13. GRAIN SIZE AND MINERALOGY OF SEDIMENTS AND SEDIMENTARY ROCKS, DSDP LEG 35[1]

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INTRODUCTION

The grain size and mineralogy of sediments and sedimentary rocks drilled during DSDP Leg 35 have been influenced by several factors, including the tectonic development of the adjacent land (primarily the coast of West Antarctica), the evolution of surface and bottom circulation, glaciation on Antarctica, and changes in biogenic productivity.

We conducted the grain-size and mineralogical studies in accordance with the standard method adopted by the P.P. Shirshov Institute of Oceanology, Academy of Sciences, USSR; the techniques are described by A.P. Lisitzin and others in the Initial Reports of the Deep Sea Drilling Project, Volume 6.

GRAIN SIZE

The results of the mechanical grain-size analyses, utilizing the combined method (Lisitzin et al., 1969), are given in Tables 1-4. Grain-size analyses for fractions of 0.05 to 0.1 mm were also made on the light and heavy fractions obtained by heavy liquid (2.9 g/cm^3) separation. The mineralogy of the coarse aleuritic fractions obtained by heavy liquid separation is presented in Tables 5-10. We conducted a statistical study of the distribution of individual fractions and investigated significant textural characteristics of the sediments, such as the median grain diameter (*Md*) and the sorting coefficient (*So*). From these studies of distribution of the *Md* and *So* values, we present this preliminary discussion of the grain size of sediments from the Southern Ocean drilled during DSDP Leg 35.

Site 322

The sedimentary strata can be subdivided into three lithologic units at Site 322.

Unit 1 comprises approximately 300 meters of upper Miocene and Pliocene, interbedded, slightly consolidated to unconsolidated sands, aleurites, and pelites. The grain-size distribution of sediments is extremely heterogeneous throughout the unit. In the upper part, the individual interlayers of sands and aleurites are well sorted (*So* reaches 1.93) whereas lower in the unit, the sorting, as interpreted from the cumulative curves, is much poorer. Most of the interlayers, and especially those in the lower part of the unit are characterized by a high pelite content (up to 45%-55%). The values of *Md*, which reach 0.035 mm in the upper part, fluctuate at the base of the unit between 0.0015 and 0.0020 mm.

Unit 2 consists of 171 meters of middle to upper Miocene clays. This unit is the extension of the lower part of Unit 1, but differs in being homogeneous. The sediment here is primarily pelite, of which more than 40% is less than 0.001 mm. The values of *Md* vary within the same range as those in Unit 1 (lower part), and sediments are well sorted in most layers as indicated by the slope of the cumulative curves.

Unit 3 (=Units 3 and 4 in the Site Report chapters, this volume), approximately 47 meters of middle or possibly lower Miocene sediment, differs rather distinctly from the overlying unit and is characterized by the intercalation of consolidated sandstones and aleurites. The sediments are generally rather poorly sorted (*So* fluctuates from 2.3 to 5.0) and contain substantially less pelitic material than Unit 2 (up to 20%-25%).

Site 323

Texture and other lithologic parameters were studied in detail from the sediments of Site 323 and enabled us to define four units.

Unit 1, the thickest of this sequence, comprises 266 meters of Pliocene and Miocene intercalated pelites and aleurites with admixtures of sand-sized organic remains in some parts of the section. Sorting is rather poor; values of *So* vary from 2.8 to 4.8. Pelitic material predominates (70%-90%) throughout the entire interval. In the upper part of the unit, the values of *Md* vary quite markedly from 0.001 to 0.12 mm. However, in the lowermost strata, the values of *Md* do not exceed 0.003-0.004 mm. Overall, this unit is both lithologically similar and stratigraphically equivalent to Unit 1 from Site 322.

Unit 2 consists of 240 meters of middle to lower Miocene consolidated pelitic sediments, which contain an admixture of silica and a large proportion of radiolarian and diatom remains. A characteristic feature of the unit is the higher degree of sorting with increased depth (*So* ranges from 3.66 to 1.44). As with the overlying unit, the pelitic fraction dominates, and in many samples constitutes as much as 90%-95% of the sediment. The aleuritic fraction forms a much smaller part and the fine arenaceous fraction, which occurs in the uppermost and lowermost part of Unit 1, is completely absent. The high values of *Md* in the upper part of Unit 2 (0.04-0.05 mm), resulting from interlayers of unconsolidated sands, are replaced down section by *Md* values of 0.001-0.005 mm.

Unit 3, 130 meters of lower Miocene to ? middle Oligocene consolidated pelitic sediments, differs but little in gross lithology from the overlying Unit 2. However, fine aleuritic materials are noticeably pres-

[1]Translated from Russian.

TABLE 1
Granulometry of Sediments at Site 322 by the Combined Method

Sample (Interval in cm)	Weight Suspension (g)	% of Wet Wt.	Weight Percent of Size Fractions (in mm) >5	5-3	3-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1-2, 26-30	11.26	28.2	–	–	–	–	–	–	3.91	29.40	51.77	3.82	5.06	6.04
1-3, 70-76	6.55	54.0	–	–	–	–	–	–	3.05	3.05	12.06	12.99	23.81	45.04
2-2, 113-116	8.89	43.3	–	–	–	2.92	7.31	3.15	0.56	0.45	0.34	8.78	21.26	55.23
3-1, 18-20	9.53	39.4	–	–	–	–	–	–	0.21	0.21	0.84	27.60	23.92	47.22
4-1, 65-67	12.61	28.7	–	–	–	–	–	–	0.32	0.64	0.40	24.01	25.46	49.17
4-2, 57-60	11.42	26.9	–	–	–	–	–	–	1.93	9.54	4.99	11.56	33.10	38.88
5-1, 81-85	13.39	27.1	–	–	–	–	–	–	1.12	0.45	2.91	26.66	28.23	40.63
6-1, 30-33	15.56	22.6	–	–	–	–	–	–	0.32	0.19	0.57	13.38	36.44	49.10
9-2, 143-146	16.19	22.8	–	–	–	–	–	–	1.24	14.52	58.74	5.80	8.15	11.55
10-1, 101-105	17.15	19.17	–	–	–	0.70	0.29	0.82	32.24	38.02	9.04	4.88	5.21	8.80
10-2, 43-46	15.24	20.3	–	–	–	–	0.13	1.31	33.66	45.01	6.89	1.12	1.58	10.30
11-1, 42-46	24.48	19.7	–	–	–	–	0.16	1.23	31.78	35.54	10.29	5.02	5.93	10.05
11-2, 45-49	18.48	16.8	–	–	–	–	4.60	0.81	24.57	33.01	7.36	6.66	6.65	16.34
11-3, 24-32	17.07	17.5	–	–	–	–	0.12	1.58	38.37	26.83	8.90	4.34	5.57	14.29
11-4, 17-24	16.83	17.4	–	–	–	–	0.12	4.58	39.63	18.18	5.76	7.84	16.87	7.02
11-5, 36-40	20.62	19.8	–	–	–	–	–	–	0.19	0.15	0.53	28.42	27.55	46.16
11-6, 109-115	10.09	22.0	–	–	–	–	–	–	0.09	0.18	1.09	19.62	19.46	59.56

TABLE 2
Granulometry of Sediments at Site 323 by the Combined Method

Sample (Interval in cm)	Weight Suspension (g)	% of Wet Wt.	Weight Percent of Size Fractions (in mm)[2] >5	5-3	3-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1-1, 50-60	22.40	15.3	–	–	–	–	1.43	6.43	24.33	22.37	23.88	6.74	5.45	9.37
1-1, 140-150	12.30	41.8	–	–	–	–	–	3.01	5.45	5.53	9.43	6.67	21.54	48.37
1-2, 34-43	13.36	91.8	–	–	–	–	–	–	0.90	1.42	0.52	23.29	28.29	45.58
1-3, 21-22	4.28	18.5	–	–	–	–	–	0.26	62.85	1.94	5.61	7.38	8.64	13.32
1-3, 78-88	15.14	89.5	–	–	–	–	–	–	0.13	1.06	0.73	29.99	25.62	42.47
1-4, 118-127	14.52	60.1	–	–	–	–	–	–	0.14	0.28	0.28	23.82	37.74	37.74
2-1, 128-130	11.95	43.8	–	–	–	–	–	–	3.10	2.76	4.52	29.20	30.21	30.21
3-1, 88-94	11.99	34.1	–	–	–	–	–	–	0.75	2.00	6.26	26.26	23.61	41.12
3-2, 14-20	23.45	20.2	–	–	–	–	2.86	11.68	20.51	14.12	33.01	4.13	5.63	8.06
3-2, 61-70	7.37	51.5	–	–	–	–	–	–	0.27	1.36	3.12	13.97	25.65	55.63
3, CC	5.04	–	–	–	–	–	–	–	4.96	2.18	0.79	9.53	26.19	56.35
5-1, 145-146	5.98	23.8	–	–	–	–	–	–	0.33	0.33	0.16	36.96	31.61	30.61
6-1, 100-110	9.34	38.8	–	–	–	–	–	–	1.82	1.07	1.82	18.41	38.44	38.44
6-1, 140-142	11.79	36.9	–	–	–	–	–	–	0.17	0.17	0.51	21.88	24.09	53.18
7-1, 141-143	8.05	37.8	–	–	–	–	–	–	1.24	0.12	1.24	21.25	30.56	45.59
7-2, 105-110	6.69	39.9	–	–	–	–	–	–	1.05	3.74	30.02	5.24	9.87	50.08
7-3, 18-24	14.75	34.6	–	–	–	–	–	–	1.63	3.66	2.03	33.23	35.86	23.59
8-1, 133-143	12.60	28.9	–	–	–	–	–	–	0.16	0.16	0.79	16.67	41.11	41.11
10-1, 113-122	20.31	22.0	–	–	–	–	–	–	0.34	0.89	3.25	48.06	30.72	16.74
10-2, 75-85	21.74	26.0	–	–	–	–	–	–	0.64	4.55	0.60	28.70	32.52	32.99
10-3, 106-114	2.56	–	–	–	–	–	–	–	0.39	0.39	0.39	31.01	33.91	33.91
11-1, 22-32	1.85	–	–	–	–	–	–	–	–	0.54	1.62	31.78	32.81	33.25
11-2, 137-148	15.20	29.7	–	–	3.95	1.05	0.26	0.20	1.18	1.05	7.50	20.99	24.87	38.95
12-1, 110-114	17.87	28.5	–	–	–	–	–	–	0.11	0.45	0.56	12.84	31.72	54.32
12-2, 9-18	10.67	43.1	–	–	–	–	–	–	0.09	1.69	2.91	16.03	39.64	39.64
12-2, 73-74	2.05	–	–	–	–	–	–	–	0.49	2.44	6.34	25.47	32.63	32.63
12-2, 100-104	18.34	22.4	–	–	–	–	–	–	0.05	0.05	0.49	22.53	25.79	51.09
13-5, 63-70	7.59	32.2	–	5.40	14.08	12.52	0.92	0.26	0.26	0.40	0.92	8.06	28.59	28.59
13-5, 106-115	1.98	–	–	–	–	–	–	–	0.51	0.51	3.54	31.10	33.43	30.91
13-6, 145-150	6.81	48.8	–	–	–	–	–	–	0.29	0.88	5.58	18.36	27.75	47.14
14-2, 1-8	1.73	–	–	–	–	–	–	–	–	0.58	4.05	26.81	34.28	34.28
14-2, 65-73	16.19	22.3	–	–	–	–	–	–	0.12	0.06	1.98	26.68	29.22	41.94
14-2, 128-135	1.69	–	–	–	–	–	–	–	0.59	0.59	1.18	27.82	34.91	34.91
15-1, 52-60	2.68	–	–	–	–	–	–	–	0.37	0.74	0.74	29.87	34.14	34.14
15-2, 91-100	2.31	–	–	–	–	–	–	–	0.43	0.87	2.16	16.02	24.68	55.84
15-3, 29-36	1.70	–	–	–	–	–	–	–	–	1.18	1.18	22.35	33.35	41.94
15-4, 54-63	1.68	–	–	–	–	–	–	–	–	0.60	0.60	21.96	28.69	48.15
15-5, 89-98	25.01	26.0	–	–	–	–	–	–	0.24	0.08	0.12	33.03	33.03	33.50
15-6, 19-26	21.33	21.9	–	–	–	–	–	–	0.09	0.05	0.50	28.36	27.12	43.88
16-1, 57-62	12.73	84.4	–	–	–	–	–	–	0.16	0.16	0.32	27.49	29.69	42.18
16-3, 32-37	5.79	42.2	–	–	–	–	–	–	0.17	0.34	0.17	18.20	26.08	55.04
16-4, 83-92	19.80	22.7	–	–	–	–	–	–	0.05	0.10	0.10	25.20	28.64	45.91
18-2, 80-86	12.86	20.6	–	–	–	–	–	–	0.16	0.16	1.09	24.10	29.39	45.10
18-3, 130-139	6.31	51.0	–	–	–	–	–	–	5.23	2.54	3.33	17.59	29.95	41.36
18-4, 115-124	15.45	26.9	–	–	–	–	–	–	0.32	0.84	0.78	18.25	37.22	42.59
18-5, 14-20	15.54	20.4	–	–	–	–	–	–	0.06	0.06	0.12	23.24	25.55	50.97
18-5, 65-73	19.19	22.1	–	–	–	–	–	–	0.31	0.36	0.57	22.94	29.55	46.27

TABLE 3
Grain Size of Sediments at Site 324 by the Combined Method

Sample (Interval in cm)	Weight Suspension (g)	% of Wet Wt.	Weight Percent of Size Fractions (in mm) >5	5-3	3-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1-2, 126-131	6.29	52.8	–	–	–	–	–	–	2.07	1.59	2.23	18.11	30.05	45.95
1-3, 124-132	8.86	45.8	–	–	–	–	–	–	2.48	0.79	4.85	16.15	21.33	54.40
1-4, 125-131	10.16	36.4	–	–	–	–	–	–	0.10	0.20	2.76	20.86	24.21	51.87
1-6, 31-38	13.91	38.3	–	–	–	–	–	–	2.59	0.93	1.22	19.69	24.46	51.11
2-1, 83-92	13.91	34.0	–	–	–	–	–	–	0.07	0.07	0.80	21.64	27.17	50.25
2-2, 61-70	15.97	66.9	–	–	–	–	–	–	0.06	0.06	1.13	14.03	35.50	49.22
2-3, 52-61	9.19	34.7	–	–	–	–	–	–	1.85	0.22	1.96	14.47	26.77	54.73
2-4, 27-36	10.70	33.5	–	–	–	–	–	–	–	0.09	3.36	14.74	26.39	55.42
2-5, 35-45	9.41	33.8	–	–	–	–	–	–	–	0.21	2.55	19.66	30.18	47.40
2-6, 95-104	9.98	39.7	–	–	–	–	–	–	–	0.10	1.60	16.13	22.55	59.62
3-1, 137-146	12.35	25.3	–	–	–	–	–	–	–	0.08	0.64	19.28	30.61	49.39
3-2, 136-145	12.03	32.7	–	–	–	–	–	–	–	0.08	0.72	23.47	23.61	52.12
3-3, 67-77	14.20	28.7	–	–	–	–	–	–	–	0.07	0.21	25.56	26.62	47.54
3-4, 47-57	12.91	37.5	–	–	–	–	–	–	–	0.08	1.32	27.03	29.28	42.29
3-5, 99-100	12.80	31.5	–	–	–	–	–	–	0.16	0.16	2.11	22.19	22.80	52.58
3-6, 138-148	13.79	28.1	–	–	–	–	–	–	0.36	1.16	6.02	31.47	27.41	33.58
4-2, 113-123	14.63	30.3	–	–	–	–	–	–	0.07	0.07	2.26	23.44	24.54	49.62
4-3, 30-40	10.63	30.0	–	–	–	–	–	–	0.09	–	1.41	16.00	31.98	50.52
4-4, 54-64	13.42	27.3	–	–	–	–	–	–	0.07	0.07	2.91	19.52	25.34	52.09
5-2, 66-83	14.03	35.7	–	–	–	–	–	–	0.29	0.15	15.32	13.47	20.24	50.53
5-3, 25-35	16.64	81.3	–	–	–	–	–	–	0.06	0.12	3.13	20.13	34.07	42.49
6-2, 19-30	17.00	27.2	–	–	–	–	–	–	0.18	0.76	4.82	19.30	33.35	41.59
7-1, 69-78	15.85	26.0	–	–	–	–	–	–	0.06	0.06	1.39	19.31	29.84	49.34
7-3, 110-120	16.41	14.6	–	–	–	–	–	–	–	0.07	2.44	6.63	34.55	56.31
7-6, 119-129	12.99	25.0	–	–	–	–	–	–	0.08	0.08	3.00	8.85	29.10	58.89
8-3, 61-71	13.67	27.0	–	–	–	–	–	–	0.07	0.14	4.17	14.57	27.56	53.40

TABLE 4
Grain Size of Sediments at Site 325 by the Combined Method

Sample (Interval in cm)	Weight Suspension (g)	% of Wet Wt.	Weight Percent of Size Fractions (in mm) >5	5-3	3-2	2-1	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	0.05-0.01	0.01-0.005	0.005-0.001	<0.001
1-1, 49-59	13.33	34.8	–	–	–	–	–	–	5.03	0.60	2.93	19.87	28.36	43.21
1-1, 133-144	9.36	43.6	–	–	–	–	–	–	0.64	0.32	2.67	31.30	34.29	30.78
1-2, 26-36	15.57	41.8	–	–	–	–	–	–	0.76	0.28	2.18	29.52	35.76	31.50
1-4, 81-92	17.91	25.6	–	–	–	–	–	–	5.58	5.64	13.23	25.19	31.66	18.70
2-2, 39-49	16.78	24.6	–	–	–	–	–	–	5.07	2.98	3.58	25.79	31.29	31.29
3-2, 11-24	13.82	27.3	–	–	–	–	–	–	0.36	0.58	3.62	26.84	34.30	34.30
3-3, 76-87	19.56	22.6	–	–	–	–	–	–	3.17	4.45	19.17	22.81	25.20	25.20
3-4, 26-36	16.34	22.5	–	1.71	1.65	2.14	2.51	3.06	2.88	5.75	16.40	7.90	17.38	38.62
5-1, 55-57	15.34	31.2	5.60	0.78	0.78	0.72	0.06	0.18	0.52	0.60	1.17	23.95	24.64	40.00
6-1, 145-150	11.25	29.0	–	–	–	–	–	–	16.33	0.36	3.64	14.85	33.60	46.22
7-1, 131-135	13.25	14.8	–	–	–	–	–	–	1.96	3.92	8.08	8.45	18.57	59.02
7-2, 138-142	12.32	18.6	–	–	–	–	–	–	0.65	0.97	3.57	15.51	30.68	48.62
8-1, 45-59	12.35	21.5	–	–	–	–	–	–	0.73	1.62	3.24	22.02	30.61	41.78
8-2, 119-128	15.55	10.1	–	–	–	–	–	–	1.22	0.32	4.05	18.07	30.42	45.92
8-3, 27-35	13.25	21.3	–	–	–	–	–	–	0.91	0.23	2.87	14.25	28.53	53.21
9-3, 90-98	10.79	16.5	–	–	–	–	–	–	0.65	0.28	0.83	21.04	35.03	42.17
10-1, 35-39	9.64	15.0	–	–	–	–	–	–	1.56	0.41	4.36	18.98	29.46	45.23
10-2, 26-30	6.55	48.9	–	–	2.44	2.14	3.36	6.86	5.95	6.41	8.09	7.05	28.85	28.85
10-3, 99-102	11.84	21.3	–	–	–	–	–	–	0.51	11.74	8.45	14.35	24.24	40.71
10, CC	8.16	33.3	–	–	–	–	–	–	0.25	0.25	2.70	18.12	39.34	39.34

ent, especially in the upper and middle parts of the unit. Nevertheless, the *Md* values consistently range between 0.002 and 0.005 mm. As noted by the steepness of the slope of the cumulative curves, the sediments are well sorted and, as in the overlying units, are primarily composed of clay-size particles.

Unit 4 (=Units 4 and 5 of the Site Report chapters, this volume) consists of 63 meters of (?) lower Oligocene through Upper Cretaceous sediments and is the lithologic extension of Unit 3. In Unit 4, however, the final aleuritic fraction is almost completely lacking. The entire section is represented by consolidated pelite, and in the lowermost part the finest pelitic fraction (less than 0.001 mm) constitutes 45%-50% of the sediment.

All the Site 323 units (2, 3, and 4) are texturally and lithologically very similar and could be considered as a single lithologic unit.

Site 324

The shallowest hole drilled during DSDP Leg 35 was at Site 324, where 218 meters of Pliocene and Pleistocene deposits were recovered. The sediments are generally homogeneous, slightly consolidated and unconsolidated pelites, with a few interlayers of fine aleurite. In all samples, 70%-90% of the sediment is of pelitic size, and the fraction less than 0.001 constitutes from 45% to 50%. The *Md* values vary but little throughout the interval and do not exceed 0.001-0.002 mm. Inter-

TABLE 5
Grain Size Analyses by Heavy Liquid (2.9 g/cm^3) Separation of the 0.05-0.1 mm Fraction at Site 322

Sample (Interval in cm)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
1-2, 26-30	3.3176	1.20	98.80
1-3, 70-76	0.2018	1.88	98.12
2-2, 113-116	0.0311	5.46	94.54
3-1, 18-20	0.0132	–	100.00
4-1, 65-67	0.0848	1.17	98.83
4-2, 57-60	1.1013	0.30	99.70
5-1, 81-85	0.0711	0.98	99.02
6-1, 30-33	0.0255	5.09	94.91
9-2, 143-146	2.3503	0.15	99.85
10-1, 101-105	5.5209	1.21	98.79
10-2, 43-46	5.8622	2.36	97.64
11-1, 42-46	6.7072	3.61	96.39
11-2, 45-49	5.1030	3.80	96.20
11-3, 24-32	4.5875	4.94	95.06
11-4, 17-24	4.0727	5.20	94.80
11-5, 36-40	0.0330	9.39	90.61
11-6, 109-115	0.0274	2.55	97.45
13-2	0.0337	2.96	97.04

TABLE 6
Grain Size Analyses by Heavy Liquid (2.9 g/cm^3) Separation of the 0.05-0.1 mm Fraction at Site 323

Sample (Interval in cm)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
1-1, 50-60	5.0165	1.84	98.16
1-1, 140-150	0.6837	1.59	98.41
1-2, 34-43	0.1974	0.45	99.55
1-3, 21-22	0.8373	7.01	92.99
1-3, 78-88	0.1617	–	100.00
1-4, 118-127	0.0389	0.25	99.75
2-1, 128-130	0.3330	–	100.00
3-1, 88-94	0.2456	–	100.00
3-2, 14-20	3.3150	2.84	97.16
3-2, 61-70	0.0955	–	100.00
3-CC	0.1171	2.04	97.96
6-1, 100-110	0.1032	–	100.00
7-2, 105-110	0.2566	–	100.00
7-3, 18-22	0.5566	–	100.00
10-1, 119-112	0.1836	–	100.00
10-2, 26-30	0.4228	7.23	92.77
10-2, 75-85	1.0069	–	100.00
10-3, 99-102	1.3914	6.34	93.66
10-3, 106-114	0.2875	–	100.00
11-1, 22-32	0.2409	–	100.00
11-2, 137-148	0.1678	0.65	99.35
12-1, 110-114	0.0885	–	100.00
12-2, 9-18	0.6611	0.49	99.51
12-2, 73-77	0.1526	–	100.00
13-5, 106-115	0.2745	–	100.00
13-6, 145-150	0.1677	0.44	99.56
14-2, 1-8	0.1677	–	100.00
15-1, 52-60	0.0435	1.60	98.40
15-2, 91-100	0.0234	–	100.00
15-3, 25-36	0.0123	–	100.00
15-4, 54-69	0.0121	–	100.00
15-5, 89-98	0.0210	2.85	97.15
15-6, 19-26	0.0111	–	100.00
16-1, 57-62	0.0335	0.29	99.71
16-3, 32-37	0.0011	–	100.00
16-4, 83-92	0.0222	17.56	82.44
18-2, 80-86	0.0081	–	100.00
18-3, 130-139	0.1681	–	100.00
18-4, 115-124	0.1352	1.18	98.82
18-5, 65-73	0.0698	8.59	91.41

TABLE 7
Grain Size Analyses by Heavy Liquid (2.9 g/cm^3) Separation of the 0.05-0.1 mm Fraction at Site 324

Sample (Interval in cm)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
1-2, 126-131	0.1083	1.66	98.34
1-6, 31-38	0.1468	2.99	97.01

TABLE 8
Grain Size Analyses by Heavy Liquid (2.9 g/cm^3) Separation of the 0.05-0.1 mm Fraction at Site 325

Sample (Interval in cm)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
1-1, 49-59	0.0900	3.55	96.45
1-1, 133-144	0.0269	–	100.00
1-2, 26-36	0.374	4.27	95.73
1-4, 81-92	1.0097	1.72	98.28
2-2, 39-49	0.4026	5.06	94.94
3-2, 11-24	0.0855	2.10	97.90
3-3, 76-87	0.8808	3.06	96.94
3-4, 26-36	0.9432	4.62	95.38
5-1, 55-57	0.0099	57.57	42.43
5, CC	0.0138	5.79	94.21
6-1, 145-150	0.0506	4.54	95.46
7-1, 131-135	0.5280	4.96	95.04
7-2, 138-142	0.1262	1.66	98.34
8-1, 45-49	0.0370	3.51	96.49
8-2, 119-128	0.0560	1.78	98.22
8-3, 27-35	0.0292	–	100.00
9-3, 90-98	0.0281	2.49	97.51
10-1, 35-39	0.0437	1.60	98.40

TABLE 9
Grain Size of Sediments of Site 325, Core 8, Section 2, by Heavy Liquid (2.9 g/cm^3) Separation of the 0.05-0.1 mm Fraction

Sample Interval (cm)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
22.5-23.5	2.6661	3.23	96.77
23.5-25.0	3.6730	3.74	96.26
25.0-26.0	2.1825	5.27	94.73
26.0-27.5	3.9642	10.23	89.77
27.5-29.0	2.6561	4.86	95.14
29.0-30.5	2.3684	6.08	93.92
30.5-32.0	2.1134	7.68	92.32
32.0-33.5	1.5235	9.98	90.02
33.5-34.5	1.2390	9.56	90.44
34.5-35.5	1.4693	6.62	93.38
35.5-37.0	0.8729	10.21	89.79
37.0-39.0	1.5448	8.52	91.48
39.0-41.0	1.4208	8.82	91.18
41.0-42.0	0.1744	5.96	94.04
42.0-44.0	0.0373	2.14	97.86

bedded consolidated pelitic sediments occur in the lower part of the section and are underlain by a zone of loose sand. This pattern somewhat resembles that of the uppermost part of Unit 2, of Site 323. However, because these intervals are of different ages, a parallel cannot be drawn. The sediments penetrated at Site 324 correlate with those of the uppermost units of Sites 322 and 323.

TABLE 10
Grain Size of Elutriated Samples of Sites 322-325
Separated by Heavy Liquid (2.9 g/cm^3)
of the 0.1-0.05 mm Fraction

Sample (Interval in cm)	Sample Weight (g)	Weight Suspension (g)	% Heavy Fraction	% Light Fraction
Site 322				
1, CC	0.8334	0.0182	7.14	92.86
2, CC	0.2770	0.1356	1.40	98.60
3, CC	0.0236	0.0101	–	100.00
4, CC	0.0918	0.0686	1.60	98.40
5, CC	0.1695	0.0987	1.62	98.38
6, CC	0.3299	0.1811	5.85	94.15
10, CC	0.5084	0.3208	1.77	98.23
11, CC	0.3451	0.2303	10.37	89.63
Site 323				
1, CC	0.0763	0.0345	–	100.00
2, CC (>63 μm)	1.3282	0.1370	2.34	97.66
3, CC	0.2479	0.1092	2.01	97.99
4, CC (>63 μm)	0.1562	0.0129	6.20	93.80
5, CC	0.0931	0.0472	1.69	98.31
6, CC	0.0508	0.0208	0.48	99.52
7, CC	2.2319	1.1507	1.74	98.26
8, CC	0.3887	0.0840	4.05	95.95
9, CC	0.0175	0.0028	–	100.00
10, CC	0.0712	0.0175	–	100.00
12, CC	0.0230	0.0156	68.58	31.42
13, CC	0.0294	0.0213	67.13	32.87
15, CC	0.0342	0.0222	–	100.00
17, CC	0.0210	0.0110	70.90	29.10
8-3	0.3603	0.1661	0.06	99.94
Site 324				
1-2	1.0611	0.8310	2.64	97.36
1-3	0.2339	0.1483	1.15	98.85
3, CC	0.1412	0.0187	3.74	96.26
4, CC	0.0072	0.0037	2.70	97.30
5, CC	0.0621	0.0560	0.18	99.82
6, CC	0.0076	0.0051	1.96	98.04
7, CC	0.1035	0.0585	4.44	95.56
8-2	0.5268	0.1617	2.41	97.59
Site 325				
1-4	12.3110	0.8792	10.99	89.01
2-1	1.2225	0.3388	3.01	96.99
2, CC	0.1374	0.0810	0.86	99.14
3-1	0.9659	0.0156	13.46	86.54
4, CC	0.2334	0.0744	1.48	98.52
3, CC	0.2956	0.0576	1.39	98.61
4-1	1.1658	0.0100	5.00	95.00
4-1	0.7744	0.1066	2.06	97.94
7-2	0.1362	0.0654	0.15	99.85
9-3	0.0862	0.0325	0.31	99.69
9, CC	0.2775	0.0902	0.11	99.89
10-3	6.1549	3.7293	4.89	95.11
10-3	1.2168	0.4261	3.49	96.51

Site 325

In comparison with the other sites, the sampling of sediments at Site 325 was considerably poorer; as a consequence, we succeeded in tentatively defining only two units with diverse lithological features.

Unit 1 consists of a thick sequence (approximately 600-620 m) of intercalated soft and more consolidated pelites, with an admixture of fine aleurite in the upper part and consolidated pelites with a small admixture of fine aleurite in the lowermost part of the section. The sediments have tentatively been dated as ? Oligocene to Pliocene. In the upper, soft part, sorting is poor to moderate (*So* fluctuates from 2 to 3.16). The *Md* values, which vary from 0.002 to 0.005 mm, indicate the presence of a great amount of fine-grained material. The content of pelitic particles averages 80%-90% of which the finest fraction comprises 15%-60%. Ice-rafted debris is common in the sediments of this unit.

Unit 2 is 100 meters thick and is characterized by a greater degree of consolidation. It consists of intercalated sandstones, aleurites, and pelites of lower Miocene to (?) Oligocene age and does not differ greatly in grain size from Unit 1. It is noteworthy, however, that the percentage of the fraction less than 0.001 mm is consistent throughout the unit and almost always forms 40%-50% of the sample. The *Md* values do not differ from those of Unit 1 and are 0.001-0.004 mm. Most of the sediments are well sorted.

MINERALOGY OF COARSE ALEURITIC FRACTIONS

We studied the mineralogy of the aleuritic fraction (grain size larger than 0.05 mm) in great detail. This size fraction is widely distributed in bottom sediments, and its composition provides the best basis for recognition of mineral suites and the presence of heavy minerals.

Two methods were employed in preparation of the samples for analyses. We prepared washed residues of the most representative sediments (over 50 g) by means of a 0.063 mm sieve onboard ship in order to immediately obtain mineralogical data. In addition, the fraction larger than 0.05 mm was isolated during grain-size analysis. We isolated the heavy subfraction by separation with heavy liquid with a specific gravity of 2.90. The ratios of the heavy to light subfractions are shown in Tables 5-10. The percentage of the heavy subfraction is not constant, but varies between 1% and 71%; in most cases, however, it is quite low.

The distribution of minerals found in the light and heavy fractions is presented in Tables 11-14. These data show that various sedimentary, metamorphic, and igneous rocks were the sources for the clastic minerals. Biogenic and authigenic minerals were also very significant in the origin of the sediments.

Site 322

The most common minerals of the heavy subfraction of the Neogene sediments are monoclinic pyroxene, epidote, and opaque minerals. Rock debris, altered minerals, hornblende, and orthopyroxenes (mainly hypersthenes) are less common. The abundance of these clastic minerals is considerably lower in the sediments near the base of the hole; here the authigenic hydrous ferric oxides and manganese are the major constituents.

The content of pyrite, another authigenic mineral, varies from single grains to 2.9% and markedly increases in the overlying Miocene sediments. Accessory minerals form the remainder of the heavy subfraction.

Site 323

The mineral suites of the Neogene sediments from the upper part of this hole differ from those found at

TABLE 11A
Distribution of Minerals in the Heavy and Light Fraction of Leg 35 Sediments

Sample (Interval in cm)	Opaque Minerals	Magnetite and Magnetic Fragments	Magnetic Spherules	Fe-Oxides	Pyrite, Marcasite	Fe-Mn Aggregates	Chrome-Spinel	Olivine	Serpentine	Hornblende	Hornblende Basaltic	Tremolite, Actinolite	Glaucophane	Anthophyllite	Pyroxene-Monoclinic	Pyroxene-Rhombic	Epidote	Garnet	Biotite	Chlorite and Chlorite Fragments	Fe-Mica	Muscovite	Glauconite	Zircon	Leucoxene	Sphene	Rutile
Site 322																											
2-2, 113-116	3.0	–	–	49.0	0.9	–	–	–	–	3.0	–	0.4	–	–	15.3	3.0	21.6	–	–	0.2	–	–	–	0.5	–	0.4	–
3-1, 18-20	15	–	1.0	9.0	2.0	–	–	–	–	2.0	1.0	–	–	–	12.0	5.0	11.0	3.0	–	1.0	–	–	–	–	–	–	–
4-1, 65-67	15.6	–	–	27.1	2.5	–	–	–	–	4.9	–	0.3	–	–	22.8	1.4	20.4	0.7	–	0.3	–	–	–	0.7	–	0.3	–
4-2, 57-60	4.8	–	–	1.7	0.9	–	0.2	0.2	–	6.6	0.2	0.5	–	–	39.6	10.9	25.9	0.7	0.2	0.2	–	–	–	–	–	0.2	–
5-1, 81-85	4.0	–	–	3.0	3.0	–	–	–	–	2.0	–	–	–	–	18.0	3.0	7.0	–	1.0	–	–	–	–	–	–	–	–
6-1, 30-33	13.8	–	0.3	4.1	0.3	–	–	–	–	1.3	0.3	–	–	–	32.9	15.5	21.6	1.0	–	–	–	–	–	0.4	–	–	–
9-2, 143-146	9.2	–	–	4.3	0.3	–	–	–	–	1.7	0.3	0.5	–	–	43.1	8.7	22.5	0.5	–	–	–	–	–	0.3	–	0.3	–
10-1, 101-105	3.3	–	–	1.3	0.3	–	–	–	–	3.0	0.5	1.3	–	–	41.1	9.1	21.2	0.3	–	0.3	–	–	–	0.3	–	0.5	–
10-2, 43-46	3.4	–	–	1.8	0.4	–	–	–	–	5.6	0.2	–	–	–	42.7	10.9	23.6	0.9	–	0.2	–	–	–	0.2	–	0.4	–
11-1, 42-46	9.2	–	–	0.9	1.4	–	–	0.2	–	5.6	0.2	1.6	–	–	36.5	0.7	31.7	–	–	0.2	–	–	–	–	–	0.4	–
11-2, 45-49	7.2	–	–	1.2	1.8	–	–	0.4	–	5.5	–	0.4	–	–	40.2	0.8	35.4	0.4	–	–	–	–	–	0.2	–	0.4	–
11-3, 24-32	14.4	–	–	1.7	1.9	–	–	–	–	4.0	0.2	0.6	–	–	36.0	0.2	27.6	1.3	–	–	–	–	–	0.2	–	0.2	–
11-4, 17-24	18.6	–	–	0.9	2.9	–	–	–	–	7.9	0.2	0.4	–	–	28.3	0.6	32.0	0.5	0.2	–	–	–	–	0.2	–	–	–
11-5, 36-40	2.3	–	0.2	5.0	0.2	77.5	–	–	–	0.8	–	0.2	–	–	3.7	–	5.6	0.4	3.5	–	–	–	–	0.2	–	0.2	–
11-6, 109-115	2.8	–	–	7.5	0.3	72.8	–	–	–	1.1	–	0.3	–	–	7.2	–	6.4	–	–	0.3	–	–	–	0.3	–	–	–
Site 323																											
1-1, 50-60	15.0	3.2	–	0.2	1.9	–	–	–	–	28.6	0.2	1.9	–	–	6.1	–	19.8	6.5	0.7	0.2	–	–	–	2.4	0.2	3.9	–
1-1, 140-150	10.9	2.8	–	0.4	2.6	–	–	–	–	28.0	–	1.6	–	–	1.6	1.0	28.4	4.4	0.4	–	–	–	–	5.7	0.2	2.6	–
1-2, 34-43	9.2	5.3	–	1.1	5.6	–	–	–	–	26.8	–	0.7	–	–	3.5	–	32.5	2.1	–	0.4	–	–	–	2.1	–	1.8	–
1-3, 21-22	22.7	–	–	0.2	7.9	–	–	–	–	19.3	–	0.9	–	–	9.5	–	15.7	8.4	–	–	–	–	–	4.0	1.3	0.7	0.2
1-3, 78-88	25.0	1.0	–	6.0	4.0	–	–	–	–	4.0	–	–	–	–	7.0	1.0	8.0	2.0	–	–	–	–	–	1.0	–	2.0	–
1-4, 118-127	25.0	5.0	–	4.0	–	–	–	–	–	9.0	–	–	–	–	6.0	–	10.0	3.0	–	–	–	–	–	–	–	–	–
2-1, 128-130	22.0	–	–	18.0	–	–	–	–	–	9.0	–	–	–	–	3.0	1.0	18.0	3.0	1.0	1.0	–	–	–	1.0	–	–	–
3-1, 88-94	15.6	3.3	–	5.7	2.0	–	–	–	–	25.5	0.4	1.2	–	–	5.7	–	30.8	0.8	–	–	–	–	–	1.2	–	1.2	0.4
3-2, 14-20	11.4	11.6	–	0.2	1.7	–	–	–	–	29.5	–	–	–	–	7.9	0.2	22.7	3.4	0.2	–	–	–	–	1.3	0.2	1.1	–
3-2, 61-70	15.7	27.6	–	6.3	2.3	–	–	–	–	12.8	–	0.8	–	–	3.8	0.8	24.8	3.0	–	–	–	–	–	0.8	–	1.5	–
5-1, 145-176	–	–	–	1.2	–	–	–	–	–	1.6	–	–	–	–	–	–	–	0.2	–	–	–	–	–	0.2	–	0.2	–
6-1, 100-110	21.0	–	–	6.0	–	–	–	–	–	1.0	–	–	–	–	2.0	–	4.0	1.0	–	1.0	–	–	–	–	–	–	–
6-1, 140-142	0.8	–	–	2.7	–	–	–	–	–	0.8	–	–	–	–	0.8	–	0.3	–	–	–	–	–	–	–	–	–	–
7-1, 141-143	2.6	–	–	7.7	–	–	–	–	–	0.5	–	–	–	–	0.5	–	0.7	–	–	0.2	–	–	–	0.2	–	–	–
7-2, 105-110	13.0	8.0	–	2.0	1.0	–	–	–	–	1.0	–	–	–	–	1.0	–	5.0	–	–	1	–	–	–	–	–	–	–
7-3, 18-24	6.0	–	–	4.0	–	–	–	–	–	–	–	–	–	–	2.0	–	6.0	1	–	–	–	–	–	–	–	–	–
10-2, 26-30	9.3	–	–	0.4	21.8	–	–	–	–	3.2	1.0	2.0	–	–	43.8	0.2	10.0	1.0	–	0.4	–	–	–	0.6	–	–	–
10-3, 99-102	3.3	–	–	–	–	–	–	–	–	4.8	0.5	1.3	–	–	61.5	–	15.8	0.5	–	0.3	–	–	–	0.5	–	0.3	–
10-3, 106-114	0.6	–	–	4.7	–	–	–	–	–	0.3	–	0.3	–	0.3	0.3	–	0.3	–	–	–	–	–	–	–	–	–	–
11-1, 22-32	0.9	–	–	–	0.2	–	–	–	–	0.5	–	–	–	–	0.5	0.2	0.2	–	0.2	0.5	–	–	–	0.2	–	–	–
11-2, 137-148	4.6	26.4	–	–	28.8	–	–	–	–	2.1	–	0.5	–	–	–	–	9.3	–	–	–	–	–	–	–	–	–	–
12-2, 9-18	2.6	–	–	4.3	–	–	–	–	–	0.2	–	–	–	–	–	–	0.2	0.5	–	0.5	–	–	–	–	–	0.2	–
12-2, 73-74	33.0	–	–	10	–	–	–	–	–	7.0	–	1.0	–	–	–	–	21.0	13.0	–	–	–	–	–	3	3	–	–
12-2, 100-104	–	–	–	–	–	–	–	–	–	1.0	–	–	–	–	0.2	–	0.5	–	–	0.5	–	–	–	–	–	–	–
13-5, 63-70	–	–	–	6.3	–	–	–	–	–	0.6	–	–	–	–	0.3	–	0.5	0.5	–	0.9	–	–	–	–	–	–	–
13-5, 106-115	–	–	–	5.0	–	–	–	–	–	0.3	–	–	–	–	–	–	–	–	–	0.5	–	–	–	–	–	–	–
13-6, 145-150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

14-2, 1-8	–	–	–	5.4	–	–	–	–	–	0.6	–	–	–	–	0.3	–	0.6	–	–	1.3	–	–	–	–	–	–	–
14-2, 65-73	–	–	–	3.5	–	–	–	–	–	0.5	–	–	–	–	–	–	1.4	–	–	0.5	–	–	–	–	–	–	–
14-2, 128-135	–	–	–	12.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.3	–	–	–	–	–	–	–
15-1, 52-60	–	–	–	12.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
15-2, 91-100	–	–	–	4.5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
15-3, 29-36	0.7	–	–	9.1	–	–	–	–	–	–	–	–	–	–	0.4	–	0.2	–	–	–	–	–	–	0.4	–	–	–
15-5, 89-92	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
14-6, 19-26	5.0	–	–	1.0	–	–	–	–	–	–	–	–	–	–	3.0	–	2.0	1.0	–	–	–	–	–	–	–	–	–
16-1, 57-62	90.0?	–	–	2.9	–	–	–	–	–	0.8	–	–	–	–	1.3	–	3.3	–	–	–	–	–	–	–	–	–	–
16-3, 32-37	7.4	–	–	21.5	–	67.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
16-4, 88-93	10.2	1.3	–	2.6	–	8.1	–	–	–	–	–	–	–	–	0.3	0.3	0.5	0.5	–	–	–	–	–	0.5	0.3	–	–
18-2, 80-86	6.0	–	–	8.0	–	–	–	–	–	1.0	–	–	–	–	–	–	1.0	–	–	–	–	–	–	1	–	–	–
18-3, 130-139	5	–	–	5	–	–	–	–	–	–	–	–	–	–	2	–	3	–	–	–	–	–	–	2	–	–	–
18-4, 115-124	1.7	–	–	0.9	0.4	93.3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.4	–	–	–
18-5, 14-20	–	–	–	3.2	–	–	–	–	–	–	–	–	–	–	0.7	0.2	0.9	–	–	0.7	–	–	–	–	–	–	–
18-5, 65-73	–	–	–	10.7	–	87.7	–	–	–	–	–	–	–	–	–	–	–	0.3	–	–	–	–	–	0.3	–	–	–
18-5, 133-143	0.6	–	–	1.5	–	–	–	–	–	–	–	–	–	–	–	–	0.3	–	–	–	–	–	–	–	–	–	–
3, CC	12.8	–	–	3.1	3.8	–	–	–	–	30.9	–	–	–	–	6.5	0.4	26.2	4.2	–	–	–	–	–	4.9	–	0.8	–
Site 324																											
1-2, 126-131	15	–	–	4	–	–	–	–	–	19	–	–	–	–	23	1	6	3	–	2	–	–	–	1	2	1	–
1-4, 125-131	1.0	–	–	4.0	–	–	–	–	–	1.0	–	–	–	–	0.3	–	0.5	0.5	–	–	–	–	–	0.3	–	–	–
1-6, 31-38	31.2	–	–	0.5	–	–	–	–	–	33.8	–	–	–	–	3.9	1.3	9.7	4.7	–	–	–	–	–	1.8	0.5	1.6	0.5
2-1, 83-92	0.3	–	–	0.3	–	–	–	–	–	1.8	–	0.3	–	–	1.2	0.3	0.8	–	–	1.2	–	–	–	–	–	–	–
2-2, 61-70	0.3	–	–	0.3	–	–	–	–	–	–	–	–	–	–	–	–	0.3	0.3	–	–	–	–	–	–	–	–	–
2-3, 52-61	1.4	–	–	0.3	1.1	–	–	–	–	1.1	–	–	–	–	0.8	–	1.4	–	–	3.1	–	–	–	0.6	–	–	–
2-4, 27-36	0.9	–	–	5.0	–	–	–	–	–	0.2	–	–	–	–	–	–	0.4	–	0.7	–	–	–	–	0.2	–	–	–
2-5, 35-45	3.6	–	–	1.0	–	–	–	–	–	0.3	–	–	–	–	0.3	–	–	–	–	3.6	–	–	–	–	–	–	–
2-6, 95-104	1.7	–	–	0.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
3-1, 137-146	25.5	–	–	3.2	–	–	–	–	–	0.7	–	–	–	–	–	–	1.1	–	–	–	–	–	–	–	–	–	–
3-2, 136-145	2.8	–	–	6.3	–	–	–	–	–	0.5	–	–	–	–	1.0	1.0	0.5	1.0	–	–	–	–	–	0.5	–	–	–
3-3, 67-77	5.6	–	–	4.7	–	–	–	–	–	0.6	–	–	–	–	0.3	–	0.8	–	–	–	–	–	–	0.5	–	–	–
3-4, 47-57	1.1	–	–	2.8	–	–	–	–	–	0.4	–	–	–	–	–	–	0.4	0.4	–	–	–	–	–	0.4	–	–	–
3-5, 99-100	–	–	–	2.5	–	–	–	–	–	0.5	–	–	–	–	0.5	–	0.7	0.2	–	0.2	–	–	–	–	–	–	–
4-2, 113-123	2.9	–	–	4.2	–	–	–	–	–	3.2	–	–	–	–	–	–	–	–	–	1.6	–	–	–	–	–	–	–
4-3,30-40	–	–	–	–	–	–	–	–	–	1.8	–	–	–	–	0.9	–	0.5	–	0.5	1.3	–	–	–	–	–	–	–
4-4, 54-64	0.8	–	–	3.6	–	–	–	–	–	0.4	–	–	–	–	1.1	–	0.4	0.4	–	–	–	–	–	–	–	–	–
5-2, 66-83	0.6	–	–	5.4	–	–	–	–	–	0.6	–	–	–	–	–	–	–	–	0.4	0.2	–	–	–	–	–	–	–
5-3, 25-35	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7-1, 69-78	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	1	–	–	–	–	1	–	–	–
7-3, 110-120	7.0	–	–	8.6	–	–	–	–	–	0.5	–	–	–	–	–	0.3	0.5	0.3	–	0.3	–	–	–	–	–	0.3	–
7-6, 119-129	0.9	–	–	22.5	1.1	–	–	–	–	0.3	–	–	–	–	0.3	–	0.3	–	–	0.3	–	–	–	–	–	–	–
8-3, 61-71	13.6	–	–	0.3	–	–	–	–	–	3.0	–	–	–	–	0.3	0.3	0.5	–	–	3.8	–	–	–	–	–	–	–
Site 325																											
1-1, 49-59	12.3	9.4	–	3.4	0.5	–	–	–	–	22.1	–	0.5	–	–	7.8	4.7	28.6	0.9	–	0.5	–	–	–	0.5	0.3	0.3	–
1-1, 133-144	8.3	13.0	–	3.2	–	13.5	–	–	–	16.2	–	1.4	–	–	11.1	3.2	18.4	2.3	–	–	–	–	–	0.5	–	–	–
1-2, 26-36	43	–	–	–	–	–	–	–	–	4	–	–	–	–	5	2	14	1	–	–	–	–	–	–	–	–	–
1-4, 181-192	15.9	–	–	3.4	0.2	–	–	–	–	27.7	0.2	–	–	–	20.8	1.8	21.9	0.2	–	0.2	–	–	–	–	–	0.7	–
2-2, 39-49	18.2	–	–	0.4	0.2	–	–	–	–	22.9	0.2	2.5	–	–	19.3	0.8	24.5	0.4	–	0.6	–	–	–	0.6	–	0.4	–
3-2, 11-24	19.7	–	–	3.3	2.9	–	–	–	–	22.2	–	–	–	–	15.3	3.6	23.4	0.4	–	0.4	–	–	–	1.4	–	–	0.4
3-3, 76-87	11.5	–	–	0.2	0.2	–	–	–	–	27.1	–	0.9	–	–	26.0	0.9	19.9	–	–	0.2	–	–	–	0.7	–	0.2	–
3-4, 26-36	15.4	–	–	0.2	3.4	–	–	–	–	27.8	–	1.9	–	–	16.8	1.5	24.9	0.2	–	–	–	–	–	0.7	0.5	0.2	–
5-1, 55-57	18.8	–	–	1.6	1.0	–	–	–	–	6.5	0.8	0.3	–	–	32.9	4.9	23.8	2.1	–	–	–	–	–	0.8	1.3	0.3	–
5, CC	43.4	–	–	1.0	–	–	–	–	–	–	–	–	–	–	38.3	–	7.7	1.9	–	–	–	–	–	1.9	–	–	–

TABLE 11A – *Continued*

Sample (Interval in cm)	Opaque Minerals	Magnetite and Magnetic Fragments	Magnetic Spherules	Fe-Oxides	Pyrite, Marcasite	Fe-Mn Aggregates	Chrome-Spinel	Olivine	Serpentine	Hornblende	Hornblende Basaltic	Tremolite, Actinolite	Glaucophane	Anthophyllite	Pyroxene-Monoclinic	Pyroxene-Rhombic	Epidote	Garnet	Biotite	Chlorite and Chlorite Fragments	Fe-Mica	Muscovite	Glauconite	Zircon	Leucoxene	Sphene	Rutile
6-1, 145-150	25.3	–	–	0.9	21.0	–	–	–	–	1.4	0.2	0.9	–	–	36.9	1.4	6.4	0.7	–	–	–	–	–	0.2	0.2	0.2	–
7-1, 131-134	14.5	–	–	1.8	–	–	–	–	–	6.8	0.2	–	–	–	53.2	0.2	13.5	2.3	–	0.2	–	–	–	0.5	0.7	–	–
7-2, 138-142	20.0	–	–	0.8	0.8	–	–	–	–	1.0	–	0.5	–	–	48.0	0.3	18.0	2.5	–	–	–	–	–	0.3	–	0.3	–
8-1, 45-49	33.5	–	–	3.9	8.7	–	–	–	–	6.8	1.0	–	–	–	15.4	–	9.5	12.5	–	–	–	–	–	1.9	–	1.0	–
8-2, 22, 5-23, 5	8.9	–	–	0.3	–	–	–	–	–	1.7	1.1	–	–	–	47.8	0.6	19.7	0.8	–	–	–	–	–	0.6	–	–	–
8-2, 23, 5-25, 0	12.9	–	–	1.4	3.5	–	–	–	–	1.8	2.5	–	–	–	46.0	0.4	14.6	0.7	–	1.6	–	–	–	0.5	–	–	–
8-2, 25-26	14.3	–	–	3.1	2.4	–	–	–	–	4.9	1.5	–	–	–	43.8	–	–	0.9	–	0.6	–	–	–	–	–	–	–
8-2, 26, 0-27, 5	16.3	–	–	2.9	1.9	–	–	–	–	1.9	1.7	–	–	–	43.6	0.2	19.9	1.1	–	0.8	–	–	–	–	0.6	–	–
8-2, 27.5-28.0	5.9	–	–	0.8	1.8	–	–	–	–	1.0	1.4	–	–	–	48.4	0.4	24.4	1.2	–	3.8	–	–	–	0.4	–	–	–
8-2, 29.0-30.5	7.7	–	–	1.9	1.7	–	–	–	–	3.1	0.8	–	–	–	46.0	0.3	24.5	1.9	–	1.9	–	–	–	0.3	0.6	–	–
8-2, 30.5-32.5	9.0	–	–	1.5	2.7	–	–	–	–	0.8	1.5	–	–	–	39.2	0.4	29.0	1.5	–	0.8	–	–	–	0.4	0.4	–	–
8-2, 32.5-33.5	8.9	–	–	1.6	5.4	–	–	–	–	–	0.7	–	–	–	41.8	–	22.9	2.0	–	1.3	–	–	–	0.2	–	–	–
8-2, 33.5-34.5	11.0	–	–	–	5.4	–	–	–	–	2.1	1.2	–	–	–	39.6	0.2	21.0	2.6	–	1.6	–	–	–	0.5	0.5	–	–
8-2, 34.5-35.5	4.5	–	–	3.4	2.9	–	–	–	–	0.8	0.8	0.3	–	–	44.3	–	21.2	2.1	–	1.0	–	–	–	0.5	–	–	–
8-2, 35.5-37.0	9.2	–	–	5.4	2.5	–	–	–	–	0.8	1.5	0.2	–	–	40.6	–	20.3	0.8	–	1.4	–	–	–	0.6	0.6	–	–
8-2, 37.0-39.0	7.5	–	–	1.5	3.1	–	–	–	–	1.0	1.8	–	–	–	53.3	–	23.3	1.0	–	1.0	–	–	–	0.3	0.5	–	–
8-2, 39.0-41.0	5.1	–	–	1.8	2.8	–	–	–	–	2.8	0.8	0.3	–	–	46.7	0.3	17.5	2.3	–	1.5	–	–	–	–	0.5	0.3	–
8-2, 41.0-42.0	12.7	–	–	3.1	14.9	–	–	–	–	1.7	0.3	–	–	–	37.3	–	20.9	1.4	–	0.8	–	–	–	0.3	0.3	–	–
8-2, 42.0-44.0+	5	–	–	3	–	–	–	–	–	–	1	–	–	–	12	–	11	–	–	–	–	–	–	3	–	–	–
8-2, 119-128	16.0	–	–	2.8	0.6	–	–	–	–	1.1	–	–	–	–	45.6	1.1	21.0	1.7	–	–	–	–	–	0.6	1.1	0.6	–
8-3, 27-35	25.3	–	–	1.5	21.4	–	–	–	–	2.3	–	–	–	–	15.7	–	14.2	9.5	–	–	–	–	–	2.3	–	–	–
9-3, 90-98	6.9	–	–	2.5	35.0	–	–	–	–	3.0	–	–	–	–	36.5	–	8.6	1.4	–	–	–	–	–	0.3	–	–	–
10-1, 35-39	17.7	–	–	5.1	20.6	–	–	–	–	4.6	–	–	–	–	26.8	0.6	13.7	1.7	–	–	–	–	–	0.6	0.6	–	–

Site 322. At Site 323 the heavy subfraction is composed primarily of hornblende and epidote and the content of monoclinic pyroxenes rarely exceeds 10%.

The content of magnetite (separate determination) and other opaque minerals is greater here than in the sediments from Site 322. Garnet, sphene, zircon, and apatite, which at Site 322 were found only as single grains, occur in measurable proportions at Site 323. Among the minerals of the light subfraction, the content of quartz, feldspar, and opaline biogenic material is much greater than at Site 322. However, in the lower Miocene (Core 10, Sections 2 and 3) a layer occurs that contains a mineral suite in the coarse aleuritic fraction which is similar to those found in the Neogene sediments at Site 322.

In the Paleogene sediments, the content of clastic minerals in the coarse aleuritic fraction noticeably decreases relative to the overlying sediment, whereas the occurrence of authigenic minerals (hydrous ferric oxide and manganese) increases, as do barite and zeolites in the Paleocene and Maestrichtian sediments. The content of fish debris increases sharply and single interlayers rich in calcitic biogenic remains are present. At Site 323 barite constitutes nearly 74% of the heavy, coarse aleuritic subfraction from sediments above basalt.

Sites 324 and 325

Drilling at Sites 324 yielded sediments of Pliocene-Pleistocene age. The mineral suites of the coarse aleuritic fractions are similar to those encountered in the upper part of the sequence at Site 323. The mineralogical make-up of the coarse aleuritic fraction of Site 324 is also similar to that of the upper part of the Pliocene-Pleistocene sequence at Site 325. In the Miocene, the mineralogy is similar to that of the Neogene sediments of Site 322.

From analysis of the data given in Tables 11-14 we were able to distinguish at least three major mineral suites. The boundaries between them are not always sharp and consequently we could also have recognized transitional suites. For the purpose of this study, however, we restricted ourselves to only the principal suites (Table 15). The first two suites differ in their relative abundances of clastic minerals, which probably reflect compositions of the source rocks. The third suite is characterized by a distinct increase of authigenic minerals and fish debris and by a decrease in clastic minerals.

DISCUSSION

The mineralogical composition of sediments at Leg 35 sites is related to the geological history of the western part of Antarctica. During Mesozoic and Cenozoic time, the time during which the most ancient rocks of the area studied were being formed, there existed, instead of Antarctica, a vast orogenically arched uplift which in the Paleogene was subjected to intensive denudation (Grikurov, 1973). However, these processes are not reflected in the composition of the Maestrichtian and Paleogene sediments which were, on the contrary, formed under conditions of a minimal influx of terrigenous material. We believe that the clastic sediments (greater than 0.5 mm) which were being predominantly transported by bottom currents were instead trapped in a deep trough which existed at that time. There was no sediment transport by ice-rafting, since glaciation of Antarctica did not begin until the Neogene. With the onset of the Paleogene, rift valleys formed in the central anticlinoriums and these retained most of the clastic particles. During Eocene-Oligocene time, the earlier sediments which had been formed under typical pelagic conditions were subjected to alteration by hydrothermal solutions. The solutions rose along fractures in the basaltic layer, diffused through the sediment, and ultimately reached the sea floor. Here, under benthonic conditions they caused the formation of a lithologically distinctive sediment. Initially, the chemical elements introduced by the hydrothermal solutions were subjected to differentiation as they moved through the sediments. This is indicated by their chemical composition and is discussed in greater detail elsewhere in this volume. The process is reflected in the mineral composition of the coarse aleuritic fraction by the formation of barite in the lowermost strata and enrichment of the sediments by free hydrous ferric oxide and manganese in the upper strata. At the Paleogene-Neogene boundary the depositional environment abruptly changed, with a substantial influx of terrigenous sedimentary material. This resulted from active block faulting of the Antarctic Andes following the intensive denudation and leveling of the late Mesozoic arched uplift. The block faulting also produced the rather dissected topography. Apparently, the Antarctic shelf in the Pacific sector was formed at the same time. Mineral suite I is always present in the coarse aleuritic fraction of sediments deposited during this time. In the middle Miocene at Site 323 and Pliocene at Site 325, suite I was replaced by suite II and at Site 322, suite I has occurred in sediments to the present time. This change of mineral suites in the clastic fraction is doubtless due to variations in the composition of the source rocks of western Antarctica. Presumably, mineral suite I was formed during the denudation of rocks of the Canyon Series, whereas mineral suite II incorporates rocks of the Canyon as well as the Scotia series.

Our study of the petrographic composition of the interbedded gravel layers (Site 324, Core 4 and Site 325, Core 2, Section 1), which are characteristic of suite II (Table 16), seemingly confirms our beliefs regarding the composition of source rocks on the Antarctic continent. The change in the mineral suites occurs earlier in the western part of the investigated area than in the eastern part, and at Site 322 deposition of suite I has been maintained to the present. This is indicative of the diverse denudation occurring on various parts of the Antarctic Coast or variations in the transportation complex from continent to ocean basin.

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TABLE 11B
Distribution of Minerals in the Heavy and Light Fraction of Leg 35 Sediments

Sample (Interval in cm)	Apatite	Sillimanite	Distene	Andalusite	Corundum	Tourmaline	Barite	Volc. Glass Basic	Carbonate	Dolomite	Teeth and Fish Bones	Indeterm. Fragments and Grains	Quartz	Feldspar (n<1.54)	Feldspar Basic and Medium	Feldspar Acid	Microcline	Chlorite	Biotite	Muscovite	Glauconite	Serpentine	Chrysotile-Asbest.	Volc. Glass Acid	Volc. Glass Basic	Volc. Ash	Biogenic Siliceous Debris
Site 322																											
2-2, 113-116	0.4	–	–	–	–	–	–	–	0.4	–	–	1.8	13.6	11.7	7.2	4.5	–	0.3	–	0.3	–	–	–	1.0	1.0	7.2	1.0
3-1, 18-20	–	–	–	–	–	–	–	–	–	–	–	5.0	10.9	5.8	8.2	6.0	–	0.7	–	–	–	–	–	0.2	0.7	6.3	2.5
4-1, 65-67	0.3	–	0.3	–	–	–	0.7	–	0.3	–	–	1.4	19.3	4.5	10.6	6.3	–	0.3	–	–	–	–	–	–	–	8.7	–
4-2, 57-60	0.2	–	0.2	–	–	–	0.2	–	–	–	–	6.6	13.2	6.6	10.8	9.1	–	0.8	0.2	–	–	–	–	3.7	0.8	17.4	0.2
5-1, 81-85	–	–	–	–	–	–	–	–	–	–	–	–	6.8	4.1	5.5	4.0	–	–	–	–	–	–	–	0.8	0.5	15.2	51.8
6-1, 30-33	0.3	–	–	–	–	–	1.7	–	0.7	–	–	5.8	10.0	2.3	8.3	2.8	–	0.3	–	–	–	–	–	0.3	0.5	6.2	0.8
9-2, 143-146	0.3	–	–	–	–	–	0.3	–	–	–	–	7.8	8.5	5.0	6.8	6.1	–	0.5	–	–	–	–	–	1.7	2.2	25.4	0.2
10-1, 101-105	0.5	–	–	–	–	–	–	–	0.3	–	–	16.7	17.5	9.5	19.2	6.2	–	–	–	–	–	–	–	0.9	1.8	21.8	–
10-2, 43-46	0.4	–	–	–	–	0.2	–	–	0.4	–	–	8.7	15.8	5.5	13.4	5.2	–	0.3	–	–	–	–	–	–	1.3	28.4	–
11-1, 42-46	0.6	–	–	–	–	–	–	–	–	–	–	10.8	17.5	5.2	14.2	12.3	–	–	0.3	–	–	–	–	–	–	–	–
11-2, 45-49	0.6	–	–	–	–	–	–	–	–	–	–	5.5	22.7	4.8	14.3	5.4	–	0.3	–	–	–	–	–	–	–	7.8	–
11-3, 24-32	0.4	–	–	–	–	–	–	–	0.2	–	–	11.1	22.2	7.4	13.8	11.3	–	–	–	–	–	–	–	–	–	–	–
11-4, 17-24	0.5	–	–	–	–	–	–	–	0.2	–	–	6.3	17.8	11.5	13.6	6.6	–	0.3	–	–	–	–	–	–	–	–	–
11-5, 36-40	0.2	–	–	–	–	–	–	–	–	–	–	–	11.1	3.4	8.3	7.1	–	–	0.3	0.3	–	–	–	0.6	–	1.4	0.3
11-6, 109-115	0.7	–	–	–	–	0.3	–	–	–	–	–	–	2.2	0.4	1.5	1.1	–	0.2	–	–	–	–	–	0.6	–	1.1	–
Site 323																											
1-1, 50-60	4.8	–	–	–	–	–	–	–	–	–	–	4.4	39.3	24.6	1.4	1.8	–	1.1	0.4	–	0.4	–	–	0.4	–	–	–
1-1, 140-150	3.4	–	–	–	–	–	–	–	–	–	–	6.0	40.8	24.6	0.4	4.8	0.4	–	0.9	–	–	–	–	–	–	–	0.9
1-2, 34-43	2.1	–	–	0.4	–	–	–	–	–	–	–	6.4	29.5	17.2	0.3	4.6	–	–	0.3	–	0.3	–	–	–	–	–	0.3
1-3, 21-22	1.5	–	–	–	–	–	–	–	–	–	–	7.7	33.2	21.3	0.4	1.7	0.4	–	–	–	–	–	–	–	–	–	0.4
1-3, 78-88	1.0	–	–	–	–	–	–	–	–	–	–	4.0	22.7	12.4	1.9	3.9	–	–	–	–	0.4	–	–	–	–	–	–
1-4, 118-127	–	–	–	–	–	–	–	–	–	–	–	3.0	23.8	6.9	1.6	2.0	–	–	–	–	–	–	–	–	0.4	–	17.2
2-1, 128-130	–	–	–	1.0	–	–	–	–	–	–	–	–	11.7	8.3	0.9	4.0	–	0.9	–	–	–	–	–	–	0.4	–	1.7
3-1, 88-94	2.5	–	–	–	–	–	–	–	–	–	–	3.7	31.5	15.8	2.7	1.2	–	–	–	–	–	–	–	0.4	0.8	–	1.5
3-2, 14-20	2.8	–	–	–	–	–	–	–	–	–	–	5.8	32.8	18.0	2.2	6.4	–	0.4	–	–	0.4	–	–	–	–	–	0.4
3-2, 61-70	0.8	–	–	–	–	–	–	–	–	–	–	–	34.6	34.5	18.9	1.8	4.7	0.4	0.4	–	–	–	–	–	–	0.4	–
5-1, 145-176	–	–	–	–	–	–	–	–	–	–	–	24.7	21.8	8.1	0.5	1.8	–	–	–	–	–	–	–	–	–	–	1.8
6-1, 100-110	–	–	–	–	–	–	–	–	–	–	–	3	7.1	1.3	1.7	0.3	–	0.7	–	–	–	–	–	36.5	1.0	–	–
6-1, 140-142	–	–	–	–	–	–	–	–	–	–	–	–	11.0	1.6	0.8	1.1	–	–	–	–	–	–	–	0.5	–	–	1.1
7-1, 141-143	–	–	–	–	–	–	–	–	–	–	–	3.8	13.2	0.3	0.2	1.0	–	–	–	–	–	–	–	0.0	–	–	3.8
7-2, 105-110	–	–	–	–	–	–	–	–	–	–	–	–	13.9	2.8	–	1.8	–	–	–	–	–	–	–	25.4	–	–	6.1
7-3, 18-24	–	–	–	–	–	–	–	–	–	–	–	2	10.1	0.5	0.5	1.4	–	–	–	–	–	–	–	5.5	–	–	3.2
10-2, 26-30	0.2	–	–	–	–	–	–	–	–	–	–	6.1	11.8	4.6	19.7	0.4	–	–	–	–	–	–	–	–	–	–	0.4
10-3, 99-102	–	–	–	–	–	–	–	–	–	–	–	11.2	19.2	5.3	31.2	1.9	–	–	–	–	–	–	–	–	–	–	0.4
10-3, 106-114	–	–	–	–	–	–	–	–	–	–	–	5.3	9.1	1.2	6.3	0.3	–	–	–	–	–	–	–	0.3	0.3	–	8.4
11-1, 22-32	–	–	–	–	–	–	–	–	–	–	–	26.3	37.8	17.4	0.9	1.4	–	–	–	–	–	–	–	–	–	–	7.7
11-2, 137-148	–	–	–	–	–	–	–	–	–	23.8	–	–	18.9	7.8	2.3	4.2	–	0.9	–	–	–	–	–	0.9	–	–	0.9
12-2, 9-18	–	–	–	–	–	–	–	–	–	–	–	26.1	39.5	18.3	–	0.7	0.2	–	–	–	–	–	–	0.2	–	–	2.1
12-2, 73-74	–	–	–	–	–	–	–	–	–	–	–	–	47.5	23.1	1.9	–	–	–	–	–	–	–	–	0.5	–	–	0.5
12-2, 100-104	–	–	–	–	–	–	–	–	–	–	–	–	40.4	18.2	0.2	1.5	–	–	–	–	–	–	–	0.2	–	–	–
13-5, 63-70	–	–	–	–	–	–	–	–	–	–	–	–	21.0	4.8	–	0.5	–	–	–	–	–	–	–	–	–	–	0.6
13-5, 106-115	–	–	–	–	–	–	–	–	–	–	–	–	30.0	6.3	0.3	–	0.3	–	–	0.5	–	–	–	0.3	–	–	2.8
13-6, 145-150	–	–	–	–	–	–	–	–	–	–	–	–	14.7	5.7	0.5	1.0	–	0.5	–	–	–	–	–	35.0	–	–	1.0

14-2, 1-8	–	–	–	–	–	–	–	–	–	–	–	–	21.0	19.2	0.3	1.0	–	–	–	–	–	–	–	–	–	–	–
14-2, 65-73	–	–	–	–	–	–	–	–	–	–	–	–	20.9	5.7	–	–	0.3	–	–	–	–	–	–	–	–	–	–
14-2, 128-135	–	–	–	–	–	–	–	–	–	–	–	–	7.7	2.5	0.6	0.3	–	–	–	–	–	–	–	0.3	–	–	–
15-1, 52-60	–	–	–	–	–	–	–	–	–	–	–	–	0.8	–	–	–	–	–	–	–	–	–	–	–	–	–	–
15-2, 91-100	–	–	–	–	–	–	–	–	–	–	–	–	3.4	1.5	–	0.8	–	–	–	–	–	–	–	–	–	–	0.4
15-3, 29-36	–	–	–	–	–	–	–	–	–	–	–	–	3.3	0.4	–	0.7	–	–	–	–	–	–	–	–	–	–	0.4
15-5, 89-92	–	–	–	–	–	–	–	–	–	–	–	–	13.8	3.5	0.4	1.8	0.4	–	–	–	–	–	–	1.3	–	–	6.7
14-6, 19-26	–	–	–	–	–	–	–	–	–	–	–	–	3.3	0.8	0.8	–	–	0.8	–	–	–	–	–	0.4	–	–	3.3
16-1, 57-62	–	–	–	–	–	–	–	0.4	–	–	–	1.3	1.7	0.3	–	0.3	–	–	–	–	–	–	–	1.0	–	–	8.6
16-3, 32-37	–	–	–	–	–	–	–	–	–	–	–	3.7	7.3	–	0.8	–	–	0.4	–	–	–	–	–	25.9	–	–	0.8
16-4, 83-93	–	–	–	–	–	–	73.8	–	–	–	–	1.6	1.8	0.9	–	0.4	–	0.5	–	–	–	–	–	8.0	–	–	–
18-2, 80-86	–	–	–	–	–	–	23	–	–	–	–	–	0.8	0.4	0.8	–	–	–	–	–	–	–	–	6.5	–	–	22.9
18-3, 130-139	–	–	–	–	–	–	29	–	–	1	–	3	–	–	–	–	–	–	–	–	–	–	–	0.4	–	–	90.8
18-4, 115-124	–	–	–	–	–	–	3.3	–	–	–	–	–	–	–	0.8	–	–	0.4	–	–	–	–	–	0.4	–	–	–
18-5, 14-20	–	–	–	–	–	–	–	–	–	–	–	1.4	3.6	3.0	–	0.5	–	–	–	–	–	–	–	–	–	–	–
18-5, 65-73	–	–	–	–	–	–	1.0	–	–	–	–	–	1.2	–	0.8	–	–	–	–	–	–	–	–	0.8	–	–	–
18-5, 133-143	–	–	–	–	–	–	–	–	–	–	–	–	5.3	3.0	–	0.6	–	–	–	–	–	–	–	–	–	–	3.3
3, CC	1.5	–	–	–	–	–	–	–	–	–	–	4.9	48.5	13.5	–	0.7	0.7	–	–	0.4	0.7	–	–	–	–	–	–
Site 324																											
1-2, 126-131	–	–	–	–	–	–	–	–	–	–	–	15	33.6	21.8	0.7	0.7	0.3	1.0	–	–	0.3	–	–	2.0	–	–	0.3
1-4, 125-131	–	–	–	–	–	–	–	–	–	–	–	11.3	37.8	19.8	0.5	0.5	–	–	–	–	0.5	–	–	0.8	–	–	0.5
1-6, 31-38	2.4	–	–	–	–	–	–	–	–	–	–	8.1	36.7	26.0	1.4	1.7	0.3	0.7	0.7	–	0.7	–	–	0.3	0.3	–	–
2-1, 83-92	–	–	–	–	–	–	–	–	–	–	–	30.7	30.9	17.3	2.5	1.8	–	–	–	–	–	–	–	–	–	–	0.9
2-2, 61-70	–	–	–	–	–	–	–	–	–	–	–	29.8	25.4	16.4	0.9	1.1	0.3	1.7	–	–	–	–	–	–	–	–	0.9
2-3, 52-61	–	–	–	–	–	–	–	–	–	–	–	28.4	31.4	12.0	4.2	3.9	0.3	–	–	–	–	–	–	–	–	–	–
2-4, 27-36	–	–	–	–	–	–	–	–	–	–	–	18.7	29.5	35.2	1.3	0.7	0.4	–	–	–	–	–	–	–	–	–	–
2-5, 35-45	–	–	–	–	–	–	–	–	–	–	–	7.7	35.8	39.7	0.3	1.8	–	1.8	0.8	–	–	–	–	1.8	–	–	–
2-6, 95-104	–	–	–	–	–	–	–	–	–	–	–	24.0	38.2	30.8	–	0.6	–	–	–	–	0.6	–	–	–	–	–	0.6
3-1, 137-146	–	–	–	–	–	–	–	–	–	–	–	21.5	26.6	14.0	1.4	1.4	–	0.4	–	–	–	–	–	–	–	–	–
3-2, 136-145	–	–	–	–	–	–	–	–	–	–	–	18.8	43.0	18.3	1.0	0.5	–	–	–	–	–	–	–	–	–	–	–
3-3, 67-77	–	–	–	–	–	–	–	–	–	–	–	15.0	18.6	4.5	2.8	0.8	–	–	–	–	–	–	–	0.3	–	–	3.1
3-4, 47-57	–	–	–	–	–	–	–	–	–	–	–	4.2	2.1	1.4	1.1	0.4	–	–	–	–	–	–	–	0.7	–	–	–
3-5, 99-100	–	–	–	–	–	–	–	–	–	–	–	–	4.5	4.0	0.7	1.2	–	–	–	–	–	–	–	–	–	–	–
4-2, 113-123	–	–	–	–	–	–	–	–	–	–	–	22.5	34.2	15.7	1.1	1.1	–	–	–	–	–	–	–	0.5	–	–	–
4-3, 30-40	–	–	–	–	–	–	–	–	–	–	–	35.0	39.2	20.5	–	1.3	–	–	–	–	0.9	–	–	0.5	–	–	–
4-4, 54-64	–	–	–	–	–	–	–	–	–	–	–	12.4	32.4	21.3	1.5	0.8	–	–	–	–	0.4	–	–	0.8	0.8	–	0.8
5-2, 66-83	–	–	–	–	–	–	–	–	–	–	–	–	35.6	24.6	0.6	1.0	–	–	–	–	0.2	–	–	–	–	–	0.6
5-3, 25-35	–	–	–	–	–	–	–	–	–	–	–	–	0.6	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7-1, 69-78	–	–	–	–	–	–	–	–	–	–	–	–	16	11	–	2	1	–	–	–	–	–	–	–	–	–	1
7-3, 110-120	–	–	–	–	–	–	–	–	–	–	–	14.8	35.0	10.0	0.3	–	–	–	–	0.3	–	–	–	0.3	–	–	–
7-6, 119-129	–	–	–	–	–	–	–	–	–	–	–	–	35.4	14.0	0.3	–	–	–	–	–	0.5	–	–	0.8	–	–	0.5
8-3, 61-71	–	–	–	–	–	–	–	–	–	–	–	5.7	8.2	4.9	–	0.3	–	–	–	–	–	–	–	1.1	–	–	0.5
Site 325																											
1-1, 49-59	0.3	–	–	–	–	–	0.3	–	–	–	–	7.6	15.2	11.0	3.7	4.6	–	0.5	0.5	–	–	–	–	0.5	–	–	–
1-1, 133-144	0.5	–	–	–	–	–	0.5	–	–	–	–	7.9	10.6	3.9	1.6	1.2	–	–	–	–	–	–	–	–	–	–	0.4
1-2, 26-36	–	–	–	–	–	–	–	–	–	–	–	–	22.6	3.8	4.7	2.8	–	1.4	–	–	–	–	–	0.9	–	–	3.8
1-4, 181-192	0.2	–	–	–	–	–	0.7	–	–	–	–	6.1	29.8	18.0	4.2	2.9	–	0.3	–	–	–	–	–	–	–	–	0.3
2-2, 39-49	1.3	–	–	–	–	–	–	–	–	–	–	7.7	30.2	12.1	9.5	1.3	–	0.4	–	–	–	–	–	0.4	–	–	0.4
3-2, 11-24	0.7	–	–	–	–	–	–	–	–	–	–	7.3	29.0	6.8	3.6	4.1	–	0.9	–	–	–	–	–	0.5	–	–	–
3-3, 76-87	0.7	–	–	–	–	–	–	–	–	–	–	11.5	30.2	15.2	13.0	0.9	–	1.8	–	–	–	–	–	0.4	–	–	0.9
3-4, 26-36	0.5	–	–	–	–	–	–	–	–	–	–	6.3	22.0	10.4	7.8	2.2	–	2.6	–	–	–	–	–	0.4	–	–	–
5-1, 55-57	–	–	–	–	–	–	–	–	–	–	–	4.9	17.7	2.4	18.1	7.6	–	–	–	–	–	–	–	–	–	–	–
5, CC	–	–	–	–	–	–	–	–	–	–	–	5.8	14.3	5.4	23.4	3.7	–	–	–	–	–	–	–	2.9	–	–	–

TABLE 11B – *Continued*

Sample (Interval in cm)	Apatite	Sillimanite	Distene	Andalusite	Corundum	Tourmaline	Barite	Volc. Glass Basic	Carbonate	Dolomite	Teeth and Fish Bones	Indeterm. Fragments and Grains	Quartz	Feldspar (n<1.54)	Feldspar Basic and Medium	Feldspar Acid	Microcline	Chlorite	Biotite	Muscovite	Glauconite	Serpentine	Chrysotile-Asbest.	Volc. Glass Acid	Volc. Glass Basic	Volc. Ash	Biogenic Siliceous Debris
6-1, 145-150	–	–	–	–	–	–	–	–	–	–	–	4.3	22.0	6.8	25.7	1.0	–	–	–	–	–	–	–	0.5	–	–	6.3
7-1, 131-134	–	–	–	–	–	–	–	–	–	–	–	6.1	24.3	4.3	28.0	0.4	–	–	–	–	–	–	–	–	–	–	–
7-2, 138-142	–	–	–	–	–	–	–	–	–	–	–	7.3	19.5	4.9	25.9	0.8	–	–	–	–	–	–	–	0.8	–	–	3.8
8-1, 45-49	–	–	–	–	–	–	–	–	–	–	–	5.8	39.4	9.6	7.2	0.6	–	0.6	–	–	–	–	–	1.2	–	–	31.2
8-2, 22.5-23.5	–	–	–	–	–	–	–	–	–	–	–	18.5	18.0	1.7	37.0	0.6	–	–	–	–	0.6	–	–	–	–	–	0.6
8-2, 23.5-25.0	–	–	–	–	–	–	–	–	–	–	–	14.1	12.1	10.4	25.5	–	–	–	–	–	0.4	–	–	–	–	11.3	–
8-2, 25-26	–	–	–	–	–	–	–	–	–	–	–	5.2	17.5	5.6	25.0	0.4	–	0.4	–	–	–	–	–	–	–	–	–
8-2, 26.0-27.5	–	–	–	–	–	–	–	–	–	–	–	9.1	10.2	3.8	33.0	–	–	–	–	–	–	–	–	–	–	–	–
8-2, 27.5-28.0	0.2	–	–	–	–	–	–	–	–	–	–	15.3	11.9	2.5	33.7	–	–	–	–	–	0.4	–	–	–	–	–	48.5
8-2, 29.0-30.5	–	–	–	–	–	–	–	–	–	–	–	9.3	7.6	4.9	32.6	0.8	–	2.3	–	–	–	–	–	–	–	–	–
8-2, 30.5-32.5	0.2	–	–	–	–	–	–	–	–	–	–	12.6	11.6	4.9	24.3	0.4	–	–	–	–	–	–	–	–	–	–	–
8-2, 32.5-33.5	0.5	–	–	–	–	–	–	–	–	–	–	14.7	13.8	1.4	35.4	–	–	–	–	–	–	–	–	–	–	21.5	0.9
8-2, 33.5-34.5	0.2	–	–	–	–	–	–	–	–	–	–	14.0	13.2	4.9	29.5	–	–	–	–	–	–	–	–	–	–	–	–
8-2, 34.5-35.5	–	–	–	–	–	–	–	–	–	–	–	18.2	5.0	6.7	26.4	–	–	–	–	–	–	–	–	–	–	13.4	–
8-2, 35.5-37.0	0.6	–	–	–	–	–	–	–	–	–	–	14.5	11.3	8.7	26.1	0.4	–	–	–	–	–	–	–	–	–	11.3	0.4
8-2, 37.0-39.0	0.3	–	–	–	–	–	–	–	–	–	–	5.4	11.7	3.8	30.4	1.1	–	0.4	–	–	–	–	–	–	–	–	0.8
8-2, 39.0-41.0	–	–	–	–	–	–	–	–	–	–	–	17.3	20.9	1.8	27.5	–	–	0.4	–	–	–	–	–	–	–	11.7	–
8-2, 41.0-42.0	–	–	–	–	–	–	–	–	–	–	–	6.3	4.6	4.2	20.2	–	–	1.1	–	–	–	–	–	–	–	–	2.3
8-2, 42.0-44.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	78.9
8-2, 119-128	–	–	–	–	–	–	–	–	–	–	–	7.8	17.1	2.8	21.9	0.9	–	–	–	–	–	–	–	0.5	–	–	–
8-3, 27-35	–	–	–	–	–	–	–	–	–	–	–	7.1	23.3	4.3	20.2	2.1	0.4	–	–	–	–	–	–	0.9	–	–	20.2
9-3, 90-98	–	–	–	–	–	–	–	–	–	–	–	5.0	10.5	3.8	24.2	–	–	–	–	–	–	–	–	1.4	–	–	–
10-1, 35-39	–	–	–	–	–	–	–	–	–	–	–	8.0	5.5	1.2	6.3	0.8	–	–	–	–	–	–	–	0.8	–	–	14.8

TABLE 11C
Distribution of Minerals in the Heavy and Light Fraction of Leg 35 Sediments

Sample (Interval in cm)	Biogenic Carbonate Debris	Fe-Oxides	Carbonate	Zeolites	Clay Mineral Aggregates	Clay Carbonate Debris	Fe-Mn Debris	Fish Teeth and Bones	Chalcedonic Debris	Palagonite and Palagonitic Debris	Indeterm. Fragments and Grains	Remarks
Site 322												
2-2, 113-116	–	–	0.7	4.5	19.7	–	–	1.0	0.3	–	26.0	
3-1, 18-20	0.5	–	–	2.4	55.8	–	–	–	–	–	–	
4-1, 65-67	–	–	–	1.0	6.8	–	–	0.3	0.7	–	41.5	
4-2, 57-60	–	–	–	0.6	–	–	–	–	–	–	36.6	
5-1, 81-85	–	–	–	–	8.1	–	–	–	–	–	3.2	
6-1, 30-33	–	–	–	23.4	–	–	–	8.5	–	–	36.6	
9-2, 143-146	–	–	–	1.7	15.0	–	–	–	–	0.7	25.0	
10-1, 101-105	–	–	–	0.3	–	–	–	–	0.3	0.3	22.2	
10-2, 43-46	–	–	0.3	1.0	–	–	–	–	0.7	–	28.4	
11-1, 42-46	–	–	–	–	–	–	–	–	–	–	50.5	
11-2, 45-49	–	–	0.3	–	–	–	–	0.3	–	–	44.1	
11-3, 24-32	–	–	–	–	–	–	–	–	–	–	45.3	
11-4, 17-24	–	–	0.3	0.6	–	–	–	–	0.3	–	50.0	
11-5, 36-40	–	–	0.3	0.3	27.1	–	3.4	28.6	0.3	2.0	5.2	
11-6, 109-115	–	–	0.2	0.2	54.1	–	23.0	15.0	–	–	–	
Site 323												
1-1, 50-60	0.4	–	–	–	–	–	–	–	–	–	29.8	
1-1, 140-150	–	–	–	–	–	–	–	–	–	–	27.7	
1-2, 34-43	2.0	–	–	–	18.2	–	–	–	–	–	27.2	
1-3, 21-22	0.4	–	–	8.6	–	–	–	–	–	–	33.6	
1-3, 78-88	1.2	–	–	–	44.2	–	–	–	–	–	13.3	
1-4, 118-127	6.6	–	–	–	39.9	–	–	1.6	–	–	–	
2-1, 128-130	–	–	–	0.4	72.6	–	–	4.3	–	–	0.9	
3-1, 88-94	0.4	–	–	–	45.5	–	–	0.4	–	–	–	
3-2, 14-20	0.4	–	–	–	–	–	–	–	–	–	–	
3-2, 61-70	1.8	–	–	–	–	26.6	–	1.5	–	–	9.0	(Not separated)
5-1, 145-176	1.2	–	–	6.5	28.2	–	–	1.8	–	–	–	(Not separated)
6-1, 100-110	–	–	–	–	50.4	–	–	1.0	–	–	–	(Not separated)
6-1, 140-142	–	–	–	–	77.7	–	–	0.8	–	–	–	(Not separated)
7-1, 141-143	–	–	–	–	56.7	–	–	3.6	–	–	–	(Not separated)
7-2, 105-110	–	–	–	–	47.6	–	–	1.4	–	–	0.5	(Not separated)
7-3, 18-24	–	–	–	0.5	76.9	–	–	1.4	–	–	–	(Not separated)
10-2, 26-30	4.2	–	–	1.3	57.6	–	–	–	–	–	–	(Not separated)
10-3, 99-102	–	–	–	0.4	17.1	–	–	–	–	–	24.5	(Not separated)
10-3, 106-114	0.6	–	–	0.6	56.4	–	–	5.0	–	–	–	(Not separated)
11-1, 22-32	0.9	–	–	–	4.2	–	–	0.2	–	–	–	(Not separated)
11-2, 137-148	3.2	–	–	–	60.9	–	–	–	–	–	–	(Not separated)
12-2, 9-18	–	–	–	–	2.4	–	–	2.4	–	–	–	(Not separated)
12-2, 73-74	1.9	–	–	–	–	–	–	–	–	–	24.6	(Not separated)
12-2, 100-104	–	–	–	1.2	11.9	–	–	–	–	–	24.0	(Not separated)
13-5, 63-70	23.0	–	–	0.5	38.1	–	–	1.2	–	–	1.2	(Not separated)
13-5, 106-115	0.3	–	–	1.0	32.6	–	–	16.0	–	–	3.8	(Not separated)
13-6, 145-150	33.1	–	–	–	–	–	–	8.5	–	–	–	(Not separated)
14-2, 1-8	0.3	–	–	0.6	26.7	–	–	13.4	–	–	9.3	(Not separated)
14-2, 65-73	34.6	–	–	7.9	24.4	–	–	–	–	–	–	(Not separated)
14-2, 128-135	–	–	–	1.5	21.8	–	–	38.6	–	–	13.5	(Not separated)
15-1, 52-60	–	–	–	1.1	66.8	–	–	19.0	–	–	–	(Not separated)
15-2, 91-100	–	–	–	1.5	55.5	–	–	26.4	–	–	–	(Not separated)
15-3, 29-36	–	–	–	0.9	59.9	–	–	20.8	–	–	2.4	(Not separated)
15-5, 89-92	0.4	–	–	–	30.8	–	–	31.4	–	–	9.4	(Not separated)
14-6, 19-26	60.0	–	–	–	16.3	–	–	14.3	–	–	–	(Not separated)
16-1, 57-62	12.4	–	–	50.4	–	23.2	–	2.1	–	–	–	(Not separated)
16-3, 32-37	4.4	–	–	4.0	23.4	–	–	23.8	–	–	5.6	
16-4, 83-93	–	–	–	2.3	45.4	–	34.0	34.0	–	–	–	
18-2, 80-86	1.5	–	–	36.7	8.5	–	–	21.8	–	–	–	
18-3, 130-139	1.2	–	–	2.8	–	–	–	4.8	–	–	–	
18-4, 115-124	–	–	–	81.0	10.0	–	0.4	7.0	–	–	–	
18-5, 14-20	–	–	–	13.0	47.3	–	–	26.2	–	–	–	
18-5, 65-78	–	–	–	2.8	37.7	–	16.8	23.9	–	–	16.0	
18-5, 133-143	0.9	–	–	0.6	83.3	–	–	–	–	–	–	
3, CC	–	–	–	0.4	2.1	–	–	–	–	–	33.0	

TABLE 11C – *Continued*

Sample (Interval in cm)	Biogenic Carbonate Debris	Fe-Oxides	Carbonate	Zeolites	Clay Mineral Aggregates	Clay Carbonate Debris	Fe-Mn Debris	Fish Teeth and Bones	Chalcedonic Debris	Palagonite and Palagonitic Debris	Indeterm. Fragments and Grains	Remarks
Site 324												
1-2, 126-131	–	–	–	–	–	–	–	0.7	–	–	38.6	
1-4, 125-131	–	–	–	–	17.4	–	3.3	–	–	–	–	
1-6, 31-38	0.7	–	–	–	–	–	–	–	–	–	30.5	
2-1, 83-92	–	–	–	0.6	9.6	–	–	–	–	–	–	
2-2, 61-70	–	–	–	–	21.0	–	–	1.4	–	–	–	
2-3, 52-61	–	–	–	0.6	8.6	–	–	0.8	–	–	–	
2-4, 27-36	–	–	–	0.4	6.4	–	–	–	–	–	–	
2-5, 35-45	–	–	–	1.5	–	–	–	–	–	–	–	
2-6, 95-104	2.3	–	–	–	–	–	–	–	–	–	–	
3-1, 137-146	–	–	–	–	4.2	–	–	–	–	–	–	
3-2, 136-145	–	–	–	–	4.8	–	–	–	–	–	–	
3-3, 67-77	0.3	–	–	42.3	–	–	–	–	–	–	–	
3-4, 47-57	0.7	–	–	–	–	–	–	0.4	–	–	–	
3-5, 99-100	–	–	–	–	85.0	–	–	–	–	–	–	
4-2, 113-123	–	–	1.3	–	11.7	–	–	–	–	–	–	
4-3, 30-40	–	–	–	–	–	–	–	–	–	–	–	
4-4, 54-64	0.8	–	–	–	20.8	–	–	–	–	–	–	
5-2, 66-83	–	–	–	4.9	3.9	–	–	–	–	–	21.5	
5-3, 25-35	–	–	–	99.4	–	–	–	–	–	–	–	
7-1, 69-78	1	–	–	44	3	–	–	–	–	–	6	
7-3, 110-120	–	–	–	15.8	5.7	–	–	–	–	–	–	
7-6, 119-129	3.3	–	–	9.6	2.2	–	–	–	–	–	7.7	
8-3, 61-71	0.3	–	–	57.5	–	–	–	–	–	–	–	
Site 325												
1-1, 49-59	15.2	–	–	–	23.3	–	–	–	–	–	25.5	
1-1, 133-134	21.4	–	–	–	52.6	–	0.8	–	–	–	6.7	
1-2, 26-36	7.0	–	–	–	53.0	–	–	–	–	–	–	
1-4, 181-192	2.9	–	–	0.3	16.1	–	–	–	–	–	25.2	
2-2, 39-49	2.2	–	–	–	43.5	–	–	–	–	–	–	
3-2, 11-24	1.4	–	–	–	53.7	–	–	–	–	–	–	
3-3, 76-87	1.4	–	–	–	36.7	–	–	–	–	–	–	
3-4, 26-36	1.7	–	–	–	52.9	–	–	–	–	–	–	
5-1, 55-57	–	–	–	0.4	44.7	–	–	–	–	–	9.1	
5, CC	0.4	–	–	–	40.3	–	–	–	–	–	9.6	
6-1, 145-150	1.6	–	–	–	22.5	–	–	–	–	–	13.7	
7-1, 131-134	–	–	–	–	33.2	–	2.6	–	–	–	6.4	
7-2, 138-142	0.4	–	–	0.4	43.5	–	–	–	–	–	–	
8-1, 45-49	–	–	–	–	10.2	–	–	–	–	–	–	
8-2, 22.5-23.5	–	–	–	–	–	–	–	–	–	–	41.5	
8-2, 23.5-25.0	–	–	–	–	–	–	–	–	–	–	40.3	
8-2, 25-26	0.4	0.8	–	–	–	–	–	–	–	–	49.9	
8-2, 26.0-27.5	–	–	–	–	–	–	–	–	–	–	53.0	
8-2, 27.5-28.0	–	–	–	–	–	–	–	–	–	–	–	
8-2, 29.0-30.5	1.5	–	–	–	–	–	–	–	–	–	50.4	
8-2, 30.5-32.5	–	–	–	6.7	4.2	–	–	–	–	–	47.9	
8-2, 32-5-33.5	0.5	–	–	3.8	–	–	–	–	–	–	22.2	
8-2, 33.5-34.5	–	–	–	9.4	12.4	–	–	–	–	–	22.5	
8-2, 34.5-35.5	–	–	–	–	–	–	–	–	–	–	48.5	
8-2, 35.5-37.0	–	–	–	–	–	–	–	–	–	–	46.8	
8-2, 37.0-39.0	–	–	–	13.6	–	–	–	–	–	–	38.2	
8-2, 39.0-41.0	–	–	–	–	–	–	–	–	–	–	37.7	
8-2, 41.0-42.0	0.4	–	–	–	14.5	–	–	–	–	–	27.9	
8-2, 42.0-44.0	16.7	–	–	–	–	–	–	–	–	–	0.6	
8-2, 119-128	30.7	–	–	0.9	25.2	–	–	–	–	–	–	
8-3, 27-35	5.2	–	–	–	23.2	–	–	–	–	–	–	
9-3, 90-98	1.0	–	–	–	40.5	–	–	–	–	–	–	
10-1, 35-39	0.4	–	–	–	70.2	–	–	–	–	–	–	

TABLE 12
Distribution of Minerals in Light Fraction of Samples (Elutriated)

Sample (Interval in cm)	Quartz	Microcline	Feldspar	Plagioclase (Basic and Medium)	Plagioclase (Acid)	Glauconite	Biotite	Muscovite	Chlorite	Foraminifers	Sponge Spicules	Radiolarians	Diatoms	Teeth, Bones	Clay Min. Authigenic (Authigenic)	Carbonate	Serpentine	Volc. Glass (Acid)	Volc. Glass (Basic)	Indeterm. Grains	Fe-Oxide	Chrisotile-Asbest.
Site 322																						
1, CC	27.6	–	11.1	12.9	–	1.7	1.2	1.2	2.3	6.4	–	–	1.7	–	–	–	–	–	–	31.6	2.3	–
2, CC	14.7	–	8.3	14.1	–	–	0.6	–	–	–	2.6	3.2	–	–	–	–	–	3.2	–	53.3	–	–
3, CC	16.5	–	8.5	19.4	–	–	0.8	–	–	–	–	–	2.0	–	29.4	–	–	1.6	2.0	19.8	–	–
4, CC	13.5	–	6.7	12.3	–	–	2.5	0.6	1.8	–	–	1.2	0.6	–	19.6	–	–	4.9	3.1	33.2	–	–
5, CC	10.6	0.7	7.0	12.7	–	–	1.4	–	1.4	–	–	2.8	–	12.0	23.2	–	–	–	1.4	26.8	–	–
6, CC	15.4	–	4.7	15.4	–	–	0.9	0.5	–	–	–	1.9	–	–	16.4	–	–	–	–	42.9	1.9	–
10, CC	17.5	–	10.5	18.5	–	–	0.5	–	0.5	–	–	–	0.5	–	18.5	–	–	–	–	32.0	1.5	–
11, CC	14.5	–	6.2	17.6	–	–	–	–	–	–	–	1.0	–	3.6	11.9	–	–	–	2.1	32.2	10.9	–
Site 323																						
1, CC	2.5	–	–	1.0	–	–	–	–	1.0	–	–	67.7	–	–	24.8	–	–	–	–	3.0	–	–
2, CC	40.4	–	12.5	11.7	–	–	0.4	–	1.0	–	–	1.7	–	–	9.1	–	–	0.9	–	22.9	0.4	–
3, CC	32.1	–	13.5	12.7	3.5	–	–	–	1.8	–	0.9	8.3	1.8	–	–	–	0.4	0.9	0.4	21.9	0.9	0.9
4, CC	17.4	–	14.5	11.0	–	–	–	–	1.8	–	–	9.3	–	–	10.5	–	–	0.6	–	35.5	1.2	–
5, CC	22.9	–	13.8	15.4	–	0.5	4.3	–	1.1	–	10.1	5.9	0.5	–	–	–	–	0.5	–	20.2	4.8	–
6, CC	38.0	–	10.1	5.1	–	–	4.3	0.6	1.3	–	1.3	11.4	–	–	9.5	–	–	–	–	22.7	–	–
7, CC	40.6	–	10.0	12.0	–	–	0.5	–	1.9	–	–	–	–	–	9.6	–	–	1.0	–	24.4	–	–
8-3	2.9	–	2.9	3.4	–	–	–	–	–	–	–	5.7	3.4	–	–	–	–	–	–	81.7	–	–
8, CC	36.9	–	17.2	9.6	–	–	1.5	1.0	0.5	2.5	–	–	1.0	–	–	–	–	0.5	–	27.3	2.0	–
9, CC	22.9	–	8.8	5.3	–	–	–	–	1.2	–	0.6	14.7	–	–	13.5	–	–	1.8	–	31.2	–	–
10, CC	0.8	–	–	0.4	–	–	–	–	–	–	–	0.8	–	–	89.6	4.4	–	–	–	4.0	–	–
12, CC	8.8	–	0.8	1.3	–	–	–	–	–	3.8	–	0.4	0.8	–	–	–	–	–	–	1.7	82.4	–
13, CC	4.5	–	4.9	6.5	–	0.4	–	–	–	53.1	–	–	–	6.5	–	–	–	–	–	19.6	4.5	–
15, CC	9.6	–	1.5	1.5	–	–	–	–	1.5	–	–	8.9	0.7	24.4	17.1	31.1	–	2.2	–	–	1.5	–
17, CC	–	–	–	–	–	1.2	–	–	–	83.7	–	1.7	4.7	8.1	–	–	–	–	–	–	0.6	–
Site 324																						
1-2	39.1	0.5	15.0	16.4	1.4	–	–	–	1.4	–	–	–	–	–	1.0	–	–	1.9	0.5	23.2	–	–
1-3	28.2	–	7.3	10.4	–	–	1.2	–	0.6	–	–	3.0	–	–	11.7	–	–	12.2	2.5	22.9	–	–
3, CC	36.5	–	10.3	11.2	–	1.4	–	–	0.9	–	–	2.3	–	–	6.5	–	–	0.5	–	30.4	–	–
4, CC	28.9	0.4	12.2	14.6	–	–	–	–	1.7	–	1.3	0.4	–	–	11.2	–	–	1.7	0.8	20.4	6.4	–
5, CC	36.3	–	18.3	9.4	–	–	1.1	–	1.7	–	–	–	–	–	5.5	–	–	1.1	–	24.4	2.2	–
6, CC	29.6	–	7.2	13.8	–	–	0.7	–	2.0	–	–	–	–	–	25.0	–	–	2.6	0.7	18.4	–	–
7, CC	32.4	0.6	14.4	9.6	–	–	1.1	–	1.1	10.6	–	2.6	–	–	–	–	–	–	1.1	23.9	2.6	–
8-2	31.9	0.5	7.3	17.1	30.4	–	–	1.0	–	–	–	–	–	–	–	–	0.5	–	–	11.3	–	–
Site 325																						
1-4	34.7	–	17.8	12.6	–	0.5	1.0	–	0.5	2.6	–	–	1.0	–	–	–	–	–	–	29.3	–	–
2-1	32.9	0.5	8.5	14.1	1.4	–	0.9	–	0.9	–	–	–	–	–	–	2.3	–	–	–	38.5	–	–
2, CC	20.8	–	15.2	21.3	–	0.5	2.0	–	–	–	–	6.6	–	–	4.6	–	–	0.5	–	27.5	1.0	–
3-1	28.5	–	9.3	15.3	1.6	0.5	1.1	–	–	–	–	1.1	–	–	–	2.2	–	–	–	40.4	–	–
3, CC	18.6	–	9.8	17.2	–	–	–	–	–	–	–	6.2	–	–	–	9.8	–	–	0.5	25.5	–	–
4-1	8.0	–	3.8	4.3	–	–	–	0.5	1.6	–	–	–	–	–	65.2	1.6	–	–	3.2	11.8	–	–
4-1	18.2	–	5.8	13.0	5.8	–	–	–	0.6	–	–	–	–	–	–	3.9	1.3	–	2.6	46.9	1.9	–
4, CC	21.8	0.6	16.0	6.3	–	–	1.1	1.7	2.6	–	1.1	3.4	1.7	–	13.7	–	–	1.1	–	28.9	–	–
6-1	20.4	–	15.4	18.5	1.9	0.7	1.1	–	0.7	–	–	–	–	–	–	–	–	0.7	–	38.1	1.1	–
7-2	15.5	0.5	4.8	10.6	–	–	0.5	–	–	–	0.5	14.0	–	–	–	–	–	–	0.5	52.6	0.5	–
9, CC	13.8	–	–	16.8	–	–	1.5	–	–	–	–	3.6	9.7	–	–	2.0	–	0.5	–	52.1	–	–
9-3	10.1	–	5.4	6.0	–	–	2.4	–	0.6	–	–	57.7	7.1	–	–	1.2	–	0.6	–	8.9	–	–
10	13.1	–	6.1	36.9	0.8	–	0.8	0.4	–	–	–	2.4	2.0	–	–	1.6	–	–	–	35.9	–	–
10-3	18.0	0.5	10.9	27.5	4.4	–	1.6	–	–	–	–	–	1.6	–	–	–	–	–	–	33.9	–	–

TABLE 13
Distribution of Minerals in Heavy Fraction of Sediments (Elutriated)

Sample (Interval in cm)	Opaque Minerals	Magnetic Spherules	Fe-Oxide	Hornblende	Hornbl. Basalt	Tremolite-Actinolite	Glaucophane	Anthophyllite	Pyroxene (Monoclinic)	Pyroxene (Rhombic)	Epidote	Clinozoisite	Coesite	Orthite	All Groups of Epidote	Garnet	Zircon	Rutile	Sphene
Site 322																			
1, CC	4.0	–	–	13.7	–	2.0	–	1.0	25.7	6.9	7.9	–	5.0	–	12.9	2.0	2.0	–	1.0
2, CC	5.0	–	9.0	3.0	–	–	–	–	14.0	–	1.0	–	–	–	1.0	2.0	–	–	–
3, CC	6.4	–	–	5.5	–	1.8	–	–	49.6	4.6	13.5	–	1.8	–	15.3	4.6	1.8	–	–
4, CC	4.0	–	4.0	5.6	–	0.8	–	–	48.8	8.0	4.8	–	1.6	–	6.4	3.2	1.6	0.8	–
5, CC	14.7	–	22.2	7.4	–	2.9	–	–	17.6	7.3	7.4	–	–	–	7.4	–	–	–	–
6, CC	8.0	–	1.8	6.2	0.9	0.9	–	–	47.9	7.1	7.5	4.4	–	–	11.9	1.8	0.9	0.4	0.4
10, CC	10.5	–	–	6.9	1.4	1.4	–	–	44.7	1.4	10.1	–	5.5	–	15.7	1.4	–	–	0.5
11, CC	14.6	–	66.1	6.1	–	0.5	–	–	6.6	–	1.9	–	1.4	–	3.3	0.5	–	–	–
Site 323																			
1, CC	3.0	–	–	1.0	–	–	–	–	7.0	–	–	–	1.0	–	1.0	–	–	–	–
2, CC	23.6	–	14.7	13.0	–	–	–	–	18.1	1.1	8.5	–	3.4	–	11.9	7.9	4.5	0.6	1.7
3, CC	13.2	–	2.8	30.4	–	0.9	–	–	8.5	1.9	16.0	–	3.8	–	19.8	1.9	–	–	–
4, CC	14.1	–	50.9	12.3	1.7	–	–	–	7.0	–	–	–	–	–	–	1.7	–	–	–
5, CC	25.8	–	23.9	9.9	2.8	–	–	–	6.9	–	4.7	–	–	–	4.7	–	–	1.4	1.4
6, CC	5.0	–	8.0	8.0	–	–	–	–	8.0	–	3.0	–	2.0	–	5.0	1.0	2.0	–	–
7, CC	13.9	–	–	41.3	–	–	–	0.3	5.9	0.3	10.1	–	2.8	–	12.9	2.4	4.9	0.3	2.1
8-3	22.6	–	3.2	3.2	–	–	–	–	12.8	–	9.6	–	–	–	9.6	32.5	–	–	–
8, CC	14.1	–	12.2	19.9	–	1.6	–	1.0	3.1	–	4.7	1.0	1.6	–	7.3	2.6	1.6	–	0.5
9, CC	–	–	4.0	1.0	–	–	–	–	1.0	–	–	–	1.0	–	1.0	1.0	–	–	–
10, CC	2.0	–	2.0	–	–	–	–	–	2.0	–	–	–	1.0	–	1.0	–	–	–	–
12, CC	–	–	96.5	0.7	–	–	–	–	1.4	–	–	–	–	–	–	–	–	–	–
13, CC	5.0	–	6.0	3.0	–	–	–	–	–	–	2.0	–	–	–	2.0	1.0	–	–	–
15, CC	3.0	–	6.0	–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	–
17, CC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Site 324																			
1-2	13.4	–	–	35.2	1.1	0.7	–	–	15.0	1.6	14.6	–	2.0	0.4	17.0	2.0	3.1	0.4	1.1
1-3	6.1	–	2.6	30.7	2.6	1.7	–	–	18.6	1.7	11.8	–	4.3	–	16.1	1.7	1.7	–	2.6
3, CC	17.3	–	13.4	5.3	–	2.7	–	–	12.0	–	9.3	–	4.0	–	13.3	8.0	4.0	1.3	–
4, CC	5.0	–	12.0	1.0	–	–	–	–	3.0	1.0	–	–	–	–	–	–	–	–	–
5, CC	5.0	1.0	7.0	–	–	–	–	–	3.0	–	3.0	–	–	–	3.0	–	–	–	–
6, CC	3.0	–	6.0	1.0	–	–	–	–	1.0	2.0	1.0	–	–	–	1.0	1.0	–	–	–
7, CC	1.9	–	78.5	5.6	–	–	–	–	3.7	–	1.9	–	–	–	1.9	3.7	–	–	0.9
8-2	19.7	–	3.4	19.7	–	–	–	–	9.7	–	10.8	4.4	2.2	–	17.4	8.8	3.7	–	2.2
Site 325																			
1-4	26.9	–	–	22.3	–	1.9	–	0.8	14.4	4.9	12.1	–	0.8	–	12.9	1.1	1.9	–	0.8
2-1	14.3	–	–	12.6	–	0.8	–	–	23.5	1.2	17.6	–	4.1	0.4	22.1	1.6	1.2	–	0.4
2, CC	17.6	–	–	12.5	1.7	–	–	–	35.0	1.7	16.9	–	2.1	–	19.0	2.5	–	–	–
3-1	46.5	–	2.0	8.7	–	0.7	–	–	12.7	7.3	8.7	–	2.7	–	11.4	2.0	2.7	–	–
3, CC	4.0	–	2.7	9.3	–	1.3	–	–	26.7	1.3	12.0	4.0	5.3	–	21.3	4.0	–	–	2.7
4-1	14.5	–	13.8	13.8	0.7	2.0	–	–	26.9	5.9	5.9	–	1.3	–	7.2	3.3	–	–	–
4-1	12.0	–	12.0	16.0	–	–	–	–	10.0	–	16.0	–	6.0	–	22.0	4.0	–	–	–
4, CC	13.4	–	3.9	13.4	–	–	–	2.4	9.4	1.6	18.1	–	2.4	–	20.5	0.8	–	–	–
6-1	25.6	–	3.9	6.2	–	–	0.4	–	39.7	0.4	7.8	1.9	1.2	–	10.9	1.2	1.2	0.4	–
7-2	2.0	–	2.0	1.0	–	–	–	–	6.0	1.0	4.0	–	1.0	–	5.0	1.0	1.0	–	–
9, CC	5.0	–	1.0	–	–	–	–	–	12.0	1.0	1.0	–	1.0	–	2.0	1.0	–	–	–
9-3	4.0	–	–	–	3.0	–	–	–	12.0	1.0	7.0	–	–	–	7.0	2.0	–	–	–
10-3	6.2	–	7.4	4.4	1.8	2.4	–	–	54.2	1.5	7.8	–	0.9	0.3	9.0	1.5	0.9	–	0.3
10	6.5	–	4.0	2.4	1.2	1.6	–	–	50.9	2.0	11.3	–	1.2	–	12.5	0.8	0.4	–	–

TABLE 13 – *Continued*

Apatite	Sillimanite	Distene	Andalusite	Corundum	Biotite	Chlorite	Glauconite	Volc. Glass (Basic and Medium)	Teeth, Bones	Carbonate	Leucoxene	Olivine	Stanrolite	Barite	Muscovite	Serpentine	Tourmaline	Fe-Mica	Indeterm. Grains and Fragments
2.0	1.0	–	–	–	4.0	3.0	1.0	–	–	–	–	–	–	–	–	–	–	–	17.8
–	1.0	–	–	1.0	2.0	–	–	2.0	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10.4
0.8	–	–	–	–	0.8	1.6	–	–	–	–	–	–	–	–	–	–	–	–	13.6
2.9	–	–	–	–	–	2.9	–	–	5.9	8.8	–	–	–	–	–	–	–	–	–
1.8	0.4	0.4	–	–	0.4	–	–	–	–	–	0.4	0.9	–	–	–	–	–	–	7.5
1.4	0.5	–	–	–	0.9	1.4	–	–	–	–	–	–	–	–	–	–	–	–	11.0
1.4	–	–	–	–	–	0.9	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.0	–
1.7	0.6	–	–	–	–	0.6	–	–	–	–	–	–	–	–	–	–	–	–	–
–	0.9	0.9	–	–	1.9	0.9	–	–	–	–	–	0.9	–	–	–	–	–	–	15.1
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12.3
2.8	–	–	–	–	2.8	–	–	–	–	6.9	–	–	–	–	–	–	–	–	10.7
1.0	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	–	–	–	–	–
2.8	–	0.3	–	–	–	–	–	0.7	–	–	0.7	0.7	–	–	–	–	–	–	9.1
–	–	–	–	–	3.2	–	–	–	–	–	–	–	–	–	–	–	–	–	12.9
1.6	–	–	–	–	1.0	0.5	–	–	–	26.7	–	0.5	–	–	–	–	–	–	5.8
–	–	–	–	–	–	–	–	–	–	2.0	–	–	–	–	–	–	–	–	–
–	–	1.0	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5.0
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.4
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.0
–	–	–	–	–	–	–	–	–	–	7.0	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	100.0	–	–	–	–	–	–	–	–	–
5.0	–	–	–	–	1.6	–	–	–	–	–	–	–	0.4	0.4	–	–	–	–	2.0
1.7	1.7	–	–	–	–	1.7	–	–	–	–	–	–	–	–	–	–	–	–	8.8
2.7	–	–	–	2.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17.3
–	–	–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	–	–	5.0
–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4.0
1.9	–	–	–	–	–	1.9	–	–	–	–	–	–	–	–	–	–	–	–	–
1.5	–	–	0.7	–	–	1.5	–	–	–	4.4	–	1.5	–	–	0.7	–	–	5.1	–
1.5	–	0.4	–	–	0.4	–	–	–	–	0.8	–	–	–	–	–	–	–	–	9.0
0.8	0.8	–	–	–	1.2	0.8	–	–	–	0.4	0.4	–	–	–	0.8	–	–	–	17.1
0.8	–	–	–	–	–	1.7	–	–	–	–	–	–	–	–	–	–	–	–	7.5
1.3	0.7	–	–	–	–	–	–	–	–	–	–	0.7	–	–	–	–	–	–	3.3
–	–	–	–	–	–	–	–	–	–	20.0	–	4.0	–	–	–	–	–	–	2.7
0.7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	11.2
–	–	–	–	–	–	4.0	–	4.0	–	–	–	4.0	–	–	–	2.0	–	–	10.0
0.8	–	–	–	–	1.6	0.8	–	–	–	–	0.8	0.8	–	–	–	–	0.8	–	29.0
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.4	–	–	9.7
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4.0
–	–	–	–	–	–	–	–	–	–	1.0	–	–	–	–	–	–	–	–	9.0
–	–	–	–	–	–	1.0	–	–	–	–	1.0	–	–	–	–	–	–	–	9.0
–	–	–	0.3	–	0.9	0.9	0.3	–	–	–	0.6	–	0.3	–	–	–	–	–	7.1
1.6	–	0.8	–	–	0.4	0.8	–	–	–	–	0.4	–	0.4	–	–	–	–	1.6	11.7

TABLE 14
X-Ray Mineralogy (All Sample)

Sample (Interval in cm)	Quartz	Feldspar	Calcite	Aragonite	Cristobalite
Site 322					
1-2, 26-30	23	22	–	–	–
1-3, 70-76	10	12	–	–	–
3-1, 18-20	11	13	–	–	–
4-1, 65-67	6	7	–	–	–
4-2, 57-60	9	15	–	–	–
5-1, 81-85	8	13	–	–	–
6-1, 30-33	10	11	–	–	–
9-2, 143-146	7	16	–	–	–
10-1, 101-105	8	11	–	–	–
10-2, 43-46	10	17	–	–	–
11-2, 45-49	10	18	–	–	–
11-3, 24-32	15	20	–	–	–
11-4, 17-24	13	25	–	–	–
11-6, 109-115	18	7	–	–	–
Site 323					
1-1, 50-60	55	30	–	–	–
1-1, 140-145	27	15	–	–	–
1-2, 34-43	9	8	–	–	–
1-2, 78-88	12	11	–	–	–
1-4, 118-127	12	8	–	–	–
3-1, 88-94	15	12	–	–	–
3-2, 14-20	35	22	–	–	–
3-2, 61-70	12	18	–	–	–
7-2, 105-110	8	12	–	–	–
7-3, 18-24	11	8	–	–	–
8-1, 120-121	6	4	–	–	60
10-1, 113-122	17	22	–	–	–
10-2, 75-85	10	9	–	–	–
10-3, 106-114	18	12	–	–	–
11-1, 22-32	20	10	–	–	–
11-2, 137-148	24	15	–	–	–
13-5, 106-115	20	10	–	–	–
13-6, 145-150	27	10	–	–	–
14-2, 1-8	26	9	–	–	–
14-2, 128-135	20	8	–	–	–
15-1, 52-60	12	4	–	–	–
15-2, 91-100	18	8	–	–	–
15-3, 29-36	12	6	–	–	–
15-4, 54-63	17	4	–	–	–
15-5, 89-98	7	4	–	–	–
15-6, 19-26	12	3	17	2	–
16-1, 57-62	12	3	40	–	–
16-2, 30	12	2	–	–	–
16-2, 58	7	2	–	–	–
16-3, 32-37	10	1	–	–	–
16-4, 83-94	6	6	–	–	–
18-2, 80-86	10	6	–	–	–
18-3, 130-139	10	6	–	–	–
18-4, 115-124	6	6	–	–	–
18-5, 65-73	4	4	–	–	–
Site 324					
1-3, 124-132	20	14	–	–	–
1-3, 126-134	12	12	–	–	–
1-4, 125-131	20	15	–	–	–
1-6, 36-38	22	30	–	–	–
2-1, 83-92	18	12	–	–	–
2-2, 61-70	20	8	–	–	–
2-3, 52-61	24	14	–	–	–
2-4, 27-36	25	14	–	–	–
2-5, 35-45	20	13	–	–	–
2-6, 95-104	23	13	–	–	–
3-1, 137-146	27	14	–	–	–
3-2, 136-145	22	12	–	–	–
3-3, 67-77	25	12	–	–	–
3-4, 47-57	23	10	–	–	–
3-5, 99-110	21	7	–	–	–
3-6, 138-148	20	19	–	–	–
4-2, 113-123	18	11	–	–	–
4-3, 30-40	16	12	–	–	–
4-4, 54-64	20	12	–	–	–
5-2, 66-83	23	14	–	–	–
5-3, 25-35	30	14	–	–	–
6-2, 19-30	24	11	–	–	–
7-1, 69-78	30	11	–	–	–
7-3, 110-121	25	12	–	–	–
7-6, 119-129	28	12	–	–	–
8-3, 61-71	25	9	–	–	–
Site 325					
1-1, 49-59	11	10	–	–	–
1-1, 133-144	9	12	1	–	–
1-2, 26-36	8	12	–	–	–
1-4, 81-92	16	18	–	–	–
2-2, 39-49	9	16	–	–	–
3-2, 11-24	7	10	–	–	–
3-3, 76-87	13	20	–	–	–
3-4, 26-36	10	17	–	–	–
4-2, 90	13	17	–	–	–
4-3, 20-26	12	15	–	–	–
4-3, 130	15	13	–	–	–
4, CC	20	20	–	–	–
5-1, 55-57	10	14	–	–	–
8-1, 45-49	10	9	–	–	–
8-2, 119-128	11	9	6	–	–
8-3, 27-35	9	12	–	–	–
9-3, 90-98	18	19	–	–	–

TABLE 15
Characteristic Mineral Complexes of Leg 35 Sediments

Minerals	Complex 1 Range	Complex 1 Average	Complex 2 Range	Complex 2 Average	Complex 3 Range	Complex 3 Average
Heavy Minerals						
Monoclinic Pyroxene	1.53-53.3	39.2	1.6-26.0	10.4	0-7.2	0.1
Rhombic Pyroxene	0-15.5	2.0	0-4.7	1.3	0-0.3	0.1
Epidote	0-35.4	18.0	9.7-32.5	23.3	0-9.3	3.1
Hornblende	0.0-7.9	3.3	12.8-33.8	25.1	0-2.1	0.6
Opaque Minerals	3.0-43.4	12.6	8.3-31.2	15.4	0-90.0	14.8
Fe-oxide	0-49.0	2.2	0.22-16.7	2.8	2.9-98.4	47.6
Pyrite-Marcasite	0-35.0	5.3	0-7.9	2.2	0-28.8	4.2
Garnet	0-12.5	1.7	0-8.4	2.6	0-0.5	0.2
Apatite	0-0.6	0.2	0.21-4.8	1.6	0-0.7	0.1
Zircon	0-2.3	0.4	0-5.7	1.8	0-0.5	0.2
Sphene	0-1.0	0.2	0-3.9	1.1	0-0.2	0.1
Barite	0-1.7	0.1	0-0.7	0.1	0-73.8	9.8
Indeterm. Minerals and Fragments	1.4-18.5	9.1	0-11.5	5.3	0-3.7	0.9
Light Minerals						
Quartz	4.6-39.4	15.1	7.1-48.5	26.6	0-47.5	9.1
Feldspar	1.2-11.7	5.3	0.5-26.0	12.9	0-23.1	3.5
Plagioclase Acid	0-12.3	2.8	0.3-6.4	2.6	0-7.1	1.2
Plag. Basic and Medium	5.5-37.0	20.2	0-13.0	2.8	0-8.3	1.5
Volc. Glass Acid	0-3.7	0.5	0-36.5	3.1	0.4-35.0	6.7
Volc. Glass Basic	0-3.4	0.3	0-1.0	0.1	0.0	0.0
Volc. Ash	0-28.4	5.5	0-17.2	1.4	0-1.4	0.2
Zeolite	0-23.4	1.9	0-8.6	0.4	0-81.0	10.8
Teeth, Bones	0-8.5	0.3	0-4.3	0.5	0-34.0	15.1
Clay Fragments	0-57.6	14.5	0-76.9	31.5	0-45.4	23.6
Indeterm. Minerals and Fragments	0-53.0	25.6	0-39.5	14.2	0-24.6	4.3

TABLE 16
Petrography of Gravel of Site 323, Core 4, and Site 255, Core 2, Section 1

Rock	Frequency of Occurrence
Diabase	+++
Quartz-Feldspar	++
Pegmatoid Granite	+
Aplitic Granite	+
Gabbro	++
Siliceous Rock	+++
Siliceous-carbonaceous Slate	+
Sedimentary rock fragments	+++
Tuff	++
Epidosite	+
Gneiss	+
Quartz-feldspar Slate	++