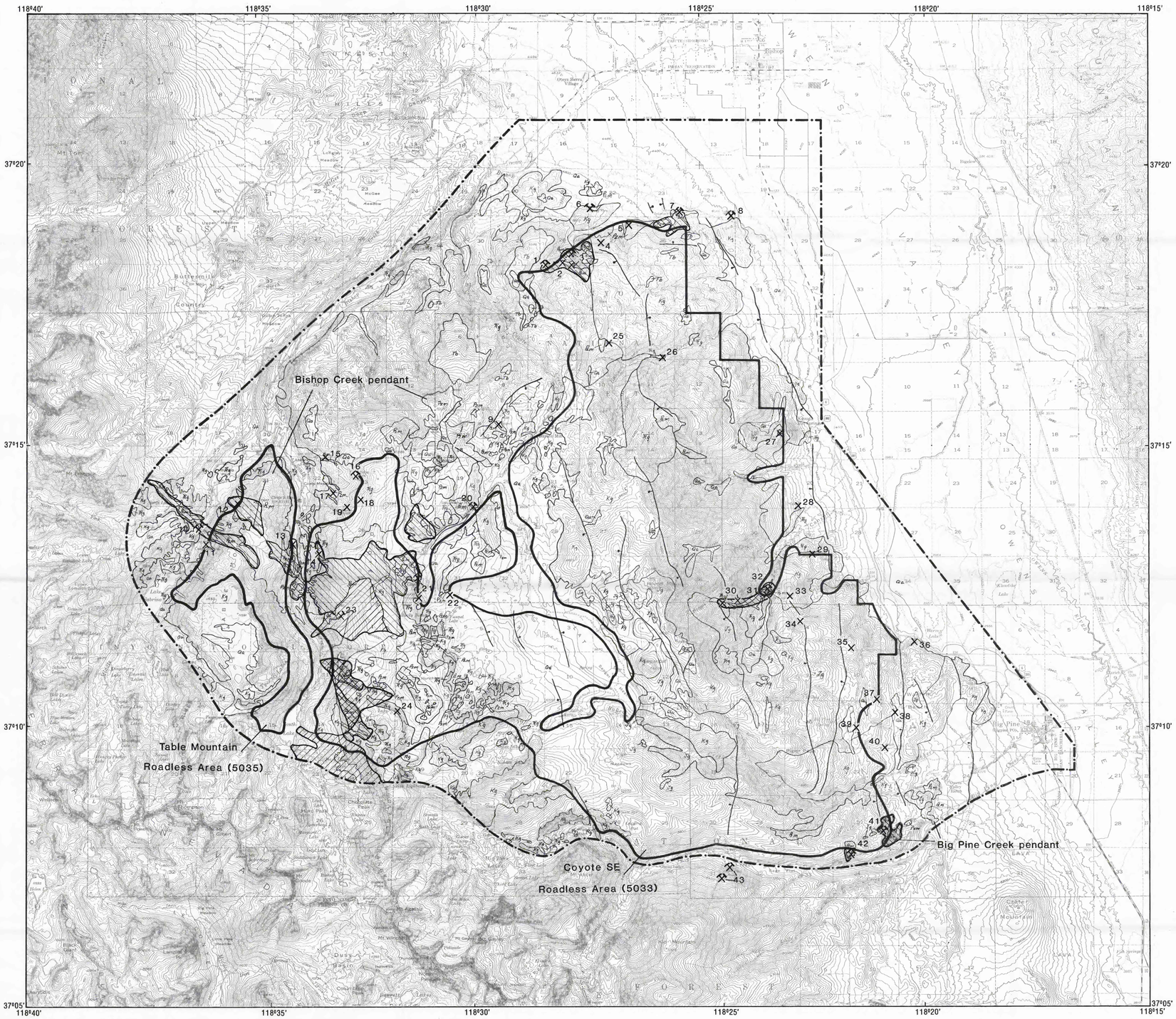
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1426-B



Base from U.S. Geological Survey
Mount Tom, 1949; Bishop, Mount
Goddard, 1957; Big Pine, 1958

Geology generalized from
Elliott and McKee (1982)

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MINERAL RESOURCE POTENTIAL MAP OF THE COYOTE SE AND TABLE MOUNTAIN ROADLESS AREAS, INYO COUNTY, CALIFORNIA

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EXPLANATION

- AREA WITH LOW RESOURCE POTENTIAL FOR TUNGSTEN--Based on evaluation of existing mines and prospects and low geochemical anomalies in stream-sediment and panned-concentrate samples
- AREA WITH LOW RESOURCE POTENTIAL FOR URANIUM--Based on low geochemical anomalies in stream-sediment samples
- AREA WITH LOW RESOURCE POTENTIAL FOR MARBLE--Based on evaluation of existing mines, prospects, and quarries
- MINE--Number refers to list of mines and prospects and table 1 of accompanying pamphlet
- PROSPECT--Number refers to list of mines and prospects and table 1 of accompanying pamphlet

LIST OF MINES AND PROSPECTS

1. Chipmunk (Pickup) mine	22. Prospect
2. Prospect	23. Linder mine
3. Chipmunk II (Brown) mine and prospect	24. Green Lake prospect
	25. Prospect
4. Prospect	26. McVan prospect
5. Early-Morhardt prospect	27. Prospect
6. Yaney mine	28. Buckshot prospect
7. Bishop Antimony mine	29. Prospect
8. Rossi Tungsten mine	30. Middle Fork Shannon prospects
9. Numainger prospect	31. Prospect
10. Cardinal mine	32. Marble Tungsten mine
11. West Side prospect	33. Prospect
12. Stevens prospect	34. Prospect
13. Waterfall prospect	35. Prospect
14. Slim Chance prospect	36. Nebeclta Feldspar-Kaolin deposit
15. Lookout prospect	37. Prospect
16. Schober mine	38. Warren Bench Sierra White Feldspar deposit
17. Black Bump prospects	39. Prospect
18. Schober No. 2 claim	40. Prospect
19. Norrill prospect	41. Bakock (Bakoch) mine
20. Salty Peter mine	42. Marble quarries
21. Brackett mine and prospect	43. Blue Star mines

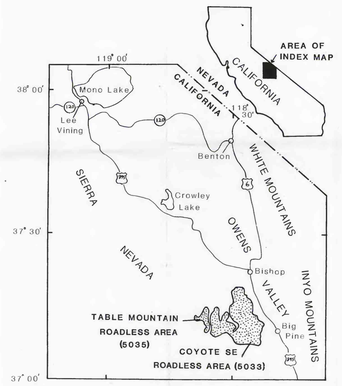
CORRELATION OF MAP UNITS

Qa	QUATERNARY	CENOZOIC
Tb	TERTIARY	
Kg	CRETACEOUS	MESOZOIC
Jg	JURASSIC	
Trg	TRIASSIC	
Pzm		PALEOZOIC

DESCRIPTION OF MAP UNITS

- Qa ALLUVIUM, COLLUVIUM, AND GLACIAL DEPOSITS (HOLOCENE AND PLEISTOCENE)--Unconsolidated sand, silt, gravel, and boulders; rock glaciers, glacial moraines
- Tb OLIVINE BASALT (MIOCENE)--Basaltic dikes, necks, and lava flows. One flow dated at 9.6 m.y. by the K-Ar method (Dalrymple, 1963)
- Kg GRANITIC ROCKS (CRETACEOUS)--Plutons of the Sierra Nevada batholith containing rocks ranging in composition from quartz diorite to alaskite. Mostly granodiorite. In this area, unit includes parts of the Lamarck Granodiorite, granodiorite of Coyote Flat, and leucogranite of Rawson Creek
- Jg GRANITIC ROCKS (JURASSIC)--Plutons of the Sierra Nevada batholith, ranging in composition from granodiorite to granite
- Trg GRANITIC ROCKS (TRIASSIC)--Plutons of the Sierra Nevada batholith containing rocks ranging from hornblende gabbro and diorite to granite. Mostly granodiorite. In this area, includes the Tungsten Hills Quartz Monzonite
- Pzm METAMORPHIC ROCKS (PALEOZOIC)--Metavolcanic and metasedimentary rocks. Unit includes pelitic hornfels, calc-hornfels, quartzite, marble, phyllite, and schist. These rocks occur mostly in two roof pendants, the Bishop Creek pendant and the Big Pine Creek pendant

- CONTACT
- FAULT--Bar and ball on downthrown side
- APPROXIMATE BOUNDARY OF ROADLESS AREA
- BOUNDARY OF GEOLOGIC MAP



INDEX MAP SHOWING LOCATION OF ROADLESS AREAS

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This map presents the results of a mineral resource potential survey of the Coyote SE (5033) and Table Mountain (5035) Roadless Areas in Inyo National Forest, Inyo County, California. The areas were classified as further planning areas during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

SUMMARY

Geologic and geochemical investigations and a survey of mines, prospects, and altered areas indicate that the Coyote SE and Table Mountain Roadless Areas contain areas that have a low resource potential for tungsten and marble. Virtually all of the metallic mineral occurrences within the boundaries are in tactite deposits. Tungsten, in the mineral scheelite, is the most important metal found in this region; other metals including copper, molybdenum, gold, and silver occur in small amounts in the tactite. A low resource potential for uranium exists in a small area of the southeastern part of the Coyote SE Roadless Area. Moderate- to low-grade scheelite-bearing tactite has been identified in three places in or near the Coyote SE and Table Mountain Roadless Areas: (1) at the Waterfall prospect; (2) at the Chipmunk (Pickup) mine; and (3) at the Middle Fork Shannon prospects and the Marble Tungsten mine.

A low resource potential for marble is identified along the southeast boundary of the Coyote SE Roadless Area. All mines and prospects have been abandoned or are inactive.

INTRODUCTION

The Coyote SE and Table Mountain Roadless Areas lie along the eastern front of the Sierra Nevada between Bishop and Big Pine, Calif. They include approximately 58,300 acres in Inyo County.

The two areas are east of the main crest of the Sierra Nevada and range from about 12,000 ft above sea level near the center of the Coyote SE Roadless Area to about 4,000 ft in the Owens Valley near Bishop. Primary access to the Coyote SE area from the north is by a steep four-wheel-drive dirt road. Several other dirt roads reach the roadless-area boundary including the Shannon Road in Shannon Canyon. Access from the south is along Big Pine Creek on Big Pine Creek Road. California Highway 168 to Lake Sabrina and South Lake provides access to the lower elevations of the Table Mountain Roadless Area, and the South Lake road provides access to the lower elevations of the Coyote SE area.

GEOLOGY

The area covered by this report records a complex geologic history involving Paleozoic miogeosynclinal sedimentation, late Paleozoic and Mesozoic deformation, Mesozoic plutonism, and Cenozoic igneous activity and basin-and-range faulting. The rocks can be divided into the following four major groups: (1) lower Paleozoic through middle Paleozoic metasedimentary rocks consisting of marble, pelitic hornfels, micaceous quartzite, schist, and metachert; (2) upper Paleozoic metavolcanic rocks, mostly meta-andesite with some felsic types; (3) granitic rocks, mostly granodiorite, that were intruded in late Triassic to late Cretaceous time; (4) basaltic and andesitic intrusive and extrusive rocks of Miocene age. The Miocene volcanic rocks were erupted onto ancestral basin-and-range topography along faults that later controlled the structural development of Owens Valley and the eastern Sierra front.

The largest cluster of Paleozoic metasedimentary rocks in the study area is called the Bishop Creek pendant which covers approximately 20 mi^2, and includes some 6,500 ft of strata. These rocks range in age from Early Ordovician to Devonian (Moore and Foster, 1980). A much smaller pendant to the south is called the Big Pine Creek pendant. Moore and Foster (1980) report the Big Pine Creek pendant to be latest Precambrian and Cambrian in age. Other uncorrelated metamorphic units are scattered throughout the study area.

Triassic to Late Cretaceous granitic rocks of the Sierra Nevada batholith underlie most of the Coyote SE and Table Mountain Roadless Areas. The granitic rocks include hornblende gabbro, quartz diorite, granodiorite, quartz monzonite, granite, and alaskite. Dikes of aplite and pegmatite are also present in the area.

Basaltic dikes and dissected lava flows of late Cenozoic age crop out over a small part of the northeast end of the Coyote SE Roadless Area. The dissected flows are remnants of a once more extensive basaltic cap, and north-trending dikes in the central part of this roadless area are the remains of feeders.

Several types of Quaternary surficial deposits are present in the roadless areas including glacial till of several ages and modern stream and alluvial fan deposits.

GEOCHEMICAL STUDIES AND ROCK ANALYSES

The U.S. Geological Survey collected 64 rock, 90 stream-sediment, and 90 nonmagnetic heavy-mineral-concentrate samples from drainage basins in the Coyote SE and Table Mountain Roadless Areas. The drainage basins from which the eroded material containing anomalous values originated were evaluated by assigning a numerical score dictated by the number of anomalous metals and their actual concentrations in stream-sediment and panned-concentrate samples. A map was produced (Donahoe and Chaffee, 1983) showing drainage basins with high scores and an explanation of results.

All of the drainage basins with high scores contain outcrops of metamorphosed sedimentary rocks that have been intruded and altered by granitic plutons of the Sierra Nevada batholith. This suggests that contact-metasomatic mineral deposits are the source of the metals detected. The geochemical anomalies in these drainage basins are characterized in general by anomalies of the elements Ag, As, Au, B, Be, Bi, Cd, Co, Cu, Fe, Mn, Mo, Pb, Sn, W, and Zn. This suite of elements, taken in conjunction with the geologic environment in these areas, suggests that precious-metal-rich contact-metasomatic tungsten deposits of the tactite type may be present in any or all of these anomalous drainage basins.

U.S. Bureau of Mines rock samples were fire assayed for gold and silver, analyzed for tungsten by inductive-coupled argon-plasma spectrography, and analyzed for base metals by atomic-absorption methods. The results were used to identify metallic mineral occurrences and to aid in resource evaluation.

MINING DISTRICTS AND MINERALIZED AREAS

The Coyote SE and Table Mountain Roadless Areas are within the Bishop Creek mining district, a subdivision of the Bishop mining district which is noted for its tungsten production. Present production for the Tungsten Hills is small.

Thirty-two mining properties were assessed within and along the roadless-area boundaries (table 1 of accompanying pamphlet); all but one were tungsten prospects. Two, the Marble Tungsten and the Schober and associated properties, produced 8,000 stu (one short ton unit (stu) contains 20 lb of WO_3) and 10,000 tons of approximately 0.5 percent WO_3, respectively. Several other properties that lie along or just outside the roadless-area boundaries were tungsten producers, and include the Bakock (Bakoch), Chipmunk, Linder, Marble, Tungsten, and the Rossi mine (which produced over 10,000 stu WO_3). No active mines are present in the Coyote SE or Table Mountain Roadless Areas today.

Coyote SE Roadless Area

A search of Inyo County records revealed a total of 236 lode and 10 placer claims in or near the Coyote SE Roadless Area; the earliest claims in the area were located in 1879. Three properties within or along the roadless-area boundaries contain low-grade resources of over 1,000 tons ranging from 0.24 to 0.54 percent average WO_3 the Chipmunk (Pickup) mine, Marble Tungsten mine, and Middle Fork Shannon prospects, with estimated tonnages of 18,000, 4,000, and 2,900 tons respectively (table 1). About 800,000 tons of low-grade marble resources are at the Marble Tungsten mine.

Table Mountain Roadless Area

A search of Inyo County records revealed a total of 34 lode claims and one placer claim in or near the Table Mountain Roadless Area. No patented claims exist within the roadless area; the earliest claims were located in 1902. The Waterfall and Stevens prospects, located on the roadless-area boundary, contain scheelite-bearing tactite in small marble pods. These deposits are small, discontinuous, and of low grade.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

The potential for mineral resources within the Coyote SE and Table Mountain Roadless Areas is low. Tungsten and marble resources are identified in the areas. Geochemical and geologic studies indicate that concentrations of metallic minerals with resource potential would most likely be found in tactite deposits. The most important metal in this environment is tungsten; gold, silver, copper, and molybdenum are present as secondary elements.

Coyote SE Roadless Area

Metamorphic rocks, including some mineralized tactite, occur in the Coyote SE Roadless Area. Significant concentrations of metallic minerals in these tactites are rare, however, and most of the surface deposits have been found. Stream-sediment and panned-concentrate samples from drainages that cut the Bishop Creek roof pendant and also metamorphic rocks at the north end of the study area and in Shannon Canyon contain slightly anomalous concentrations of Ag, As, B, Bi, Co, Cu, Fe, Mo, Pb, Sn, W, and Zn, suggesting mineralization of the tactite type. The overall low concentration of these elements in these samples suggests that the possibility of metal-rich deposits is small. Weakly to moderately anomalous levels of uranium were found in stream-sediment samples in the southwesternmost part of the Coyote SE Roadless Area. Neither the source area nor the uranium-bearing mineral is known for this element. Based on the low concentrations of uranium, the resource potential for uranium is low.

Known and potential tungsten resources are within or near the northern, southeastern, and western parts of the Coyote SE Roadless Area, and in Shannon Canyon on the east side. Tungsten resources occur in the inactive Chipmunk and Marble Tungsten mines outside the roadless area. The resource potential in these mines is considered low because of the low grade and small tonnage of identified deposits.

Table Mountain Roadless Area

Analysis of samples of tactite from the Waterfall prospect, near the Table Mountain Roadless Area, suggests a low resource potential for tungsten. This potential is substantiated by anomalous amounts of Ag, Au, B, Bi, Cu, W, and Zn in stream-sediment and panned-concentrate samples in areas including and adjacent to the Waterfall prospect in the Bishop Creek roof pendant. This suite of elements is often associated with tactite mineralization (Hose and others, 1979).

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Donahoe, J. L., and Chaffee, M. A., 1983, Geochemical anomaly map of the Coyote SE and Table Mountain Roadless Areas, Inyo County, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1426-C, scale 1:62,500.

Elliott, G. S., and McKee, E. H., 1982, Geologic map of the Coyote SE and Table Mountain Roadless Areas, Inyo County, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1426-A, scale 1:62,500.

Moore, J. N., and Foster, C. T., Jr, 1980, Lower Paleozoic metasedimentary rocks in the east-central Sierra Nevada, California: Correlation with Great Basin formations: Geological Society of America Bulletin, v. 91, p. 37-43.

Rose, A. W., Hawkes, H. E., and Webb, J. S., 1979, Geochemistry in mineral exploration: London, Academic Press, 657 p.

Tucker, W. B., and Sampson, R. J., 1938, Mineral resources of Inyo County: California Journal of Mines and Geology, v. 34, p. 368-500.

Explanatory pamphlet accompanies map

Interior—Geological Survey, Reston, Va.—1983

For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225