DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1639
PAMPHLET

GEOLOGY AND MINERAL RESOURCE POTENTIAL OF THE SERVICE CREEK ROADLESS AREA, ROUTT COUNTY, COLORADO

By

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STUDIES RELATED TO WILDERNESS

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and related acts, the U.S. Geological Survey and the U.S. Bureau of Mines have been conducting mineral surveys of wilderness and primitive areas. Areas officially designated as "wilderness," "wild," or "canoe" when the act was passed were incorporated into the National Wilderness Preservation System, and some of them are presently being studied. The act provided that areas under consideration for wilderness designation should be studied for suitability for incorporation into the Wilderness System. The mineral surveys constitute one aspect of the suitability studies. The act directs that the results of such surveys are to be made available to the public and be submitted to the President and the Congress. This report discusses the results of a mineral survey of the Service Creek Roadless Area (A2104), Routt National Forest, Routt County, Colo. The Service Creek Roadless Area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

MINERAL RESOURCE POTENTIAL SUMMARY STATEMENT

The Service Creek Roadless Area, near Steamboat Springs, Colo., was studied by the U.S. Bureau of Mines in 1980 and by the U.S. Geological Survey in 1975-76 and 1982. Geologic mapping and geochemical sampling during this study show no evidence of a potential for the occurrence of any major mineral deposit near the ground surface within the roadless area. A search of courthouse records has shown that no mining activity has been recorded for the area. There are, however, single and multielement geochemical anomalies of certain rare-earth and metallic minerals, randomly scattered throughout the roadless area. These anomalies, although locally clustered in some areas, especially along and south of a linear feature just south of Silver Creek, are not indicative of the presence of a resource. Therefore, the potential of the roadless area for the occurrence of metallic mineral resources is low.

The area is underlain by an essentially homogeneous plutonic intrusive; therefore, the nature of the geologic terrain precludes the occurrence of oil and gas resources.

INTRODUCTION

Location and setting

The Service Creek Roadless Area encompasses about 62 sq mi of the Routt National Forest in the scenic mountainous region of the Gore Range in northern Colorado. The area lies just south-southwest of Rabbit Ears Pass, about 12 mi southeast of Steamboat Springs, and about 17 mi northwest of Kremmling (fig. 1). Maximum relief of the roadless area is about 4,000 ft. The crest of Gore Mountain, one of the highest features in the area, has an altitude of 10,687 ft. The mountainous terrain along the western border of the roadless area, typically grades abruptly into lower farm and ranch lands; whereas, to the east, mountainous terrain prevails. The Gore Range continues north and south of the roadless area. Secondary roads, mainly U.S. Forest Service roads, give access to the east and west sides of the roadless area; U.S. Highway 40 passes near the northwestern part of the area. Two trails lead into and through the roadless area—one along Service Creek, the other along Silver Creek.

Along the major drainages of Harrison, Service, and Silver Creeks, as well as some secondary tributaries, erosion and downcutting during uplift has locally resulted in steep, rock-walled, and narrow canyons. However, for the most part, the roadless area consists of rounded ridges and gentle to moderately sloping noses. Most of the bedrock exposed in the gentler terrain is subdued and consists primarily of rounded outcrops protruding through a thin mantle of soil. On steeper slopes, rounded cobble-boulder deposits are common and often obscure the underlying bedrock. Most of the terrain is covered by moderate to dense coniferous forest. Downed timber, especially within drainage basins, locally makes off-trail travel difficult. Only stretches along major drainages and a few scattered grassy upland parks and meadow areas are free of trees.

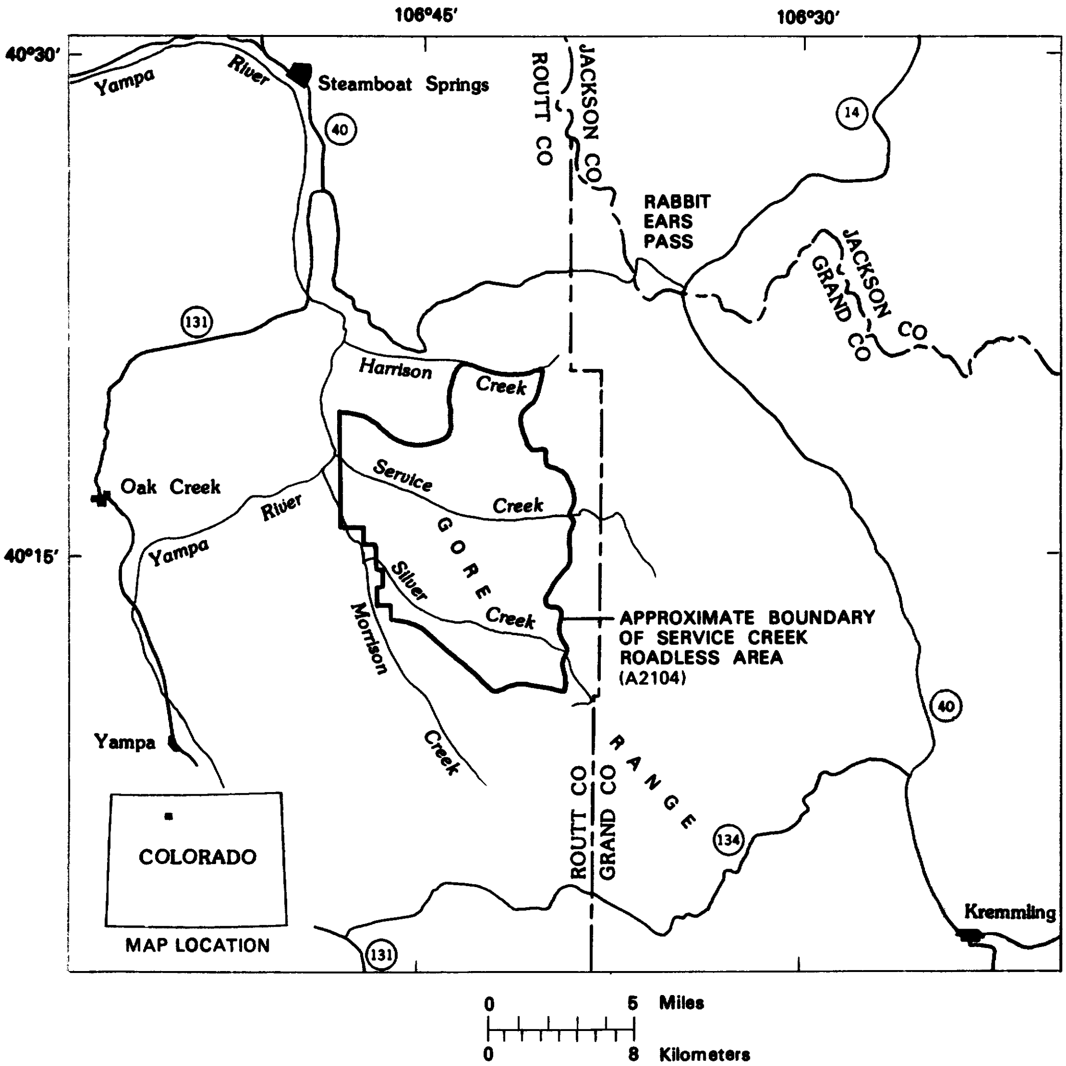

Figure 1.--Index map showing location of the Service Creek Roadless Area (A2104), Routt County, Colo.

Previous and present investigations

Geologic mapping that included the Service Creek Roadless Area was published at a scale of 1:250,000 (Tweto, 1975). Geologic mapping and geochemical sampling of the northern part of the roadless area, north of lat 40°15', was done in detail by George Snyder in 1975-76 (Snyder, 1980). Much of the detailed geologic description and interpretations, as well as the geology north of lat 40°15', were simplified for this report. In 1980, the U.S. Bureau of Mines carried out both field investigations and a search of courthouse records to evaluate the mineral resources of the roadless area (Kluender, 1982).

South of lat 40°15', reconnaissance geologic mapping and geochemical sampling (with limited additional sampling done to the north) were carried out by the U.S. Geological Survey from mid-August till early September in 1982.

Acknowledgments

We wish to thank David Allerton, Greg Cavallo, Allen Kleiman, and Leslie Sparrow (all with USGS), who assisted in the field during the geologic mapping and geochemical sampling of the roadless area, and whose continuing contributions in the office have made this report possible. We are also indebted to Evergreen Helicopters who adjusted their schedule to accommodate the field mapping program and to Frank Miles who provided access through his property to the roadless area and made an onsite heliport available to us.

GEOLOGY

The Service Creek Roadless Area is dominated by a 1.7-b.y.-old batholith of quartz monzonite (fig. 2). Throughout this unit are randomly scattered small and local intrusions of younger Precambrian dikes and inclusions of older Precambrian rocks. The quartz monzonite continues to the northwest, east, and south of the roadless area; however, to the northeast and west, it is either discontinuous or overlain by younger rocks. To the north-northeast, the quartz monzonite is intruded and overlain by Tertiary volcanic rocks; and along the western boundary of the roadless area, sedimentary rocks of the Tertiary Browns Park Formation overlie the quartz monzonite.

Much of the descriptive text and pertinent data about the geology of units outside and north of the roadless area is taken from Snyder (1980).

The quartz monzonite within the roadless area is variable in color, composition, texture, and weathering characteristics. The pink to gray to light-gray rock ranges from massive to gneissic biotite granite, quartz monzonite, and granodiorite. Along the western boundary of the roadless area, especially north-northeast from the mouth of Silver Creek, the unit becomes migmatitic. Texture of the quartz monzonite is variable and ranges from fine-grained (almost aphanitic) rock, to medium-grained equigranular rock, to coarse-grained rock. The coarse-grained rock can be either equigranular, or more commonly porphyritic, containing from 5 to 30 percent large phenocrysts of potassium-feldspar crystals. Although the texture of the unit appears gradational, many exposures show the coarse-grained rock in sharp contact with the fine-grained gneissic rock.

North of Silver Creek, especially at the canyon mouth and in the eastern part of the roadless area the fine-grained quartz monzonite is interlayered or banded with the coarse-grained porphytic quartz monzonite. Here, there is evidence that the fine-grained rock intruded the coarse-grained rock in sill-like fashion, with the fine-grained rock pinching in and out, reaching a thickness of 3-5 ft in a near-horizontal plane.

The weathering characteristics and soil development of the quartz monzonite are directly related to the grain size. The coarse-grained rock commonly weathers to large round boulders or gruss and produces a coarse sand. Where porphyritic, the rock weathers to a soil that is littered with weathered-out feldspar phenocrysts in a matrix of coarse sand. The medium-grained rock commonly weathers from cobbles to cobble boulders, and the soil, although similar to the coarse-grained rock, consists mostly of fine-grained sand. The fine-grained rock commonly weathers into blocks. Soils produced in this environment are better developed and contain angular fragments in a matrix of fine sand, silt, and silty clay.

Intrusions of younger Precambrian amphibolitic and pegmatitic rocks and inclusions of older Precambrian metavolcanic, metasedimentary, and igneous rocks are randomly scattered and randomly oriented throughout the quartz monzonite in the roadless area. Both the intrusions and inclusions are small irregularly shaped bodies that reflect no regional pattern. Most outcrop areas are subdued, and many were recognized by float only.

The amphibolitic intrusions are gabbro and diorite rock that are variable in composition, generally fine grained, and are probably contemporaneous with the intrusion of the quartz monzonite. Most pegmatites range in texture from fine- to coarse-grained rock of granitic composition and were emplaced over a long time span. Inclusions in the quartz monzonite consist of gabbro, diorite, peridotite, felsic gneiss, amphibolite metavolcanics, and calc-silicate rock. Texture of the inclusions is quite variable and ranges from fine-grained through coarse-grained rock.

Two rock units mantle the quartz monzonite in parts of the roadless area. To the north, especially at the headwaters of Harrison Creek, a volcanic flow of Tertiary (Miocene) age locally enters the roadless area. This dark-olive trachybasaltic flow, lava dated between 17 and 20 m.y. old (Snyder, 1980), includes a small welded pumice deposit. Although other intrusive rocks are mapped by Snyder north of the roadless area, it is believed that they have no significance in the assessment of resource potential for the roadless area. Along the western boundary of the roadless area, sedimentary rocks of the Tertiary Browns Park Formation locally overlap the Precambrian quartz monzonite in the roadless area. This unit, dated at 20.2±1.9 m.y., consists of calcareous to noncalcareous siltstone, sandstone, and conglomerate. The Browns Park Formation is exposed along the western front of the Gore Range both north and south of the roadless area.

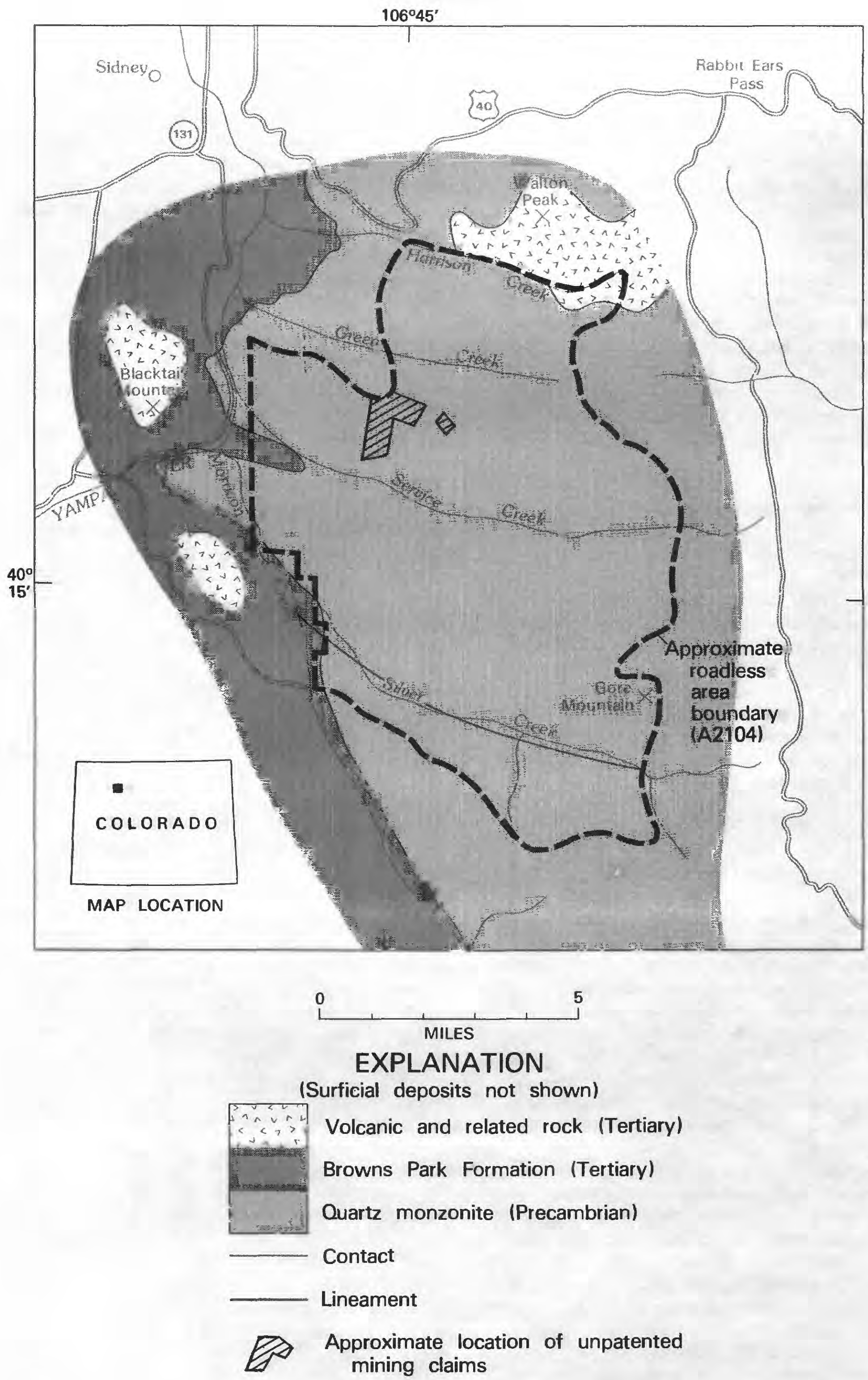

Figure 2.--Map of the Service Creek Roadless Area showing simplified geology and areas of unpatented mining claims.

No major tectonic events were observed in the roadless area, and no faults or folds were mapped. There are linear features seen on aerial photographs reflected by topographic and drainage features, however, no ground observations support any occurrence of tectonic events.

GEOCHEMISTRY

Geochemical sampling of the Service Creek Roadless Area north of lat 40°15' was done by George Snyder (USGS) in 1975-76, and mainly south of lat 40°15' by Paul Schmidt in 1982. A total of 440 samples was taken for geochemical analysis, of which 380 were stream-sediment samples sized to a minus-80 mesh, 40 were panned heavy-mineral concentrates from bulk stream-sediment samples, and 20 were rock samples from outcrops. All samples were analyzed for 31 elements by semiquantitative emission spectrographic methods (Grimes and Marranzino, 1968). In addition, selected stream-sediment samples were quantitatively analyzed for uranium by a fluorimetric method (Smith and Lynch, 1969) and for mercury by flameless atomic absorption technique (McNerney and others, 1972). No anomalous concentrations of mercury were detected in any of the samples.

Analytical results for selected elements are given in tables 1-3. Only those elements are listed that are present in anomalous concentrations in some of the samples. Anomaly thresholds for the various elements in each sample medium were established subjectively by a method based partly on the total frequency distribution for each element, and partly on anomaly thresholds previously established in other study areas containing similar rocks. All anomaly thresholds fall within the upper 10 percent of reported element concentrations for stream-sediment samples.

Of the samples collected in the roadless area and analyzed for selected elements, some stream-sediment samples (table 1) contained anomalous concentrations of silver, barium, cobalt, chromium, lanthanum, manganese, nickel, lead, tin, thorium, uranium, and yttrium; some stream panned-concentrate samples (table 2) contained anomalous concentrations of barium, lanthanum, molybdenum, niobium, lead, tin, thorium, vanadium, tungsten, and yttrium; and some rock samples (table 3) contained anomalous concentrations of boron, barium, chromium, copper, nickel, scandium, tin, and zinc. Of these anomalous concentrations, only cobalt, chromium, lanthanum, lead, nickel, thorium, uranium, and yttrium were reported in any appreciable number of samples.

MINING DISTRICTS AND MINERALIZED AREAS

A field investigation to assess the mineral resource potential of the Service Creek Roadless Area and a search of courthouse records to obtain claim locations within or adjacent to the area were conducted during 1980 by the U.S. Bureau of Mines (Kluender, 1982).

Field studies included a reconnaissance of known prospects and mineralized areas. Grab samples were taken at the workings examined, and panned-concentrate samples were taken from stream gravels of major drainages of the area. During field reconnaissance, 21 samples were taken: complete analytical results are available, upon request from the U.S. Bureau of Mines, Intermountain Field Operations Center, Denver, Colo.

Service Creek Roadless Area has very little history of mining activity, and no mineral production has been recorded. Except for a group of 18 claims located on Service Peak (T. 4 N., R. 84 W.) in the Service Creek drainage (fig. 2), the search of county mining records disclosed no other claims lying within or adjacent to the area.

No mines were present within or adjacent to the roadless area at the time of the field investigation. Examination of three prospect pits north of Service Creek disclosed no apparent mineralized areas. Assay results of three samples taken from the pit walls (table 4) showed minor amounts of several elements, but these do not indicate the presence of a resource.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Geologic mapping and geochemical sampling of the Service Creek Roadless Area failed to identify any favorable geologic or geochemical environment for the occurrence of metallic-mineral deposits near the ground surface. The roadless area lies north of the Colorado mineral belt (Tweto and Sims, 1963), and although former mining activity is recorded both north and south of the roadless area, it occurred outside the roadless area and in a different geologic environment. Moreover, the roadless area is dominated by an essentially homogeneous batholith that lacks any major tectonic structures, such as large-scale faults and any dominant veins or zones of alteration that would be conducive to or suggestive of mineralization.

Geochemical sampling identified scattered single and multielement anomalies throughout the roadless area. Metallic elements such as cobalt, chromium, lanthanum, lead, nickel, thorium, and yttrium occurred in anomalous amounts in an appreciable number of geochemical samples. The anomalous concentrations of thorium and the rare-earth elements lanthanum and yttrium are probably attributable to thorite and complex rare-earth-bearing minerals such as bastnasite, cyrtolite, monazite, and xenotime contained in small veins and dikes cutting the granitic basement complex. The anomalous uranium concentrations, though considerably greater than the regional background, are not sufficiently high to indicate a potential for uranium resources, and probably represent uranium as a minor constituent in one of the thorium or rare-earth-bearing minerals. Cobalt, chromium, and nickel appear to have been derived from small ultramafic bodies of metaigneous rocks that form inclusions in the granitic basement complex. Most of the anomalous lead values are barely greater than the anomaly threshold, and many of them probably represent lead derived from the decay of radioactive minerals contained in small dikes and veins. Although anomalies for copper, silver, tin, and tungsten are present in a few widely scattered samples, the concentrations are low and are not indicative of a potential for presence of a resource.

Geochemically analyzed rock samples that were taken from small intrusive bodies or inclusions in the quartz monzonite show anomalous values. The small inclusions and intrusions of rock within the quartz monzonite are randomly spaced and widely scattered throughout the roadless area and show neither pattern nor areal distribution that would suggest the presence of substantially mineralized areas.

Although many samples indicate anomalous metallic values in the area, these anomalies merely reflect the presence of small, widely scattered inclusions and veins or dikes in the quartz monzonite country rock. The mineral occurrences in these inclusions and veins are individually not large enough to be more than mineralogical curiosities, and taken together they are much too widely dispersed to constitute a resource. Moreover, nothing about the pattern or distribution of these occurrences, combined with the geologic setting, is suggestive of any known examples of substantially mineralized areas. We therefore believe that the roadless area has a low potential for the occurrence of metallic mineral resources, based on the results of this study.

Because the area is underlain by an essentially homogeneous crystalline rock, the nature of the geological terrain precludes the occurrence of oil and gas resources.

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Table 1.--Stream-sediment samples (minus-80 mesh) from Service Creek Roadless Area that contain anomalous concentrations of selected elements

[Semiquantitative spectrographic analysis by D. F. Siems, B. Bailey, Betty Adrian, Ann Campbell and Randy Baker (USGS); fluorimetric analysis for uranium (U) by J. Sharkey (USGS). All data in ppm (parts per million). Leaders (----) indicate not detected or considered anomalous]

Element------------	Ag	Ba	Co	Cr	Cu	La	Mn	Ni	Pb	Sn	Th	U	Y
Detection limit-----	0.5	20	5	10	5	20	10	5	10	10	100	1	10
Anomaly threshold---	.5	1,000	50	700	70	1,000	2,000	100	100	10	100	20	300
Sample No.													
2	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
3	---	-----	--	-----	---	------	-----	---	---	--	100	--	-----
6	---	-----	--	-----	---	------	-----	---	---	--	---	26	-----
10	---	-----	--	-----	---	------	-----	150	---	--	---	--	-----
20	---	3,000	--	-----	---	------	-----	---	---	--	---	--	-----
33	---	-----	--	700	100	------	-----	150	---	--	---	--	-----
35	---	-----	--	-----	---	>1,000	-----	---	---	--	200	--	-----
37	---	-----	50	-----	---	------	-----	150	---	--	---	--	-----
38	---	-----	50	-----	---	------	-----	150	---	--	---	--	-----
40	---	-----	50	-----	---	------	-----	150	---	--	---	--	300
49	---	-----	--	-----	---	------	5,000	---	---	--	---	--	-----
63	---	-----	--	-----	---	------	-----	---	---	--	---	34	-----
64	---	-----	--	-----	---	------	3,000	---	---	--	---	--	-----
65	---	-----	--	-----	---	1,000	-----	---	---	--	---	33	300
67	---	-----	--	-----	---	1,000	-----	---	---	--	---	--	-----
72	---	-----	--	-----	---	------	3,000	---	---	--	---	43	-----
81	---	-----	--	-----	---	------	3,000	---	---	--	---	--	-----
83	---	-----	--	-----	---	------	-----	---	---	--	---	21	-----
84	---	-----	--	-----	---	------	-----	---	---	--	---	69	-----
85	---	-----	--	-----	---	>1,000	-----	---	---	--	150	--	300
112	---	-----	--	-----	---	------	-----	---	---	--	---	43	-----
129	---	-----	--	700	---	------	3,000	---	---	50	---	--	1,000
131	---	-----	--	-----	---	------	-----	150	---	--	---	--	-----
144	---	-----	--	-----	---	------	-----	---	---	--	150	--	-----
168	---	-----	--	-----	100	------	-----	---	---	--	---	--	-----
174	0.5	-----	--	-----	70	------	-----	---	---	--	---	--	-----
175	---	-----	--	-----	---	------	-----	---	---	--	---	23	-----
189	---	-----	--	-----	---	------	-----	150	---	--	---	--	300
200	---	-----	--	-----	---	------	-----	---	---	--	---	--	500
242	---	-----	50	1,000	---	------	-----	---	---	--	---	--	-----
252	---	-----	--	-----	---	------	-----	---	---	--	150	--	-----
255	---	-----	50	1,000	---	------	-----	100	---	--	---	--	-----
258	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
260	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
264	---	-----	--	700	---	------	-----	---	---	--	---	--	-----
266	0.5	-----	--	-----	---	------	-----	---	---	--	---	--	-----

Table 1.--Continued

Element-------------	Ag	Ba	Co	Cr	Cu	La	Mn	Ni	Pb	Sn	Th	U	Y
Detection limit-----	0.5	20	5	10	5	20	10	5	10	10	100	1	10
Anomaly threshold---	.5	1,000	50	700	70	1,000	2,000	100	100	10	100	20	300
Sample No.													
267	---	-----	--	-----	---	------	-----	---	100	--	100	--	-----
269	---	-----	--	-----	---	>1,000	-----	---	150	--	500	--	500
275	---	-----	50	-----	---	------	-----	---	---	--	---	--	-----
276	---	-----	50	-----	---	------	-----	150	---	--	---	--	-----
279	---	-----	50	-----	---	------	-----	---	---	--	---	--	-----
287	---	-----	--	700	---	------	-----	---	---	--	---	--	-----
291	---	-----	--	-----	---	>1,000	-----	---	150	--	300	--	-----
296	---	-----	--	-----	---	>1,000	-----	---	150	--	300	--	-----
297	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
307	---	-----	--	-----	---	------	-----	---	---	--	200	--	-----
309	---	-----	50	-----	---	------	-----	---	---	--	---	--	-----
310	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
313	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
317	---	-----	70	-----	---	------	-----	---	---	--	150	--	-----
319	---	-----	50	-----	---	------	-----	---	---	--	---	--	-----
321	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
322	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
324	---	-----	--	-----	---	------	-----	---	---	--	100	--	-----
330	---	-----	--	-----	---	1,000	-----	---	150	--	500	--	300
333	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
336	---	-----	--	-----	---	1,000	-----	---	100	--	---	--	-----
346	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
378	---	-----	--	-----	---	>1,000	-----	---	---	--	---	--	-----
382	---	-----	--	-----	---	------	-----	---	100	--	200	--	-----
397	0.7	-----	--	-----	---	------	-----	---	---	--	---	--	-----
403	---	-----	--	-----	---	------	-----	---	100	--	---	--	-----
407	---	1,500	--	-----	---	------	-----	150	---	--	---	--	-----
410	---	1,000	--	700	---	------	-----	100	---	--	---	--	-----
411	---	-----	50	-----	---	------	-----	---	---	--	---	--	-----
413	---	-----	--	-----	---	1,000	-----	---	---	--	---	--	-----
419	---	1,500	50	700	---	------	-----	300	---	--	---	--	-----
421	0.7	-----	--	-----	---	------	-----	---	---	--	---	--	-----
434	---	-----	--	-----	---	------	2,000	---	---	--	---	--	-----
436	---	1,500	--	-----	---	------	-----	---	---	--	---	--	-----
437	---	1,500	--	-----	---	------	-----	---	---	--	---	--	-----
462	---	-----	--	-----	---	------	2,000	---	150	--	100	--	-----
463	---	-----	--	-----	---	------	2,000	---	---	--	---	--	-----
466	---	-----	--	-----	---	>1,000	-----	---	150	--	100	--	-----
467	---	-----	--	-----	---	>1,000	-----	---	100	--	---	--	-----
475	---	-----	--	700	---	------	-----	150	---	--	---	--	-----
476	---	-----	--	-----	---	------	-----	100	---	--	---	--	-----
479	---	-----	--	-----	---	------	-----	---	---	--	100	--	-----

Table 2.--Stream-sediment samples (panned concentrates) from Service Creek Roadless Area, that contain anomalous concentrations of selected elements

[Semiquantitative spectrographic analysis by Betty Adrian (USGS). All data in ppm (parts per million). Leaders (----) indicate not detected or considered anomalous]

Element-------------	Ba	La	Mo	Nb	Pb	Sn	Th	V	W	Y
Detection limit-----	50	50	10	50	20	20	200	20	100	20
Anomaly threshold---	1,500	2,000	50	200	200	50	1,500	500	100	2,000
Sample No.										
13	-----	------	--	---	---	--	3,000	---	100	-----
18	-----	------	--	---	---	--	-----	---	200	-----
32	-----	------	50	---	---	--	-----	---	---	-----
34	-----	------	--	---	500	--	3,000	---	---	2,000
36	-----	------	--	200	---	--	-----	---	150	-----
39	-----	------	--	300	---	--	-----	500	---	-----
47	-----	>2,000	--	---	---	--	-----	---	---	-----
55	-----	------	--	---	---	50	-----	---	100	-----
62	-----	------	--	---	---	--	1,500	---	---	-----
71	-----	------	--	---	---	--	3,000	---	---	-----
85	2,000	------	--	---	---	--	-----	---	---	-----
89	-----	>2,000	--	---	200	--	3,000	---	150	2,000
107	-----	------	--	300	---	50	-----	500	---	-----
109	-----	------	--	200	---	--	-----	500	---	-----
128	-----	------	--	---	---	--	-----	500	---	-----
140	-----	------	--	---	---	--	-----	---	300	-----
181	-----	------	--	---	---	--	2,000	---	---	-----
202	-----	------	--	---	---	--	1,500	---	---	-----

Table-3.--Rock samples from Service Creek Roadless Area that contain anomalous concentrations of selected elements

[Semiquantitative spectrographic analysis by M. S. Erickson (USGS). All data in ppm (parts per million). Leaders (----) indicate not detected or considered anomalous]

Element-------------	B	Ba	Cr	Cu	Ni	Sc	Sn	Zn	Description
Detection limit-----	10	20	10	5	5	5	10	200	
Anomaly threshold---	70	3,000	2,000	150	150	50	10	200	
Sample No.									
27	---	------	-----	---	300	--	10	---	Gneiss.
28	---	3,000	-----	---	200	--	--	---	Diorite.
31	70	>5,000	-----	---	---	--	15	---	Peridotite.
34A	---	------	-----	---	---	50	--	---	(Contact) peridotite.
87	---	5,000	-----	---	---	--	--	---	Gneiss.
115	---	3,000	-----	---	---	--	--	---	Diorite.
120	---	------	-----	150	---	--	--	---	Do.
141C	---	------	-----	---	---	50	--	---	Amphibolite.
146	---	------	2,000	---	150	--	20	300	Do.
151A	---	------	-----	---	---	50	10	200	Trachyandesite.
152	---	3,000	-----	---	---	--	--	---	Diorite.
155	---	------	-----	---	---	70	15	---	Peridotite.
162	---	------	-----	---	---	50	--	---	Gabbro/diorite.
171B	---	------	-----	---	---	70	--	---	Do.
172	---	------	-----	150	---	--	--	---	Granitic dike.
173	---	------	-----	---	200	50	--	---	Gabbro/diorite.
487	---	2,200	-----	---	120	--	--	---	Hornblendite.
516	---	------	-----	---	---	--	11	---	Pegmatitic quartz.
559	---	------	1,100	---	270	65	--	---	Hornblendite.

Table 4.--Selected analytical results

[Table simplified from Kluender, 1982. Leaders (---), indicate not detected or not considered anomalous]

Sample locality no.	Sample type	Fire assay oz/ton	Radio-metric analyses	Element (percent)						
		Ag	U_3O_8	Ba	La	Mo	Ni	Ti	V	Y
6	Grab, 5-ft grid, 8- by 6- by 4-ft prospect pit in quartz monzonite.	0.4	---	---	---	---	---	---	---	---
7	Grab, 5-ft grid, 4- by 4- by 2-ft prospect pit in quartz monzonite.	---	---	0.1	---	---	---	---	---	---
8	Grab, 5-ft grid, 4- by 6- by 2-ft prospect pit in quartz monzonite.	0.2	0.008	---	0.05	0.01	0.02	0.8	0.1	0.05