UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results of vein, rock, stream-sediment, mangrove-sediment, sinter, and heavy-mineral concentrate samples from Yap and Truk, Federated States of Micronesia

By

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INTRODUCTION

The islands states of Yap and Truk (fig. 1), Federated States of Micronesia, are located in the western Pacific Ocean and until recently, were administered as a United States Trust Territory. In the fall of 1986, a team from the U.S. Geological Survey conducted a geologic and geochemical resource investigation of the four islands of Yap and two islands from Truk. Two hundred and twenty samples from Yap and twenty four samples from Truk were collected and analyzed for 31 elements by emission spectrography and for Au, Te, As, Bi, Cd, Sb, Zn, and Hg by atomic-absorption spectroscopy. This study was funded by the Office of Territorial and International Affairs, and the U.S. Geological Survey.

SAMPLE COLLECTION AND PREPARATION

Samples were collected in November and December of 1986 by W.R. Miller, J.J. Rytuba, M.A. Arnold, and T.L. Vercoutere and shipped to the U.S. Geological Survey laboratory in Denver, Colorado for preparation and analyses. Two hundred and forty eight samples were collected; of these 71 were vein samples, 57 rocks, 48 stream-sediments, 7 sinters, 17 mangrove-sediments, and 44 heavy-mineral concentrates.

Rock and vein samples

Surface exposure of rocks and veins vary from rare nearly-fresh exposure to more commonly weathered exposures. Rock samples were collected by compositing several samples from about a 1 square meter area or less. Vein samples were collected by compositing several samples across and along trend of the vein. Rock and vein samples were prepared by crushing and then were pulverized to minus 0.15 mm with ceramic plates.

Stream-sediment samples

Stream-sediment samples consisted of 1 to 2 kg composite samples of stream sediment. These samples were oven dried at 100 °C for 12 hours and sieved to less than 0.18 mm (minus 80 mesh).

Heavy-mineral-concentrate samples

Heavy-mineral concentrate samples consisted of collecting a 5 to 7 kg composite sample of stream sediments that were panned in the field to obtain the heavy-mineral concentrates. These concentrate samples were air dried and sieved to less than 1 mm (minus 18 mesh), and the magnetite removed with a hand magnet. The remaining concentrate was separated using bromoform (specific gravity 2.86) into a light and heavy fraction. The light fraction, which contained mainly minerals such as plagioclase, was discarded. The remaining heavy-mineral fraction was separated electromagnetically with a Frantz isodynamic separator with a forward slope of 15° and a side slope of 20° at 0.6 amperes. The magnetic fraction at 0.6 amperes contained primarily pyroxenes, amphiboles, and spinel minerals and was discarded. The remaining nonmagnetic fraction at 0.6 amperes was split. One split was hand-ground to minus 0.15 mm with an agate mortar for spectrographic analysis; the other split was saved for mineralogical studies.

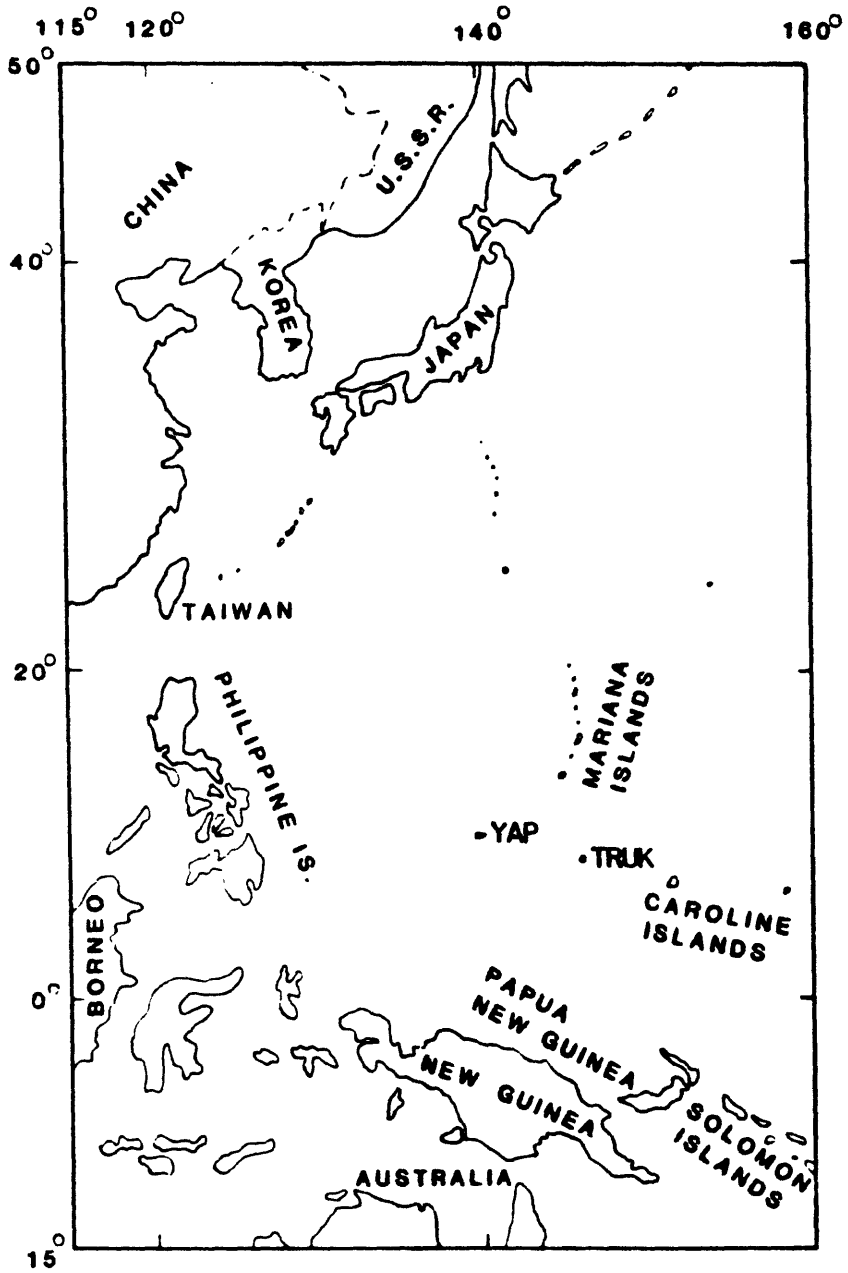

Figure 1. Index map of study area

Mangrove sediment samples

Mangrove sediment samples were collected by driving a 4 cm diameter core sampler into the sediments during high tide. The core samples consisted of approximately 15 cm of organic-rich, fine-grained sediments and calcareous debris. The samples were dried in an oven at 80 °C, were then ashed in a furnace at 500 °C for 18 to 24 hours to remove the organic material, and were then sieved to less than 0.18 mm.

ANALYTICAL PROCEDURES

Each sample was analyzed for 31 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). The elements analyzed and their lower limits of determination are listed in table 1. Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides and carbonates. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. The precision of the analytical method is approximately plus or minus one reporting interval at the 83 percent confidence level and plus or minus two reporting intervals at the 96 percent confidence level (Motooka and Grimes, 1976). In addition, gold, tellurium, antimony, arsenic, bismuth, cadmium, and zinc were determined in each sample, except for heavy-mineral concentrates, using atomic-absorption spectroscopy. Mercury was also determined in rock, vein, and sinter samples.

A brief description of these procedures follows:

Gold A 10-gram sample is roasted for 1 hour at 700 °C, gold is then extracted with hydrobromic acid-0.5 percent bromine solution and MIBK (methyl isobutyl ketone). Flame atomic-absorption spectroscopy is used to determine gold to 0.05 ppm detection limit; samples below this limit are determined by electrothermal atomic-absorption spectroscopy using background correction to 0.001 ppm detection limit (O'Leary and Meier, 1986).

Tellurium Tellurium is extracted from a 5-gram sample with hydrobromic-2 percent bromine solution and MIBK. Ascorbic acid is used to reduce iron interference. Flame atomic-absorption spectroscopy is used to determine tellurium to 0.02 ppm detection limit (O'Leary and Meier, 1986).

Antimony, arsenic, bismuth, cadmium, and zinc The metals of interest are solubilized from a 1.0 gram sample with hydrochloric-hydrogen peroxide solution and extracted with Aliquot 336-MIBK. Flame atomic-absorption spectroscopy is used to determine these metals. Limits of detection are antimony 2 ppm, arsenic 10 ppm, bismuth 1 ppm, cadmium 0.1 ppm, and zinc 5 ppm (O'Leary and Viets, 1986).

Mercury A 0.1-gram sample is heated with a heat source to drive off mercury which is trapped on gold coil. The gold coil is then heated to drive off the mercury and determined by flameless atomic-absorption spectroscopy to a detection limit of 0.02 ppm (McNerney, 1972 and Vaughn, 1964).

The results of these analyses are shown in tables 2-11.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called Rock Analysis Storage System (RASS). This data base contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a binary form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1977).

DESCRIPTION OF DATA TABLES

Tables 2-11 list the results of analyses for the samples. The data are arranged so that column 1 contains the USGS-assigned sample numbers. Columns 2 and 3 are the sample localities in latitude and longitude. Columns in which the element headings show the letter "s" before the element symbol are emission spectrographic analyses; "aa" indicates atomic-absorption analyses. Values determined for the major elements (iron, magnesium, calcium, and titanium) are given in weight percent; all others are given in parts per million (micrograms/gram).

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TABLE 1.--Limits of determination for the spectrographic analysis based on a 10-mg sample

[The spectrographic limits of determination for heavy-mineral-concentrate samples are based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for rocks and stream sediments]

Elements	Lower determination limit	Upper determination limit
	Weight percent	
Iron (Fe)	0.05	20
Magnesium (Mg)	.02	10
Calcium (Ca)	.05	20
Titanium (Ti)	.002	1
	Parts per million	
Manganese (Mn)	10	5,000
Silver (Ag)	0.5	5,000
Arsenic (As)	200	10,000
Gold (Au)	10	500
Boron (B)	10	2,000
Barium (Ba)	20	5,000
Beryllium (Be)	1	1,000
Bismuth (Bi)	10	1,000
Cadmium (Cd)	20	500
Cobalt (Co)	5	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Lanthanum (La)	20	1,000
Molybdenum (Mo)	5	2,000
Niobium (Nb)	20	2,000
Nickel (Ni)	5	5,000
Lead (Pb)	10	20,000
Antimony (Sb)	100	10,000
Scandium (Sc)	5	100
Tin (Sn)	10	1,000
Strontium (Sr)	100	5,000
Vanadium (V)	10	10,000
Tungsten (W)	50	10,000
Yttrium (Y)	10	2,000
Zinc (Zn)	200	10,000
Zirconium (Zr)	10	1,000
Thorium (Th)	100	2,000

TABLE 2. CHEMICAL DATA FOR 47 ROCKS SAMPLES , YAP ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE
BY001	9 33 12	138 11 55	15.0	.20	15.00	.070	1,500	N	N	N	N	N	N
BY002	9 33 12	138 11 55	10.0	.15	10.00	.070	1,500	N	N	N	N	N	<1.0
BY003	9 33 12	138 11 55	7.0	.50	10.00	.300	1,000	7.0	N	N	N	N	N
BY004	9 33 18	138 11 57	7.0	.10	15.00	.150	1,500	N	N	N	N	N	N
BY005	9 33 18	138 11 57	5.0	3.00	5.00	.700	1,000	N	N	N	N	<20	N
BY006	9 33 18	138 11 57	7.0	.20	10.00	.100	1,500	N	N	N	N	N	N
BY007	9 33 18	138 11 57	7.0	1.50	5.00	.700	1,500	N	N	N	N	20	N
BY008	9 33 12	138 11 55	2.0	.15	1.00	.150	50	7.0	N	N	N	N	N
BY009	9 33 12	138 11 55	7.0	1.50	2.00	.700	700	N	N	N	N	20	N
BY010	9 33 12	138 11 55	10.0	.15	5.00	.100	200	N	N	N	N	N	N
BY011	9 33 12	138 11 55	15.0	.30	15.00	.200	1,500	N	N	N	N	N	N
BY012	9 35 22	138 9 43	3.0	.20	1.50	.070	500	10.0	N	N	N	30	3.0
BY013	9 35 22	138 9 43	3.0	.10	.15	.100	500	7.0	N	N	N	150	1.5
BY014	9 35 22	138 9 43	5.0	5.00	5.00	.700	1,000	N	N	N	N	N	N
BY015	9 35 22	138 9 43	2.0	.10	.15	.050	500	N	N	N	N	100	3.0
BY016	9 35 1	138 9 47	5.0	5.00	5.00	.500	700	N	N	N	N	N	N
BY017	9 35 42	138 10 5	15.0	.07	<.05	.100	70	N	N	N	N	<20	N
BY018	9 35 42	138 10 5	5.0	.10	<.05	.300	300	N	N	N	N	<20	N
BY019	9 35 47	138 10 10	3.0	.15	<.05	.300	20	N	N	N	N	30	N
BY020	9 35 47	138 10 10	3.0	1.00	<.05	.200	1,000	N	N	N	N	70	N
BY021	9 35 54	138 10 12	3.0	.10	<.05	.300	300	N	N	N	N	<20	N
BY024	9 35 54	138 10 30	3.0	5.00	5.00	.150	1,000	N	N	N	N	20	N
BY025	9 34 32	138 9 54	.3	.02	.05	.030	<10	N	N	N	N	N	N
BY026	9 35 39	138 9 52	2.0	.07	<.05	.050	30	1.0	N	N	N	<20	N
BY027	9 35 39	138 9 52	1.5	.05	.05	.030	15	1.0	N	N	N	20	N
BY042	9 34 18	138 7 52	5.0	7.00	3.00	.500	700	N	N	N	N	N	N
BY043	9 34 18	138 7 52	3.0	5.00	3.00	.500	700	N	N	N	N	20	N
BY044	9 34 18	138 7 52	5.0	5.00	5.00	.700	700	N	N	N	N	N	N
BY045	9 34 18	138 7 52	3.0	3.00	3.00	.300	500	N	N	N	N	200	N
BY051	9 34 44	138 9 44	1.5	.07	<.05	.070	300	N	N	N	N	N	N
BY058	9 32 27	138 9 47	1.5	N	N	.070	3,000	N	N	N	N	N	1.0
BY059	9 32 27	138 9 47	3.0	.02	N	.300	100	N	N	N	N	N	N
BY062	9 34 30	138 9 56	5.0	.70	.05	.500	100	N	N	N	N	N	N
BY063	9 35 32	138 9 53	5.0	3.00	3.00	.500	700	N	N	N	N	<20	N
JY11C	9 33 17	138 11 56	5.0	.70	2.00	.700	1,000	N	N	N	N	N	<1.0
JY34	9 34 10	138 10 16	5.0	.50	2.00	.700	1,500	N	N	N	N	N	1.5
JY61	9 34 47	138 8 8	3.0	.05	.07	.300	70	N	N	N	10	N	N
JY66	9 34 17	138 7 50	5.0	5.00	5.00	.700	700	N	N	N	N	1,000	N
JY67	9 34 17	138 7 50	5.0	3.00	3.00	1.000	700	N	N	N	N	70	N
JY68	9 34 17	138 7 50	7.0	3.00	5.00	1.000	700	N	N	N	<10	150	N
Y001	9 30 59	138 6 12	5.0	3.00	3.00	.700	500	N	N	N	N	70	N
Y004	9 33 30	138 12 8	.7	.15	.05	.050	70	N	N	N	10	<20	N
Y011	9 32 36	138 11 38	3.0	7.00	.15	.007	500	N	N	N	N	N	N
Y021	9 35 39	138 9 50	2.0	.30	<.05	.020	70	N	N	N	<10	<20	N
Y046	9 30 14	138 4 58	3.0	1.50	2.00	.500	300	N	N	N	N	100	N

TABLE 2. CHEMICAL DATA FOR 47 ROCKS SAMPLES , YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
BY001	N	N	30	50	300	N	N	N	15	N	N	5	N	N
BY002	N	N	20	30	300	N	N	N	15	N	N	5	N	N
BY003	N	N	50	70	20,000	N	N	N	15	N	N	7	N	N
BY004	N	N	15	20	3,000	N	N	N	<5	N	N	5	N	N
BY005	N	N	50	70	2,000	N	N	N	50	<10	N	30	N	300
BY006	N	N	50	30	>20,000	N	N	N	5	N	N	<5	N	N
BY007	N	N	70	30	5,000	20	N	N	70	<10	N	30	N	500
BY008	N	N	20	30	20,000	N	N	N	15	N	N	7	N	N
BY009	N	N	70	70	700	N	N	N	50	N	N	30	N	200
BY010	N	N	10	50	700	N	N	N	15	N	N	<5	N	N
BY011	N	N	50	70	1,500	N	N	N	30	N	N	7	N	N
BY012	N	N	N	15	>20,000	N	<5	50	15	<10	N	5	N	300
BY013	N	N	N	<10	>20,000	N	<5	70	7	<10	N	7	N	150
BY014	N	N	70	300	1,000	N	N	N	150	N	N	30	N	N
BY015	N	N	N	N	3,000	<20	N	70	7	<10	N	5	N	300
BY016	N	N	70	1,000	150	N	N	N	300	N	N	20	N	N
BY017	N	N	20	150	1,000	N	N	N	7	<10	N	20	N	N
BY018	N	N	15	50	300	N	N	N	10	N	N	20	N	N
BY019	N	N	<5	15	50	<20	N	N	20	N	N	15	N	N
BY020	N	N	70	50	200	N	N	N	100	N	N	30	N	N
BY021	N	N	15	70	150	N	N	N	30	N	N	30	N	N
BY024	N	N	30	300	30	N	N	N	70	N	N	30	N	<100
BY025	N	N	N	50	20	N	N	N	5	N	N	N	N	N
BY026	N	N	10	30	200	N	N	N	20	N	N	N	N	N
BY027	N	N	N	20	200	N	N	N	10	N	N	N	N	N
BY042	N	N	70	2,000	70	N	N	N	300	N	N	15	N	N
BY043	N	N	70	1,000	70	N	N	N	200	N	N	20	N	1,000
BY044	N	N	70	1,000	50	N	N	N	300	N	N	20	N	300
BY045	N	N	50	300	300	N	N	N	150	10	N	10	N	3,000
BY051	N	N	10	50	30	N	N	N	15	N	N	10	N	N
BY058	N	N	N	20	7	<20	N	70	N	N	N	7	N	N
BY059	N	N	N	300	30	N	N	N	50	N	N	30	N	N
BY062	N	N	15	700	150	N	N	N	300	N	N	30	N	N
BY063	N	N	50	300	70	N	N	N	150	N	N	30	N	300
JY11C	N	N	70	30	15,000	<20	N	N	30	N	N	30	N	150
JY34	N	N	10	<10	20	N	N	N	10	N	N	20	N	N
JY61	N	N	N	70	50	N	N	N	15	N	N	10	N	N
JY66	N	N	70	700	100	N	N	N	200	<10	N	30	N	2,000
JY67	N	N	70	300	500	N	N	N	150	N	N	30	N	1,500
JY68	N	N	70	700	70	N	N	N	200	10	N	30	N	2,000
Y001	N	N	70	1,000	100	N	N	N	200	<10	N	30	N	1,500
Y004	N	N	5	70	15	N	N	N	30	N	N	N	N	N
Y011	N	N	100	3,000	7	N	N	N	3,000	N	N	7	N	N
Y021	N	N	10	100	500	N	N	N	100	N	N	N	N	N
Y046	N	N	30	150	70	N	N	N	150	N	N	20	N	700

TABLE 2. CHEMICAL DATA FOR 47 ROCKS SAMPLES , YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
BY001	150	N	10	N	N	N	<.001	N	<.02	N	N	N	N	5
BY002	70	N	10	N	30	N	.001	N	.02	N	N	N	N	15
BY003	200	N	15	N	30	N	.012	N	.52	N	N	N	N	15
BY004	70	N	<10	N	<10	N	.002	N	<.02	N	N	<.1	N	25
BY005	200	N	20	N	50	N	.002	N	<.02	N	N	N	N	30
BY006	150	N	N	N	N	N	.001	N	.24	N	N	.2	N	15
BY007	150	N	30	N	150	N	.002	N	<.02	N	N	.2	N	70
BY008	200	N	10	N	20	N	.150	N	.36	N	N	N	N	10
BY009	150	N	20	N	50	N	.001	N	<.02	N	N	N	N	40
BY010	70	N	<10	N	<10	N	.020	N	<.02	N	N	N	N	15
BY011	100	N	10	N	15	N	.001	N	<.02	N	N	N	N	25
BY012	20	N	N	N	200	N	.080	N	.10	<10	N	.5	N	25
BY013	20	N	<10	N	300	N	.027	N	.14	N	N	.4	N	30
BY014	200	N	20	N	70	N	<.001	N	.10	N	N	N	N	10
BY015	<10	N	N	N	300	N	.240	N	.08	N	N	N	N	15
BY016	150	N	20	N	30	N	.007	N	.04	<10	N	N	N	30
BY017	100	N	N	N	15	N	.034	N	1.22	20	N	N	N	55
BY018	150	N	N	N	20	N	.004	N	.40	N	N	N	N	35
BY019	50	N	15	N	30	N	.009	N	<.02	N	N	N	N	40
BY020	150	N	20	300	10	N	.020	N	<.02	10	N	N	N	400
BY021	200	N	10	<200	30	N	.004	N	<.02	N	N	N	N	90
BY024	150	N	15	N	N	N	<.001	N	<.02	N	N	N	N	N
BY025	20	N	N	N	N	N	<.001	N	<.02	N	N	N	N	N
BY026	70	N	N	N	10	N	.010	N	.02	N	N	N	N	5
BY027	20	N	N	N	N	N	.002	N	.02	N	N	N	N	5
BY042	100	N	10	N	30	N	.001	N	<.02	N	N	N	N	25
BY043	100	N	15	N	50	N	.001	N	<.02	N	N	N	N	20
BY044	100	N	15	N	50	N	<.001	N	<.02	N	N	N	N	20
BY045	100	N	15	N	20	N	.004	N	<.02	N	N	N	N	20
BY051	100	N	15	N	N	N	.008	N	<.02	10	N	N	N	15
BY058	15	N	N	<200	700	N	.002	<.02	<.02	N	N	.3	N	400
BY059	150	N	N	N	20	N	.011	<.02	<.02	10	N	N	N	15
BY062	150	N	20	N	50	N	.002	N	<.02	N	1	N	2	50
BY063	200	N	20	N	50	N	<.001	N	<.02	N	N	N	N	N
JY11C	200	N	50	N	70	N	.010	N	.04	N	N	N	N	N
JY34	15	N	70	N	100	N	<.001	N	<.02	N	N	N	N	20
JY61	200	N	N	N	30	N	.002	N	<.02	N	N	.1	N	10
JY66	200	N	20	N	50	N	<.001	N	<.02	N	N	.1	N	10
JY67	200	N	20	N	70	N	.002	N	<.02	N	N	.2	N	10
JY68	200	N	20	N	70	N	.004	N	<.02	N	N	.1	N	10
Y001	150	N	20	N	50	N	.001	N	.02	N	N	N	N	20
Y004	15	N	N	N	<10	N	.001	N	.04	N	N	N	N	5
Y011	20	N	N	N	N	N	<.001	N	.02	N	N	N	N	25
Y021	100	N	N	N	<10	N	.007	N	.10	N	N	N	N	5
Y046	150	N	15	N	50	N	.027	N	<.02	N	N	N	N	10

TABLE 2. CHEMICAL DATA FOR 47 ROCKS SAMPLES , YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE
Y047	9 29 49	138 4 51	5.0	5.00	3.00	.700	700	N	N	N	N	<20	N
Y048	9 29 49	138 4 51	5.0	5.00	3.00	.700	700	N	N	N	N	N	N

Sample	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
Y047	N	N	70	1,000	50	N	N	N	300	N	N	20	N	<100
Y048	N	N	70	700	30	N	N	N	200	N	N	20	N	<100

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
Y047	100	N	15	N	70	N	.001	N	<.02	N	N	N	N	30
Y048	150	N	15	N	50	N	.002	N	<.02	N	N	N	N	35

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS, FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE
BY022	9 35 54	138 10 12	3.0	.30	<.05	.20	500	N	N	N	N	N	N
BY023	9 35 54	138 10 12	3.0	.10	N	.15	1,000	N	N	N	N	N	N
BY028	9 34 32	138 9 54	10.0	.02	N	.03	100	N	N	N	N	<20	N
BY029	9 34 32	138 9 54	3.0	<.02	<.05	.07	150	N	N	N	N	<20	N
BY030	9 34 34	138 9 55	10.0	.03	N	.05	70	N	N	N	N	N	N
BY031	9 34 34	138 9 55	5.0	.03	<.05	.03	70	.7	N	N	N	<20	N
BY032	9 34 18	138 10 21	5.0	.05	N	.30	50	N	N	N	N	N	N
BY033	9 34 18	138 10 21	5.0	<.02	<.05	.15	100	N	N	N	N	N	N
BY034	9 34 23	138 10 19	10.0	<.02	N	.07	700	N	N	N	N	70	N
BY035	9 34 23	138 10 19	5.0	.03	<.05	.20	200	N	N	N	N	N	N
BY036	9 34 37	138 9 59	7.0	.05	<.05	.07	30	<.5	N	N	N	<20	N
BY037	9 34 35	138 10 0	3.0	.05	<.05	.07	15	N	N	N	<10	<20	N
BY038	9 34 34	138 9 54	5.0	.03	<.05	.03	100	N	N	N	N	<20	N
BY039	9 34 37	138 9 54	3.0	.10	<.05	.15	50	N	N	N	N	<20	N
BY046	9 34 47	138 9 43	3.0	.30	<.05	.20	100	N	N	N	<10	<20	N
BY047	9 34 47	138 9 43	3.0	.07	<.05	.10	100	N	N	N	N	N	N
BY048	9 34 47	138 9 43	1.5	.05	<.05	.07	300	N	N	N	N	N	N
BY049	9 34 47	138 9 43	1.5	.05	<.05	.07	300	N	N	N	N	N	N
BY050	9 34 47	138 9 43	3.0	.10	<.05	.15	300	N	N	N	N	<20	N
BY052	9 34 44	138 9 44	3.0	.70	<.05	.15	300	N	N	N	N	<20	N
BY053	9 34 44	138 9 45	3.0	.50	N	.15	2,000	<.5	N	N	N	70	N
BY054	9 31 46	138 9 39	1.5	<.02	<.05	.05	200	N	N	N	N	<20	N
BY055	9 31 57	138 9 39	3.0	.20	N	.20	30	N	N	N	N	N	N
BY056	9 32 6	138 9 45	5.0	.15	N	.30	700	N	N	N	N	150	N
BY057	9 32 6	138 9 45	20.0	.07	N	.10	1,500	N	N	N	N	200	<1
BY061	9 34 5	138 10 33	3.0	.05	<.05	.07	70	N	N	N	<10	200	N
JY28	9 34 33	138 9 55	5.0	<.02	<.05	.07	100	N	N	N	N	N	N
JY29	9 34 33	138 9 56	7.0	<.02	N	.03	100	<.5	N	N	<10	N	N
JY30	9 34 34	138 9 55	3.0	.07	<.05	.50	1,500	N	N	N	N	<20	N
JY31	9 34 34	138 9 55	20.0	<.02	N	.03	50	1.0	N	N	N	N	N
JY32	9 34 34	138 9 58	15.0	.02	N	.07	50	N	N	N	N	<20	N
JY33	9 34 33	138 9 58	5.0	.10	<.05	.20	1,000	N	N	N	<10	20	N
JY35	9 34 12	138 10 17	2.0	.10	<.05	.07	70	1.0	N	N	<10	30	N
JY36	9 34 12	138 10 17	3.0	.20	<.05	.15	150	N	N	N	10	150	N
JY37	9 34 15	138 10 21	2.0	.15	<.05	.30	20	N	N	N	10	<20	N
JY43	9 34 24	138 10 17	20.0	<.02	N	.10	200	N	N	N	N	N	N
JY44	9 34 23	138 10 16	5.0	.07	<.05	.15	200	N	N	N	N	N	N
JY45	9 34 23	138 10 15	3.0	N	N	.20	70	N	N	N	N	N	N
JY47	9 34 39	138 9 53	3.0	.15	<.05	.30	1,000	N	N	N	<10	20	N
JY48	9 34 39	138 9 53	10.0	.03	N	.07	20	.7	N	N	N	<20	N
JY49	9 34 39	138 9 54	1.0	.10	<.05	.02	150	N	N	N	N	N	N
JY51	9 34 37	138 9 59	5.0	.07	<.05	.07	50	N	N	N	<10	30	N
JY52	9 34 37	138 10 0	5.0	.02	<.05	.05	30	N	N	N	<10	<20	N
JY53	9 34 36	138 10 0	5.0	.07	.05	.10	70	N	N	N	<10	20	N
JY54	9 34 37	138 9 58	3.0	.03	<.05	.07	1,500	2.0	N	N	10	20	N

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V
BY022	N	N	20	70	200	N	N	N	15	<10	N	20	N	N	150
BY023	N	N	20	20	50	N	N	N	30	N	N	30	N	N	150
BY028	N	N	<5	100	200	N	15	N	5	10	N	10	N	N	70
BY029	N	N	N	70	150	N	15	N	5	<10	N	7	N	N	100
BY030	N	N	5	50	300	N	7	N	5	15	N	15	N	N	70
BY031	N	N	N	30	700	N	200	N	<5	30	N	15	N	N	70
BY032	N	N	N	70	500	N	N	N	10	<10	N	30	N	N	300
BY033	N	N	10	30	500	N	N	N	7	N	N	30	N	N	150
BY034	N	N	70	150	300	N	15	N	20	N	N	20	N	N	150
BY035	N	N	10	70	200	N	N	N	10	N	N	30	N	N	150
BY036	N	N	N	50	300	N	N	N	<5	20	N	20	N	N	1,000
BY037	N	N	N	70	100	N	20	N	<5	15	N	7	N	N	70
BY038	N	N	N	50	300	N	50	N	<5	15	N	15	N	N	70
BY039	N	N	N	30	500	N	30	N	<5	20	N	15	N	N	100
BY046	N	N	10	150	100	N	N	N	20	N	N	30	N	N	100
BY047	N	N	10	30	150	N	N	N	15	N	N	15	N	N	100
BY048	N	N	10	100	30	N	N	N	15	30	N	10	N	N	70
BY049	N	N	5	100	30	N	N	N	15	15	N	10	N	N	70
BY050	N	N	10	200	70	N	N	N	30	20	N	30	N	N	100
BY052	N	N	20	20	150	<20	N	N	50	20	N	30	N	N	150
BY053	N	N	150	500	150	<20	N	N	200	N	N	30	N	N	100
BY054	N	N	50	150	30	N	N	N	10	N	N	10	N	N	70
BY055	N	N	5	70	300	N	N	N	20	N	N	30	N	N	200
BY056	N	N	10	150	150	N	N	N	15	<10	N	30	N	N	300
BY057	N	N	70	200	200	N	N	N	30	<10	N	100	N	N	150
BY061	N	N	N	70	300	N	20	N	10	50	N	15	N	N	70
JY28	N	N	N	70	700	N	N	N	<5	<10	N	15	N	N	70
JY29	N	N	<5	50	150	N	50	N	5	15	N	7	N	N	50
JY30	N	N	10	20	100	N	N	N	30	<10	N	30	N	N	200
JY31	N	N	10	100	70	N	N	N	<5	20	N	10	N	N	50
JY32	N	N	10	300	15	N	N	N	7	10	N	30	N	N	150
JY33	N	N	20	100	150	N	N	N	20	<10	N	30	N	N	200
JY35	N	N	N	150	150	N	N	N	7	15	N	10	N	N	70
JY36	N	N	10	200	200	N	N	N	20	20	N	30	N	N	150
JY37	N	N	N	150	70	<20	N	N	150	N	N	30	N	N	150
JY43	N	N	20	200	300	N	N	N	7	10	N	50	N	N	150
JY44	N	N	<5	50	300	N	N	N	15	N	N	30	N	N	150
JY45	N	N	N	30	30	N	N	N	20	N	N	20	N	N	150
JY47	N	N	70	150	70	N	N	N	50	<10	N	30	N	N	300
JY48	N	N	N	50	70	N	30	N	N	10	N	15	N	N	70
JY49	N	N	15	2,000	10	<20	N	N	70	N	N	<5	N	N	15
JY51	N	N	N	100	500	N	15	N	5	10	N	20	N	N	70
JY52	N	N	N	20	150	N	30	N	<5	<10	N	15	N	N	70
JY53	N	N	N	150	500	N	30	N	5	15	N	20	N	N	100
JY54	N	N	50	70	500	N	N	N	7	30	N	15	N	N	100

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
BY022	N	N	N	15	N	.002	N	.58	<10	N	N	N	20
BY023	N	N	N	10	N	.003	N	.44	N	N	N	N	80
BY028	N	N	<200	N	N	.021	<.02	1.80	40	N	N	N	105
BY029	N	N	N	10	N	.050	<.02	2.20	N	N	N	N	70
BY030	N	N	<200	N	N	.380	<.02	2.78	80	N	N	N	170
BY031	N	N	N	N	N	.380	<.02	5.10	40	2	N	2	120
BY032	N	N	N	20	N	.005	<.02	2.42	N	N	N	N	70
BY033	N	N	N	20	N	.004	<.02	2.18	N	N	N	N	70
BY034	N	N	<200	<10	N	.110	.02	2.80	20	N	.5	N	350
BY035	N	N	N	15	N	.002	N	1.44	N	N	N	N	75
BY036	N	N	<200	N	N	.070	N	1.40	N	N	N	N	180
BY037	N	N	N	N	N	3.700	N	1.00	N	N	N	N	35
BY038	N	N	300	N	N	.420	.04	2.32	80	N	<.1	N	500
BY039	N	N	N	15	N	.220	<.02	4.05	20	N	N	N	180
BY046	N	15	N	30	N	.014	N	<.02	N	N	N	N	50
BY047	N	N	N	10	N	.016	N	<.02	N	N	N	N	10
BY048	N	N	N	<10	N	.005	N	<.02	N	N	N	N	10
BY049	N	N	N	<10	N	.010	N	<.02	10	N	N	N	10
BY050	N	10	N	15	N	.007	N	<.02	N	N	N	N	30
BY052	N	100	500	20	N	.001	N	<.02	N	N	<.1	N	550
BY053	N	20	<200	20	N	.001	N	<.02	N	N	.3	N	180
BY054	N	N	N	N	N	.019	N	<.02	N	N	N	N	10
BY055	N	15	N	<10	N	.260	N	<.02	N	N	N	N	85
BY056	N	N	N	20	N	.004	N	<.02	N	N	N	N	20
BY057	N	15	N	N	N	.050	N	<.02	N	N	1.0	N	170
BY061	N	N	N	<10	N	.320	N	4.70	70	N	N	N	120
JY28	N	N	N	N	N	.330	N	1.38	30	N	N	N	200
JY29	N	N	<200	N	N	.720	N	1.00	60	N	N	N	250
JY30	N	15	200	30	N	.009	N	.23	N	N	N	N	100
JY31	N	N	<200	N	N	.008	<.02	1.85	N	N	N	N	115
JY32	N	N	200	<10	N	.110	<.02	.52	10	N	N	N	300
JY33	N	N	200	20	N	.016	N	.38	20	N	N	N	350
JY35	N	<10	N	N	N	.260	N	<.02	30	N	N	<2	40
JY36	N	<10	N	15	N	.320	N	<.02	50	N	N	2	80
JY37	N	<10	N	30	N	.009	N	.02	N	N	N	N	10
JY43	N	N	<200	N	N	.026	<.02	1.28	N	N	N	N	400
JY44	N	N	N	<10	N	.004	N	.60	N	N	N	N	70
JY45	N	N	N	10	N	.010	N	<.02	N	N	N	N	20
JY47	N	10	200	20	N	.080	N	<.02	N	N	N	N	50
JY48	N	N	N	N	N	.550	<.02	2.00	50	N	N	N	100
JY49	N	N	N	N	N	.003	N	<.02	N	N	.2	<2	105
JY51	N	N	N	10	N	.640	<.02	2.25	N	N	N	N	140
JY52	N	N	N	<10	N	.300	N	.92	10	N	N	N	115
JY53	N	N	N	15	N	.650	N	2.20	20	N	N	N	55
JY54	N	N	N	10	N	.140	.04	1.08	N	N	.5	N	115

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS, FEDERATED STATES OF MICRONESIA--Continued

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE
JY55	9 34 35	138 10 0	3.0	.15	<.05	.30	70	N	N	N	<10	30	N
JY56	9 34 36	138 10 1	5.0	.03	<.05	.10	500	N	N	N	<10	<20	N
JY69	9 34 45	138 9 43	5.0	.20	.05	.30	700	N	N	N	15	<20	N
JY71	9 34 45	138 9 43	3.0	.10	<.05	.10	150	N	N	N	15	N	N
JY72	9 34 45	138 9 43	2.0	.07	<.05	.07	70	N	N	N	10	N	N
JY73	9 34 45	138 9 43	2.0	.15	<.05	.30	15	N	N	N	10	<20	N
JY74	9 34 45	138 9 38	15.0	.02	N	.10	50	N	N	N	N	<20	N
JY75	9 34 46	138 9 38	7.0	5.00	5.00	.70	1,000	N	N	N	N	N	N
JY76	9 34 45	138 9 37	20.0	.03	<.05	.07	100	N	N	N	N	<20	N
JY77	9 31 57	138 9 39	1.5	.10	<.05	.07	1,000	N	N	N	10	200	N
JY78	9 32 8	138 9 50	3.0	.20	<.05	.20	700	N	N	N	N	<20	N
JY84	9 32 23	138 9 42	3.0	.20	<.05	.20	1,500	N	N	N	10	150	1
JY85	9 32 23	138 9 42	1.0	.15	<.05	.20	70	N	N	N	N	<20	<1
JY88	9 34 7	138 10 34	5.0	.07	<.05	.15	300	3.0	N	N	10	150	N
JY89	9 34 4	138 10 33	5.0	.10	<.05	.20	500	N	N	N	<10	200	N
Y049	9 31 44	138 9 36	.7	.07	.05	.05	700	N	N	N	N	200	N
Y050	9 31 55	138 9 39	1.0	.10	<.05	.07	100	N	N	N	N	70	N
Y051	9 32 8	138 9 32	1.5	.07	<.05	.07	<10	N	N	N	N	<20	N
Y052	9 32 11	138 9 39	1.0	.07	<.05	.07	100	N	N	N	<10	30	N
Y104	9 34 35	138 9 57	3.0	.07	<.05	.10	50	N	N	N	N	<20	N
Y107	9 34 43	138 9 46	1.5	.07	<.05	.10	150	N	N	N	N	N	N
Y108	9 34 43	138 9 46	3.0	.15	<.05	.15	500	N	N	N	10	N	N
Y109	9 34 43	138 9 46	3.0	.20	<.05	.20	300	N	N	N	N	N	N
Y110	9 34 43	138 9 46	3.0	.15	<.05	.20	70	N	N	N	N	N	N
Y111	9 34 47	138 9 37	5.0	<.02	<.05	.50	50	N	N	N	N	N	N
Y112	9 34 48	138 9 37	15.0	N	N	.03	70	N	N	N	N	N	N

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V
JY55	N	N	N	50	300	N	7	N	10	<10	N	30	N	N	200
JY56	N	N	10	50	200	N	7	N	15	<10	N	20	N	N	150
JY69	N	N	20	50	100	N	N	N	20	<10	N	30	N	N	300
JY71	N	N	7	100	50	N	N	N	20	N	N	20	N	N	150
JY72	N	N	7	50	70	N	N	N	10	N	N	10	N	N	100
JY73	N	N	N	20	70	N	N	N	7	N	N	20	N	N	30
JY74	N	N	N	30	2,000	N	15	N	<5	N	N	30	N	N	150
JY75	N	N	70	1,000	70	N	N	N	300	N	N	30	N	N	200
JY76	N	N	30	100	1,000	N	N	N	10	N	N	30	N	N	200
JY77	N	N	70	100	70	<20	N	N	15	N	N	10	N	N	100
JY78	N	N	5	100	70	N	N	N	30	N	N	30	N	N	300
JY84	N	N	50	10	100	<20	N	N	15	N	N	10	N	N	15
JY85	N	N	N	N	70	N	N	N	10	N	N	7	N	N	50
JY88	N	N	15	100	300	N	15	N	15	30	N	30	N	N	150
JY89	N	N	15	200	200	N	10	N	50	30	N	30	N	N	300
Y049	N	N	50	50	30	N	N	N	10	N	N	5	N	N	70
Y050	N	N	10	70	30	N	N	N	5	N	N	7	N	N	100
Y051	N	N	N	1,000	50	N	100	N	7	N	N	70	N	N	100
Y052	N	N	N	30	20	<20	N	N	<5	N	N	7	N	N	100
Y104	N	N	N	300	70	N	N	N	7	<10	N	20	N	N	150
Y107	N	N	N	70	50	N	N	N	5	N	N	7	N	N	50
Y108	N	N	15	150	50	N	N	N	15	N	N	20	N	N	150
Y109	N	N	30	100	70	N	N	N	30	N	N	30	N	N	200
Y110	N	N	5	70	100	N	N	N	15	N	N	30	N	N	150
Y111	N	N	20	300	150	N	N	N	10	N	N	30	N	N	300
Y112	N	N	70	500	500	N	N	N	5	N	N	50	N	N	700

TABLE 3. CHEMICAL DATA FOR 71 VEIN SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
JY55	N	N	N	30	N	.020	<.02	.55	N	N	.1	N	170
JY56	N	N	200	15	N	.070	<.02	.78	N	N	.4	N	250
JY69	N	30	N	30	N	.012	N	<.02	N	N	.2	N	65
JY71	N	N	N	10	N	.019	N	<.02	N	N	.1	N	25
JY72	N	N	N	20	N	.009	N	<.02	N	N	.2	N	10
JY73	N	15	N	100	N	.060	N	<.02	N	N	.1	N	10
JY74	N	N	N	<10	N	.026	.04	3.45	N	N	.2	N	120
JY75	N	15	N	50	N	.007	N	<.02	N	N	.1	N	15
JY76	N	N	N	N	N	.200	N	.80	N	N	.1	N	115
JY77	N	10	N	10	N	.005	N	<.02	N	N	N	N	15
JY78	N	N	N	15	N	.002	N	<.02	N	N	.2	N	30
JY84	N	50	N	50	N	.001	N	<.02	N	N	.3	N	65
JY85	N	30	N	30	N	<.001	N	<.02	N	N	.1	N	40
JY88	N	N	N	10	N	2.420	<.02	.32	N	N	.3	N	130
JY89	N	N	<200	30	N	.070	<.02	.34	N	N	.2	N	135
Y049	N	N	N	<10	N	1.020	N	<.02	N	N	N	N	5
Y050	N	N	N	<10	N	.007	N	<.02	N	N	N	N	5
Y051	N	N	N	N	N	.660	N	<.02	N	N	N	N	20
Y052	N	N	N	<10	N	.005	N	<.02	N	N	N	N	5
Y104	N	N	N	10	N	.360	N	.30	N	N	N	N	65
Y107	N	<10	N	20	N	.003	N	.02	N	N	N	N	5
Y108	N	N	N	15	N	.024	N	<.02	N	N	N	N	15
Y109	N	N	N	20	N	.002	N	<.02	N	N	N	N	50
Y110	N	10	N	30	N	.008	N	<.02	N	N	N	N	60
Y111	N	N	N	20	N	.009	N	.70	N	N	N	N	45
Y112	N	N	N	<10	N	.004	N	1.06	N	N	N	N	60

TABLE 4. CHEMICAL DATA FOR 43 STREAM SEDIMENT SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
Y002	9 33 37	138 12 2	10.0	.30	.70	>1.0	1,500	N	N	N	N	<20
Y003	9 33 30	138 12 8	10.0	3.00	3.00	>1.0	1,500	N	N	N	N	<20
Y005	9 33 15	138 12 9	10.0	3.00	3.00	>1.0	1,500	N	N	N	N	<20
Y006	9 33 8	138 12 2	10.0	5.00	5.00	1.0	1,500	N	N	N	N	<20
Y007	9 33 4	138 11 57	7.0	5.00	3.00	1.0	1,000	N	N	N	N	<20
Y008	9 32 47	138 11 43	3.0	2.00	2.00	.3	1,500	N	N	N	N	<20
Y009	9 32 42	138 11 38	10.0	2.00	1.50	>1.0	1,000	N	N	N	N	<20
Y010	9 32 40	138 11 37	15.0	2.00	.70	>1.0	1,000	N	N	N	N	<20
Y012	9 35 26	138 9 42	15.0	3.00	3.00	>1.0	1,500	N	N	N	N	<20
Y013	9 35 22	138 9 44	10.0	5.00	3.00	>1.0	1,000	N	N	N	N	<20
Y014	9 35 0	138 9 29	10.0	3.00	3.00	>1.0	1,500	N	N	N	N	20
Y015	9 35 5	138 9 35	10.0	3.00	2.00	>1.0	1,000	N	N	N	N	<20
Y016	9 35 10	138 9 36	10.0	5.00	3.00	>1.0	1,500	N	N	N	N	<20
Y017	9 35 55	138 10 15	10.0	3.00	3.00	>1.0	1,500	N	N	N	N	<20
Y018	9 35 50	138 10 11	3.0	1.50	.70	.5	500	N	N	N	N	<20
Y019	9 35 34	138 10 47	7.0	5.00	3.00	>1.0	1,000	N	N	N	N	<20
Y020	9 36 6	138 11 8	7.0	2.00	7.00	>1.0	1,000	N	N	N	<10	N
Y022	9 34 28	138 9 53	7.0	.20	.15	.5	300	N	N	N	15	<20
Y023	9 34 31	138 9 58	3.0	.15	<.05	.7	200	N	N	N	<10	N
Y024	9 34 23	138 10 13	3.0	.07	<.05	.2	1,500	N	N	N	N	N
Y025	9 32 3	138 10 17	7.0	1.50	1.00	1.0	1,000	N	N	N	N	50
Y026	9 33 14	138 9 13	3.0	.15	.07	.3	500	N	N	N	N	N
Y027	9 34 19	138 10 6	5.0	2.00	1.50	1.0	700	N	N	N	N	30
Y028	9 34 47	138 7 23	1.5	.70	20.00	.3	150	N	N	N	10	N
Y029	9 34 45	138 7 50	10.0	3.00	3.00	1.0	1,500	N	N	N	N	N
Y030	9 34 2	138 7 50	10.0	5.00	3.00	1.0	1,000	N	N	N	N	<20
Y031	9 33 44	138 7 56	7.0	5.00	3.00	>1.0	1,500	N	N	N	N	N
Y032	9 32 46	138 7 56	7.0	5.00	3.00	1.0	1,500	N	N	N	N	N
Y033	9 32 31	138 7 52	7.0	3.00	2.00	>1.0	1,500	N	N	N	N	N
Y034	9 30 51	138 6 55	10.0	5.00	3.00	>1.0	1,500	N	N	N	N	<20
Y035	9 30 46	138 6 49	5.0	3.00	2.00	1.0	700	N	N	N	N	N
Y036	9 33 51	138 6 53	10.0	5.00	3.00	1.0	1,000	N	N	N	N	N
Y037	9 33 35	138 6 52	15.0	5.00	3.00	>1.0	1,500	N	N	N	N	<20
Y038	9 33 3	138 6 35	5.0	5.00	3.00	1.0	1,000	N	N	N	N	<20
Y039	9 32 26	138 6 25	7.0	5.00	3.00	1.0	1,000	N	N	N	N	N
Y040	9 32 15	138 6 6	7.0	5.00	3.00	1.0	700	N	N	N	N	N
Y041	9 31 44	138 5 45	5.0	1.50	10.00	.7	700	N	N	N	<10	N
Y042	9 31 24	138 5 41	3.0	2.00	7.00	.5	700	N	N	N	N	N
Y043	9 31 11	138 5 39	5.0	3.00	7.00	.7	700	N	N	N	N	N
Y044	9 30 9	138 6 22	10.0	3.00	2.00	>1.0	1,000	N	N	N	N	<20
Y045	9 30 14	138 4 58	10.0	2.00	3.00	1.0	700	N	N	N	N	<20
Y101	9 35 42	138 9 45	10.0	1.50	1.50	>1.0	1,500	N	N	N	N	<20
Y102	9 35 49	138 9 49	7.0	2.00	2.00	>1.0	1,000	N	N	N	N	<20

TABLE 4. CHEMICAL DATA FOR 43 STREAM SEDIMENT SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN
Y002	N	N	N	70	200	200	N	N	N	150	<10	N	30	N
Y003	N	N	N	70	1,000	150	N	N	N	300	<10	N	20	N
Y005	N	N	N	70	2,000	100	N	N	N	200	<10	N	30	N
Y006	N	N	N	70	1,500	150	N	N	N	300	<10	N	30	N
Y007	N	N	N	70	3,000	70	N	N	N	300	<10	N	30	N
Y008	N	N	N	20	100	150	<20	N	N	30	N	N	30	N
Y009	N	N	N	70	3,000	150	N	N	N	150	<10	N	30	N
Y010	N	N	N	150	>5,000	150	N	N	N	700	<10	N	30	N
Y012	N	N	N	70	1,500	150	N	N	N	300	<10	N	30	N
Y013	N	N	N	70	1,500	100	N	N	N	300	<10	N	20	N
Y014	N	N	N	100	5,000	150	N	N	N	300	<10	N	30	N
Y015	N	N	N	100	2,000	100	N	N	N	300	<10	N	30	N
Y016	N	N	N	70	2,000	100	N	N	N	200	<10	N	20	N
Y017	N	N	N	100	3,000	150	N	N	N	200	<10	N	20	N
Y018	N	N	N	70	200	150	<20	N	N	100	N	N	30	N
Y019	N	N	N	100	1,000	150	N	N	N	300	N	N	30	N
Y020	N	N	N	70	1,500	50	N	N	N	150	15	N	20	N
Y022	N	N	N	50	200	50	<20	20	N	30	N	N	15	N
Y023	N	N	N	7	500	100	N	5	N	50	N	N	30	N
Y024	N	N	N	150	30	100	N	N	N	30	N	N	30	N
Y025	N	N	N	200	>5,000	100	N	N	N	700	<10	N	20	N
Y026	N	N	N	15	150	70	<20	N	N	50	N	N	30	N
Y027	N	N	N	70	1,500	100	N	N	N	200	N	N	30	N
Y028	N	N	N	5	200	15	<20	N	N	30	N	N	5	N
Y029	N	N	N	70	2,000	100	N	N	N	300	10	N	30	N
Y030	N	N	N	100	2,000	70	N	N	N	300	<10	N	30	N
Y031	N	N	N	70	2,000	70	N	N	N	300	<10	N	20	N
Y032	N	N	N	70	1,500	70	N	N	N	300	10	N	30	N
Y033	N	N	N	70	1,500	70	N	N	N	200	200	N	20	N
Y034	N	N	N	70	1,500	70	N	N	N	300	<10	N	30	N
Y035	N	N	N	70	1,000	70	N	N	N	200	N	N	20	N
Y036	N	N	N	70	1,500	100	N	N	N	300	<10	N	30	N
Y037	N	N	N	100	3,000	100	N	N	N	500	<10	N	30	N
Y038	N	N	N	70	1,000	70	N	N	N	200	<10	N	20	N
Y039	N	N	N	70	1,000	70	N	N	N	300	10	N	30	N
Y040	N	N	N	70	2,000	70	N	N	N	300	<10	N	30	N
Y041	N	N	N	70	1,000	50	N	N	N	200	N	N	20	N
Y042	N	N	N	70	700	50	N	N	N	200	30	N	20	N
Y043	N	N	N	70	1,000	50	N	N	N	300	N	N	20	N
Y044	N	N	N	100	3,000	100	N	N	N	300	<10	N	20	N
Y045	N	N	N	70	1,500	70	N	N	N	200	15	N	30	N
Y101	N	N	N	70	1,000	100	N	N	N	150	N	N	20	N
Y102	N	N	N	70	1,000	100	N	N	N	150	N	N	20	N

TABLE 4. CHEMICAL DATA FOR 43 STREAM SEDIMENT SAMPLES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-SR	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
Y002	N	300	N	20	N	50	N	.002	<.02	N	N	.1	N	60
Y003	200	200	N	15	N	30	N	.001	<.02	N	N	N	N	20
Y005	300	300	N	20	N	50	N	.001	<.02	N	N	.1	N	25
Y006	200	300	N	20	N	50	N	.001	<.02	N	N	.1	N	40
Y007	200	300	N	20	N	50	N	.003	<.02	N	N	.1	N	25
Y008	300	100	N	20	N	30	N	.001	<.02	N	N	.1	N	35
Y009	300	300	N	20	N	50	N	.001	<.02	N	N	.1	N	35
Y010	<100	300	N	15	<200	30	N	.034	.06	N	N	.1	N	55
Y012	200	150	N	15	N	50	N	.001	<.02	N	N	N	N	25
Y013	100	200	N	20	N	70	N	.001	<.02	N	N	N	N	30
Y014	150	200	N	15	N	30	N	.002	<.02	N	N	.2	N	40
Y015	150	200	N	20	N	30	N	.001	<.02	N	N	N	N	35
Y016	150	200	N	15	N	30	N	.002	<.02	N	N	N	N	30
Y017	1,000	200	N	15	N	30	N	.006	<.02	N	N	.1	N	40
Y018	N	200	N	15	N	30	N	.005	.04	N	N	.2	N	140
Y019	200	200	N	20	N	50	N	.002	<.02	N	N	.1	N	25
Y020	1,500	150	N	15	N	30	N	.001	.02	N	N	.1	N	25
Y022	N	150	N	10	N	10	N	.002	<.02	N	N	.4	N	35
Y023	N	200	N	N	N	30	N	.012	.10	N	N	.1	N	50
Y024	N	300	N	15	N	20	N	.003	.10	N	N	.3	N	45
Y025	N	200	N	15	200	30	N	.003	<.02	N	N	.2	N	210
Y026	N	150	N	<10	N	30	N	.005	.02	N	N	.2	N	200
Y027	150	200	N	20	N	50	N	.005	.02	N	N	.2	N	50
Y028	3,000	70	N	<10	N	N	N	<.001	<.02	N	N	.1	N	5
Y029	500	300	N	20	N	30	N	.002	<.02	N	N	.1	N	40
Y030	300	150	N	20	N	50	N	.002	<.02	N	N	.1	N	35
Y031	300	150	N	20	N	50	N	.001	<.02	N	N	.1	N	40
Y032	300	200	N	20	N	50	N	.001	<.02	N	N	.1	N	45
Y033	500	150	N	20	N	30	N	.003	<.02	N	N	.1	N	35
Y034	300	150	N	20	N	30	N	.001	<.02	N	N	N	N	65
Y035	150	150	N	15	N	30	N	.003	.02	N	N	N	N	45
Y036	200	200	N	20	N	50	N	.002	.02	N	N	.1	N	75
Y037	300	200	N	20	N	50	N	.003	<.02	N	N	N	N	40
Y038	200	150	N	20	N	50	N	.002	<.02	N	N	.1	N	45
Y039	200	200	N	20	N	50	N	.001	<.02	N	N	N	N	60
Y040	300	150	N	20	N	100	N	.001	<.02	N	N	.1	N	35
Y041	1,500	150	N	20	N	30	N	.001	.02	N	N	.2	N	30
Y042	1,500	100	N	15	N	30	N	.004	<.02	N	N	.1	N	30
Y043	1,000	150	N	20	N	50	N	.002	<.02	N	N	N	N	30
Y044	300	200	N	15	N	50	N	.005	.04	N	N	N	N	55
Y045	500	300	N	30	N	50	N	.002	<.02	N	N	N	N	50
Y101	200	300	N	15	N	30	N	.001	.02	N	N	N	N	50
Y102	200	200	N	15	N	50	N	.005	.10	N	N	N	N	50

TABLE 5. CHEMICAL DATA FOR 39 HEAVY-MINERAL CONCENTRATES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE	S-BI	S-CD	S-CO
Y002	9 33 37	138 12 2	1.5	.2	.7	>2.0	150	N	N	N	<20	N	N	N	N	N
Y003	9 33 30	138 12 8	3.0	1.5	5.0	>2.0	500	N	N	N	N	N	N	N	N	20
Y005	9 33 15	138 12 9	5.0	1.5	7.0	>2.0	500	<1	N	N	N	N	N	N	N	30
Y006	9 33 8	138 12 2	2.0	1.5	7.0	>2.0	500	<1	N	N	N	N	N	N	N	30
Y007	9 33 4	138 11 57	2.0	2.0	7.0	>2.0	500	N	N	N	N	N	N	N	N	50
Y008	9 32 47	138 11 43	1.5	.3	5.0	>2.0	300	N	N	N	N	N	N	N	N	15
Y009	9 32 42	138 11 38	3.0	1.0	5.0	>2.0	700	N	N	N	N	N	N	N	N	20
Y010	9 32 40	138 11 37	3.0	3.0	3.0	>2.0	700	N	N	N	N	N	N	N	N	50
Y012	9 35 26	138 9 42	5.0	2.0	7.0	>2.0	700	N	N	N	N	<50	N	N	N	20
Y013	9 35 22	138 9 44	5.0	3.0	7.0	>2.0	700	<1	N	N	<20	<50	N	N	N	30
Y014	9 35 0	138 9 29	5.0	7.0	10.0	1.0	1,000	N	N	N	N	N	N	N	N	50
Y015	9 35 5	138 9 35	5.0	5.0	7.0	>2.0	1,000	N	N	N	N	N	N	N	N	70
Y016	9 35 10	138 9 36	7.0	2.0	7.0	>2.0	1,000	N	N	N	N	<50	N	N	N	30
Y017	9 35 55	138 10 15	3.0	1.5	15.0	>2.0	500	N	N	N	20	N	N	N	N	20
Y018	9 35 50	138 10 11	10.0	1.5	5.0	1.5	700	N	N	N	N	N	N	N	N	70
Y019	9 35 34	138 10 47	3.0	2.0	5.0	>2.0	700	N	N	N	N	<50	N	N	N	30
Y020	9 36 6	138 11 8	1.5	2.0	20.0	2.0	500	N	N	N	30	N	N	N	N	15
Y023	9 34 31	138 9 58	3.0	.1	.1	>2.0	300	N	N	N	N	N	N	N	N	<10
Y025	9 32 3	138 10 17	5.0	10.0	5.0	1.0	1,000	N	N	N	N	N	N	N	N	70
Y028	9 34 47	138 7 23	1.5	1.5	30.0	1.0	200	N	N	N	30	N	N	N	N	10
Y029	9 34 45	138 7 50	7.0	3.0	7.0	>2.0	1,000	N	N	N	N	<50	N	N	N	50
Y030	9 34 2	138 7 50	5.0	2.0	7.0	>2.0	700	N	N	N	N	N	N	N	N	30
Y031	9 33 44	138 7 56	5.0	3.0	5.0	2.0	1,000	N	N	N	N	<50	N	N	N	50
Y032	9 32 46	138 7 56	5.0	2.0	7.0	>2.0	700	<1	N	N	N	N	N	N	N	30
Y033	9 32 31	138 7 52	3.0	2.0	7.0	>2.0	500	N	N	N	N	N	N	N	N	30
Y034	9 30 51	138 6 55	3.0	2.0	5.0	>2.0	700	N	N	N	N	<50	N	N	N	30
Y035	9 30 46	138 6 49	2.0	1.5	2.0	>2.0	500	N	N	N	N	N	N	N	N	30
Y036	9 33 51	138 6 53	5.0	3.0	5.0	2.0	700	N	N	N	N	N	N	N	N	30
Y037	9 33 35	138 6 52	3.0	2.0	3.0	>2.0	700	N	N	N	N	N	N	N	N	30
Y038	9 33 3	138 6 35	3.0	3.0	3.0	2.0	700	<1	N	N	N	<50	N	N	N	30
Y039	9 32 26	138 6 25	3.0	2.0	3.0	2.0	700	N	N	N	N	<50	N	N	N	20
Y040	9 32 15	138 6 6	5.0	5.0	3.0	2.0	700	N	N	N	N	<50	N	N	N	50
Y041	9 31 44	138 5 45	.7	.7	15.0	1.5	150	N	N	N	20	N	N	N	N	10
Y042	9 31 24	138 5 41	1.0	1.0	20.0	1.5	200	N	N	N	50	N	N	N	N	10
Y043	9 31 11	138 5 39	.7	1.0	20.0	.7	200	N	N	N	50	N	N	N	N	10
Y044	9 30 9	138 6 22	1.5	2.0	5.0	>2.0	700	N	N	N	N	N	N	N	N	20
Y045	9 30 14	138 4 58	5.0	3.0	5.0	2.0	1,000	N	N	N	N	<50	N	N	N	30
Y101	9 35 42	138 9 45	5.0	1.0	5.0	>2.0	700	N	N	N	N	<50	N	N	N	30
Y102	9 35 49	138 9 49	7.0	2.0	7.0	>2.0	1,000	N	N	N	N	N	N	N	N	50

TABLE 5. CHEMICAL DATA FOR 39 HEAVY-MINERAL CONCENTRATES, YAP ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH
Y002	200	15	N	N	<50	30	<20	N	15	N	N	150	N	<20	N	300	N
Y003	700	20	<50	N	<50	100	N	N	15	N	<200	200	N	30	N	100	N
Y005	1,000	15	<50	N	<50	100	<20	N	10	N	700	200	N	50	N	100	N
Y006	1,000	1,500	<50	N	<50	100	300	N	10	N	300	200	N	50	N	100	N
Y007	1,000	20	N	N	<50	200	<20	N	15	N	<200	200	N	50	N	100	N
Y008	300	30	N	N	<50	30	<20	N	10	50	300	300	N	50	N	150	N
Y009	500	500	<50	N	70	100	N	N	15	N	500	300	N	70	N	1,000	N
Y010	2,000	70	<50	N	70	500	N	N	10	N	200	200	N	70	N	1,500	N
Y012	700	1,000	<50	N	50	200	N	N	15	70	700	200	N	30	N	100	N
Y013	700	5,000	N	N	<50	300	N	N	15	N	700	200	N	30	N	70	N
Y014	1,500	100	N	N	N	200	N	N	70	N	N	200	N	N	N	30	N
Y015	700	300	N	15	<50	300	N	N	15	N	500	200	N	30	N	70	N
Y016	700	5,000	N	N	<50	200	N	N	15	N	700	200	N	30	N	70	N
Y017	700	150	N	N	<50	150	20	N	15	200	3,000	150	N	<20	N	200	N
Y018	500	70	N	<10	N	100	70	N	20	N	500	300	N	20	N	100	N
Y019	500	50	N	N	50	200	50	N	15	N	1,000	200	N	30	N	100	N
Y020	700	10	N	N	N	70	30	N	15	N	3,000	100	N	<20	N	200	N
Y023	2,000	15	N	15	50	20	<20	N	15	N	N	300	N	70	N	>2,000	N
Y025	5,000	30	N	N	N	500	<20	N	20	N	N	100	N	N	N	70	N
Y028	200	<10	N	N	N	70	N	N	<10	N	3,000	100	N	N	N	70	N
Y029	700	1,000	<50	<10	<50	300	1,000	N	20	N	2,000	200	N	50	N	200	N
Y030	700	5,000	N	N	<50	300	N	N	15	N	1,000	300	N	50	N	100	N
Y031	700	7,000	<50	N	<50	300	20	N	15	50	1,500	200	N	70	N	100	N
Y032	500	5,000	<50	N	<50	300	150	N	15	500	1,500	200	N	50	N	100	N
Y033	300	1,500	<50	N	<50	200	3,000	N	15	2,000	1,500	200	N	70	N	100	N
Y034	700	1,000	N	N	50	300	50	N	15	50	700	200	N	50	N	70	N
Y035	700	300	N	N	70	150	700	N	15	30	700	200	N	30	N	70	N
Y036	300	150	N	N	N	200	30	N	15	N	700	200	N	30	N	100	N
Y037	700	20	N	N	50	200	N	N	15	N	700	300	N	30	N	100	N
Y038	500	7,000	N	N	N	300	20	N	15	300	1,000	200	N	30	N	100	N
Y039	500	1,000	N	N	N	200	150	N	15	2,000	700	200	N	20	N	100	N
Y040	700	700	<50	N	N	300	<20	N	15	150	700	200	N	<20	N	70	N
Y041	200	15	N	N	N	70	N	N	<10	N	5,000	70	N	N	N	N	N
Y042	200	20	N	N	N	70	<20	N	<10	N	5,000	70	N	<20	N	50	N
Y043	200	10	N	N	N	70	<20	N	N	N	5,000	70	N	N	N	30	N
Y044	1,000	2,000	N	N	70	150	30	N	15	30	1,000	200	N	20	N	50	N
Y045	500	30	N	N	N	200	<20	N	15	N	500	300	N	20	N	100	N
Y101	300	50	N	N	N	100	20	N	15	N	700	300	N	50	N	70	N
Y102	500	300	<50	N	70	200	<20	N	15	N	700	300	N	50	N	500	N

TABLE 6. CHEMICAL DATA FOR 7 SINTERS, YAP ISLANDS, FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
BY040	9 34 9	138 10 33	15	N	N	.20	50	N	N	N	N	N
BY060	9 34 9	138 10 33	>20	<.02	<.05	.10	300	N	N	N	N	150
JY58	9 34 9	138 10 33	20	<.02	<.05	.15	50	N	N	N	N	<20
JY59	9 34 9	138 10 33	>20	N	<.05	.07	70	N	N	N	N	N
JY60	9 34 9	138 10 33	>20	N	N	.15	70	N	N	N	N	N
Y106	9 34 10	138 10 33	20	N	N	.15	30	N	N	N	N	N
JY86	9 34 9	138 10 33	20	N	<.05	.20	70	N	N	N	N	N

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V
BY040	N	N	N	N	50	500	N	N	N	N	10	N	7	N	N	100
BY060	N	N	N	N	100	200	N	N	N	N	20	N	20	N	N	200
JY58	N	N	N	N	300	300	N	N	N	N	20	N	10	N	N	700
JY59	N	N	N	N	100	500	N	N	N	N	10	N	7	N	N	300
JY60	N	N	N	N	50	700	N	N	N	N	15	N	<5	N	N	70
Y106	N	N	N	N	30	500	N	N	N	N	N	N	7	N	N	30
JY86	N	N	N	N	70	500	N	N	N	N	20	N	<5	N	N	200

Sample	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
BY040	N	N	N	10	N	.190	<.02	2.35	30	2	N	N	60
BY060	N	N	N	N	N	.010	N	.50	10	N	N	N	30
JY58	N	N	N	10	N	.030	N	1.00	N	N	.2	N	30
JY59	N	N	N	N	N	.060	.04	1.85	N	N	.2	N	25
JY60	N	N	N	N	N	.005	N	.80	N	N	.3	N	10
Y106	N	N	N	10	N	.520	.06	2.20	60	5	N	N	30
JY86	N	N	N	15	N	.017	N	.90	N	N	.3	N	20

TABLE 7. CHEMICAL DATA FOR 13 MANGROVE SEDIMENTS, YAP ISLANDS, FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	LATITUDE	LONGITUD	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
Y113	9 33 57	138 10 45	5	3.0	5.0	1.0	700	N	N	N	100	N
Y114	9 34 2	138 10 44	5	2.0	7.0	1.0	500	N	N	N	100	<20
Y115	9 34 5	138 10 40	3	1.5	10.0	.3	500	N	N	N	150	<20
Y116	9 34 9	138 10 39	3	1.5	5.0	.7	700	N	N	N	100	N
Y117	9 34 14	138 10 36	5	1.5	2.0	.5	700	N	N	N	50	N
Y118	9 34 19	138 10 32	5	1.0	1.5	.5	500	N	N	N	150	N
Y119	9 34 35	138 10 28	3	2.0	15.0	1.0	700	N	N	N	100	N
Y120	9 34 45	138 10 10	7	3.0	7.0	>1.0	700	N	N	N	100	N
Y121	9 34 34	138 10 12	7	5.0	5.0	1.0	700	N	N	N	15	N
Y122	9 34 43	138 10 2	7	2.0	2.0	>1.0	1,500	N	N	N	50	<20
Y123	9 34 23	138 9 53	7	2.0	5.0	>1.0	700	N	N	N	100	N
Y124	9 33 57	138 9 28	5	2.0	15.0	1.0	500	N	N	N	70	N
Y125	9 33 28	138 8 58	10	2.0	1.5	>1.0	1,000	N	N	N	150	N

TABLE 7. CHEMICAL DATA FOR 13 MANGROVE SEDIMENTS, YAP ISLANDS, FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
Y113	N	N	N	70	2,000	30	N	20	N	200	<10	N	20	N	700
Y114	N	N	N	50	5,000	70	N	7	N	150	15	N	20	N	1,000
Y115	N	N	N	20	300	50	N	15	N	100	15	N	15	N	2,000
Y116	N	N	N	20	500	100	N	5	N	50	<10	N	20	N	1,000
Y117	N	N	N	70	70	100	N	5	N	50	<10	N	30	N	150
Y118	N	N	N	50	300	150	N	30	N	50	10	N	30	N	200
Y119	N	N	N	50	700	30	N	<5	N	150	<10	N	15	N	2,000
Y120	N	N	N	70	1,000	70	N	<5	N	200	10	N	30	N	1,000
Y121	N	N	N	100	1,500	150	N	N	N	300	<10	N	30	N	300
Y122	N	N	N	70	700	100	N	10	20	150	10	N	20	N	300
Y123	N	N	N	70	1,000	150	N	30	N	150	<10	N	20	N	700
Y124	N	N	N	50	700	50	N	N	N	150	<10	N	20	N	2,000
Y125	N	N	N	70	700	100	N	30	N	150	10	N	20	N	300

TABLE 7. CHEMICAL DATA FOR 13 MANGROVE SEDIMENTS, YAP ISLANDS, FEDERATED STATES OF MICRONESIA--Continued

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN	% ASH
Y113	200	N	15	N	30	N	.006	<.02	60	N	.2	2	25	83.2
Y114	150	N	10	N	20	N	.016	.20	50	N	.2	<2	55	91.1
Y115	100	N	15	N	20	N	.006	.10	40	N	.2	2	80	87.6
Y116	150	N	15	N	30	N	.018	.15	10	N	.2	N	65	94.5
Y117	200	N	15	<200	30	N	.002	.20	10	N	.1	N	120	91.2
Y118	200	N	15	N	30	N	.003	.10	50	N	.2	<2	60	83.7
Y119	150	N	15	N	30	N	<.001	<.02	20	N	.1	N	15	93.4
Y120	200	N	20	N	50	N	.001	<.02	20	N	.1	N	35	86.1
Y121	300	N	20	N	50	N	.002	<.02	20	N	.1	N	25	97.1
Y122	200	N	20	N	50	N	.021	.10	20	N	.1	N	50	90.1
Y123	200	N	15	N	30	N	.003	.04	60	N	.1	<2	40	89.9
Y124	200	N	15	N	30	N	.003	<.02	50	N	.1	N	25	86.8
Y125	150	N	15	N	30	N	.005	<.02	80	N	.1	<2	50	69.3

TABLE 8. CHEMICAL DATA FOR 10 ROCK SAMPLES, TRUK ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitud	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
BT01	7 22 38	151 43 37	7	1.50	3.0	1.0	700	N	N	N	N	150
BT02	7 25 6	151 51 9	7	1.50	3.0	1.0	700	N	N	N	N	150
BT03	7 25 25	151 51 21	5	2.00	5.0	.7	700	N	N	N	N	70
BT04	7 27 47	151 50 47	3	1.00	1.5	.7	700	N	N	N	N	500
BT05	7 26 54	151 52 54	3	.70	1.5	.7	700	N	N	N	N	300
BT06	7 26 38	151 53 47	7	5.00	5.0	1.0	700	N	N	N	N	70
TT103	7 23 34	151 42 24	3	.15	.1	.5	1,000	N	N	N	N	300
TT104	7 23 36	151 42 25	5	1.00	3.0	1.0	700	N	N	N	N	200
TT105	7 23 36	151 42 25	5	1.00	.5	1.0	1,000	N	N	N	<10	150
TT108	7 22 32	151 42 21	3	1.00	3.0	.7	700	N	N	N	N	150

TABLE 8. CHEMICAL DATA FOR 10 ROCK SAMPLES, TRUK ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
BT01	N	N	N	70	100	30	N	N	N	70	N	N	20	N	500
BT02	N	N	N	70	20	50	N	N	N	30	N	N	20	N	500
BT03	N	N	N	50	50	50	N	N	N	50	N	N	20	N	300
BT04	1.0	N	N	<5	N	<5	30	N	20	N	N	N	7	N	500
BT05	1.0	N	N	10	N	<5	30	N	N	N	N	N	7	N	500
BT06	N	N	N	70	500	70	<20	N	N	200	N	N	20	N	500
TT103	1.5	N	N	N	N	<5	30	<5	30	<5	<10	N	<5	N	300
TT104	1.5	N	N	50	N	20	20	N	N	15	N	N	10	N	500
TT105	<1.0	N	N	30	15	50	20	N	N	7	<10	N	10	N	500
TT108	<1.0	N	N	15	N	30	20	N	N	7	N	N	7	N	500

TABLE 8. CHEMICAL DATA FOR 10 ROCK SAMPLES, TRUK ISLANDS,FEDERATED STATES OF MICRONESIA--Continued

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	INST-HG	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
BT01	200	N	20	N	150	N	.001	N	<.02	N	N	.2	N	105
BT02	200	N	30	N	100	N	<.001	N	<.02	N	N	.2	N	115
BT03	200	N	20	N	100	N	<.001	N	<.02	N	N	.2	N	95
BT04	50	N	50	N	200	N	<.001	N	<.02	N	N	.2	N	125
BT05	70	N	30	N	200	N	<.001	N	<.02	N	N	.2	N	115
BT06	150	N	20	N	50	N	<.001	N	<.02	N	N	.2	N	90
TT103	10	N	50	N	500	N	<.001	N	<.02	N	N	.4	N	180
TT104	150	N	30	N	100	N	<.001	N	<.02	N	N	.3	N	115
TT105	100	N	30	N	70	N	<.001	N	<.02	N	N	.2	N	175
TT108	100	N	20	N	100	N	<.001	N	<.02	N	N	.3	N	105

TABLE 9. CHEMICAL DATA FOR 5 STREAM SEDIMENT SAMPLES, TRUK ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitud	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
MT01	7 23 14	151 42 40	10	.7	.2	>1.0	1,000	N	N	N	N	200
MT02	7 23 16	151 42 38	7	.3	.2	1.0	700	N	N	N	N	200
MT03	7 25 6	151 51 10	7	.5	.5	.7	700	N	N	N	N	100
MT04	7 25 38	151 51 10	10	.7	.7	1.0	1,000	N	N	N	N	150
MT05	7 25 42	151 51 12	10	.5	3.0	1.0	1,500	N	N	N	N	150

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
MT01	3.0	N	N	70	30	30	20	N	N	15	<10	N	20	N	<100
MT02	3.0	N	N	50	10	20	20	N	N	15	N	N	15	N	100
MT03	1.5	N	N	70	200	30	N	N	N	70	N	N	20	N	N
MT04	1.5	N	N	70	500	50	N	N	N	150	<10	N	20	N	N
MT05	2.0	N	N	200	300	70	N	N	N	150	<10	N	20	N	500

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN
MT01	150	N	30	<200	200	N	<.001	<.02	N	N	.4	N	150
MT02	150	N	30	N	200	N	.001	<.02	N	N	.3	N	125
MT03	200	N	20	N	100	N	.007	<.02	N	N	.4	N	180
MT04	200	N	20	N	150	N	.003	<.02	N	N	.4	N	200
MT05	150	N	20	N	70	N	<.001	<.02	N	N	.4	N	180

TABLE 10. CHEMICAL DATA FOR 5 HEAVY-MINERAL CONCENTRATES, TRUK ISLANDS, FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitud	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA	S-BE	S-BI	S-CD
MT01	7 23 14	151 42 40	10.0	.30	.2	>2.00	1,000	N	N	N	<20	300	N	N	N
MT02	7 23 16	151 42 38	3.0	.15	1.5	>2.00	500	N	N	N	N	70	N	N	N
MT03	7 25 6	151 51 10	7.0	3.00	7.0	1.00	700	N	N	N	N	<50	N	N	N
MT04	7 25 38	151 51 10	5.0	7.00	15.0	.70	1,500	N	N	N	N	N	N	N	N
MT05	7 25 42	151 51 12	.7	.70	30.0	.15	300	N	N	N	30	<50	N	N	N

Sample	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH
MT01	20	50	10	<50	N	150	<10	<20	N	20	N	N	200	N	50	N	300	N
MT02	20	N	200	<50	N	500	N	<20	N	50	50	<200	200	N	50	N	1,500	N
MT03	30	1,000	20,000	50	N	N	100	<20	N	30	N	500	300	N	20	N	70	N
MT04	30	7,000	300	<50	N	N	200	500	N	70	100	N	200	N	<20	N	150	N
MT05	<10	300	1,000	N	N	N	20	1,500	N	<10	500	3,000	30	N	N	N	500	N

TABLE 11. CHEMICAL DATA FOR 4 MANGROVE SEDIMENTS,TRUK ISLANDS,FEDERATED STATES OF MICRONESIA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitud	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU	S-B	S-BA
TT101	7 23 14	151 42 40	7.0	.5	.5	>1.0	300	N	N	N	15	100
TT102	7 23 16	151 42 38	5.0	.5	.7	>1.0	300	N	N	N	30	100
TT106	7 23 31	151 42 24	.7	1.0	20.0	.3	70	N	N	N	70	N
TT107	7 22 32	151 42 21	3.0	1.0	20.0	.5	200	N	N	N	70	N

Sample	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO	S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SR
TT101	3	N	N	30	15	30	20	N	20	5	10	N	15	N	100
TT102	3	N	N	20	20	20	20	10	20	10	10	N	10	N	300
TT106	N	N	N	N	15	10	<20	20	N	<5	10	N	N	N	5,000
TT107	N	N	N	15	50	30	<20	10	N	15	30	N	10	15	5,000

Sample	S-V	S-W	S-Y	S-ZN	S-ZR	S-TH	AA-AU	AA-TE	AA-AS	AA-BI	AA-CD	AA-SB	AA-ZN	% ASH
TT101	150	N	30	<200	300	N	.001	<.02	<10	N	.2	N	140	84.6
TT102	150	N	50	N	500	N	<.001	<.02	10	N	.2	N	120	89.6
TT106	50	N	<10	N	30	N	.001	.15	20	N	.2	<2	35	92.2
TT107	70	N	15	N	50	N	.002	<.02	<10	N	.2	N	100	91.3