DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-879L
FOLIO OF THE PHILIP SMITH MOUNTAINS QUADRANGLE, ALASKA
GEOCHEMICAL MAP, Sb, As, Bi, Cd, Mo, and Sn

Base from U.S. Geological Survey, 1971

Geology generalized in 1977 by W. P. Brosgé, H. N. Reiser, J. T. Dutro, Jr., and R. L. Detterman

ANTIMONY, ARSENIC, BISMUTH, CADMIUM, MOLYBDENUM, AND TIN IN THE MINUS 80 MESH STREAM-SEDIMENT FRACTION AND ROCK

CORRELATION OF MAP UNITS

SEDIMENTARY ROCKS

- Qu } QUATERNARY
- Kc } Upper Cretaceous
- Knt } Lower Cretaceous
- KJfk
- (Kc, Knt, KJfk) } CRETACEOUS; } JURASSIC
- TrPss } TRIASSIC } PERMIAN
- TPMl } PENNSYLVANIAN } MISSISSIPPIAN
- Mk
- Dk } Upper Upper Devonian
- Dhw, Dhf, Dhq, Dbc } Lower Upper Devonian
- } Upper Devonian } DEVONIAN
- UNCOMFORMITY
- DSs } SILURIAN

IGNEOUS ROCKS

- mr } JURASSIC (?) TO DEVONIAN
- Mv } MISSISSIPPIAN
- Dv } DEVONIAN

DESCRIPTION OF MAP UNITS

SEDIMENTARY ROCKS

Qu SURFICIAL DEPOSITS, UNDIVIDED (QUATERNARY)
Kc COLVILLE GROUP (UPPER CRETACEOUS)--Tuff; tuffaceous clastic rocks
Knt NANUSHUK GROUP (UPPER AND LOWER CRETACEOUS) AND TOROK FORMATION (LOWER CRETACEOUS)--Nonmarine and marine; sandstone, shale, siltstone and conglomerate
KJfk FORTRESS MOUNTAIN, OKPIKRUAK AND KONGAKUT FORMATIONS (LOWER CRETACEOUS) AND KINGAK SHALE (JURASSIC)-- Graywacke, dark-gray, partly manganiferous shale and siltstone, conglomerate
TrPss SHUBLIK FORMATION (TRIASSIC) AND SADLEROCHIT GROUP (TRIASSIC AND PERMIAN)-- Phosphatic shale and limestone, partly calcareous siltstone and shale, sandstone, barite concretions
TPMl LISBURNE GROUP (PENNSYLVANIAN AND MISSISSIPPIAN)--Limestone and dolomite
Mk KAYAK SHALE (MISSISSIPPIAN)--Black shale, limestone, sandstone
Dk KANAYUT CONGLOMERATE (UPPER DEVONIAN)--Nonmarine quartzite, ferruginous conglomerate, red shale. Basal marine sandstone
HUNT FORK SHALE (UPPER DEVONIAN)
Dhw Wacke member--Manganiferous shale and siltstone, ferruginous subgraywacke
Dhf Shale--Dark-gray shale and slate; quartzite, limestone. Thin mafic flow and sills
Dhq Quartzite member
Dbc CALCAREOUS SANDSTONE MEMBER OF HUNT FORK SHALE AND UNNAMED BROWN CALCAREOUS CLASTIC ROCKS (UPPER DEVONIAN)--Includes some reef limestone and red and green shale
DSs SKAJIT LIMESTONE (DEVONIAN AND SILURIAN)--Limestone, dolomite, marble. Few small mafic dikes

IGNEOUS ROCKS

Mv VOLCANIC ROCKS (MISSISSIPPIAN)--Diorite sill
Dv VOLCANIC ROCKS (DEVONIAN)--Pillow basalt flows
mr MAFIC ROCKS--Gabbro, diorite, and greenstone

GEOLOGIC CONTACT--Approximately located
FAULT--Dashed where approximately located
THRUST FAULT--Saw teeth on upper plate, Dotted where concealed

GEOCHEMICAL SYMBOLS

SAMPLE SITES
+ Sample site

△ 3 Stream sediment contains anomalous concentration of Mo (≥5L) or nonmagnetic heavy-mineral concentrate from stream sediment contains anomalous concentration of Mo(≥10L)--Number corresponds to the analytical results shown in tables 1 and 3

□ 3 Nonmagnetic heavy-mineral concentrate from stream sediment contains anomalous concentration of Cd(≥50)--Number corresponds to the analytical results shown in table 3

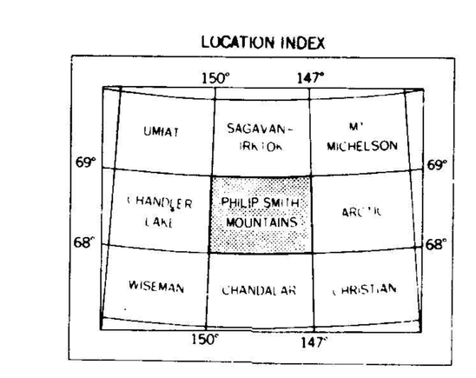
▽ 3 Stream sediment contains anomalous concentration of Sb(≥100L) or nonmagnetic heavy-mineral concentrate from stream sediment contain anomalous concentration of Sb(≥200L)--Number corresponds to the analytical results shown in tables 1 and 3

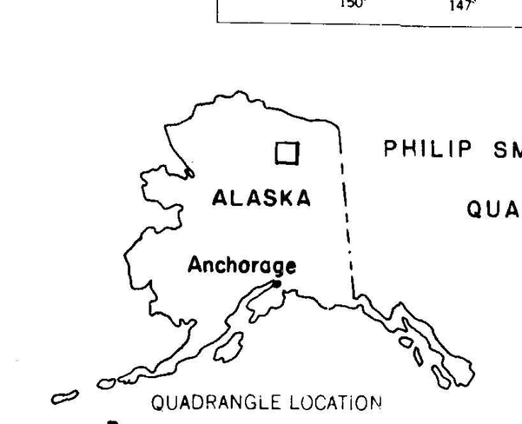
○ 3 Nonmagnetic heavy-mineral concentrate from stream sediment contains anomalous concentration of (As(≥500L)--Number corresponds to the analytical results shown in table 3

3 Stream sediment contains anomalous concentration of Sn(≥10L) or nonmagnetic heavy-mineral concentrate from stream sediment contains anomalous concentration of Sn(≥20L)--Number corresponds to the analytical results shown in tables 1 and 3

⬡ 3 Nonmagnetic heavy-mineral concentrate from stream sediment contains anomalous concentration of Bi(≥20L)--Number corresponds to the analytical results shown in table 3

(3) Rock sample site--Number corresponds to the analytical results shown in table 2





PHILIP SMITH MOUNTAINS QUADRANGLE

QUADRANGLE LOCATION

SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

Base from U.S. Geological Survey, 1971

Geology generalized in 1977 by W. P. Brosgé, H. N. Reiser, J. T. Dutro, Jr., and R. L. Detterman

ANTIMONY, ARSENIC, BISMUTH CADMIUM, MOLYBDENUM, AND TIN AND IN THE NONMAGNETIC HEAVY-MINERAL CONCENTRATE FROM STREAM SEDIMENTS

Table 1.--*Copper, lead, zinc, silver, and barium associated with anomalous antimony, arsenic, bismuth, cadmium, molybdenum and tin in stream-sediment samples, Philip Smith Mountains quadrangle, Alaska*

[Values reported in parts per million (ppm). N, not detected; L, detected but below value shown; and *, anomalous value. Lower limit of anomalous concentrations as follows in ppm. Cu, 100; Pb, 70; Zn (emission spectroscopy), 500; Zn (atomic absorption), 160; Ag, 0.5L; Ba, 1000; Mo, 5L; and Sn, 200. Antimony, arsenic, bismuth and cadmium were not detected in any samples. Analysts: E. F. Cooley and R. M. O'Leary]

Map No.	Field No. PS	Emission spectroscopy Mo	Sn	Cu	Pb	Zn	Ba	Ag	Atomic absorption Zn
1	446	20*	10N	100*	50	500*	2,000*	0.5L*	250*
2	468	10*	10N	70	30	200	1,500*	0.5N	190*
3	469	10*	10N	70	50	500*	1,500*	0.5N	200*
4	470	5L*	10N	70	50	300	1,000*	0.5N	120
5	471	5L*	10N	70	70*	500*	1,000*	0.5N	160*
6	479	20*	10N	50	50	200	1,000*	0.5N	170*
7	480	20*	10N	50	50	200	1,000*	0.5N	170*
8	526	10*	10N	50	30	200L	1,000*	0.5N	150
9	532	10*	10N	70	30	200L	2,000*	0.5N	200*
10	589	20*	10N	100*	30	300	2,000*	1.5*	240*
11	684	10*	10N	50	50	500*	1,000*	0.5N	320*
12	701	20*	10N	100*	70*	1,000*	1,000*	1.0*	530*
13	729	20*	10N	70	50	500*	1,000*	1.0*	190*
14	127	5N	200*	70	500*	500*	1,000*	0.5N	110

TABLE 2.--*Copper, lead, zinc, silver, cadmium, molybdenum, and barium in all rock samples, Philip Smith Mountains quadrangle, Alaska*

[Values reported in parts per million (ppm). N, not detected at value shown; G, greater than value shown; OB, not analyzed; L, detected but below value shown; *, small unmapped mafic rocks in unnamed brown calcareous clastic rocks and calcareous sandstone member of Hunt Fork Shale (Dbc); and, **, unmapped sliver of Skajit Limestone (DSs) in Dbc. More than one rock sample was collected at sites 2, 7, 8, 9, 11, 24, 28, 33, 36, 38, 39, 43, 46, 47, 51, 52, 53, 55, 56, 57, 58, 65 and 68. Analysts: E. F. Cooley and R. M. O'Leary]

Stratigraphic unit symbols of generalized geologic map	Map No.	Field No.	Emission spectroscopy Cu	Pb	Zn	Ag	Cd	Ba	Mo	Atomic absorption Zn
Dbc	1	75RR112X	20	20	200	0.5N	20N	150	5N	OB
DSs	2	75RR113A	70	700	1,000	1.0	20N	1,500	5N	OB
	2	75RR113B	7	100	200N	0.5N	20N	200	5N	OB
	2	75RR113C	20	100	7,000	0.5N	100	2,000	5N	OB
	2	75RR113D	50	30	1,500	0.5N	20N	300	5N	OB
	2	75RR113E	300	300	10,000G	7.0	500G	300	5N	OB
	2	75RR113S	10	10	1,000	0.5N	20N	50	5N	OB
	2	75RR113T	5N	10	200N	0.5N	20N	20N	5N	OB
Dhf	3	75RR118	70	70	200	0.5N	20N	500	5N	OB
Dbc	4	75RR120	20,000G	50	200N	7.0	20N	150	5N	OB
DSs	5	75RR121	7,000	10	200N	1.0	20N	100	5N	OB
Dbc	6	75BE88D	300	10	200N	0.5N	20N	200	5N	OB
DK	7	75BE138A	5	20	200N	0.5N	20N	70	5N	5N
	7	75BE138B	50	50	200N	0.5N	20N	70	10	5N
	7	75BE138C	20	30	200N	0.5N	20N	70	5N	40
	8	PS136RA	7	20	200	0.5N	500G	500	5N	100
	8	PS136RB	10	100	200	0.5N	500G	200	5N	250
Qv	9	PS232RA	700	20,000G	10,000G	150.0	20N	200	5N	250,000
	9	PS232RB	150	15,000	10,000G	30.0	20N	300	5N	75,000
DK	10	PS322R	10	50	200L	0.5N	20N	150	5N	60
	11	PS333RA	10	10L	200L	0.5N	20N	150	5N	20
	11	PS33RB	5L	10L	200L	0.5N	20N	100	5N	10
	11	PS333RC	5L	10L	200L	0.5N	20N	100	5N	10
PMl	12	PS535R	20	20	200	0.5N	20N	100	5N	50
TrPss	13	PSS39R	5	10L	200L	0.5N	20N	50	5N	60
Pml	14	PS563R	15	20	1,000	0.5N	20N	500	5N	120
TrPss	15	PS589R	50	20	1,000	0.5N	20N	20L	5N	250
TPMl	16	PS647R	50	50	200L	0.5N	20N	1,000	5N	80
Dbc	17	76ARR45	30	70	200	0.5N	20N	70	5N	170
DSs	18	76ARR47	1,000	20,000	10,000	30.0	70	5,000G	5N	5,000
*mr	19	76ARR48	150	100	200N	0.5N	20N	30	5N	75
DSs	20	76BE412	30	30	200N	0.5N	20N	300	5N	20
DJFK	21	76BE430B	300	30	500	2.0	20N	1,500	30	320
DK	22	76BE454	7	10N	3,000	0.5N	20N	150	5N	1,700
		76BE457X	30	100	200N	3.0	20N	150	5N	100
Dhf	24	76BE475A	100	30	200N	0.5N	20N	700	5N	160
	24	76BE475B	70	20	200N	0.5N	20N	300	5N	130
DK	25	76BE476A	5	20	200N	0.5N	20N	300	5N	20
*mr	26	76BE477	150	10	200N	0.5N	20N	150	5N	100
**DSs	27	76ARR46	OB	OB	OB	0.0B	OB	OB	OB	340,000
KJfk	28	75ADt41A1	100	30	300	1.0	20N	5,000G	5N	190
	28	75ADt41A	70	30	500	3.0	20N	3,000	5N	
	29	75ADt110A	100	20	200	0.5L	20N	5,000	5N	160
TrPss	30	75ADt110B	70	30	200	0.5N	20N	2,000	5N	160
KJfk	31	75ABe 4	100	50	200N	0.5N	20N	1,500	5N	140
	32	75ARR160	150	30	200	0.5N	20N	2,000	5N	150
TrPss	33	75ARR158A	100	20	200	2.0	20N	2,000	5N	180
	33	75ARR158A1	100	30	200	2.0	20N	2,000	5N	200
	33	75ARR158B	100	20	300	2.0	20N	5,000	5N	190
	34	75ARR66	200	30	500	2.0	20N	1,500	10	600
KJfk	35	75ADt78-2	100	50	200N	0.5N	20N	500	5N	120
	36	75ARR199B	300	50	200N	0.5N	20N	2,000	50	190
	36	75ARR199B1	200	50	200L	0.5N	20N	700	150	220
TrPss	37	75ARR26	100	20	200N	0.5N	20N	700	5N	110
KJfk	38	75ADt26B	200	30	200N	0.5N	20N	1,500	5N	120
	38	75ADt26B1	100	30	200L	0.5N	20N	700	5N	120
	39	75ABe29C	100	30	200L	0.5N	20N	1,500	5N	120
	39	75ABe29C1	150	30	200L	0.5N	20N	1,000	5N	130
	40	75ADt17F	150	50	200L	0.5N	20N	5,000	5N	140
	41	75ADt72	10	10	200L	0.5N	20N	1,000	5N	65
	42	75ADt73	20	10	200	0.5N	20N	300	5N	45
	43	75ADt9A	150	30	200N	0.5N	10N	2,000	5N	120
	43	75ADt9A-1	200	1,000	200N	0.5N	20N	3,000	5N	110
TrPss	44	75ADt10	150	20	200L	0.5N	20N	5,000	5N	140
KJfk	45	75ARR23	20	30	200N	2.0	20N	5,000	10	20
	46	75ADt2.1F	150	20	200L	0.5N	20N	2,000	5N	120
	46	75ADt2.2A	150	50	200L	0.5N	20N	1,000	20	90
	47	75ADt3	150	50	200L	0.5N	20N	2,000	5N	180
	47	75ADt3A	150	50	200L	0.5N	20N	1,500	5N	200
	47	75ADt3B	100	50	200L	1.0	20N	1,000	20	110
	47	75ADt3B1	70	50	200L	2.0	20N	700	5N	110
	48	75ADt 4	150	50	200N	0.5N	20N	2,000	5N	120
	49	75ADt28	150	50	200N	0.5N	20N	2,000	5N	120
Knt	50	75ADt1G	100	50	200L	0.5N	20N	1,000	5N	110
KJfk	51	75ADt42A	100	30	200N	0.5N	20N	2,000	5N	80
	51	75ADt42A1	70	30	200L	0.5N	20N	700	5N	90
TrPss	52	75ADt22A	70	20	200L	0.5N	20N	1,000	5N	100
	52	75ADt22A1	10	30	200	0.5N	20N	2,000	5N	120
	52	75ADt22B	20	20	200N	0.5N	20N	1,500	5N	75
	52	75ADt22B1	10	30	200L	0.5N	20N	700	5N	75
	52	75ADt22C1	50	20	200N	0.5N	20N	1,000	5N	85
	52	75ADt22C2	20	20	200N	0.5N	20N	1,000	5N	50
	52	75ADt22Amf	150	30	200L	0.5N	20N	700	5N	90
	53	75ADt24	150	50	300	0.5N	20N	1,500	5N	120
	53	75ADt24A	150	20	700	0.5N	20N	50	5N	250
	53	75ADt24X	70	150	700	0.5N	20N	700	5N	260
Knt	54	75ADt29A	100	70	200N	0.5N	20N	1,500	5N	140
KJfk	55	75ADt52	100	50	200N	0.5N	20N	1,500	5N	110
	55	75ADt52A	70	30	200N	0.5N	20N	700	5N	120
	56	75ARR51	150	50	200L	0.5N	20N	3,000	5N	240
	56	75ARR51A	150	30	200	0.5N	20N	2,000	5N	220
	57	75ARR50	50	50	200	0.5N	20N	500	5N	160
	57	75ARR50P	100	200	200N	0.5N	20N	1,000	5N	90
	58	75AAR56	100	30	200N	0.5N	20N	1,000	5N	120
	58	75ARR56A	100	30	200	0.5N	20N	700	5N	140
Knt	59	75ARR53	100	20	200N	0.5N	20N	1,000	5N	80
KJfk	60	75ADt45	100	30	200N	0.5N	20N	1,000	5N	130
Kc	61	75ADt32A	100	70	200N	0.5N	20N	1,000	5N	140
KJfk	62	75ABe31A	100	30	200L	0.5N	20N	1,500	5N	160
TrPss	63	75ADt79	10	20	200	0.5N	20N	150	5N	55
KJfk	64	75ARR48B	100	20	200L	1.5	20N	3,000	20	120
TrPss	65	75ADt55-1	50	10L	200N	0.5N	20N	1,000	5N	90
	65	75ADt55-2	30	10L	200N	0.5N	20N	700	5N	110
	66	75ADt55N	30	50	200N	0.5N	20N	100	5N	30
	67	75ADt55B	30	20	200N	0.5N	20N	1,000	5N	55
	68	75ADt55C	50	20	200N	0.5N	20N	500	5N	90
	68	75ADt55C3	30	20	200N	0.5N	20N	700	5N	65
	69	75ADt55D	30	20	200N	0.5N	20N	700	10	50
	70	75ADt55E	20	20	200N	0.5N	20N	300	5N	75

Table 3.--*Copper, lead, zinc, silver, and barium associated with anomalous antimony, arsenic, bismuth, cadmium, molybdenum and tin values in nonmagnetic heavy-mineral concentrates from stream-sediment samples, Philip Smith Mountains quadrangle, Alaska*

[Values reported in parts per million (ppm). N, not detected; L, detected but below value shown; G, greater than value shown; *, anomalous values for As, Mo, Sn, Sb, Bi, Cd, Cu, Pb, Zn, Ba, or Ag. Lower limit of anomalous concentrations as follows in ppm: As, 500L; Mo, 10L; Sn, 20L; Sb, 200L; Bi, 20L; Cd, 50L; Cu, 700; Pb, 1,500; Zn, 3,000; Ba, 7,000 and Ag, 3. Analyst: E. F. Cooley]

Map No.	Field No. PS	Emission spectroscopy As	Mo	Sn	Sb	Bi	Cd	Cu	Pb	Zn	Ba	Ag
1	3C	500L*	10N	20N	200N	20N	50N	300	1,000	1,000	20,000*	1N
2	178C	500*	10N	20N	200N	20N	50N	2,000*	100	700	20.000*	1N
3	184C	500*	50*	20N	200N	20N	50N	1,000*	1,500*	500	50,000*	1L
4	243C	500L*	10N	20N	200N	20N	50N	2,000*	1,000	2,000	5,000	1N
5	259C	500*	10N	20N	200N	20N	50N	700*	3,000*	7,000*	30,000*	1
6	360C	500L*	10N	20N	200N	20N	100*	500	2,000*	1,000	30,000*	15*
7	373C	500L*	10N	20N	200N	20N	50N	700*	5,000*	10,000G*	100,000*	2
8	408C	1,500*	10N	20*	200N	20N	50N	1,000*	10,000*	10,000G*	70,000*	7*
9	418C	1,000*	10N	20N	200N	20N	50N	500	7,000*	5,000*	70,000*	15*
10	449C	500*	30*	20N	200N	20N	50N	500	150	700	1,500	1N
11	465C	500L*	10N	20N	200N	20N	50N	20	20	500N	100,000G*	2
12	471C	1,000*	10N	20N	200N	20N	50N	200	700	2,000	5,000	15*
13	489C	2,000*	10N	20N	200N	20N	50N	100	200	500	10,000*	1
14	524C	1,000*	10L*	20N	200N	20N	50N	100	70	500L	70,000*	2
15	552C	500*	50*	20N	200N	20N	50N	200	100	500L	100,000G*	3*
16	74C	500N	10L*	20N	200N	20N	50N	2,000*	700	2,000	100,000G*	20*
17	82C	500N	10*	20N	200N	20N	50N	1,000*	500	700	70,000*	20*
18	160C	500N	20*	20N	200N	20N	70*	500	100	5,000*	5,000	1
19	173C	500N	10L*	20N	200N	20N	50N	200	100	1,000	50,000*	1N
20	416C	500N	200*	20N	200N	20N	50N	100	200	500	5,000	2
21	425C	500N	50*	20N	200N	20N	50N	500	200	700	100,000*	30*
22	427C	500N	20*	20N	200N	20N	50N	500	200	500	100,000G*	20*
23	429C	500N	20*	20N	200N	20N	50N	300	100	700	100,000G*	15*
24	431C	500N	20*	20N	200N	20N	50N	150	70	500N	100,000G*	15*
25	446C	500N	10L*	20N	200N	20N	50N	150	50	5,000*	100,000G*	1L
26	451C	500N	10L*	20N	200N	20N	50N	150	100	500	100,000G*	7*
27	467C	500N	20*	20N	200N	20N	50N	1.000*	500	500	70,000*	50*
28	472C	500N	30*	20N	200N	20N	50N	300	100	2,000	15,000*	1N
29	475C	500N	10L*	20N	200N	20N	50N	500	200	1,000	30,000*	1L
30	502C	500N	10L*	20N	200N	20N	50N	50	50	2,000	100	1N
31	542C	500N	10L*	20N	200N	20N	50N	150	150	1,500	700	1L
32	562C	500N	10L*	20N	200N	20N	50N	200	150	500L	100,000G*	10*
33	563C	500N	20*	20N	200N	20N	50N	300	200	500N	100,000G*	10*
34	579C	500N	10L*	20N	200N	20N	50N	50	50	700	1,000	1N
35	580C	500N	10L*	20N	200N	20N	50N	30	20	500L	700	1N
36	668C	500N	10L*	20N	200N	20N	50N	150	50	1.000	500	1N
37	204C	500N	10N	20*	200N	20N	50N	300	100	500	30,000*	1N
38	219C	500N	10N	20L*	200N	20N	50N	700*	150	500L	1,500	1N
39	223C	500N	10N	20*	200N	20N	50N	1,000*	100	500L	20,000*	1N
40	224C	500N	10N	20*	200N	20N	50N	100	100	500L	1,000	1N
41	296C	500N	10N	30*	200N	20N	50N	200	500	700	20,000*	1L
42	351C	500N	10N	20*	200N	20N	50N	300	1,000	1,000	30,000*	1N
43	352C	500N	10N	50*	200N	20N	50N	100	200	5,000	70,000*	1N
44	353C	500N	10N	70*	200N	20N	50N	300	1,500*	5,000*	50,000*	1N
45	354C	500N	10N	100*	200N	20N	50N	200	2,000*	5,000*	5,000	1N
46	355C	500N	10N	50*	200N	20N	50N	200	700	5,000	20,000*	1N
47	362C	500N	10N	50*	200N	20N	50N	20	500	1,000	100,000G*	1N
48	370C	500N	10N	100*	200N	20N	50N	300	500	1,000	20,000*	1L
49	377C	500N	10N	20L*	200N	20N	50N	200	50	500N	30,000*	1N
50	393C	500N	10N	20L*	200N	20N	50N	1,500*	300	1,000	15,000*	1L
51	395C	500N	10N	20L*	200N	20N	50N	100	1,000	500N	70,000*	1N
52	397C	500N	10N	50*	200N	20N	50N	200	700	500N	2,000	1N
53	398C	500N	10N	30*	200N	20N	50N	150	500	1,000	1,500	1N
54	399C	500N	10N	50*	200N	20N	50N	150	150	500	10,000*	1
55	400C	500N	10N	30*	200N	20N	50N	150	150	500L	1,000	1N
56	404C	500N	10N	50*	200N	20N	50N	100	200	1,000	5,000	1N
57	405C	500N	10N	50*	200N	20N	50N	500	3,000*	10,000*	100,000*	2
58	406C	500N	10N	20L*	200N	20N	50N	100	200	2,000	1,000	1N
59	409C	500N	10N	20L*	200N	20N	50N	200	200	500L	100,000*	1
60	410C	500N	10N	20L*	200N	20N	100*	2,000*	300	10,000G*	70,000*	5*
61	413C	500N	10N	20*	200N	20N	50N	200	300	10,000*	50,000*	1N
62	417C	500N	10N	20*	200N	20N	50N	500	500	5,000*	70,000*	15*
63	435C	500N	10N	20*	200N	20N	50N	300	700	500N	20,000*	1N
64	454C	500N	10N	100*	200N	20N	50N	200	700	500	1,000	70*
65	455C	500N	10N	100*	200N	20N	50N	100	50	500	70,000*	1N
66	456C	500N	10N	30*	200N	20N	50N	150	100	500N	1,000	1N
67	461C	500N	10N	20L*	200N	20N	50N	150	5,000*	500	70,000*	1N
68	592C	500N	10N	20*	200N	20N	50N	10	20L	500L	100	1N
69	680C	500N	10N	20*	200N	20N	50N	50	30	700	5,000	1N
70	345C	500N	10N	20N	2,000*	20N	50N	1,000*	3,000*	500L	100,000*	1L
71	346C	500N	10N	20N	7,000*	20N	50N	1,500*	2,000*	10,000G*	100,000*	1N
72	148C	500N	10N	20N	200N	20L*	50N	3,000*	10,000*	10,000*	5,000	5*
73	313C	500N	10N	20N	200N	20*	50N	200	70	1,000	500	1N
74	340C	500N	10N	20N	200N	20*	50N	1,500*	700	3,000*	30,000*	30*
75	394C	500N	10N	20N	200N	20L*	50N	300	20,000G*	7,000*	100,000G*	30*
76	424C	500N	10N	20N	200N	30*	50N	50	150	1,500	5,000	5*
77	452C	500N	10N	20N	200N	200*	50N	200	5,000*	5,000*	20,000*	100*
78	153C	500N	10N	20N	200N	20N	100*	200	2,000*	10,000G*	20,000*	2
79	365C	500N	10N	20N	200N	20N	50*	500	5,000*	10,000*	100,000G*	2
80	415C	500N	10N	20N	200N	20N	200*	1,500*	2,000*	10,000G*	30,000*	2
81	458C	500N	10N	20N	200N	20N	50*	150	700	10,000G*	50,000*	15*
82	460C	500N	10N	20N	200N	20N	50*	70	50	10,000G*	70,000*	1N
83	557C	500N	10N	20N	200N	20N	200*	20	20	500	200	1N
84	568C	300N	10N	20N	200N	20N	100*	150	1,500*	10,000*	3,000	1N
85	588C	500N	10N	20N	200N	20N	200*	10L	150	3,000*	700	1N
86	652C	500N	10N	20N	200N	20N	500G*	50	20	10,000G*	50	1N

Table 4.--*Comparison of the total number of anomalous barium values to the total number of anomalous copper, lead, zinc, and silver values within the same sample population of heavy-mineral concentration from stream-sediment samples and minus 80 mesh stream-sediment fraction, Philip Smith Mountains quadrangle, Alaska*

[Range of values reported in parts per million. Total number of samples: 737 heavy-mineral concentrates and 759 stream sediments. L, detected but below value shown; G, greater than value shown]

	Element	No. anomalous samples	Range of anomalous values Upper	Lower	No. anomalous samples associated with anomalous barium
Nonmagnetic heavy-mineral concentrate samples from stream sediments					
Emission spectrography	Ba	269	100,000G	7,000	269
	Cu	85	10,000	700	58
	Pb	66	20,000G	1,500	55
	Zn	87	10,000G	3,000	65
	Ag	46	100	3	39
-80 mesh stream-sediment samples					
Emission spectrography	Ba	79	3,000	1,000	79
	Cu	26	500	100	9
	Pb	68	500	70	14
	Zn	49	2,000	500	20
	Ag	31	30	0.5L	15
Atomic absorption	Zn	86	2,000	160	30

This map is one of a series all bearing the number MF-879. Background information relating to this map is published as U.S. Geological Survey Circular 759, available free from U.S. Geological Survey, Reston, Va. 22092.

GEOCHEMICAL MAPS SHOWING THE DISTRIBUTION AND ABUNDANCE OF ANTIMONY, ARSENIC, BISMUTH, CADMIUM, MOLYBDENUM, AND TIN IN THE PHILIP SMITH MOUNTAINS QUADRANGLE, ALASKA

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