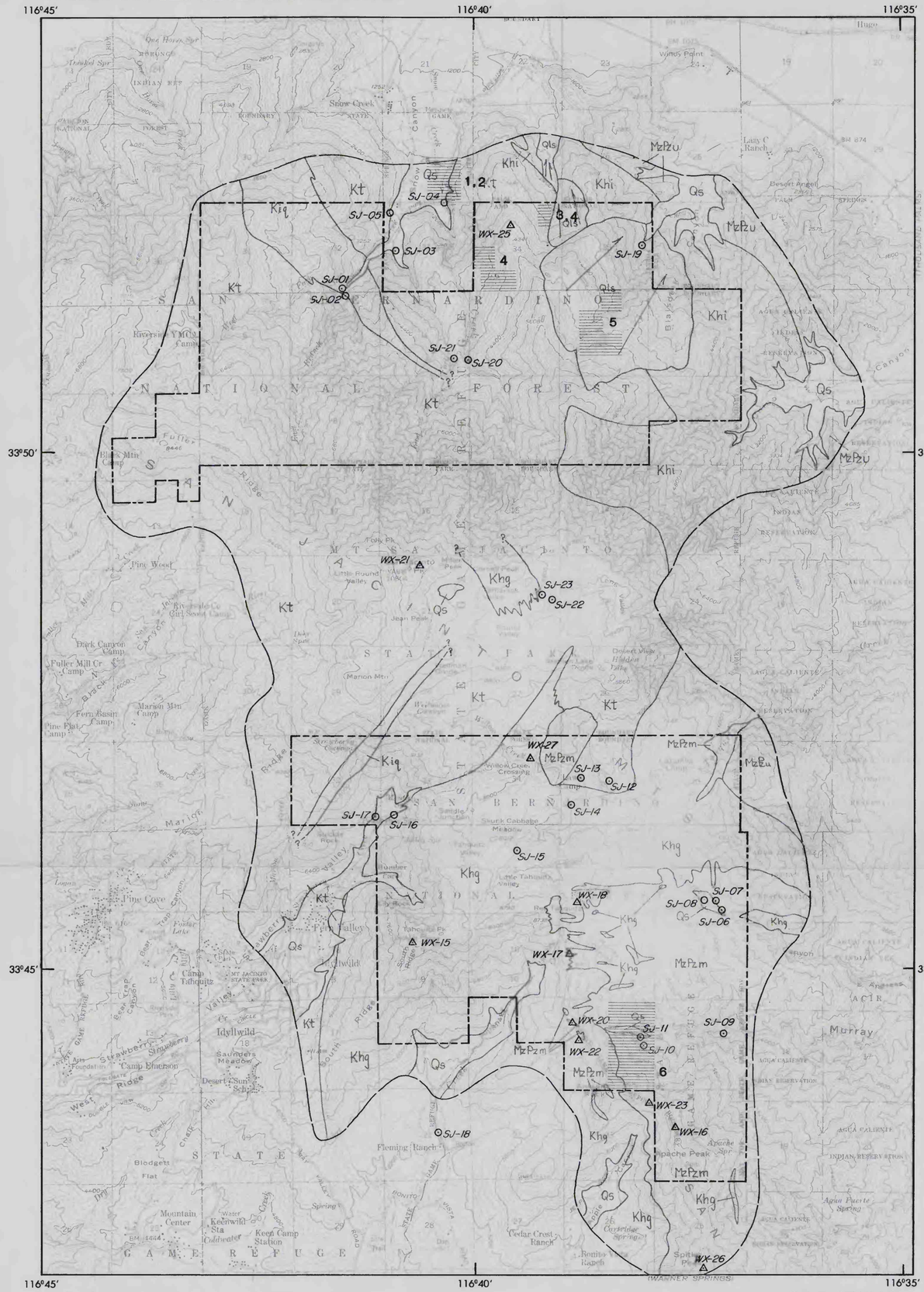
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY



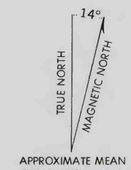
Base from U.S. Geological Survey
Palm Springs, 1957; Idyllwild, 1959

Geology simplified from
Morton and others (1980)

SCALE 1:62500

1 0 1 2 3 4 MILES
3000 0 3000 6000 9000 12000 15000 18000 21000 FEET
1 5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



APPROXIMATE MEAN
DECLINATION, 1983

MINERAL RESOURCE POTENTIAL MAP OF THE SAN JACINTO WILDERNESS, RIVERSIDE COUNTY, CALIFORNIA

By

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and

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U.S. Bureau of Mines

1983

EXPLANATION

5 APPROXIMATE LOCATION OF MINERAL CLAIM--Numbers refer to discussion in accompanying summary pamphlet; claim information provided below includes name, date, and commodity for which claim was filed

1 Vanadate (1931): placer gold
2 Eureka Nos. 1-6 (1931): placer gold
3 Gold Hill Nos. 1-6 (1938): lode gold
4 Falls Creek (1931): placer gold
5 Railroad (1903): "oil claim"
6 White Marble Nos. 1 and 2 (1924): "oil placer"

GEOCHEMICAL SAMPLE SITE

△ WX-17 Bedrock

⊙ SJ-21 Stream sediment

CORRELATION OF MAP UNITS

Qs, Qls	QUATERNARY	CENOZOIC
Kt, Kiq, Khg, Khi	CRETACEOUS	MESOZOIC
MzPzu	MESOZOIC AND PALEOZOIC(?)	MESOZOIC
MzPzm	MESOZOIC AND (OR) PALEOZOIC	MESOZOIC

DESCRIPTION OF MAP UNITS

Qs SURFICIAL DEPOSITS (QUATERNARY)--Unconsolidated to consolidated alluvium, colluvium, and dissected older alluvium. Deposits consist of sand, pebbly sand, and gravel

Qls LANDSLIDE DEPOSITS (QUATERNARY)--Arrows show inferred direction of movement

Kt TONALITE (CRETACEOUS)--Medium- to coarse-grained, compositionally uniform, sphene-bearing hornblende-biotite tonalite and minor granodiorite

Kiq INCLUSION-RICH QUARTZ DIORITE (CRETACEOUS)--Hornblende-biotite quartz diorite containing abundant mafic inclusions

Khg HETEROGENEOUS LEUCOCRATIC GRANITOID ROCKS (CRETACEOUS)--Medium- to coarse-grained granitoid rocks that include monzogranite, quartz monzonite, granodiorite, and minor tonalite. Mineralogy and fabrics variable

Khi HETEROGENEOUS INTRUSIVE ROCKS (CRETACEOUS)--Assorted felsic and mafic intrusive rocks that include quartz monzonite, granodiorite, tonalite, quartz diorite, diorite, and gabbro

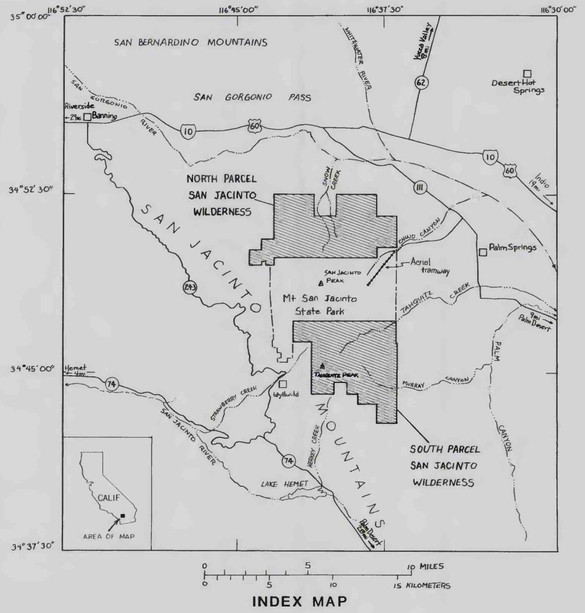
MzPzu PLUTONIC AND METAMORPHIC ROCKS, UNDIFFERENTIATED (MESOZOIC AND PALEOZOIC?)--Complexly intermingled plutonic rocks and metasedimentary rocks

MzPzm METASEDIMENTARY ROCKS (MESOZOIC AND (OR) PALEOZOIC)--Quartzofeldspathic biotite gneiss and schist and biotitic metaquartzite, associated with minor marble and calc-silicate hornfels

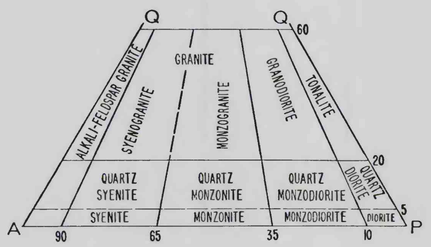
———?— CONTACT--Dashed where approximately located; queried where uncertain

– – – – APPROXIMATE BOUNDARY OF WILDERNESS

— — — — BOUNDARY OF MAPPED AREA



INDEX MAP



Classification of plutonic rock types
(from Streckeisen, 1973)

MISCELLANEOUS FIELD STUDIES MAP MF-1159-B

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 report presents the results of a mineral resource potential survey of the San Jacinto Wilderness in the San Bernardino National Forest, Riverside County, California. The San Jacinto Wilderness was established by Public Law 88-577, September 3, 1964.

SUMMARY

The San Jacinto Wilderness covers an area of about 21,950 acres in the San Jacinto Mountains of southern California, roughly 90 mi east of Los Angeles and 4 mi west of Palm Springs (index map). The wilderness includes two parcels lying north and south of Mt. San Jacinto State Park. Geologic, geochemical, and geophysical evidence, together with a review of historical prospecting and mining activities, suggests that the wilderness has low potential for all types of mineral and energy resources—including precious and base metals, construction stone and aggregate, fossil fuels, radioactive minerals, and geothermal energy.

GEOLOGY

The San Jacinto Wilderness lies near the northern end of the Peninsular Ranges of southern California, a geologic province that is dominated by plutonic igneous rock of Mesozoic age (Jahns, 1954). Geologic features of the wilderness mapped by Morton and others (1980) are shown in generalized form on the mineral resource potential map. Crystalline bedrock is exposed in most parts of the two wilderness parcels except for a few small areas that are underlain by Quaternary gravel deposits. Roughly 85 percent of the bedrock consists of plutonic igneous rocks of Mesozoic age; the remaining 15 percent consists of metasedimentary rocks of Paleozoic and (or) Mesozoic age.

Hornblende-biotite tonalite that is nearly uniform in composition and fabric is the predominant type of plutonic rock in the north parcel of the wilderness (plutonic rock terminology used herein follows Streckeisen, 1973). Plutonic rocks in the south parcel comprise a heterogeneous assemblage of granodiorite, quartz monzonite, and monzogranite. In addition, small bodies of gabbro, mafic diorite, and inclusion-rich quartz diorite are present locally, especially in the north parcel.

Metasedimentary rocks are restricted to the eastern half of the south parcel, and have been intruded by the plutonic rocks that are exposed in the western and northern areas of that parcel. The metasedimentary lithologies include biotite-rich gneiss and schist, micaceous quartzite, and minor amounts of marble and calc-silicate hornfels. These rocks are isoclinally folded and contain scattered quartz veins and abundant dikes and lenticular segregations of pegmatitic granite.

Geologic environments that are potentially favorable for the occurrence of mineral resources are limited to the belt of metasedimentary rocks in the eastern half of the south parcel, particularly the parts of this belt that lie near intrusive contacts with plutonic igneous rocks. Elsewhere in the Peninsular Ranges, mineral deposits are locally developed where similar metasedimentary rocks have been intruded by Mesozoic plutons. However, during our field studies we observed no evidence of significant mineralization in the belt of metasedimentary rocks or in any other part of the San Jacinto Wilderness.

GEOCHEMISTRY

A reconnaissance geochemical survey of the San Jacinto Wilderness (Cox and Matti, 1983) was conducted for 33 major, minor, and trace elements in order to determine spatial variations in chemistry that might reflect local concentrations of ore minerals. Chemical analyses, which for most elements were determined by emission spectrography, were performed on 11 bedrock samples, on 23 stream-sediment samples, and on 23 heavy-mineral concentrates produced by panning down a split of each stream-sediment sample. Sample locations are shown on the mineral resource potential map.

The results of the geochemical survey provide no indication of significant mineralization within the San Jacinto Wilderness. The data generally indicate that both metasedimentary rocks and calc-silicate inclusions in granitic rocks in the eastern half of the south wilderness parcel are slightly enriched in boron, barium, chromium, copper, lanthanum, molybdenum, nickel, tin, tungsten, and zinc. However, the maximum concentrations of these elements are no higher than a few hundred parts per million and are low in comparison to values that have been reported in geochemical surveys of districts with known mineral deposits. The slight enrichment of metasedimentary rocks indicated by the geochemical survey probably reflects weak metasomatism of country rock during the intrusion of plutonic igneous rocks and probably is not an indication of mineral resource potential.

GEOPHYSICS

An aeromagnetic survey was flown over the south parcel of the San Jacinto Wilderness (U.S. Geological Survey, 1979). No significant magnetic anomalies were revealed by the survey, and these data indicate there are no significant concentrations of magnetic iron ore in the south parcel.

Gravity values were measured along a north-south line across the western part of the south parcel between Idyllwild and San Jacinto Peak (H. W. Oliver, unpub. data, 1982). The gravity survey was conducted through this broad area of plutonic rocks to check for buried masses of relatively dense metamorphic rocks that might contain contact-metasomatic ore deposits. After making corrections, the resulting Bouguer gravity values are nearly constant along the line of the survey, and there is no evidence for large buried masses of high-density rocks within the plutonic rocks.

MINING DISTRICTS AND MINERALIZATION

The San Jacinto Wilderness is distinguished by a sparsity of prospecting activities and by a total lack of reported mineral production. From about 1903 to 1938, six claims or small blocks of claims were located within or immediately adjacent to the wilderness. All of these claims are now inactive, none of them are patented, and none of them have demonstrated potential. No workings were found on any of the claims, and samples collected on the claims lack evidence of metallic minerals. Known mineral resources in surrounding areas near the San Jacinto Wilderness are limited, consisting of marble and limestone, sand and gravel, and minor amounts of gold. Granitic rocks and small deposits of sand and gravel in the wilderness could be utilized as construction materials, but this is unlikely because similar deposits outside the wilderness are of equal or better quality, more accessible, and closer to existing markets.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Geologic, geochemical, and geophysical investigations, and a review of historical mining activities, all suggest that the San Jacinto Wilderness has low potential for all types of mineral resources. This conclusion is based on the following considerations: (1) no evidence of significant mineralization was observed in the wilderness; (2) maximum concentrations of metallic elements determined by a geochemical survey are low compared to values that have been reported in geochemical surveys of districts with proven mineral resources; (3) gravity and aeromagnetic surveys conducted within the south parcel of the wilderness did not reveal any masses of unusually dense or magnetic rock such as might be associated with hidden ore deposits; (4) there have been no mining activities in the wilderness; and (5) utilization of construction materials (granitic rock, sand, and gravel) is unlikely, because similar deposits outside the wilderness are of equal or better quality, more accessible, and closer to markets. Due to the foregoing reasons, we believe the San Jacinto Wilderness has low potential for metallic and radioactive minerals, construction materials, fossil fuels, and geothermal resources.

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Streckeisen, A. L., 1973, Plutonic rocks: classification and nomenclature recommended by the IUGS Subcommission on the Systematics of Igneous Rocks: Geotimes, v. 18, no. 10, p. 26-30.

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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