

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS

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October 1976

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Alaska Open-File Report 101
GENERAL GEOLOGY AND GEOCHEMISTRY OF
HEALY D-5 AND D-6 QUADRANGLES, ALASKA
By W.G. Gilbert and T.K. Bundtzen

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During the summer of 1976 the Alaska Division of Geological and Geophysical Surveys continued its geologic investigations in the central Alaska Range. This report briefly summarizes the bedrock geology of the Healy D-6 quadrangle (pl. 1) and results of nine elemental analyses from 200 stream-sediment and bedrock geochemical samples collected in the Healy D-5 and D-6 quadrangles (pl. 2, tables 1 and 2).

Gold, silver, copper, lead, zinc, molybdenum, and antimony values were determined by Henry Potworowski of the DGGG Mineral Analysis and Research Laboratory using atomic absorption spectrophotometry. Uranium and thorium values were determined by Potworowski using fluorometric and spectrophotometric methods, respectively. Anomalous values of copper, lead, zinc, and thorium were calculated with the method described by Lepeltier (1969). Anomalous values of gold, silver, molybdenum, and uranium were obtained by inspection. The geology of the Healy D-5 quadrangle is summarized by Wahrhaftig (1970), and a geologic report on the geology of the Healy D-6 quadrangle is being prepared by W.G. Gilbert, T.K. Bundtzen, and R.D. Reger.

REFERENCES CITED

- Lepeltier, Claude, 1969, A simplified treatment of geochemical data by graphical representation: *Econ. Geol.*, v. 68, p. 538-550.
Wahrhaftig, Clyde, 1970, Geologic map of the Healy D-5 quadrangle, Alaska: U.S. Geol. Survey Geol. Quad. Map GQ-807.

Table 1. Stream-sediment sample analyses (-80 mesh fraction) in ppm.

Map No.	Au	Ag	Cu	Pb	Zn	Mo	Sb	U	Th
1	0.00	0.1	38	13	88	1	0	2.2	4.2
2	0.00	0.0	30	13	80	0	0	2.2	9.8
3	0.00	0.0	25	13	60	1	0	2.3	7.8
4	0.20	0.2	64	20	100	0	0	2.2	8.5
5	0.00	0.3	54	17	120	1	0	7.1	6.0
6	0.00	0.0	34	27	95	1	0	2.0	13.0
7	0.00	0.0	56	60	142	4	0	1.9	10.5
8	0.00	0.0	144	26	420	4	0	2.9	8.0
9	0.00	0.0	68	16	146	2	0	2.3	7.0
10	0.00	0.0	64	20	120	4	0	2.7	6.0
11	0.00	1.2	22	16	140	4	0	2.5	8.5
12	0.00	0.0	68	20	120	2	0	2.4	7.3
13	0.00	0.0	40	24	88	0	0	2.2	8.3
14	0.04	0.0	90	17	100	2	0	1.7	5.0
15	0.00	0.0	74	40	180	4	0	3.0	11.5
16	0.00	0.0	48	32	148	4	0	2.8	2.8
17	0.00	0.0	36	14	80	2	0	0.9	16.0
18	0.00	0.0	26	10	80	2	0	1.1	9.8
19	0.05	0.0	15	9	65	0	0	1.3	10.5
21	0.00	0.0	30	11	110	1	0	1.3	8.3
22	0.00	0.0	35	19	180	1	0	1.7	9.0
23	0.00	0.0	40	44	240	4	0	1.2	15.5
24	0.00	0.0	40	56	220	0	0	0.9	17.8
25	0.00	0.0	38	76	210	2	0	1.7	15.3
26	0.00	0.0	44	20	340	0	0	1.9	11.8
27	0.00	0.0	36	28	500	2	0	1.5	12.0
28	0.00	0.0	24	14	60	0	0	1.1	10.0
29	0.00	0.0	16	13	70	1	0	1.1	8.50
30	0.00	0.0	17	9	61	0	0	0.9	8.3
31	0.00	0.0	30	12	80	6	0	0.8	7.5
32	0.00	0.0	17	9	56	1	0	1.4	17.5
34	0.00	0.0	16	24	100	2	0	1.9	10.3
35	0.10	0.0	32	18	190	2	0	2.0	21.5
36	0.09	0.6	33	20	150	4	0	1.8	14.5
37	0.07	0.1	30	18	190	4	0	2.2	16.3
38	0.00	0.0	24	20	120	2	0	2.5	11.8
40	0.00	0.0	38	28	140	0	0	1.5	6.7
41	0.00	0.0	30	24	140	2	0	1.5	2.6
42	0.03	0.1	26	15	95	2	0	3.9	15.0
45	0.00	0.0	30	24	84	2	0	1.9	12.8
47	0.00	0.0	57	14	65	9	0	2.7	9.0
48	0.00	0.0	64	36	120	4	0	2.4	10.5
49	0.00	0.0	52	22	126	2	0	3.7	6.3
50	0.00	0.0	31	26	95	0	0	2.4	18.0
52	0.01	0.0	41	24	120	1	2	1.7	11.8

Table 1. (Cont.)

Map No.	Au	Ag	Cu	Pb	Zn	Mo	Sb	U	Th
53	0.00	0.0	16	13	75	0	0	0.5	15.0
54	0.00	0.1	32	22	100	0	0	0.6	16.8
55	0.00	0.1	32	24	100	0	40	0.6	20.0
56	0.00	0.1	32	34	140	0	20	0.6	15.8
57	0.00	0.0	36	36	108	0	0	1.6	22.5
58	0.00	0.0	32	36	112	0	4	1.1	20.0
59	0.00	0.0	38	26	98	6	0	1.3	17.5
60	0.00	0.0	48	44	120	0	16	1.0	15.8
61	0.00	0.0	52	24	120	4	0	1.4	18.0
62	0.00	0.0	44	36	120	0	0	1.1	17.5
63	0.00	0.0	36	26	98	0	0	2.1	6.6
64	0.00	0.0	42	36	130	0	0	1.1	5.2
65	0.04	0.0	40	28	108	0	0	1.6	6.0
66	0.00	0.0	34	26	104	0	0	1.8	3.0
67	0.00	0.0	52	48	150	0	0	1.8	5.5
69	0.00	0.2	36	28	150	0	0	1.1	5.3
70	0.00	0.0	30	28	150	0	0	1.7	6.3
71	0.00	0.0	40	26	140	0	0	0.8	7.6
72	0.00	0.0	32	36	170	2	0	1.1	3.7
74	0.00	0.0	40	36	130	0	0	1.1	9.3
77	0.05	0.2	32	40	180	2	0	2.9	17.8
78	0.12	0.0	30	22	130	2	0	2.2	14.5
79	0.00	0.0	56	32	180	0	0	2.0	4.4
80	0.05	0.1	33	23	140	1	0	2.4	15.8
81	0.00	0.0	36	26	140	2	0	1.5	9.3
82	0.00	0.1	32	21	130	2	0	2.3	15.5
83	0.00	0.0	17	13	78	1	0	1.7	14.0
84	0.00	0.0	24	22	120	0	0	1.5	5.2
85	0.00	0.0	26	24	120	0	0	1.7	7.4
86	0.03	0.1	34	19	150	1	0	2.1	19.5
87	0.03	0.1	34	19	150	1	0	2.1	19.5
88	0.04	0.0	32	24	108	0	0	2.2	4.2
89	0.00	0.0	56	20	110	2	0	1.1	14.8
90	0.00	0.0	44	32	128	0	0	1.3	5.1
91	0.00	0.0	46	26	110	0	0	0.9	11.0
92	0.00	0.0	60	36	148	4	0	1.2	14.3
93	0.00	0.24	60	252	140	0	0	0.7	No sample
94	0.00	0.0	76	76	260	4	0	0.9	14.8
95	0.00	0.0	64	56	180	0	0	0.9	15.0
96	0.00	0.0	16	20	90	2	0	1.5	12.0
97	0.00	0.0	16	23	90	1	0	1.2	11.0
98	0.00	0.0	23	20	92	1	0	1.2	11.3
99	0.06	0.0	30	22	110	0	0	1.0	13.8
100	0.00	0.2	32	22	96	4	0	2.2	10.5
101	0.00	0.2	34	28	126	2	0	2.4	15.0

Table 1. (Cont.)

Map No.	Au	Ag	Cu	Pb	Zn	Mo	Sb	U	Th
102	0.00	0.0	38	34	140	0	0	1.7	5.4
103	0.00	0.0	50	66	310	2	0	1.6	5.3
104	0.00	0.0	26	20	96	0	0	1.7	15.3
109	0.00	0.2	62	34	380	4	0	2.6	5.6
110	0.00	0.0	32	24	200	4	0	2.5	6.2
111	0.00	0.0	34	26	260	2	0	1.8	5.9
113	0.00	0.0	38	46	280	2	0	1.7	6.7
114	0.00	0.0	30	42	110	2	0	1.5	5.3
115	0.02	0.2	36	46	180	0	0	1.8	6.4
116	0.00	0.0	30	28	156	0	0	1.2	16.8
117	0.00	0.0	28	26	136	0	0	0.8	17.0
119	0.00	0.0	40	24	120	0	0	1.4	11.3
120	0.00	0.0	20	32	110	2	0	4.9	23.0
121	0.00	0.0	32	22	180	2	0	3.1	19.0
122	0.00	0.0	20	12	60	0	0	1.4	12.5
123	0.00	0.0	34	30	240	2	0	2.4	30.0
125	0.00	0.0	20	90	200	2	0	1.8	24.5
126	0.00	0.0	30	26	160	2	0	2.1	18.3
127	0.00	0.0	28	16	290	0	0	2.4	13.8
128	0.00	0.0	30	32	120	0	0	1.4	22.8
129	0.00	0.0	32	26	112	0	0	1.3	6.2
130	0.00	0.0	30	30	106	2	0	5.0	17.8
131	0.04	0.0	16	30	74	2	0	5.3	17.0
132	0.00	0.0	16	32	48	2	0	2.6	17.5
133	0.00	0.0	18	20	94	2	0	2.4	23.0
134	0.00	0.0	30	66	48	2	22	2.7	22.3
135	0.00	0.0	14	46	18	2	16	1.8	16.3
136	0.00	0.0	14	36	22	0	0	2.7	23.5
137	0.00	0.0	16	26	30	2	0	1.7	17.3
138	0.00	0.0	20	46	36	0	0	5.1	14.8
140	0.00	0.0	30	36	20	2	0	3.9	22.3
141	0.06	0.0	26	76	60	4	0	2.6	19.8
142	0.00	0.0	14	12	68	2	0	1.0	9.3
143	0.00	0.0	14	16	50	2	0	1.7	16.3
144	0.00	0.0	12	22	30	0	0	1.9	14.5
145	0.00	0.2	12	16	56	0	0	1.3	10.3
146	0.00	0.0	14	18	65	1	0	2.7	11.5
148	0.00	0.0	14	44	42	0	0	1.7	7.7
150	0.00	0.0	16	24	200	0	8	1.5	17.5
151	0.00	0.0	14	50	76	0	0	2.5	18.5
152	0.00	0.0	14	18	550	0	0	1.5	9.5
153	0.00	0.0	14	26	34	0	0	1.6	14.5
154	0.00	0.0	18	26	110	2	0	3.2	23.0
155	0.00	0.0	36	18	112	0	6	1.5	12.0
156	0.00	0.2	30	18	114	0	4	1.7	18.8

Table 1. (Cont.)

<u>Map No.</u>	<u>Au</u>	<u>Ag</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Mo</u>	<u>Sb</u>	<u>U</u>	<u>Th</u>
157	0.00	0.0	30	20	130	0	0	1.7	14.5
158	0.00	0.6	24	26	44	16	8	5.1	17.3
159	0.00	0.7	21	21	650	3	4	2.1	16.8
160	0.00	0.0	12	14	50	2	0	1.9	12.0
161	0.00	0.0	20	16	90	0	0	4.4	11.5
162	0.00	0.1	12	18	78	2	0	2.9	15.3
163	0.00	0.0	15	15	90	0	0	1.6	30.5
164	0.16	0.0	42	18	110	0	0	2.3	8.00
165	0.00	0.0	42	12	100	0	0	1.9	7.50
166	0.08	0.0	350	22	200	0	0	2.0	9.00
167	0.00	0.0	60	20	200	4	24	2.3	6.00
168	0.00	0.0	44	20	140	4	0	2.5	16.0
169	0.00	0.0	24	22	100	2	0	2.2	14.8
170	0.00	0.0	26	24	100	0	0	1.9	11.8
171	0.00	0.0	48	16	120	4	0	2.5	7.50
172	0.00	0.0	20	6	66	2	0	2.3	6.50
173	0.00	0.0	13	9	55	0	0	2.1	9.25
174	0.00	0.0	30	10	100	0	0	2.2	7.50
175	0.00	0.0	42	10	122	0	0	2.8	6.75
176	0.00	0.0	15	8	52	1	0	2.3	8.00
177	0.00	0.0	20	8	56	0	0	3.0	11.8
178	0.00	0.0	20	10	56	0	0	3.0	15.3
179	0.00	0.0	22	20	38	2	0	1.9	12.8
180	0.00	0.0	26	20	90	8	30	2.0	10.8
181	0.00	0.0	28	28	80	0	32	2.3	19.0
182	0.00	0.0	30	18	100	0	17	2.3	14.0
183	0.00	0.0	13	12	34	0	13	2.9	13.5
184	0.00	0.0	18	15	60	0	0	2.4	11.5
185	0.00	0.0	28	16	70	2	54	3.5	13.0
186	0.00	0.0	20	18	30	0	18	1.8	10.5
187	0.00	0.0	28	22	30	0	0	1.0	12.0
188	0.00	0.0	13	11	35	1	9	0.5	8.25
189	0.00	0.0	22	11	68	0	0	0.8	10.8
190	0.00	0.0	25	18	70	0	5	1.2	17.0
191	0.02	0.0	20	13	55	0	0	1.2	10.8
192	0.00	0.0	8	5	20	0	0	1.7	10.3
193	0.00	0.0	36	16	70	0	0	1.8	18.3
194	0.00	0.0	17	13	54	1	0	1.6	9.3
195	0.00	0.0	25	11	78	1	0	1.3	9.0

Table 2. Rock sample analyses in ppm.

<u>Map No.</u>	<u>Au</u>	<u>Ag</u>	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Mo</u>	<u>Sb</u>	<u>U</u>	<u>Th</u>
20	0.00	0.0	20	6	6	68	0	5.6	<0.5
33	0.00	0.0	22	22	170	42	0	0.6	0.0
39	0.00	0.0	15	1	3	64	0	0.3	1.3
43	0.00	0.0	16	212	6	62	0	3.8	6.5
44	0.00	0.0	16	48	6	56	0		8.5
46	0.00	0.0	36	8	22	96	0	0.4	0.0
51	0.00	0.0	111	8	65	0	0	0.5	4.0
68	0.00	0.0	66	10	110	56	0	1.4	4.2
73	0.00	0.10	112	68	40	2	0	1.2	1.3
75	0.00	0.0	16	24	20	38	0	1.9	7.3
76	0.00	0.0	17	5	5	78	0	0.5	< 0.5
105	0.00	0.0	14	58	6	38	0	0.8	3.5
106	0.00	0.0	60	10	52	56	0	0.5	0.3
107	0.00	0.0	12	30	10	28	0	0.7	4.0
108	0.00	0.0	118	6	130	54	0	2.2	0.8
112	0.00	0.0	40	46	134	24	0	1.7	7.0
118	0.00	0.0	12	2	20	32	0	1.2	16.0
124a	0.00	0.0	24	0	14	28	0	1.2	0.0
124b	0.00	0.0	58	3	36	66	0	3.9	0.0
124c	0.00	0.0	55	2	65	56	0	1.2	0.0
124d	0.00	0.0	31	2	15	27	0	1.0	0.0
124e	0.00	0.0	16	1	5	71	0	0.6	0.0
139	0.00	0.0	20	20	20	36	0	1.8	4.4
147a	0.00	0.0	14	8	16	36	0	1.8	5.2
147b	0.00	0.0	20	12	330	36	0	1.6	2.6
149	0.00	0.0	20	20	6	60	0	4.0	3.8