Radiolaria at Site 335. Radiolarians in Core 1 are common, well preserved, and Pliocene in age. The core catcher samples of Cores 2, 3, and 4 are barren. Radiolaria in Core 5 are rare, and no species are present which are precisely age diagnostic.

Nannofossils

Cores above acoustic basement are dominated by well-preserved middle Miocene to late Pliocene nannofossils. Cores taken within basement have only poorly preserved nannofossils, making age determinations difficult. Reported ages are based almost entirely on core-catcher samples.

The upper half of Core 1 appears to belong to Zone NN18 due to the low diversity of discoasters present and the lack of *Discoaster pentaradiatus*. The lower half of Core 1 is placed in Zone NN17 on the mutual occurrence of *Coccolithus pelagicus, Cyclococcolithina leptopora, Discoaster brouweri, D. pentaradiatus, Helicopontosphaera kamptneri*, and *Pseudoemiliania lacunosa*.

Core 2 fits in Zone NN15 due to the presence of *Ceratolithus rugosus, Coccolithus pelagicus, Cyclococcolithina leptopora*, abundant *Discoaster asymmetricus, D. brouweri, D. pentaradiatus, D. surculus, D. tamalis, D. variabilis, Helicopontosphaera kamptneri, Reticulofenestra pseudoumbilica*, and *Sphenolithus abies*.

In Core 3 Zone NN13 is indicated by the occurrence of *Ceratolithus rugosus, C. tricorniculatus, Coccolithus pelagicus, Cyclococcolithina leptopora, Discoaster brouweri, D. pentaradiatus, D. surculus, D. variabilis, Helicopontosphaera kamptneri, Reticulofenestra pseudoumbilica*, and *Sphenolithus abies*.

Core 4 is placed in Zone NN11 on the occurrence of *Coccolithus pelagicus, Cyclococcolithina leptopora, Discoaster brouweri, D. challengeri, D. pentaradiatus, D. stellulus, D. variabilis, Helicopontosphaera kamptneri, Reticulofenestra pseudoumbilica, Sphenolithus abies*, and the rare occurrence *Discoaster quinqueramus*. Core 5 has fewer recognizable species, but is considered middle Miocene (Zone NN7) on the basis of the occurrence of *Discoaster* cf. *D. kugleri*.

TABLE 2
Geochemical Data for Basalts at Site 335

TABLE 2A
Major Element Analyses of Basalt Glasses at Site 335

Sample[a]	Depth (m)	Inv.	SiO_2	TiO_2	Al_2O_3	Total Iron	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
5- 2, 4-	449.54	ML	50.69	1.17	16.28	9.59	-	6.66	12.12	2.57	0.17	0.09	99.34
5- 2, 64-	450.14	ML	50.35	1.12	15.59	9.38	-	7.96	11.68	2.41	0.16	0.10	98.75
5- 2, 64- 66	450.15	AU	50.20	1.27	15.18	9.75	0.21	8.33	11.79	2.41	0.23	-	99.37
5- 2, 121-123	450.72	AU	50.45	1.30	15.67	9.94	0.19	8.33	11.69	2.52	0.41	-	100.50
5- 2, 121-123	450.72	AU	50.50	1.30	15.56	9.91	0.19	8.24	11.83	2.67	0.32	-	100.52
5- 2, 121-123	450.72	AU	49.89	1.26	15.60	10.46	0.21	8.06	11.60	2.63	0.40	-	100.11
5- 3, 8-	451.08	ML	50.11	1.14	15.45	9.52	-	8.14	11.86	2.36	0.17	0.09	98.84
5- 3, 8- 10	451.09	AU	49.70	1.27	15.18	9.65	0.21	8.31	11.83	2.37	0.23	-	98.75
6- 1, 47- 49	457.98	AU	49.56	1.28	15.21	9.66	0.21	8.29	11.83	2.34	0.24	-	98.62
6- 1, 47- 49	457.98	SG	50.30	1.18	14.30	9.95	0.21	7.80	12.20	2.30	0.22	-	98.69
6- 1, 47- 49	457.98	TM	50.03	1.14	15.94	9.10	0.17	8.25	11.51	2.70	0.14	-	98.98
6- 2, 134-136	460.35	AU	49.61	1.28	15.43	9.92	0.20	8.36	11.94	2.42	0.21	-	99.37
6- 2, 134-136	460.35	AU	50.06	1.29	15.38	10.00	0.20	8.46	12.06	2.46	0.22	-	100.13
6- 3, 62-	461.12	ML	49.63	1.15	15.68	9.46	-	7.87	11.76	2.41	0.17	0.09	98.22
6- 3, 62- 64	461.13	AU	49.83	1.29	15.38	9.72	0.21	8.25	11.67	2.37	0.22	-	98.94
6- 3, 62- 64	461.13	AU	50.00	1.29	15.49	9.72	0.21	8.25	11.76	2.38	0.23	-	99.33
6- 3, 62- 64	461.13	AU	50.13	1.29	15.50	9.77	0.20	8.25	11.77	2.38	0.23	-	99.52
6- 3, 62- 64	461.13	AU	49.74	1.29	15.37	9.74	0.18	8.27	11.71	2.37	0.23	-	98.90
6- 3, 90- 92	461.41	AU	49.11	1.28	14.87	10.06	0.19	8.46	11.84	2.43	0.22	-	98.46
6- 3, 90- 92	461.41	AU	49.20	1.28	14.99	10.13	0.18	8.42	11.85	2.43	0.22	-	98.70
6- 3, 90- 92	461.41	AU	48.66	1.30	15.04	10.08	0.20	8.48	11.90	2.46	0.21	-	98.33
6- 3, 135-137	461.86	AU	50.15	1.25	15.36	9.72	0.20	8.33	11.82	2.36	0.22	-	99.41
6- 3, 135-137	461.86	AU	50.14	1.25	15.34	9.75	0.18	8.27	11.85	2.35	0.21	-	99.34
6- 3, 135-137	461.86	AU	49.99	1.25	15.60	9.65	0.16	8.18	11.90	2.33	0.21	-	99.27
6- 4, 56-	462.56	ML	49.93	1.18	15.49	9.44	-	8.20	11.77	2.38	0.16	0.08	98.63
6- 4, 77- 80	462.79	AU	50.54	1.32	15.54	10.03	0.18	8.39	11.96	2.40	0.21	-	100.57
6- 4, 77- 80	462.79	AU	50.59	1.30	15.52	10.09	0.18	8.49	11.93	2.42	0.21	-	100.73
6- 4, 77- 80	462.79	AU	50.56	1.29	15.49	10.00	0.19	8.44	11.95	2.42	0.22	-	100.56
6- 5, 40-	463.90	ML	50.37	1.18	15.62	9.44	-	8.05	11.84	2.44	0.16	0.09	99.19
6- 6, 22- 24	465.23	AU	49.85	1.31	15.20	9.77	0.20	8.39	11.82	2.46	0.21	-	99.21
6-CC, 27- 29	466.60	AU	49.96	1.28	15.31	9.70	0.18	8.35	11.83	2.39	0.21	-	99.21
6-CC, 27- 29	466.60	AU	49.96	1.29	15.42	9.80	0.19	8.32	11.77	2.46	0.22	-	99.43
6-CC, 27- 29	466.60	AU	49.67	1.34	16.11	10.12	0.17	6.21	12.31	2.85	0.23	-	99.01
6-CC, 77- 80	466.60	AU	50.21	1.28	15.00	9.85	0.19	8.34	11.86	2.42	0.21	-	99.36
6-CC, 78-	466.60	ML	50.76	1.15	15.71	9.33	-	8.06	11.78	2.42	0.17	0.08	99.46
7- 2, 19- 21	468.70	AU	50.14	1.31	15.18	9.79	0.21	8.37	11.79	2.40	0.20	-	99.39
7- 2, 68-	469.18	ML	51.24	1.17	15.47	9.41	-	7.78	11.84	2.39	0.16	0.11	99.57
7- 2, 68- 69	469.19	AU	50.14	1.26	15.27	9.77	0.22	8.34	11.79	2.45	0.22	-	99.46
7- 2, 68- 69	469.19	AU	50.17	1.29	15.27	9.71	0.20	8.25	11.95	2.41	0.23	-	99.48
7- 2, 68- 69	469.19	AU	50.37	1.29	15.36	9.67	0.21	8.30	11.95	2.39	0.22	-	99.76
7- 2, 70- 72	469.21	AU	50.01	1.31	15.34	9.78	0.19	8.41	11.79	2.35	0.22	-	99.40
7- 2, 70- 72	469.21	AU	50.11	1.28	15.26	9.75	0.17	8.39	11.82	2.40	0.21	-	99.39
7- 2, 141-143	469.92	AU	50.06	1.21	15.43	9.82	0.22	8.21	11.80	2.35	0.23	-	99.33
7- 3, 29-	470.29	ML	50.52	1.12	15.59	9.41	-	8.13	11.77	2.37	0.16	0.10	99.17
7- 3, 126-128	471.27	AU	50.23	1.31	15.46	9.85	0.21	8.46	11.87	2.44	0.23	-	100.06
8- 1, -	476.50	AU	50.77	1.29	15.04	9.81	0.18	8.22	11.95	2.43	0.21	-	99.90
8- 1, 15- 23	476.69	AU	49.94	1.30	15.53	9.85	0.18	8.36	11.82	2.45	0.23	-	99.66
8- 1, 15- 23	476.69	AU	50.67	1.27	15.68	9.99	0.17	8.50	11.85	2.47	0.21	-	100.81
8- 1, 67-	477.17	ML	50.32	1.16	15.53	9.41	-	8.13	11.63	2.41	0.19	0.09	98.87
8- 2, 113-	479.13	ML	49.88	1.14	15.58	9.37	-	8.10	11.75	2.36	0.17	0.09	98.44
8- 3, 98-101	480.50	SG	49.80	1.27	16.00	9.35	0.18	7.90	11.50	2.51	0.20	-	98.92
8- 3, 98-101	480.50	SG	49.80	1.22	15.00	9.55	0.20	8.10	11.60	2.48	0.19	-	98.35
8- 3, 98-101	480.50	TM	50.44	1.14	15.98	9.16	0.20	8.34	11.63	2.73	0.15	-	99.77
8- 3, 125-127	480.76	AU	50.21	1.26	15.35	9.72	0.18	8.39	11.84	2.42	0.22	-	99.59
8- 3, 125-127	480.76	AU	50.16	1.26	15.38	9.71	0.17	8.39	11.90	2.41	0.22	-	99.60
8- 3, 125-127	480.76	AU	50.12	1.27	15.44	9.73	0.18	8.34	11.88	2.42	0.22	-	99.60
8- 4, 103-107	482.05	AU	50.47	1.28	15.50	9.83	0.21	8.36	11.89	2.44	0.23	-	100.21
8-CC, 28-	484.10	ML	50.40	1.13	15.72	9.47	-	7.86	11.81	2.41	0.16	0.10	99.06
8-CC, 28- 33	484.10	AU	49.95	1.24	15.33	9.71	0.19	8.30	11.78	2.37	0.21	-	99.08
8-CC, 28- 33	484.10	AU	50.03	1.27	15.41	9.77	0.20	8.28	11.73	2.36	0.22	-	99.27
9- 1, 54-	486.54	ML	51.05	1.10	15.94	9.37	-	7.71	11.91	2.44	0.16	0.10	99.78

TABLE 2A – *Continued*

Sample[a]	Depth (m)	Inv.	SiO_2	TiO_2	Al_2O_3	Total Iron	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
9- 1, 54- 58	486.56	AU	50.33	1.30	15.24	9.88	0.22	8.25	11.81	2.39	0.24	-	99.66
9- 3, 14- 17	489.16	AU	50.12	1.25	15.28	9.74	0.21	8.25	11.84	2.43	0.23	-	99.35
9- 3, 117-124	490.21	AU	50.11	1.26	15.46	9.70	0.18	8.27	12.01	2.36	0.21	-	99.56
9- 3, 117-124	490.21	AU	49.88	1.25	15.37	9.67	0.19	8.27	12.00	2.41	0.22	-	99.26
9- 3, 117-124	490.21	AU	50.02	1.26	15.43	9.66	0.18	8.30	11.97	2.40	0.22	-	99.44
9- 5, 46- 48	492.47	AU	50.03	1.26	15.43	9.75	0.18	8.30	11.97	2.35	0.21	-	99.48
9- 5, 46- 48	492.47	AU	50.06	1.27	15.44	9.69	0.18	8.21	11.98	2.28	0.23	-	99.34
10- 1, 63-	496.13	ML	50.33	1.13	15.77	9.34	-	8.17	12.03	2.35	0.16	0.09	99.37
10- 1, 63- 65	496.14	AU	50.59	1.26	15.51	9.90	0.21	8.38	12.04	2.49	0.23	-	100.61
10- 1, 145-147	496.96	AU	50.09	1.26	15.42	9.76	0.19	8.28	11.91	2.37	0.22	-	99.50
10- 1, 145-147	496.96	AU	49.99	1.29	15.45	9.61	0.19	8.25	12.02	2.39	0.21	-	99.40
10- 1, 145-147	496.96	AU	50.24	1.26	15.54	9.74	0.19	8.18	12.05	2.54	0.20	-	99.94
10- 1, 145-147	496.96	AU	50.72	1.31	15.46	9.59	0.18	8.33	11.66	2.26	0.22	-	99.73
10- 1, 145-147	496.96	AU	52.60	1.31	15.71	9.45	0.20	8.24	11.76	2.40	0.22	-	101.89
10- 3, 46- 48	498.97	AU	50.90	1.23	14.79	10.00	0.19	8.56	12.13	2.44	0.22	-	100.46
10- 3, 46- 48	498.97	AU	50.82	1.26	14.83	9.93	0.21	8.60	12.18	2.50	0.21	-	100.54
10- 3, 46- 48	498.97	AU	51.07	1.25	14.85	10.07	0.20	8.57	12.21	2.50	0.22	-	100.94
10- 3, 108-	499.58	ML	50.47	1.10	15.66	9.34	-	7.85	11.83	2.41	0.16	0.09	98.91
10- 4, 44-	500.44	ML	50.90	1.08	15.92	9.26	-	7.68	11.90	2.38	0.16	0.09	99.37
11- 2, 34-	506.84	ML	50.82	1.13	15.66	9.36	-	7.96	12.00	2.37	0.15	0.09	99.54
12- 1, 16-	514.66	ML	50.90	1.14	15.74	9.36	-	7.91	11.91	2.42	0.15	0.11	99.64
12- 2, 119-	517.19	ML	51.05	1.18	15.59	9.40	-	8.04	12.01	2.41	0.15	0.09	99.92
12- 3, 72-	518.22	ML	50.49	1.09	15.50	9.34	-	7.90	11.95	2.36	0.16	0.09	98.88
13- 1, 3-	524.03	ML	50.72	1.12	15.77	9.33	-	8.05	12.02	2.38	0.14	0.09	99.62
13- 2, 113-	526.63	ML	50.69	1.13	15.78	9.47	-	8.17	12.03	2.41	0.16	0.09	99.93
13- 2, 113-117	526.65	AU	50.64	1.24	15.63	9.58	0.19	8.00	12.08	2.56	0.21	-	100.13
13- 2, 113-117	526.65	AU	50.10	1.26	15.29	9.63	0.21	8.28	11.99	2.44	0.21	-	99.41
13- 2, 113-117	526.65	AU	50.16	1.27	15.26	9.62	0.21	8.20	11.99	2.45	0.21	-	99.37
13- 2, 113-117	526.65	AU	50.14	1.24	15.19	9.47	0.21	8.26	11.97	2.43	0.20	-	99.11
13- 3, 2-	527.02	ML	50.57	1.13	15.88	9.40	-	7.83	12.11	2.38	0.17	0.11	99.58
13- 3, 58-	527.58	ML	49.92	1.14	15.78	9.47	-	8.10	11.99	2.38	0.17	0.09	99.04
14- 1, 84-	534.34	ML	50.45	1.13	15.77	9.51	-	8.10	12.04	2.36	0.16	0.09	99.61
14- 1, 84- 86	534.35	AU	50.06	1.27	15.29	9.67	0.20	8.18	11.96	2.42	0.23	-	99.28
14- 3, 73-	537.23	ML	50.37	1.10	15.79	9.19	-	7.82	11.86	2.41	0.16	0.07	98.77

TABLE 2B
Major Element Analyses of Basalts at Site 335

Sample[a]	Depth (m)	Inv.	Method	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	Total Iron	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	CO_2	H_2O^-	H_2O^+	Total	LOI	S
5- 2, 48- 50	449.99	RB	XRFAA	48.76	1.08	15.11	4.05	4.85	8.49	0.14	8.10	11.69	2.51	0.33	0.11	0.15	1.67	1.03	99.58	2.82	-
5- 3, 48- 50	451.49	AUF	AAS	48.11	1.13	15.29	3.50	6.12	9.27	0.15	8.18	11.93	2.30	0.33	0.10	0.88	1.07	1.23	100.32	-	-
5- 3, 48- 50	451.49	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.42	-	-	0.42	-	0.0238
5- 3, 48- 50	451.49	GUNN	XRF	49.20	1.13	15.55	10.43	-	9.38	0.16	8.44	12.29	2.35	0.33	0.11	-	-	-	99.99	-	-
5- 3, 48- 50	451.49	MUN	AAS	48.10	1.02	16.20	3.55	5.87	9.06	0.17	8.44	12.26	2.33	0.40	0.09	-	-	-	98.43	2.25	-
5- 3, 55- 57	451.56	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0221
5- 3, 55- 57	451.56	BOG	XRF	48.20	1.14	14.70	10.73	-	9.65	0.16	8.33	11.41	2.35	0.36	0.10	0.13	1.00	0.89	99.50	1.64	-
6- 1, 16- 18	457.67	RB	XRFAA	49.14	1.10	15.11	2.97	5.87	8.54	0.15	8.19	11.43	2.40	0.19	0.14	0.08	1.63	1.47	99.87	2.60	-
6- 1, 47- 49	457.98	GSC	NCL	46.89	1.13	18.45	3.14	5.92	8.75	0.21	7.28	9.82	2.58	0.96	0.10	0.82	1.34	1.34	99.98	-	0.22
6- 1, 47- 49	457.98	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.70	1.54	1.54	3.78	-	-
6- 1, 53- 55	458.04	GSC	NCL	46.86	1.19	15.70	4.25	4.88	8.70	0.15	7.32	13.00	2.37	0.20	0.11	1.05	1.16	1.28	99.52	-	0.05
6- 1, 62- 64	458.13	GSC	NCL	48.25	1.17	15.29	5.63	4.38	9.45	0.15	7.47	11.66	2.42	0.37	0.11	0.09	1.36	1.18	99.53	-	0.01
6- 1, 75- 77	458.26	GSC	NCL	48.61	1.16	16.57	4.44	4.82	8.82	0.16	6.78	12.07	2.52	0.15	0.09	0	0.94	1.52	99.83	-	0.06
6- 1, 83- 85	458.34	GSC	NCL	49.53	1.20	16.01	4.55	4.38	8.47	0.16	7.20	12.02	2.68	0.21	0.10	0	1.08	1.24	100.36	-	0
6- 1, 89- 91	458.40	GSC	NCL	48.30	1.12	16.19	4.64	4.14	8.32	0.15	6.75	12.67	2.58	0.31	0.10	0.98	0.80	1.42	100.15	-	0.01
6- 1, 94- 96	458.45	GSC	NCL	49.11	1.18	16.09	4.82	4.25	8.59	0.15	7.03	12.58	2.60	0.23	0.10	0	0.62	1.56	100.32	-	0.02
6- 1, 99-101	458.50	GSC	NCL	48.95	1.08	15.52	5.43	4.98	9.87	0.17	7.59	11.80	2.51	0.39	0.10	0.16	0.64	1.16	100.48	-	0.01
6- 1, 105-107	458.56	GSC	NCL	48.55	1.09	15.25	5.38	4.29	9.13	0.16	7.88	12.21	2.51	0.32	0.10	0.38	0.96	1.38	100.46	-	0
6- 1, 112-114	458.63	GSC	NCL	47.46	1.22	15.67	5.48	4.01	8.94	0.15	6.87	13.08	2.51	0.32	0.12	1.29	0.62	1.52	100.32	-	0
6- 1, 122-124	458.73	GSC	NCL	48.25	1.19	16.12	4.36	4.59	8.51	0.14	7.06	12.14	2.45	0.31	0.11	0.42	1.02	1.48	99.64	-	0.07
6- 1, 129-131	458.80	GSC	NCL	47.86	1.27	15.83	5.51	4.52	9.48	0.14	6.81	11.64	2.45	0.29	0.13	0.20	1.08	1.89	99.62	-	0.03
6- 2, 5- 7	459.06	GSC	NCL	48.60	1.14	16.15	4.89	4.74	9.14	0.14	7.32	12.08	2.50	0.17	0.09	0	1.04	1.43	100.29	-	0.06
6- 3, 108-110	461.59	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.19	-	-	0.19	-	0.0188
6- 3, 108-110	461.59	GUNN	XRF	50.14	1.15	15.44	4.30	5.56	9.43	0.16	7.71	12.01	2.39	0.40	0.12	-	1.35	1.16	101.89	-	-
6- 4, 22- 24	462.23	ZAK	WET	47.90	1.10	14.81	3.59	6.48	9.71	0.15	7.98	11.93	2.70	0.28	0.14	-	1.56	0.91	100.06	0.53	-
6- 5, 110-112	464.61	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.42	0.98	1.39	2.79	-	-
6- 5, 110-112	464.61	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	10.20	2.70	3.08	15.98	-	-
6-CC, 30- 32	466.60	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.48	-	-	0.48	-	0.0250
6-CC, 30- 32	466.60	GUNN	XRF	49.08	1.15	15.58	3.86	6.08	9.56	0.17	8.07	12.58	2.38	0.24	0.13	-	1.10	1.23	101.65	-	-
6-CC, 30- 32	466.60	GUNN	XRF	48.84	1.16	15.73	3.81	6.08	9.51	0.18	8.19	12.66	2.33	0.24	0.12	-	1.10	1.23	101.67	-	-
6-CC, 37- 39	466.60	GUNN	XRF	49.28	1.12	15.42	3.44	6.27	9.37	0.17	8.30	12.54	2.37	0.27	0.12	-	0.96	1.26	101.52	-	-
6-CC, 37- 39	466.60	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.70	-	-	0.70	-	0.0293
6-CC, 37- 39	466.60	GUNN	XRF	49.14	1.13	15.51	3.51	6.27	9.43	0.17	8.27	12.60	2.30	0.27	0.12	-	0.96	1.26	101.51	-	-
7- 1, 8- 10	467.09	RB	XRFAA	48.38	1.08	15.13	4.18	4.75	8.51	0.15	7.82	11.56	2.40	0.26	0.12	0.05	2.10	1.15	99.13	3.48	-
7- 1, 85- 87	467.86	SGS	NAA	-	-	-	-	8.90	8.90	-	-	-	-	-	-	-	-	-	8.90	-	-
7- 2, 10- 12	468.61	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0481
7- 2, 10- 12	468.61	BOG	XRF	47.07	1.16	15.43	9.79	-	8.81	0.14	7.72	11.83	2.46	0.23	0.12	0.42	1.60	1.52	99.49	3.54	-
7- 2, 28- 30	468.79	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	1.21	-	-	1.21	-	0.0082
7- 2, 28- 30	468.79	GUNN	XRF	48.89	1.12	15.52	5.58	4.70	9.72	0.14	7.51	12.99	2.48	0.42	0.13	-	1.22	1.85	102.55	-	-
7- 2, 28- 30	468.79	GUNN	XRF	49.02	1.13	15.51	5.47	4.70	9.62	0.14	7.44	13.06	2.48	0.41	0.12	-	1.22	1.85	102.55	-	-
7- 2, 95- 97	469.46	CML	XRF	49.10	1.23	14.00	11.00	-	9.90	0.16	9.10	12.40	2.50	0.33	0.13	-	-	-	99.95	-	0.1200
8- 2, 24- 26	478.25	SGS	NAA	-	-	-	-	8.60	8.60	-	-	-	2.70	-	-	-	-	-	11.30	-	-
8- 2, 71- 75	478.73	RB	XRFAA	48.15	1.10	15.19	4.43	5.15	9.14	0.14	8.04	11.62	2.37	0.26	0.11	0.33	1.92	0.78	99.59	2.84	-
8- 2, 94- 96	478.95	SGS	NAA	-	-	-	-	9.40	9.40	-	-	-	2.90	-	-	-	-	-	12.30	-	-
8- 2, 94- 96	478.95	TM	PROBE	48.66	1.10	15.37	3.60	5.52	8.76	0.17	8.44	11.63	2.26	0.32	-	0.17	1.15	0.78	99.17	2.16	-
8- 3, 61- 63	480.12	CML	XRF	49.20	1.17	14.40	10.90	-	9.81	0.15	9.10	12.10	2.40	0.37	0.12	-	-	-	99.91	-	0.1500
8- 3, 61- 63	480.12	CML	XRF	49.50	1.18	14.00	10.70	-	9.63	0.15	9.20	12.20	2.50	0.36	0.12	-	-	-	99.91	-	0.1800
8- 3, 61- 63	480.12	CML	XRF	49.20	1.22	13.60	11.10	-	9.99	0.18	8.70	12.30	2.60	0.40	0.13	-	-	-	99.43	-	0.6500
8- 3, 98-101	480.50	TM	PROBE	49.99	1.12	15.79	1.08	7.50	8.47	0.17	8.51	11.85	2.38	0.32	-	0.17	0.20	0.14	99.22	0.66	-
8- 4, 20- 21	481.21	SGS	NAA	-	-	-	-	8.90	8.90	-	-	-	2.80	-	-	-	-	-	11.70	-	-
3- 4, 20- 21	481.21	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.28	1.52	1.07	2.87	-	-
8- 4, 27- 29	481.28	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	0.0889

TABLE 2B – *Continued*

Sample[a]	Depth (m)	Inv.	Method	SiO_2	TiO_2	Al_2O_3	Fe_2O_3	FeO	Total Iron	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	CO_2	H_2O^-	H_2O^+	Total	LOI	S
8-4, 27-29	481.28	GUNN	XRF	50.59	1.15	15.75	3.10	5.83	8.62	0.14	8.05	12.01	2.41	0.20	0.12	-	1.10	1.23	101.68	-	-
8-4, 27-29	481.28	GUNN	XRF	50.37	1.16	15.72	3.22	5.83	8.73	0.15	8.07	12.11	2.41	0.20	0.12	-	1.10	1.23	101.69	-	-
8-4, 40-42	481.41	GUNN	XRF	49.76	1.13	15.38	10.45	-	9.40	0.15	8.78	11.72	2.31	0.22	0.11	-	-	-	100.01	-	-
8-4, 129-136	482.33	RB	XRFAA	49.62	1.14	15.45	5.40	4.44	9.30	0.17	7.50	11.96	2.41	0.42	0.12	0.11	-	-	98.74	0.72	-
9-1, 26-28	486.27	AUF	AAS	46.42	1.04	16.14	4.64	5.35	9.53	0.17	7.16	12.24	2.46	0.22	0.08	0.09	2.81	0.13	98.95	-	-
9-1, 26-28	486.27	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.09	-	-	0.09	-	0.0302
9-1, 26-28	486.27	BOG	XRF	46.23	1.17	15.88	10.52	-	9.47	0.17	7.43	12.19	2.40	0.24	0.10	0.24	1.95	1.30	99.82	3.50	-
9-1, 26-28	486.27	GUNN	XRF	48.93	1.17	16.09	10.93	-	9.83	0.17	7.41	12.57	2.39	0.22	0.12	-	-	-	100.00	-	-
9-5, 15-17	492.16	AUF	AAS	48.54	1.05	16.44	3.66	5.44	8.73	0.15	8.22	11.83	2.38	0.29	0.09	0.09	1.08	1.24	100.50	-	-
9-5, 15-17	492.16	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.10	-	-	0.10	-	0.0242
9-5, 15-17	492.16	CML	XRF	49.30	1.08	14.70	10.50	-	9.45	0.17	9.20	12.20	2.30	0.28	0.11	-	-	-	99.84	-	0.2200
9-5, 15-17	492.16	GUNN	XRF	49.40	1.05	16.07	10.04	-	9.03	0.16	8.33	12.16	2.39	0.30	0.10	-	-	-	100.00	-	-
9-5, 15-17	492.16	MUN	AAS	48.50	0.93	15.40	3.80	5.29	8.71	0.16	8.17	12.02	2.24	0.34	0.09	-	-	-	96.94	2.03	-
9-5, 94-96	492.95	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.76	-	-	0.76	-	0.0000
9-5, 94-96	492.95	GUNN	XRF	49.99	1.10	15.65	4.07	4.99	8.66	0.15	7.87	12.87	2.35	0.29	0.12	-	1.31	1.22	101.98	-	-
9-5, 108-110	493.09	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.26	-	-	0.26	-	0.0170
9-5, 108-110	493.09	GUNN	XRF	49.47	1.08	16.00	4.26	5.21	9.04	0.16	7.87	12.48	2.49	0.29	0.11	-	1.39	1.35	102.16	-	-
9-5, 108-110	493.09	GUNN	XRF	49.45	1.10	16.03	4.24	5.21	9.03	0.16	7.93	12.44	2.46	0.29	0.12	-	1.39	1.35	102.17	-	-
10-1, 42-44	495.93	ZAK	WET	47.54	1.00	15.31	3.62	6.30	9.56	0.15	8.02	12.04	2.90	0.32	0.14	-	1.12	1.06	100.02	0.50	-
10-1, 145-147	496.96	GSC	NCL	47.45	1.19	17.20	1.79	7.17	8.78	0.17	8.00	12.12	2.28	0.25	0.12	1.12	0.38	0.71	99.95	-	0.12
10-2, 17-19	497.18	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	1.13	-	-	1.13	-	0.0000
10-2, 17-19	497.18	GUNN	XRF	49.04	1.11	15.91	4.44	4.68	8.67	0.17	7.53	13.68	2.50	0.29	0.12	-	1.27	1.41	102.15	-	-
10-2, 17-19	497.18	GUNN	XRF	49.18	1.11	15.91	4.56	4.68	8.78	0.17	7.37	13.65	2.47	0.28	0.12	-	1.27	1.41	102.18	-	-
10-2, 37-39	497.38	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.43	-	-	0.43	-	0.0071
10-2, 37-39	497.38	GUNN	XRF	49.50	1.07	16.01	4.56	4.84	8.94	0.17	7.46	13.05	2.39	0.29	0.11	-	1.16	1.56	102.17	-	-
10-3, 100-102	499.51	SGS	NAA	-	-	-	-	8.60	8.60	-	-	-	2.60	-	-	-	-	-	11.20	-	-
10-3, 100-102	499.51	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.48	1.21	0.91	2.60	-	-
10-6, 4-6	503.05	SGS	NAA	-	-	-	-	8.90	8.90	-	-	-	-	-	-	-	-	-	8.90	-	-
10-6, 4-6	503.05	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.27	1.16	0.74	2.17	-	-
10-6, 28-30	503.29	CML	XRF	50.30	1.15	14.70	10.00	-	9.00	0.14	9.40	11.50	2.20	0.23	0.12	-	-	-	99.74	-	0.2700
11-1, 3-5	505.04	GUNN	XRF	49.57	1.05	15.96	4.30	5.04	8.91	0.16	8.11	12.46	2.38	0.30	0.11	-	1.16	1.28	101.88	-	-
11-1, 3-5	505.04	GUNN	XRF	49.58	1.06	15.99	4.39	5.04	8.99	0.16	8.09	12.34	2.37	0.31	0.11	-	1.16	1.28	101.88	-	-
11-1, 13-15	505.14	AUF	AAS	44.40	0.93	15.05	5.01	4.11	8.62	0.17	6.92	14.79	2.29	0.38	0.07	3.24	1.81	1.24	100.41	-	-
11-1, 13-15	505.14	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	3.24	-	-	3.24	-	0.0073
11-1, 13-15	505.14	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.26	-	-	0.26	-	0.0094
11-1, 13-15	505.14	BOG	XRF	45.08	0.98	14.78	9.45	-	8.50	0.16	7.06	14.72	2.35	0.37	0.11	3.33	1.15	1.40	100.94	6.00	-
11-1, 62-64	505.63	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.16	0.96	0.69	1.81	-	-
12-2, 139-141	517.40	TM	PROBE	-	-	-	-	-	-	-	-	-	-	-	-	0.42	1.65	1.14	3.21	-	-
12-3, 138-140	518.89	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.09	-	-	0.09	-	0.0197
12-3, 138-140	518.89	GUNN	XRF	49.71	1.06	16.31	3.89	5.29	8.79	0.15	7.87	12.43	2.32	0.28	0.11	-	1.09	0.97	101.48	-	-
12-3, 138-140	518.89	GUNN	XRF	49.77	1.04	16.32	3.90	5.29	8.80	0.15	7.87	12.41	2.29	0.28	0.10	-	1.09	0.97	101.48	-	-
12-3, 146-148	518.97	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0146
12-3, 146-148	518.97	GUNN	XRF	50.17	1.06	15.90	9.91	-	8.92	0.15	8.01	12.14	2.25	0.29	0.11	-	-	-	99.99	-	-
13-3, 21-23	527.22	AUF	AAS	47.24	1.10	16.18	4.97	4.21	8.68	0.15	6.71	12.68	2.54	0.30	0.11	0.67	1.35	1.68	99.89	-	-
13-3, 21-23	527.22	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0000
13-3, 21-23	527.22	GUNN	XRF	49.26	1.11	16.22	10.21	-	9.19	0.17	6.97	13.14	2.48	0.31	0.13	-	-	-	100.00	-	-
13-3, 21-23	527.22	MUN	AAS	47.70	0.96	15.20	5.14	4.04	8.66	0.17	6.75	12.73	2.40	0.37	0.09	-	-	-	95.55	3.43	-
13-3, 24-26	527.25	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0098
13-3, 24-26	527.25	BOG	XRF	46.07	1.09	15.74	10.25	-	9.22	0.16	6.35	13.88	2.50	0.33	0.11	1.63	1.40	2.18	101.69	4.56	-
13-3, 38-44	527.41	RB	XRFAA	48.58	1.01	15.40	3.96	4.95	8.51	0.14	8.44	11.70	2.34	0.23	0.10	-	1.67	0.93	99.45	2.64	-
14-3, 123-125	537.74	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.22	-	-	0.22	-	0.0043
14-3, 123-125	537.74	GUNN	XRF	49.10	1.12	15.96	5.81	4.39	9.62	0.16	7.31	12.71	2.51	0.31	0.12	-	1.37	1.17	102.04	-	-

14- 3, 123-125	537.74	GUNN	XRF	48.94	1.13	16.08	5.89	4.39	9.69	0.16	7.26	12.63	2.60	0.31	0.12	-	1.37	1.17	102.05	-	-
14- 3, 130-143	537.87	ZAK	WET	47.80	1.00	15.66	2.97	6.48	9.15	0.15	8.70	12.07	2.30	0.18	0.14	-	1.10	0.57	99.75	0.63	-
14- 3, 131-133	537.82	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	0.06	-	-	0.06	-	0.0133
14- 3, 131-133	537.82	GUNN	XRF	50.31	1.08	15.48	3.87	5.60	9.08	0.15	8.34	11.86	2.29	0.30	0.11	-	1.21	1.25	101.85	-	-
14- 4, 130-143	539.37	RB	XRFAA	48.85	1.03	15.24	1.99	7.25	9.04	0.15	9.32	11.49	2.25	0.18	0.13	0.15	0.83	0.72	99.58	1.15	-
16- 1, 22- 24	552.73	AUM	TRACK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	-	0.0150
16- 1, 22- 24	552.73	BOG	XRF	48.66	1.11	15.57	10.35	-	9.31	0.17	8.81	12.35	2.31	0.30	0.12	0.24	1.12	0.74	101.85	2.30	-
16- 1, 31- 37	552.84	GSC	NCL	48.72	1.09	16.63	4.10	4.57	8.26	0.15	7.88	11.60	2.36	0.27	0.10	0.42	-	2.50	100.39	-	0.12

TABLE 2C
First Transition and Rare Earth Elements in Basalts at Site 335

Sample[a]	Depth (m)	Inv.	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	La	Ce	Nd	Sm	Eu	Gd	Tb	Ho	Tm	Yb	Lu
5-3, 48	451.48	GUNN	-	6774	-	-	1239	72952	-	160	-	-	-	-	-	-	-	-	-	-	-	-	-
5-3, 48	451.48	MUN	-	6115	-	421	1317	70552	-	140	62	78	-	-	-	-	-	-	-	-	-	-	-
5-3, 55	451.55	BOG	-	6960	255	342	1240	75051	42	129	58	75	-	-	-	-	-	-	-	-	-	-	-
6-1, 16	457.66	RBPU	37	6594	-	-	1162	66495	-	-	-	-	3.460	3.57	63.000	2.830	1.100	-	0.490	-	-	4.44	0.410
6-1, 47	457.97	TM	-	-	225	365	-	-	46	150	63	-	-	-	-	-	-	-	-	-	-	-	-
6-1, 47	457.97	GSC	34	-	270	290	-	-	31	110	66	64	-	-	-	-	-	-	-	-	-	-	-
6-1, 53	458.03	GSC	37	-	340	330	-	-	24	120	120	64	-	-	-	-	-	-	-	-	-	-	-
6-1, 62	458.12	GSC	41	-	360	400	-	-	32	100	58	60	-	-	-	-	-	-	-	-	-	-	-
6-1, 75	458.25	GSC	39	-	360	340	-	-	36	110	59	76	-	-	-	-	-	-	-	-	-	-	-
6-1, 83	458.33	GSC	41	-	350	330	-	-	32	120	59	60	-	-	-	-	-	-	-	-	-	-	-
6-1, 89	458.39	GSC	38	-	350	380	-	-	32	120	59	63	-	-	-	-	-	-	-	-	-	-	-
6-1, 94	458.44	GSC	39	-	340	330	-	-	32	100	59	59	-	-	-	-	-	-	-	-	-	-	-
6-1, 99	458.49	GSC	34	-	340	340	-	-	29	100	55	59	-	-	-	-	-	-	-	-	-	-	-
6-1, 105	458.55	GSC	37	-	340	360	-	-	28	110	54	62	-	-	-	-	-	-	-	-	-	-	-
6-1, 112	458.62	GSC	36	-	360	330	-	-	38	120	52	53	-	-	-	-	-	-	-	-	-	-	-
6-1, 122	458.72	GSC	39	-	360	360	-	-	34	140	62	180	-	-	-	-	-	-	-	-	-	-	-
6-1, 129	458.79	GSC	37	-	360	310	-	-	36	120	61	62	-	-	-	-	-	-	-	-	-	-	-
6-2, 5	459.05	GSC	40	-	350	340	-	-	41	130	51	61	-	-	-	-	-	-	-	-	-	-	-
6-3, 108	461.58	GUNN	-	6894	-	-	1239	73391	-	145	-	-	-	-	-	-	-	-	-	-	-	-	-
6-5, 110	464.60	TM	-	-	300	340	-	-	35	83	50	-	-	-	-	-	-	-	-	-	-	-	-
6-5, 110	464.60	TM	-	-	155	70	-	-	<1	75	22	-	-	-	-	-	-	-	-	-	-	-	-
6-CC, 30	466.60	GUNN	-	6894	-	-	1317	74379	-	154	-	-	-	-	-	-	-	-	-	-	-	-	-
6-CC, 30	466.60	GUNN	-	6954	-	-	1394	74029	-	151	-	-	-	-	-	-	-	-	-	-	-	-	-
6-CC, 37	466.60	GUNN	-	6714	-	-	1317	72913	-	169	-	-	-	-	-	-	-	-	-	-	-	-	-
6-CC, 37	466.60	GUNN	-	6774	-	-	1317	73403	-	171	-	-	-	-	-	-	-	-	-	-	-	-	-
7-1, 8	467.08	RBPU	37	6474	-	-	1162	66235	-	-	-	-	2.870	8.19	47.000	2.650	1.070	-	0.700	-	-	2.29	0.390
7-1, 85	467.85	SGS	36	-	-	291	-	69322	41	-	-	-	2.600	7.10	9.600	3.800	1.000	-	0.800	-	0.66	3.00	0.420
7-2, 10	468.60	BOG	-	7200	255	345	1085	68476	47	152	63	77	-	-	-	-	-	-	-	-	-	-	-
7-2, 28	468.78	GUNN	-	6714	-	-	1084	75616	-	162	-	-	-	-	-	-	-	-	-	-	-	-	-
7-2, 28	468.78	GUNN	-	6774	-	-	1084	74846	-	163	-	-	-	-	-	-	-	-	-	-	-	-	-
7-2, 95	469.45	CML	-	7374	-	-	1239	76939	-	222	90	84	-	-	-	-	-	-	-	-	-	-	-
8-2, 24	478.24	SGS	37	-	-	305	-	66985	46	-	-	-	3.100	9.00	10.000	3.900	1.300	-	0.950	-	0.71	4.10	0.500
8-2, 71	478.71	RBPU	37	6594	-	-	1084	71099	-	-	-	-	3.170	6.62	50.000	2.140	1.040	-	0.950	-	-	3.79	0.420
8-2, 94	478.94	TM	41	6594	250	350	1317	68175	49	155	68	-	2.930	5.90	5.400	2.470	0.900	-	0.600	1.06	-	3.06	0.470
8-2, 94	478.94	SGS	38	-	-	311	-	73217	45	-	-	-	2.700	8.30	7.500	3.800	1.100	-	0.880	-	0.69	3.40	0.710
8-3, 61	480.11	CML	-	7014	-	-	1162	76240	-	183	81	85	-	-	-	-	-	-	-	-	-	-	-
8-3, 61	480.11	CML	-	7074	-	-	1162	74841	-	203	74	86	-	-	-	-	-	-	-	-	-	-	-
8-3, 61	480.11	CML	-	7314	-	-	1394	77639	-	197	87	86	-	-	-	-	-	-	-	-	-	-	-
8-3, 98	480.48	TM	40	6714	240	365	1317	65972	68	150	55	-	-	8.00	6.100	2.380	0.860	-	0.600	0.93	-	2.96	0.410
8-4, 20	481.20	TM	-	-	280	400	-	-	70	165	55	-	-	-	-	-	-	-	-	-	-	-	-
8-4, 20	481.20	SGS	38	-	-	300	-	69322	48	-	-	-	2.500	9.80	8.000	4.200	1.100	-	0.850	-	0.59	3.30	0.620
8-4, 27	481.27	GUNN	-	6894	-	-	1084	67101	-	202	-	-	-	-	-	-	-	-	-	-	-	-	-
8-4, 27	481.27	GUNN	-	6954	-	-	1162	67940	-	202	-	-	-	-	-	-	-	-	-	-	-	-	-
8-4, 40	481.40	GUNN	-	6774	-	-	1162	73092	-	183	-	-	-	-	-	-	-	-	-	-	-	-	-
8-4, 129	482.29	RBPU	37	6834	-	-	1317	72353	-	-	-	-	3.630	3.66	48.000	2.890	1.030	-	0.680	-	-	3.25	0.460
9-1, 26	486.26	BOG	-	7260	275	357	1395	73582	40	147	62	78	-	-	-	-	-	-	-	-	-	-	-
9-5, 15	492.15	GUNN	-	6295	-	-	1239	70225	-	169	-	-	-	-	-	-	-	-	-	-	-	-	-
9-5, 15	492.15	MUN	-	5575	-	454	1239	67783	-	154	62	76	-	-	-	-	-	-	-	-	-	-	-
9-5, 15	492.15	CML	-	6474	-	-	1317	73442	43	193	65	82	-	-	-	-	-	-	-	-	-	-	-
9-5, 94	492.94	GUNN	-	6594	-	-	1162	67367	-	161	-	-	-	-	-	-	-	-	-	-	-	-	-
9-5, 108	493.08	GUNN	-	6474	-	-	1239	70378	-	181	-	-	-	-	-	-	-	-	-	-	-	-	-
9-5, 108	493.08	GUNN	-	6594	-	-	1239	70238	-	182	-	-	-	-	-	-	-	-	-	-	-	-	-

10- 1,	145	496.95	GSC	39	-	300	320	-	-	32	520	66	65	-	-	-	-	-	-	-	-	-	-	-
10- 2,	17	497.17	GUNN	-	6654	-	-	1317	67502	-	153	-	-	-	-	-	-	-	-	-	-	-	-	-
10- 2,	17	497.17	GUNN	-	6654	-	-	1317	68341	-	155	-	-	-	-	-	-	-	-	-	-	-	-	-
10- 2,	37	497.37	GUNN	-	6414	-	-	1317	69603	-	161	-	-	-	-	-	-	-	-	-	-	-	-	-
10- 3,	100	499.50	TM	-	-	270	365	-	-	65	150	65	-	-	-	-	-	-	-	-	-	-	-	-
10- 3,	100	499.50	SGS	37	-	-	316	-	66985	41	-	-	-	2.900	6.80	6.600	3.300	1.000	-	0.810	-	0.54	3.10	0.370
10- 6,	4	503.04	TM	-	-	215	350	-	-	80	150	60	-	-	-	-	-	-	-	-	-	-	-	-
10- 6,	4	503.04	SGS	37	-	-	306	-	69322	43	-	-	-	2.800	9.90	-	3.500	1.300	-	0.870	-	-	3.20	0.430
10- 6,	28	503.28	CML	-	6894	-	-	1084	69945	-	191	81	75	-	-	-	-	-	-	-	-	-	-	-
11- 1,	3	505.03	GUNN	-	6295	-	-	1239	69326	-	173	-	-	-	-	-	-	-	-	-	-	-	-	-
11- 1,	3	505.03	GUNN	-	6354	-	-	1239	69956	-	175	-	-	-	-	-	-	-	-	-	-	-	-	-
11- 1,	13	505.13	BOG	-	6240	220	305	1317	66098	36	143	54	57	-	-	-	-	-	-	-	-	-	-	-
11- 1,	62	505.62	TM	-	-	255	500	-	-	70	155	60	-	-	-	-	-	-	-	-	-	-	-	-
12- 2,	139	517.39	TM	-	-	250	400	-	-	70	150	50	-	-	-	-	-	-	-	-	-	-	-	-
12- 3,	138	518.88	GUNN	-	6354	-	-	1162	68421	-	153	-	-	-	-	-	-	-	-	-	-	-	-	-
12- 3,	138	518.88	GUNN	-	6235	-	-	1162	68491	-	154	-	-	-	-	-	-	-	-	-	-	-	-	-
13- 3,	21	527.21	GUNN	-	6654	-	-	1317	71414	-	156	-	-	-	-	-	-	-	-	-	-	-	-	-
13- 3,	21	527.21	MUN	-	5755	-	441	1317	67419	-	135	63	74	-	-	-	-	-	-	-	-	-	-	-
13- 3,	24	527.24	BOG	-	6960	2752335		1317	71693	48	142	62	70	-	-	-	-	-	-	-	-	-	-	-
14- 3,	123	537.73	GUNN	-	6714	-	-	1239	74841	-	146	-	-	-	-	-	-	-	-	-	-	-	-	-
14- 3,	123	537.73	GUNN	-	6774	-	-	1239	75401	-	145	-	-	-	-	-	-	-	-	-	-	-	-	-
14- 3,	131	537.81	GUNN	-	6474	-	-	1162	70664	-	164	-	-	-	-	-	-	-	-	-	-	-	-	-
14- 4,	130	539.30	RBPU	36	6175	-	-	1162	70389	-	-	-	-	2.980	3.46	64.000	2.540	0.850	-	0.940	-	-	3.69	0.370
14- 4,	130	539.30	ON	-	-	-	-	-	-	-	-	-	-	-	6.52	6.220	2.370	0.910	3.570	-	-	-	2.87	-
16- 1,	22	552.72	BOG	-	6780	275	392	1317	72393	44	199	59	76	-	-	-	-	-	-	-	-	-	-	-
16- 1,	31	552.81	GSC	35	-	320	350	-	-	32	120	60	48	-	-	-	-	-	-	-	-	-	-	-

TABLE 2D
Trace Elements in Basalts at Site 335

Sample[a]	Depth (m)	Inv.	B	Li	Rb	Sr	Cs	Ba	Tl	Th	U	Y
5- 3, 48- 50	451.49	AUM	-	-	-	-	-	-	-	-	0.072	-
5- 3, 48- 50	451.49	GUNN	-	-	7.00	97.0	-	94	-	-	-	-
5- 3, 48- 50	451.49	MUNC	-	-	8.00	89.0	-	115	-	-	-	-
5- 3, 55- 57	451.56	AUM	-	-	-	-	-	-	-	-	0.080	-
6- 1, 16- 18	457.67	PU	-	-	-	-	3	-	-	1.12	0.830	-
6- 1, 47- 49	457.98	GSC	5	5	15	120	0	84	-	-	-	24
6- 1, 47- 49	457.98	TM	25	10.0	-	88.0	-	55	-	-	-	33.0
6- 1, 53- 55	458.04	GSC	5	15	4	100	0.4	26	-	-	-	24
6- 1, 62- 64	458.13	GSC	5	26	12	90	0.08	28	-	-	-	28
6- 1, 75- 77	458.26	GSC	5	6	5	98	0.3	28	-	-	-	30
6- 1, 83- 85	458.34	GSC	5	33	6	110	0.4	32	-	-	-	30
6- 1, 89- 91	458.40	GSC	5	11	11	100	0.8	30	-	-	-	31
6- 1, 94- 96	458.45	GSC	5	12	7	90	0.3	28	-	-	-	27
6- 1, 99-101	458.50	GSC	5	18	14	100	0.8	37	-	-	-	30
6- 1, 105-107	458.56	GSC	5	30	10	150	0.4	33	-	-	-	29
6- 1, 112-114	458.63	GSC	5	14	11	94	0.5	33	-	-	-	28
6- 1, 122-124	458.73	GSC	5	24	8	130	0.5	36	-	-	-	28
6- 1, 129-131	458.80	GSC	5	4	7	87	0.3	28	-	-	-	28
6- 2, 5- 7	459.06	GSC	5	3	4	88	0.2	23	-	-	-	26
6- 3, 108-110	461.59	AUM	-	-	-	-	-	-	-	-	0.080	-
6- 3, 108-110	461.59	GUNN	-	-	7.00	97.0	-	72	-	-	-	-
6- 4, 22- 24	462.23	ZAK	-	22.5	7.50	-	-	-	-	-	-	-
6- 5, 110-112	464.61	TM	42	8.0	-	62.0	-	25	-	-	-	46.0
6- 5, 110-112	464.61	TM	28	14.0	-	1100.0	-	150	-	-	-	40.0
6-CC, 30- 32	466.60	AUM	-	-	-	-	-	-	-	-	0.062	-
6-CC, 30- 32	466.60	GUNN	-	-	4.00	88.0	-	79	-	-	-	-
6-CC, 30- 32	466.60	GUNN	-	-	3.00	88.0	-	78	-	-	-	-
6-CC, 37- 39	466.60	GUNN	-	-	5.00	85.0	-	69	-	-	-	-
6-CC, 37- 39	466.60	AUM	-	-	-	-	-	-	-	-	0.100	-
6-CC, 37- 39	466.60	GUNN	-	-	5.00	88.0	-	72	-	-	-	-
7- 1, 8- 10	467.09	PU	-	-	-	-	2	-	-	1.19	1.260	-
7- 2, 10- 12	468.61	AUM	-	-	-	-	-	-	-	-	0.081	-
7- 2, 28- 30	468.79	AUM	-	-	-	-	-	-	-	-	0.120	-
7- 2, 28- 30	468.79	GUNN	-	-	9.00	106.0	-	66	-	-	-	-
7- 2, 28- 30	468.79	GUNN	-	-	10.00	106.0	-	68	-	-	-	-
7- 2, 95- 97	469.46	CML	-	-	6.95	102.7	-	-	-	0.50	0.094	34.0
8- 2, 71- 75	478.73	PU	-	-	-	-	2	-	-	1.11	1.170	-
8- 2, 94- 96	478.95	TM	15	31.0	-	73.0	-	25	-	-	-	35.0
8- 3, 61- 63	480.12	CML	-	-	10.00	99.0	-	-	-	<1.00	0.130	31.0
8- 3, 61- 63	480.12	CML	-	-	9.00	94.0	-	-	-	<1.00	0.089	31.0
8- 3, 61- 63	480.12	CML	-	-	12.00	105.0	-	-	-	-	-	32.0
8- 3, 98-101	480.50	TM	<1	9.0	-	70.0	-	42	-	-	-	38.0
8- 4, 20- 21	481.21	TM	17	29.0	-	65.0	-	32	-	-	-	32.0
8- 4, 27- 29	481.28	AUM	-	-	-	-	-	-	-	-	0.140	-
8- 4, 27- 29	481.28	GUNN	-	-	1.00	92.0	-	71	-	-	-	-
8- 4, 27- 29	481.28	GUNN	-	-	2.00	93.0	-	81	-	-	-	-
8- 4, 40- 42	481.41	GUNN	-	-	3.00	85.0	-	63	-	-	-	-
8- 4, 129-136	482.33	PU	-	-	-	-	3	-	-	1.23	1.320	-
9- 1, 26- 28	486.27	AUM	-	-	-	-	-	-	-	-	0.077	-
9- 5, 15- 17	492.16	AUM	-	-	-	-	-	-	-	-	0.080	-
9- 5, 15- 17	492.16	CML	-	-	7.00	100.0	-	45	-	-	-	30.0

TABLE 2D – *Continued*

Zr	Hf	Nb	Ta	Pd	Ir	Pt	Au	Cd	Pb	Sb	F	P	Ga	Sn	Ag	Ge	Yb
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.53	-	0.67	-	-	-	-	49	-	0.48	-	-	-	-	-	-	-
80	-	-	-	-	-	-	-	-	2.2	-	-	-	12	1.2	0.025	0.92	2
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	0.25	-	-	-	11	0.97	0.025	0.35	2
90	-	-	-	-	-	-	-	-	0.25	-	-	-	10	0.68	0.025	0.71	2
88	-	-	-	-	-	-	-	-	0.25	-	-	-	10	1.1	0.025	0.35	2
95	-	-	-	-	-	-	-	-	0.25	-	-	-	12	1.1	0.025	0.35	2
90	-	-	-	-	-	-	-	-	0.25	-	-	-	10	0.76	0.025	0.35	2
90	-	-	-	-	-	-	-	-	0.25	-	-	-	13	1.0	0.025	0.90	2
92	-	-	-	-	-	-	-	-	1.5	-	-	-	11	1.0	0.025	0.83	2
80	-	-	-	-	-	-	-	-	0.25	-	-	-	13	0.58	0.025	0.35	2
86	-	-	-	-	-	-	-	-	0.25	-	-	-	11	0.51	0.025	0.35	2
97	-	-	-	-	-	-	-	-	1.6	-	-	-	12	0.58	0.140	0.35	2
92	-	-	-	-	-	-	-	-	0.25	-	-	-	13	0.63	0.025	0.35	2
92	-	-	-	-	-	-	-	-	0.25	-	-	-	12	0.60	0.025	0.35	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	0.028	-	-	-	-	-	-
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.70	-	0.73	-	-	-	-	44	-	0.71	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.57	-	0.65	-	-	-	-	44	-	0.56	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.48	-	1.00	-	-	-	-	42	-	0.70	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2D – *Continued*

Sample[a]	Depth (m)	Inv.	B	Li	Rb	Sr	Cs	Ba	Tl	Th	U	Y
9- 5, 15- 17	492.16	GUNN	-	-	5.00	89.0	-	75	-	-	-	-
9- 5, 15- 17	492.16	MUN	-	-	8.00	85.0	-	82	-	-	-	-
9- 5, 94- 96	492.95	AUM	-	-	-	-	-	-	-	-	0.110	-
9- 5, 94- 96	492.95	GUNN	-	-	6.00	86.0	-	79	-	-	-	-
9- 5, 108-110	493.09	AUM	-	-	-	-	-	-	-	-	0.140	-
9- 5, 108-110	493.09	GUNN	-	-	5.00	99.0	-	64	-	-	-	-
9- 5, 108-110	493.09	GUNN	-	-	4.00	100.0	-	70	-	-	-	-
10- 1, 42- 44	495.93	ZAK	-	19.4	11.50	-	-	-	-	-	-	-
10- 1, 145-147	496.96	GSC	5	5	6	97	0.2	47	-	-	-	23
10- 2, 17- 19	497.18	AUM	-	-	-	-	-	-	-	-	0.091	-
10- 2, 17- 19	497.18	GUNN	-	-	5.00	90.0	-	48	-	-	-	-
10- 2, 17- 19	497.18	GUNN	-	-	5.00	89.0	-	67	-	-	-	-
10- 2, 37- 39	497.38	GUNN	-	-	6.00	115.0	-	70	-	-	-	-
10- 3, 100-102	499.51	TM	28	19.0	-	70.0	-	16	-	-	-	35.0
10- 6, 4- 6	503.05	TM	18	30.0	-	75.0	-	12	-	-	-	31.0
10- 6, 28- 30	503.29	CML	-	-	3.38	95.3	-	-	-	0.70	0.075	31.0
11- 1, 3- 5	505.04	GUNN	-	-	6.00	99.0	-	72	-	-	-	-
11- 1, 3- 5	505.04	GUNN	-	-	5.00	99.0	-	77	-	-	-	-
11- 1, 13- 15	505.14	AUM	-	-	-	-	-	-	-	-	0.140	-
11- 1, 13- 15	505.14	AUM	-	-	-	-	-	-	-	-	0.095	-
11- 1, 62- 64	505.63	TM	25	34.0	-	70.0	-	32	-	-	-	35.0
12- 2, 139-141	517.40	TM	30	40.0	-	60.0	-	10	-	-	-	30.0
12- 3, 138-140	518.89	AUM	-	-	-	-	-	-	-	-	0.071	-
12- 3, 138-140	518.89	GUNN	-	-	1.00	143.0	-	100	-	-	-	-
12- 3, 138-140	518.89	GUNN	-	-	5.00	148.0	-	93	-	-	-	-
12- 3, 146-148	518.97	AUM	-	-	-	-	-	-	-	-	0.059	-
12- 3, 146-148	518.97	GUNN	-	-	5.00	90.0	-	66	-	-	-	-
13- 3, 21- 23	527.22	AUM	-	-	-	-	-	-	-	-	0.130	-
13- 3, 21- 23	527.22	GUNN	-	-	5.00	98.0	-	50	-	-	-	-
13- 3, 21- 23	527.22	MUN	-	-	5.00	82.0	-	62	-	-	-	-
13- 3, 24- 26	527.25	AUM	-	-	-	-	-	-	-	-	0.160	-
14- 3, 123-125	537.74	AUM	-	-	-	-	-	-	-	-	0.120	-
14- 3, 123-125	537.74	GUNN	-	-	5.00	96.0	-	50	-	-	-	-
14- 3, 123-125	537.74	GUNN	-	-	5.00	97.0	-	49	-	-	-	-
14- 3, 131-133	537.82	AUM	-	-	-	-	-	-	-	-	0.057	-
14- 3, 131-133	537.82	GUNN	-	-	5.00	86.0	-	83	-	-	-	-
14- 4, 130-143	539.37	PU	-	-	-	-	3	-	-	1.13	1.220	-
14- 4, 130-143	539.37	ZAK	-	8.5	10.50	-	-	-	-	-	-	-
16- 1, 22- 24	552.73	AUM	-	-	-	-	-	-	-	-	0.067	-
16- 1, 31- 37	552.84	GSC	5	28	6	99	0.3	37	-	-	-	23

Note: The analysts codes are as follows: AU – F. Aumento, Dalhousie University (Chapter 51, this volume); SG – H. Sigurdsson, University of Rhode Island (Chapter 71, this volume); TM – G. Thompson, Woods Hole Oceanographic Institution (Chapter 53, this volume); RB – P. Robinson, University of California, Riverside (Chapters 51 and 61, this volume); GUNN – B. Gunn, University of Montreal (Chapter 58, this volume); AUF – F. Aumento and M. Fratta, Dalhousie University; MUN – Memorial University of Newfoundland (see Chapter 56, this volume); AUM – F. Aumento and W. Mitchell, Dalhousie University (Chapter 31, this volume); S by A. J. Naldrett, University of Toronto (Chapter 32, this volume); BOG – H. Bougault, Centre Oceanologique de Bretagne (Chapters 30 and 50, this volume); GSC – Geological Survey of Canada (see Chapter 63, this volume); ZAK – G. Zakariadze, Georgian Academy of Sciences; SGS – J. Schilling, University

TABLE 2D – *Continued*

Zr	Hf	Nb	Ta	Pd	Ir	Pt	Au	Cd	Pb	Sb	F	P	Ga	Sn	Ag	Ge	Yb
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	0.018	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	0.25	-	-	-	15	0.81	0.025	0.35	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	1.01	-	0.98	-	-	-	-	45	-	0.67	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	0.016	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	-	-	-	-	-	-	-	-	0.25	-	-	-	10	0.25	0.025	0.35	2

of Rhode Island (Chapters 38 and 71, this volume); CML – R. Lambert, University of Alberta (Chapter 34, this volume); RBPU – P. Robinson, University of California, Riverside (transition elements) and H. Puchelt, Universität Karlsruhe (REE) (Chapters 51 and 37, respectively); ON – R. O'Nions, University of Oxford (Chapter 39, this volume); PU – H. Puchelt, Universität Karlsruhe (Chapter 37, this volume). The methods codes are as follows: TRACK – fission track; XRF – X-ray fluorescence; AAS – atomic absorption; XRFAA – X-ray fluorescence and atomic absorption; WET – classical wet chemical techniques; NCL – neoclassical techniques; PROBE – electron microprobe; MISC – miscellaneous techniques; NAA – neutron activation analysis; CLASS – classical wet chemical techniques; XRFFP – X-ray fluorescence and flame photometry; – – not detected.

Site 335 Hole Core 1 Cored Interval: 87.0-96.5 m

AGE: LATE PLIOCENE

ZONE: NN18; N21 (F); NN17

FOSSIL CHARACTER (FOSSIL / ABUND. / PRES.):

SECTION	FOSSIL	ABUND.	PRES.
1	F	A	G
2	F	A	G
3	F	A	G
4	F	A	G
Core Catcher	F	A	G
Core Catcher	N	A	G
Core Catcher	R	C	G

METERS: 0.5, 1.0

LITHOLOGY: VOID; REMOVED

LITHO. SAMPLE: 35, 70 (Section 1); 61, 75 (Section 2); 42, 48, 58, 80, 126 (Section 3); 75, 105 (Section 4)

LITHOLOGIC DESCRIPTION

Stiff white (N9) to light gray (N8) to yellowish gray (5Y 8/1) calcareous ooze with occasional thin purple (5P 4/2) layers. 2.5 cm long pyrite nodule coated with forams at 2-54.

N8 to N9

1. FORAM BEARING NANNO OOZE
Avg. of smear slides 1-35, 1-70, 2-61, 2-75, 4-75, 4-105

Nannos	96%
Forams	3%
Rads	TR
Sponge Spicules	TR
Pyrite	TR

N9 to 5Y 8/1

2. NANNO FORAM OOZE
Avg. of smear slides 3-48, 3-80

Forams	56%
Nannos	43%
Pyrite	TR
Rads	TR

N9 to N8
5Y 8/1 layer at 3-45
N9 layer at 3-46
N6 layer at 3-48
N8
layers of N7, N8, 5Y 8/1

5Y 8/1

N8

Grain Size

	2-80	3-80	4-80
sand	10.2	57.7	9.2
silt	18.2	15.9	15.2
clay	71.7	26.4	75.5

N8 and 5Y 8/1 layers

Carbon-Carbonate 3-72
11.2, 0.1, 93

X-ray (Bulk) 2-83
Amor 16.2, Calc 97.5, Quar 1.3, Mica 1.2

N8

X-ray (2-20μm)

	2-83	3-83	4-83
Amor	60.4	N.D.	N.D.
Quar	24.4	16.2	13.6
K-Fe	8.9	23.3	26.7
Plag	10.9	16.8	21.7
Kaol	3.7	3.1	1.1
Mica	16.7	20.0	12.5
Chlo	1.8	1.3	2.1
Mont	33.5	18.8	20.2
Anal	-	0.5	0.6
Pyri	-	-	0.9
Augi	-	-	0.7
Cris	-	TR	PRES

Explanatory Notes in Chapter 1

Site 335 Hole Core 2 Cored Interval: 125.0-134.5 m

AGE: LATE PLIOCENE; ?; EARLY PLIOCENE

ZONE: N20 (F); ?; N19 (F); NN15

FOSSIL CHARACTER (FOSSIL / ABUND. / PRES.):

SECTION	FOSSIL	ABUND.	PRES.
1	F	A	G
2	F	A	G
3	F	A	G
4	F	A	G
5	F	A	G
Core Catcher	F	A	G
Core Catcher	N	A	G
Core Catcher	R	—	—

METERS: 0.5, 1.0

LITHOLOGY: VOID; VOID; REMOVED

LITHO. SAMPLE: 130 (Section 1); 75, 130 (Section 2); 75 (Section 3); 75 (Section 4); 75 (Section 5)

LITHOLOGIC DESCRIPTION

Stiff light gray (N8) to white (N9) nanno ooze with occasional pale purple (5P 7/2) layers especially in Section 5. Purple layers mostly thin (0.5 cm) except for 10 cm thick layer in Section 2.

N8 with N6 layers

FORAM BEARING NANNO OOZE
Avg. of smear slides 1-130, 2-75, 2-130, 3-75, 4-75, 5-75

Nannos	95%
Forams	4%
Sponge Spicules	TR
Rads	TR
Pyrite	TR

N8 to N9

Grain Size

	2-80	3-80	4-80	5-80
sand	6.2	6.6	7.2	6.9
silt	25.2	22.8	30.6	25.1
clay	68.6	70.6	62.2	67.9

5P 7/2 layer
N8

Carbon-Carbonate 2-72
11.5, 0.1, 96

N8 to N7

X-ray (Bulk) 2-83
Amor 9.0, Calc 100.0

X-ray (2-20μm)

	2-83	3-83	4-83	5-83
Amor	N.D.	N.D.	N.D.	N.D.
Quar	18.2	15.6	13.9	17.7
K-Fe	19.7	19.2	11.4	18.3
Plag	18.0	19.1	19.1	40.3
Kaol	1.9	1.4	-	4.1
Mica	17.2	20.5	7.5	17.3
Chlo	2.0	1.3	-	2.2
Mont	23.0	18.9	12.8	-
Phil	-	-	34.2	-
Augi	-	3.9	0.2	-
Cris	-	TR	-	-

N9

N9

N9

Explanatory Notes in Chapter 1

Site 335 Hole Core 3 Cored Interval: 220.0-229.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE		LITHOLOGIC DESCRIPTION
					0						
EARLY PLIOCENE	N19 (F); NN13 ? NN14	F	A	G	1	0.5, 1.0	REMOVED		75, 90	N9	Stiff white (N9) ooze with 0.5 cm thick purple (5P 4/2) layer at 56 cm. Purple spot at 1-70 is possible filled burrow. Pyrite bearing purple streak at 75 cm.
		F N R	A A —	G G —	Core Catcher					N9	

FORAM BEARING NANNO OOZE
Smear slide at 90 cm

Nannos	94%
Forams	5%
Rads	TR

Grain Size

	1-80
sand	6.1
clay	20.2
silt	73.7

Carbon-Carbonate 1-72
11.5, 0.1, 95

X-ray (Bulk) 1-83
Amor 7.1, Calc 100.0

X-ray (2-20μm)

	1-83
Amor	N.D.
Quar	18.6
K-Fe	12.8
Plag	24.8
Mica	26.6
Phil	16.8
Pyri	0.5

Site 335 Hole Core 4 Cored Interval: 315.0-324.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE		LITHOLOGIC DESCRIPTION
					0						
LATE MIOCENE	N16/17 (F); NN11	F	A	G	1	0.5, 1.0	VOID	△	140	N9	
		F	A	G	2		VOID		60, 122	N9, N8, N9, 5P 7/2 layer (2-120 to 2-124), N9	
		F	A	G	3		REMOVED	|	43, 102	N9, 5G 7/1 layer (3-96 to 3-111), N9	
		F N R	A A —	G G —	Core Catcher					N9	

Stiff to very stiff chiefly white (N9) nanno ooze with slight purple spot mottling above 2-40. Purple (5P 7/2) layer from 2-120 to 2-124. Black pyritic patch at 3-43.

FORAM BEARING NANNO OOZE
Avg. of smear slides 1-140, 2-60, 2-122, 3-102

Nannos	94%
Forams	5%
Sponge Spicules	TR
Pyrite	TR

Grain Size

	2-80	3-80
sand	8.0	4.8
silt	34.4	30.6
clay	57.6	64.6

Carbon-Carbonate 2-72
11.6, 0.1, 96

X-ray (Bulk) 2-82
Amor 10.0, Calc 100.0

X-ray (2-20μm)

	2-82	3-83
Amor	N.D.	N.D.
Quar	6.5	12.1
K-Fe	-	10.2
Plag	14.0	12.5
Mica	71.4	55.5
Phil	3.7	8.9
Pyri	2.4	0.8
Augi	1.9	-

Explanatory Notes in Chapter 1

Site 335 Hole Core 5 Cored Interval: 448.0-457.5 m Sheet 1 of 2

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE		LITHOLOGIC DESCRIPTION
					0						
LATE MIOCENE	N14; NN7?	F N R	A A	M G	1	0.5, 1.0		△	70	N9	Very stiff (above 110 cm) white (N9) nanno ooze with slight greenish gray cast. Possible lighter colored burrows from 1-17 to 1-75.

FORAM BEARING NANNO OOZE
Smear slide at 90 cm

Nannos	97%
Forams	2%
Rads	TR
Pyrite	TR
Vol. Glass	TR

Site 335 Hole Core 5 Cored Interval: 448.0-457.5 m Sheet 2 of 2

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	LITHOLOGY	SAMPLES	D g/cc	V km/sec	POROSITY	LITHOLOGIC DESCRIPTION
								0							
								1	0.5, 1.0						
58.2	rR	15.0	10.95	8.5	0.37	0.89	0.13	2			B, A	2.866	6.22		

(CHEMICAL CHARACTER: Al_2O_3, Fe_2O_3, MgO, K_2O, H_2O+, CO_2)

Original basalt recovery was 1.6 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

Section 1 is FORAM-BEARING NANNO OOZE, described above.

SPARSELY PHYRIC BASALT
T. S. 3-55
Phenocrysts between 1 and 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite (10 to 20%). Vesicles with smectite and carbonate, also empty.

Explanatory Notes in Chapter 1

Site 335 Hole Core 6 Cored Interval: 457.5-467.0 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	SAMPLES	D g/cc	V km/sec	POROSITY
								0					
								1	0.5, 1.0	B	2.822	5.94	
								2					
								3		B	2.800	5.87	
								3		T CH			
61.1	rR							3		A			
								4					
								5		B sed.	2.519	5.33	
								6		B	2.789	5.90	
51.1	R							Core Catcher		A			

LITHOLOGY

LITHOLOGIC DESCRIPTION

Original basalt recovery was 7.27 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

SPARSELY TO MODERATELY PHYRIC BASALT
T. S. 3-76, 3-108, CC-37
Phenocrysts between 1 and 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and zeolite, also empty.

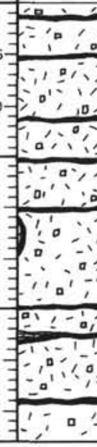
Grayish orange (10YR 7/4) foram limestone interbeds and veins.

Explanatory Notes in Chapter 1

Site 335 Hole Core 7 Cored Interval: 467.0-476.5 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	SAMPLES	D g/cc	V km/sec	POROSITY
								0					
								1	0.5, 1.0				
49.1	rR	16.0	10.15	8.0	0.23	1.52	0.42	1		A, B	2.879	6.35	
								2					
								3					

LITHOLOGY



LITHOLOGIC DESCRIPTION

Original basalt recovery was 3.3 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

SPARSELY TO MODERATELY PHYRIC BASALT
T. S. 2-10
Phenocrysts between 1 and 5%, mostly plagioclase; olivine to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Grayish orange (10YR 7/4) foram limestone interbeds and veins.

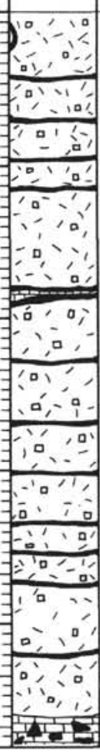
Explanatory Notes in Chapter 1

Site 335 Hole Core 8 Cored Interval: 476.5-486.0 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	SAMPLES	D g/cc	V km/sec	POROSITY
								0				
								1	B	2.869	6.06	
								2				
								3	B	2.762	5.69	
106.8	rR							4	A			
								5				

METERS: 0.5, 1.0

LITHOLOGY



LITHOLOGIC DESCRIPTION

Original basalt recovery was 4.45 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

APHYRIC TO SPARSELY PHYRIC BASALT
No T. S.
Phenocrysts between 1 and 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Grayish orange (10YR 7/4) foram limestone interbeds and veins.

Breccia consists of sideromelane, with palagonitized surfaces and fractures, in a limestone matrix.

Explanatory Notes in Chapter 1

Site 335 Hole Core 9 Cored Interval: 486.0-495.5 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	SAMPLES	D g/cc	V km/sec	POROSITY
								0				
10.8	R	16.45	10.90	7.70	0.24	1.30	0.24	1	B A	2.878	6.29	
								2				
								3				
								4				
28.6	rR							5	A B	2.815	5.88	

METERS: 0.5, 1.0

LITHOLOGY

LITHOLOGIC DESCRIPTION

Original basalt recovery was 5.2 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

SPARSELY PHYRIC BASALT
T. S. 1-26, 5-94
Phenocrysts between 1 and 5%, mostly plagioclase; olivine to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Grayish orange (10YR 7/4) foram limestone interbeds and veins. Breccia consists of sideromelane, with palagonitized surfaces and fractures, in a limestone matrix. Many of the sideromelane fragments are spall chips, only slightly displaced from original site.

Explanatory Notes in Chapter 1

Site 355 Hole Core 10 Cored Interval: 495.5-505.0 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	SAMPLES	D g/cc	V km/sec	POROSITY
								0					
								1	0.5, 1.0				
30.5	rR							2		A			
41.7	rR							3					
								4					
								5		B	2.767	5.60	

LITHOLOGIC DESCRIPTION

Original basalt recovery was 5.6 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

SPARSELY TO MODERATELY PHYRIC BASALT
T. S. 2-37
Phenocrysts between 1 and 5%, mostly plagioclase; olivine to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Breccia consists of sideromelane, with palagonitized surfaces and fractures, in a grayish orange (10YR 7/4) foram limestone matrix. Many of the sideromelane fragments are spall chips, only slightly displaced from original site.

Explanatory Notes in Chapter 1

Site 335 Hole Core 11 Cored Interval: 505.0-514.5 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	SAMPLES	D g/cc	V km/sec	POROSITY
								0					
57.0	rR	15.7	10.04	7.5	0.40	1.15	3.33	1	0.5, 1.0	A			
										B	2.851	6.00	
								2					

LITHOLOGIC DESCRIPTION

Original basalt recovery was 2.2 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

MODERATELY PHYRIC BASALT
T. S. 1-13
Phenocrysts are about 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Site 335 Hole Core 12 Cored Interval: 514.5-524.0 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	SAMPLES	D g/cc	V km/sec	POROSITY
								0					
								1	0.5, 1.0				
								2					
40.7	rR							3		B, A	2.781	5.97	

LITHOLOGIC DESCRIPTION

Original basalt recovery was 3.1 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

MODERATELY PHYRIC BASALT
T. S. 3-146
Phenocrysts are about 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Explanatory Notes in Chapter 1

Site 335 Hole Core 13 Cored Interval: 524.0-533.5 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	LITHOLOGY	SAMPLES	D g/cc	V km/sec	POROSITY
								0						
								1	0.5, 1.0					
15.8	rR							2						
30.2	rR	16.60	10.82	6.70	0.35	2.18	1.63	3			A			

LITHOLOGIC DESCRIPTION

Original basalt recovery was 3.1 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

SPARSELY TO MODERATELY PHYRIC BASALT
T. S. 3-24
Phenocrysts between 1 and 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Explanatory Notes in Chapter 1

Site 335 Hole Core 14 Cored Interval: 533.5-543.0 m

NRM INTENSITY	POLARITY	Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	LITHOLOGY	SAMPLES	D g/cc	V km/sec	POROSITY
								0						
								1	0.5, 1.0					
								2			B	2.799	6.00	
								3			A			
48.7	rR							4			B	2.725	5.77	

LITHOLOGIC DESCRIPTION

Original basalt recovery was 3.7 m. Styrofoam spacers make the amount shown here greater than the amount recovered.

APHYRIC TO MODERATELY PHYRIC BASALT
T. S. 3-131
Phenocrysts up to 5%, mostly plagioclase; olivine up to 3%; green augite very rare. Groundmass glassy to variolitic; there are more glassy rinds than have been plotted. Framework of skeletal plagioclase and olivine with mesostasis of branching plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

Explanatory Notes in Chapter 1

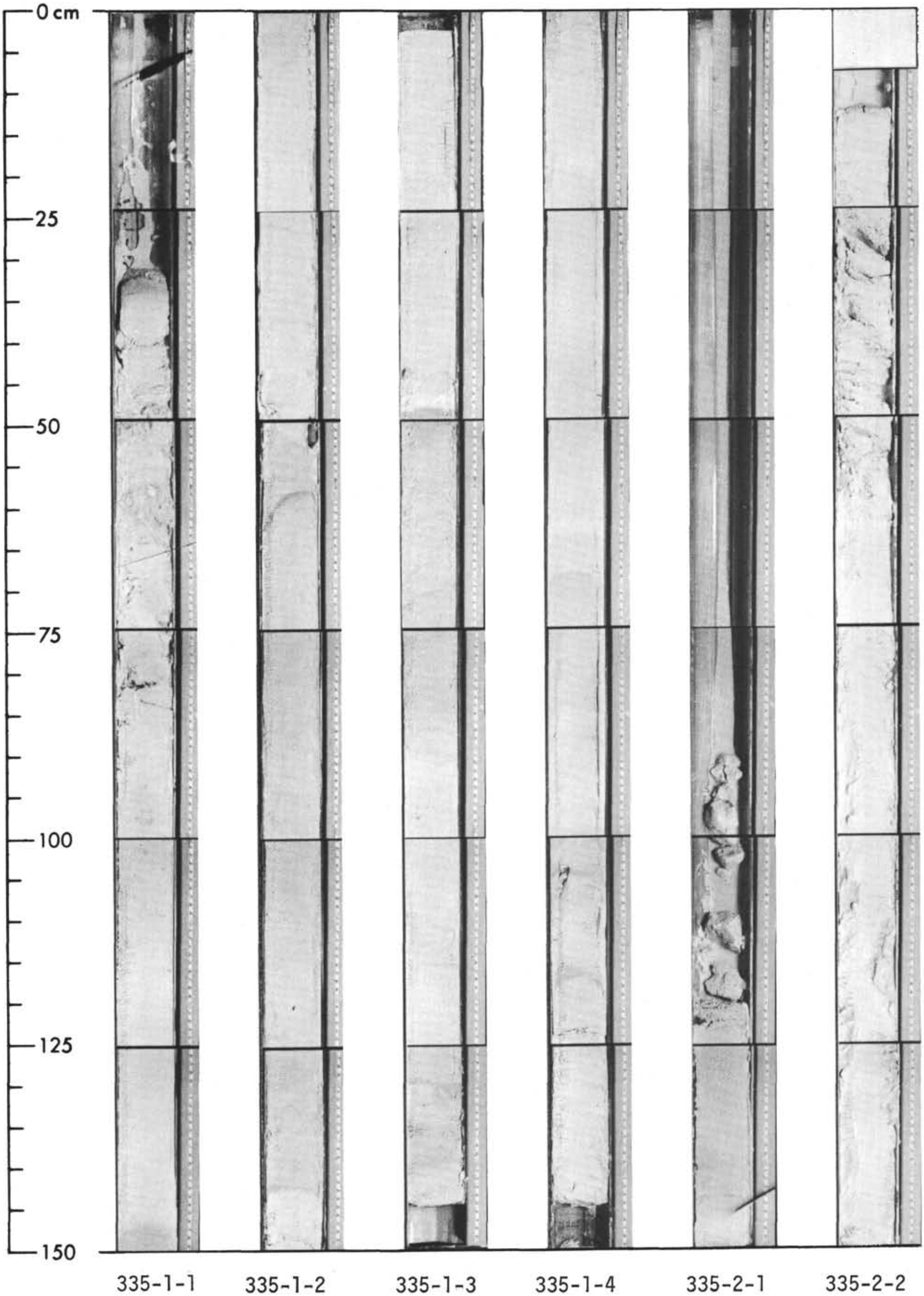
Site 335 Hole Core 15 Cored Interval: 543.0-552.5 m

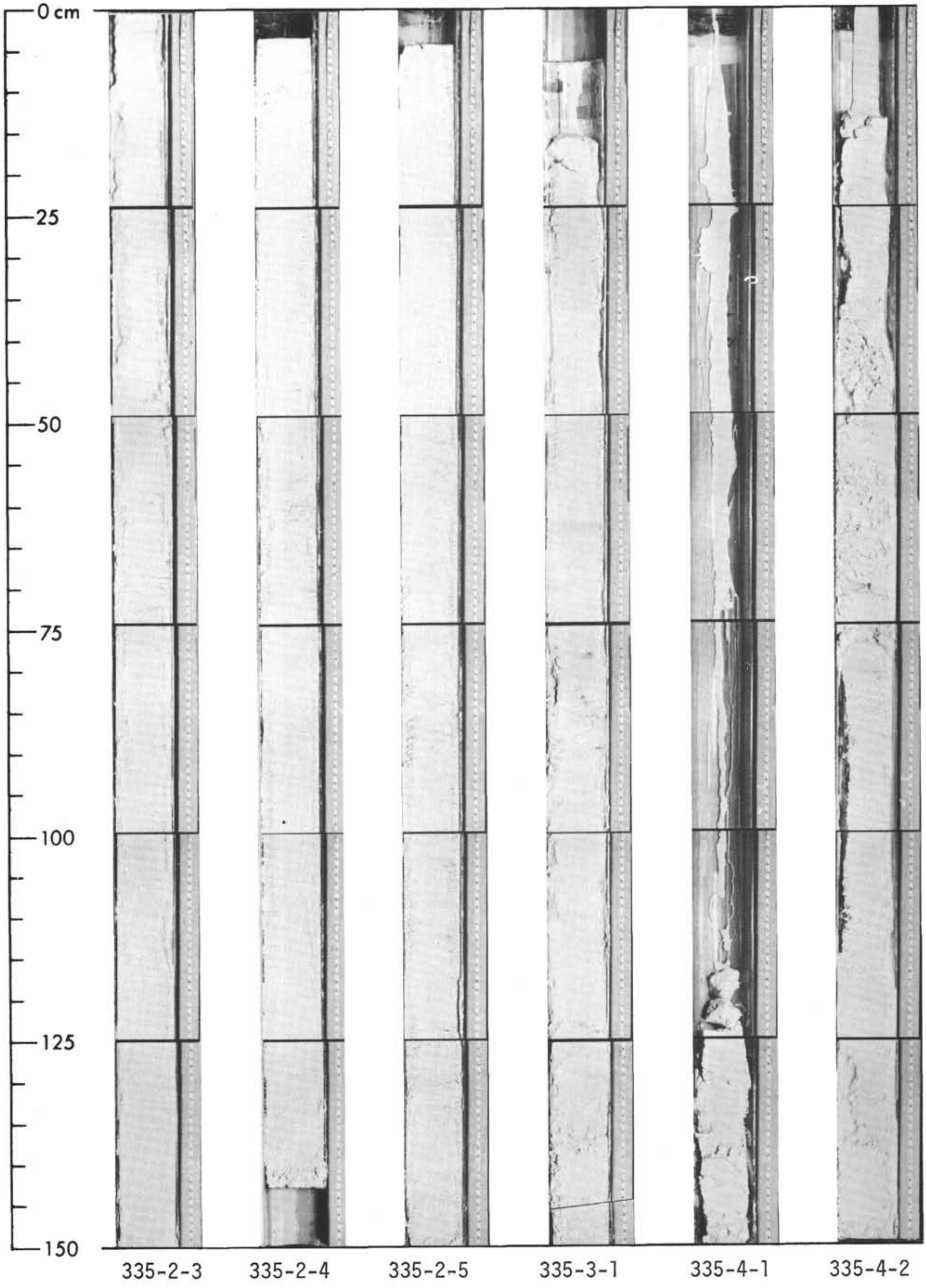
NRM INTENSITY	POLARITY	CHEMICAL CHARACTER Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	LITHOLOGY	SAMPLES	D g/cc	V km/sec	POROSITY	LITHOLOGIC DESCRIPTION
								0							Original basalt recovery was 0.1 m. Styrofoam spacers make the amount shown here greater than the amount recovered. SPARSELY PHYRIC BASALT Phenocrysts about 3%, mostly plagioclase, olivine about 1%; green augite very rare. Texture probably variolitic; vesicles with carbonate and smectite.

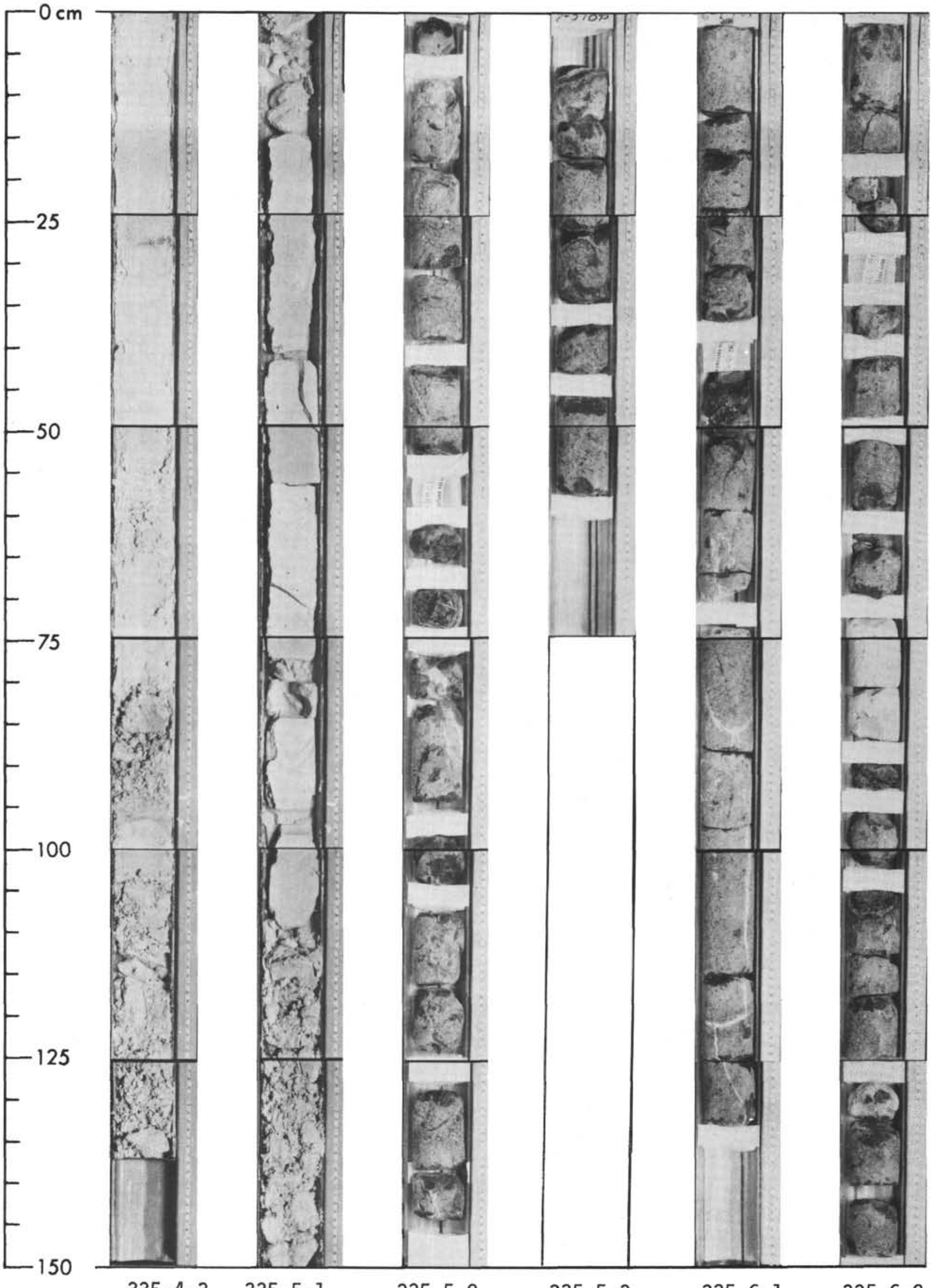
Site 335 Hole Core 16 Cored Interval: 552.5-562.0 m

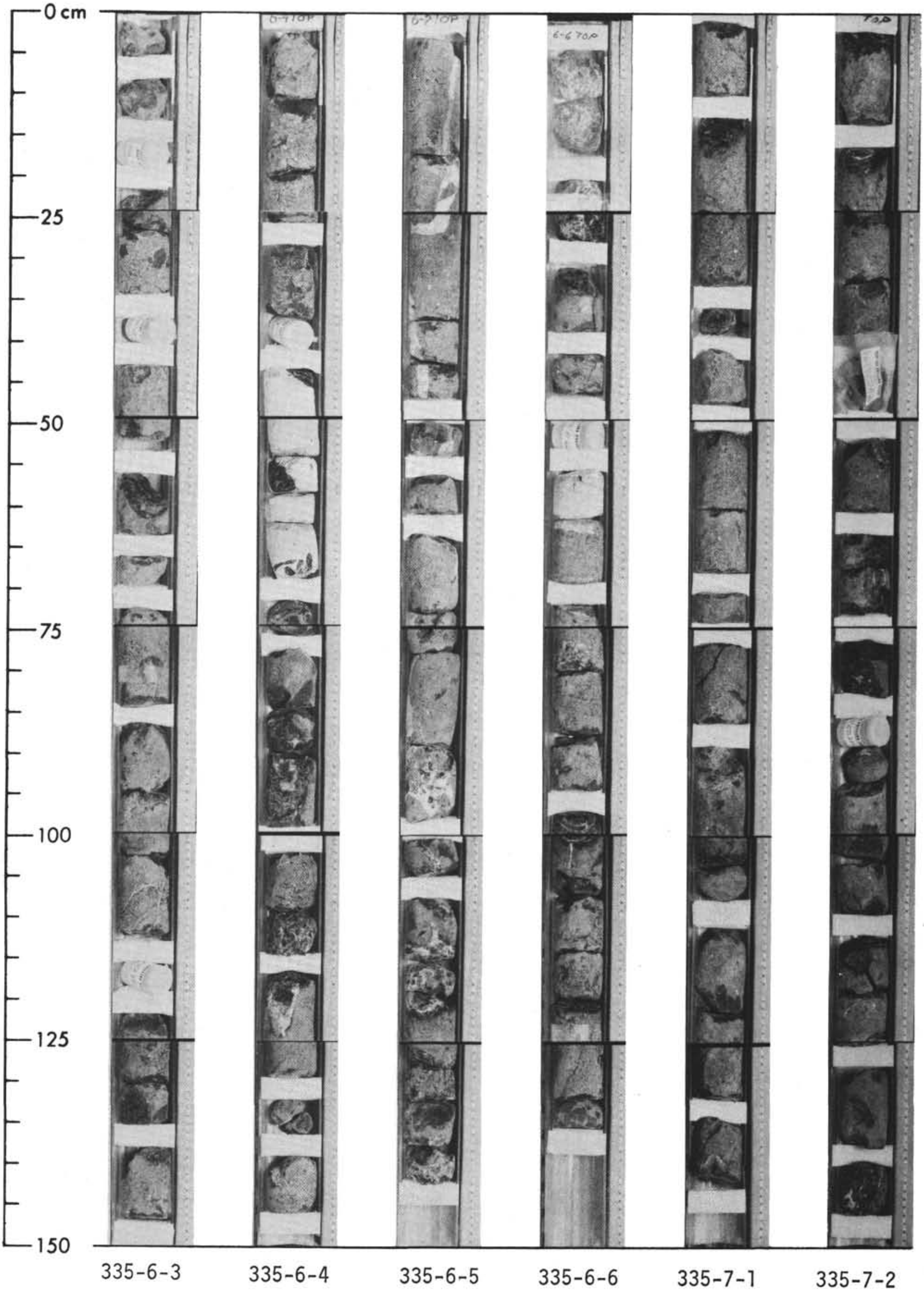
NRM INTENSITY	POLARITY	CHEMICAL CHARACTER Al_2O_3	Fe_2O_3	MgO	K_2O	H_2O+	CO_2	SECTION	METERS	LITHOLOGY	SAMPLES	D g/cc	V km/sec	POROSITY	LITHOLOGIC DESCRIPTION
								0							Original basalt recovery was 0.35 m. Styrofoam spacers make the amount shown here greater than the amount recovered.
32.1	rR	15.9	10.57	9.0	0.3	1.12	0.24		0.5		A				SPARSELY TO MODERATELY PHYRIC BASALT T. S. 1-22 Phenocrysts between 1 and 5%, mostly plagioclase; olivine to 3%; green augite very rare. Texture variolitic, with a framework of skeletal plagioclase and olivine with mesostasis of branching fine-grained plagioclase-pyroxene variolites. Abundant interstitial smectite, 10-20%. Vesicles with smectite and carbonate, also empty.

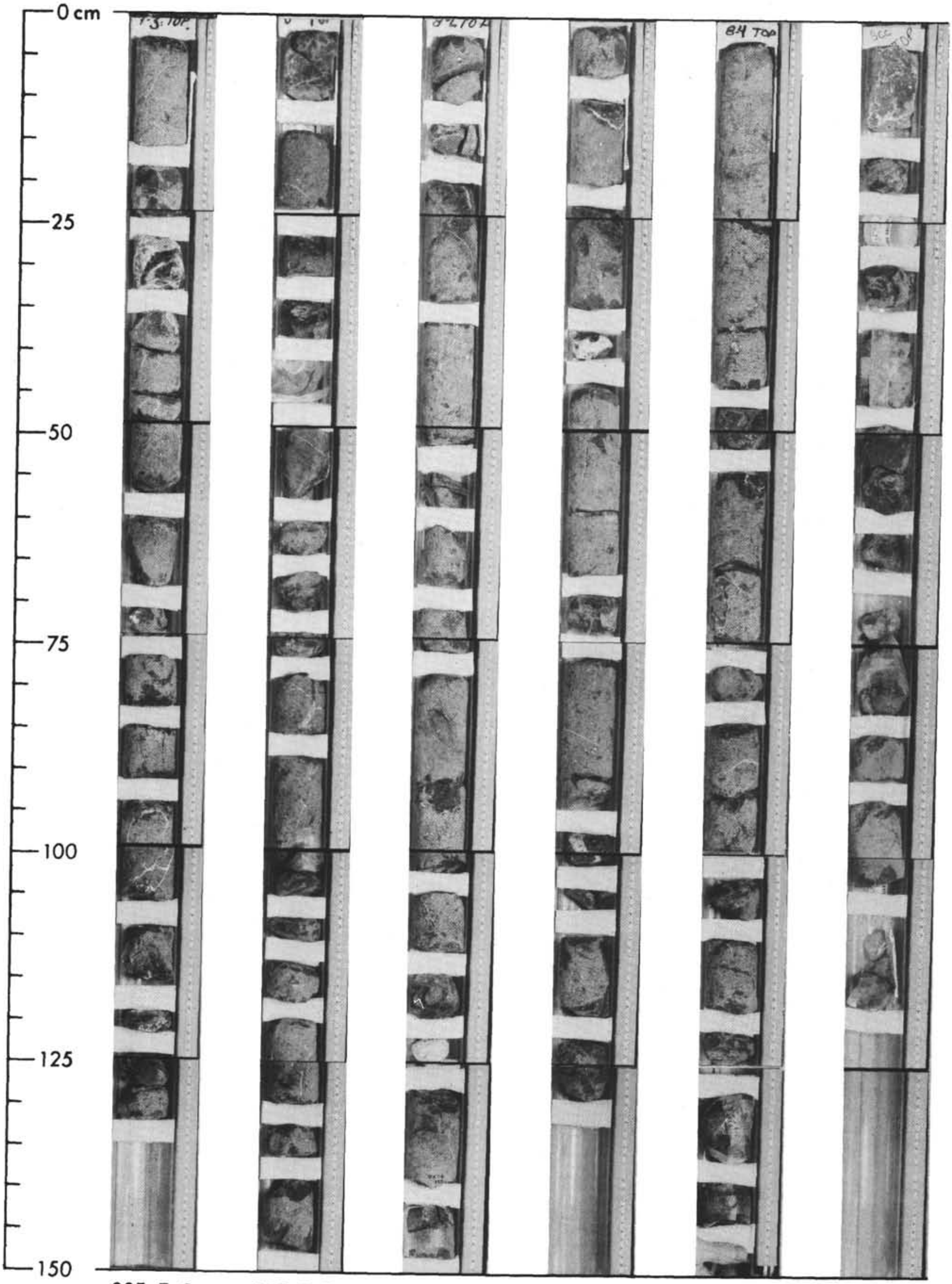
Explanatory Notes in Chapter 1


0 cm
25
50
75
100
125
150
335-1-1
335-1-2
335-1-3
335-1-4
335-2-1
335-2-2

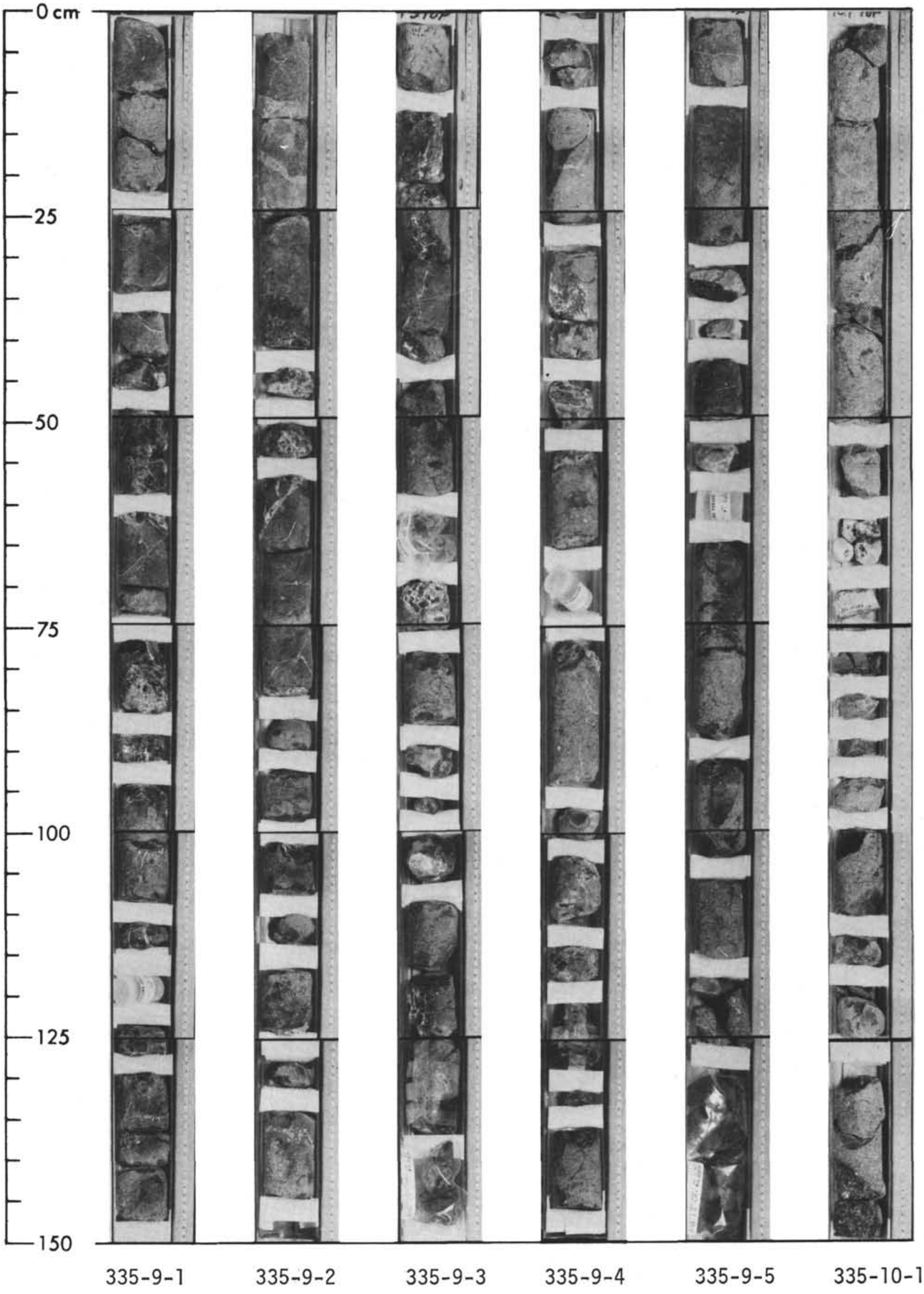

0 cm
25
50
75
100
125
150
335-2-3
335-2-4
335-2-5
335-3-1
335-4-1
335-4-2

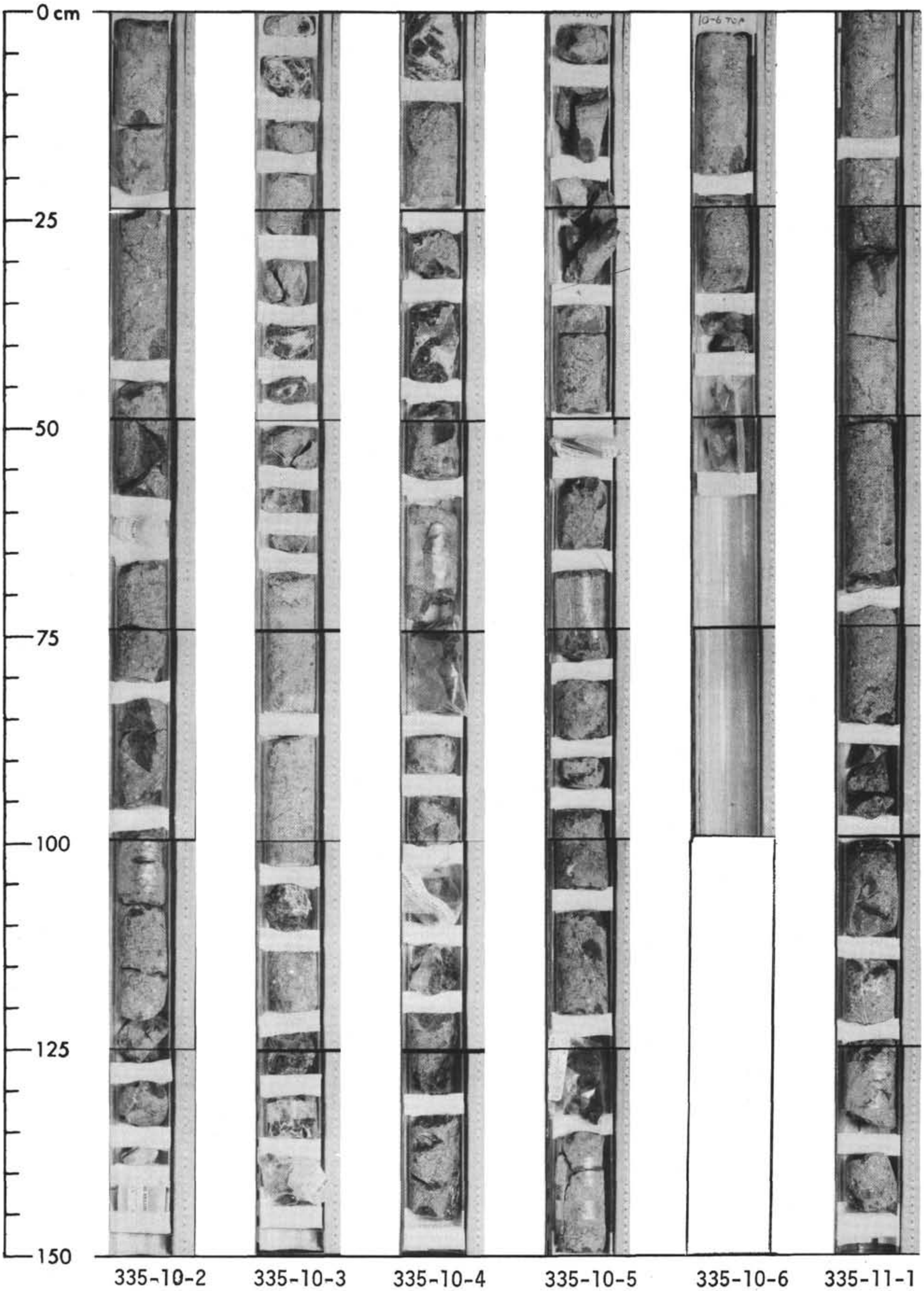

0 cm
25
50
75
100
125
150
335-4-3
335-5-1
335-5-2
335-5-3
335-6-1
335-6-2

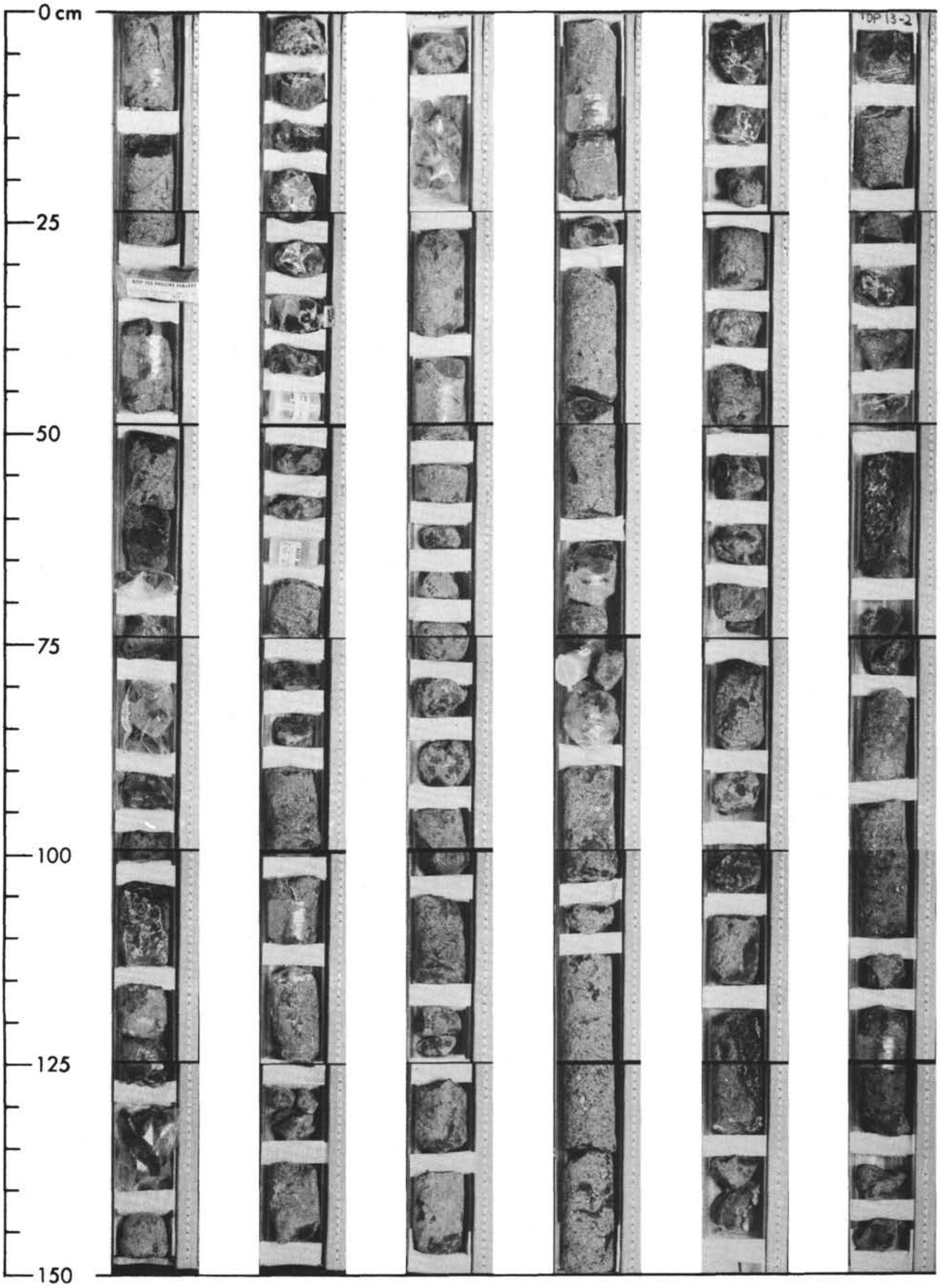

0 cm
25
50
75
100
125
150
335-6-3
335-6-4
335-6-5
335-6-6
335-7-1
335-7-2

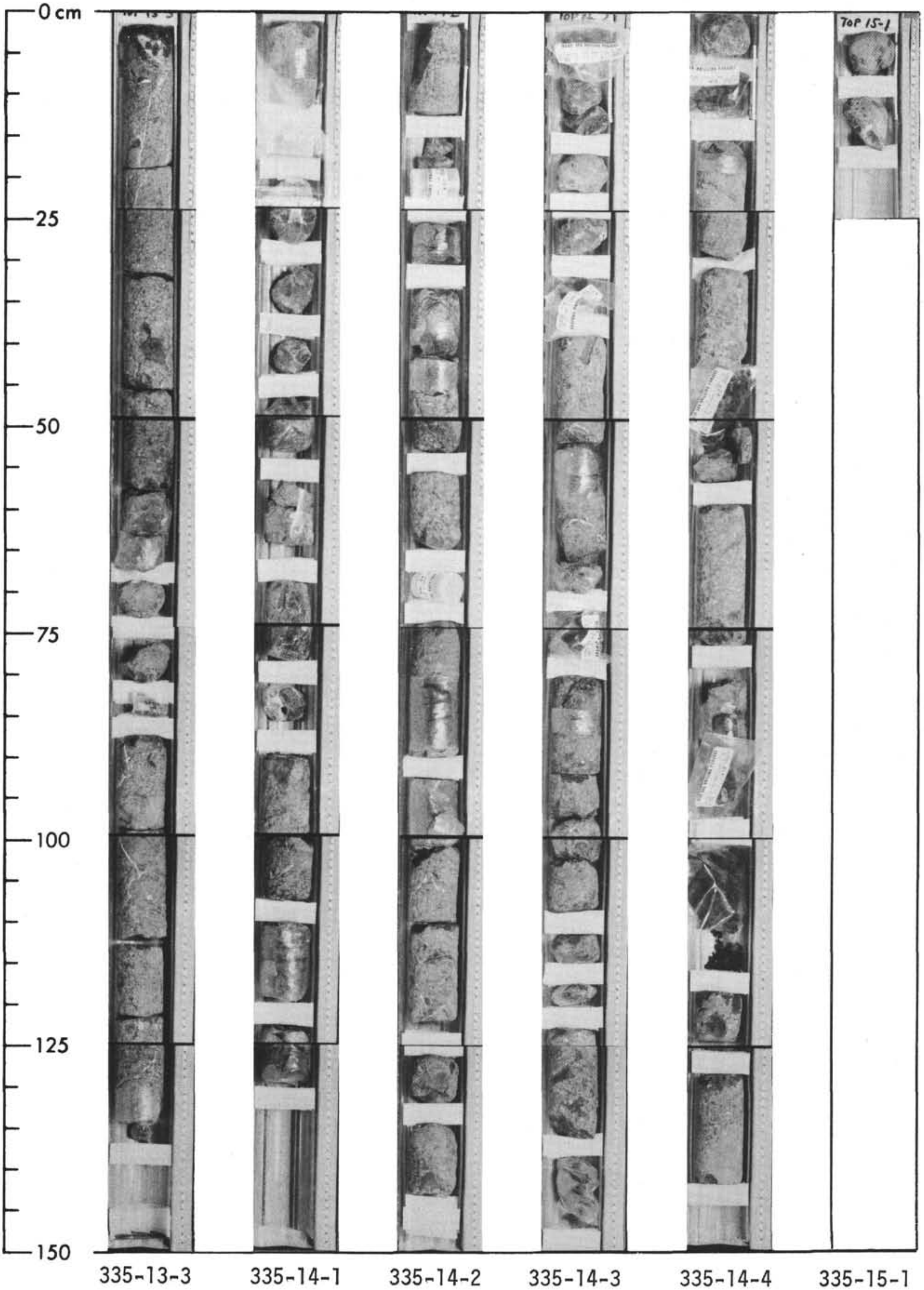


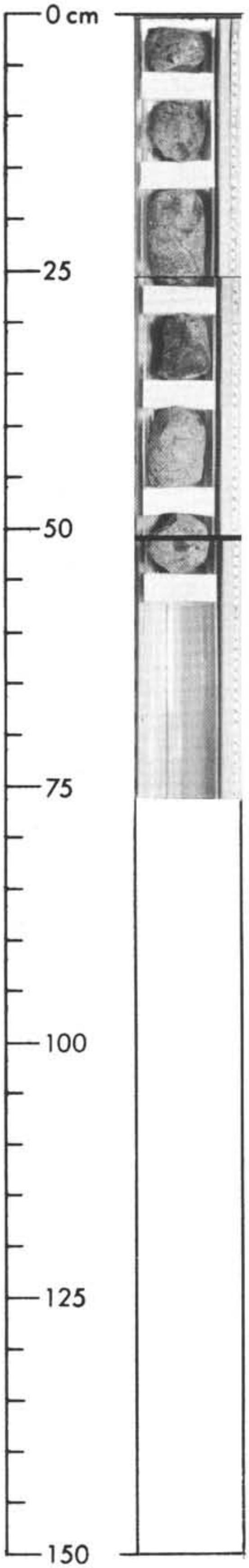
335-7-3 335-8-1 335-8-2 335-8-3 335-8-4 335-8-5


0 cm
25
50
75
100
125
150
335-9-1
335-9-2
335-9-3
335-9-4
335-9-5
335-10-1


0 cm
25
50
75
100
125
150
335-10-2
335-10-3
335-10-4
335-10-5
335-10-6
335-11-1


0 cm
25
50
75
100
125
150
335-11-2
335-12-1
335-12-2
335-12-3
335-13-1
335-13-2


0 cm
25
50
75
100
125
150
TOP 15-1
335-13-3
335-14-1
335-14-2
335-14-3
335-14-4
335-15-1



335-16-1