UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Preliminary mineral resource assessment of the proposed Miller Peak Wilderness, Cochise County, Arizona

by

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This report is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards and stratigraphic nomenclature.

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SUMMARY

The proposed Miller Peak Wilderness contains three tracts favorable for the occurrence of undiscovered tungsten deposits, one tract favorable for the occurrence of undiscovered precious- and base-metal replacement deposits, and one tract favorable for the occurrence of undiscovered precious- and base-metal vein deposits. The potential tungsten deposits have the most significance.

INTRODUCTION

The Miller Peak proposed wilderness (H.R. 4707) consists of about 22,000 acres in the Coronado National Forest, Cochise County, southeastern Arizona. The area is in the southern part of the Hartford mining district and has had intermittent mining activity from the 1870's to the present.

Information for this report is compiled primarily from a variety of sources that catalog known mining properties, combined with a detailed geologic map (Hayes and Raup, 1968). There have been no geochemical or geophysical studies or detailed mineral investigations of the area.

GEOLOGY AND STRUCTURE

Information on geology and structure is based largely on Hayes and Raup (1968), and Drewes (1980).

Rocks of the Huachuca Mountains range in age from Precambrian to Tertiary. Precambrian crystalline rocks in the northeast part of the area are successively overlain by Paleozoic sedimentary rocks, Triassic and Jurassic volcanic rocks, and a sequence of Cretaceous sedimentary rocks. These rocks are not divided on Figure 1.

In the southern part of the area, the Huachuca Quartz Monzonite (Hayes, 1967) occurrs as a large pluton of Jurassic age. In the northwest part of the area is an elongate conformable pluton of granodiorite of Cretaceous age, and associated sills of varying composition. In the south central part of the area, a Tertiary intrusive center, consisting mostly of rhyolite porphyry, is found near Sutherland Peak.

The range has been successively deformed by folding and broken by thrust, reverse, and normal faulting, primarily at a time near the Cretaceous-Tertiary transition.

KNOWN MINERAL DEPOSITS

Information on the known mineral deposits in the Miller Peak area is based chiefly on four sources (Wilson, 1941; Wilson, 1951; Keith, 1973; and CRIB[1]), and is summarized here in Table 1 and Figure 2. Production data for individual mines is not available. Keith (1973) summarizes production estimates from the Hartford district to 1970 as follows: 9,000 tons of base- and precious-metal ore containing about 37 tons of copper, 294 tons of lead, 188 tons of zinc, 393 ounces of gold, and 25,000 ounces of silver. Tungsten production is estimated at 170 tons of 60 to 78% WO_3 concentrate.

[1]CRIB: Computerized Resources Information Bank, a data base of mineral-deposit information available to the public from the U.S. Geological Survey.

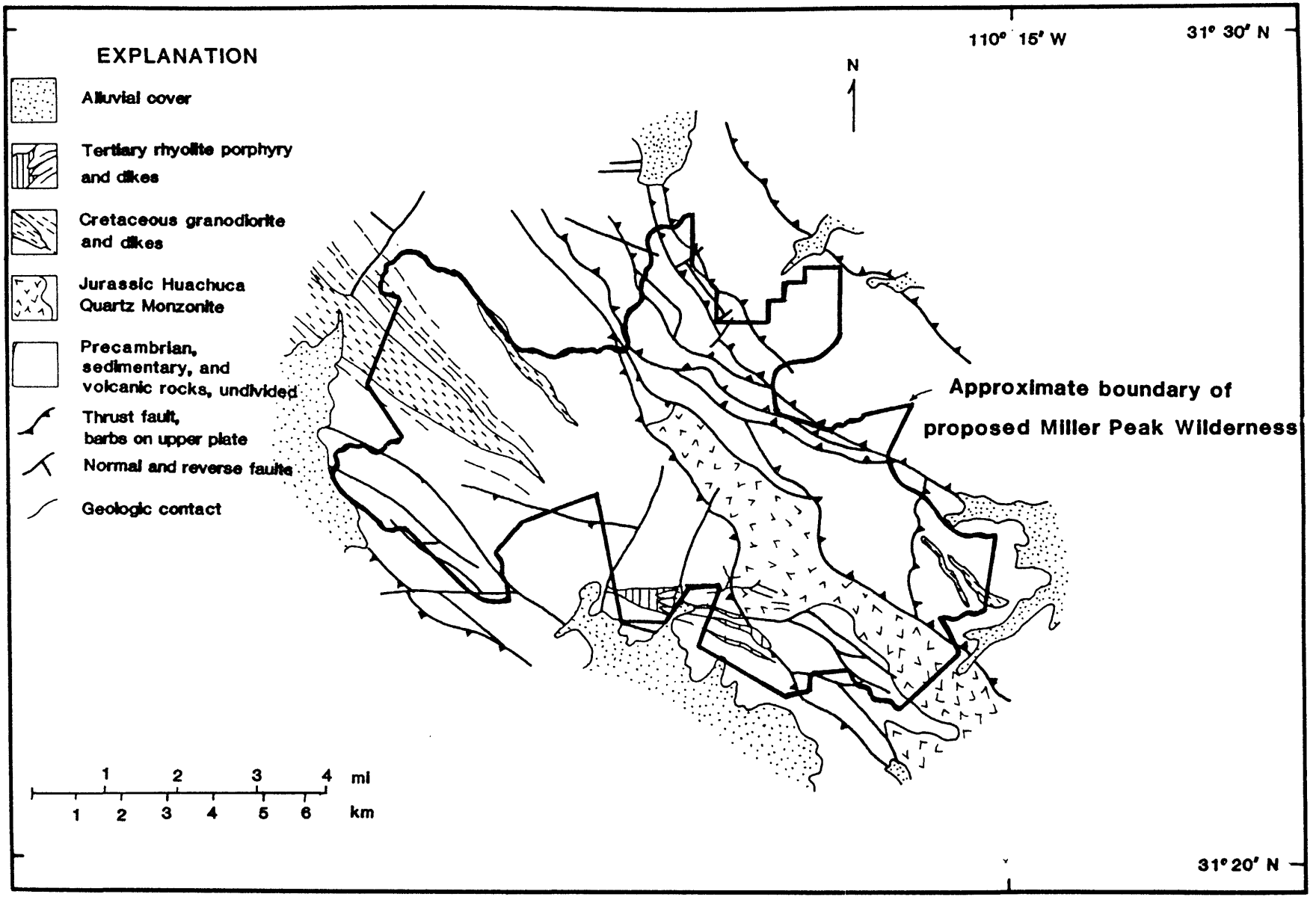


Figure 1. GENERALIZED GEOLOGY OF THE PROPOSED MILLER PEAK WILDERNESS

TABLE 1. KNOWN MINERAL DEPOSITS IN AND NEAR THE PROPOSED MILLER PEAK WILDERNESS

No.	Name	Type	Commodities Present W	Au	Ag	Cu	Pb	Zn
1	Western	VN	X		X	X	X	
2	Morgan	VN	X	X	X			
3	Lucky Strike	VN	X	X	X		X	
4	Van Horn	VN	X	X	X			
5	Zaleski	VN	X	X			X	
6	Wakefield	VN	X	X	X	X	X	
7	Arrow	VN	X	X			X	
8	Reef	VN	X	X	X	X	X	X
9	Harper	VN	X	X	X	X	X	
10	Pomona	VN	X	X	X	X	X	X
11	Victory	VN	X					
12	Cave Creek	RP			X	X	X	X
13	Lutz Tunnel	RP		X	X	X		
14	Hamburg	RP		X	X	X	X	X
15	Armistice	RP		X	X	X	X	
16	Alto	RP		X	X	X	X	X
17	Lucy Bell	RP		X	X	X	X	
18	Reserector	RP		X	X	X		
19	State of Texas	RP		X	X	X	X	X
20	Baumkirscher	RP		X	X	X	X	X
21	Schwarzenbach	RP		X	X	X	X	X
22	Copper Glance	VN		X	X	X		
23	Peterson	VN		X	X	X		
24	Eureka	VN		X	X	X	X	
25	Power	VN		X	X	X	X	X
26	Tracy	VN		X	X	X		
27	Miller Canyon	VN				X	X	X

'VN' signifies vein deposit; 'RP' signifies replacement deposit. 'Commodities present' refers to commodities known to have been produced or observed to occur. Any particular deposit may well contain other metals. The numbers are coded to locations on Figure 2.

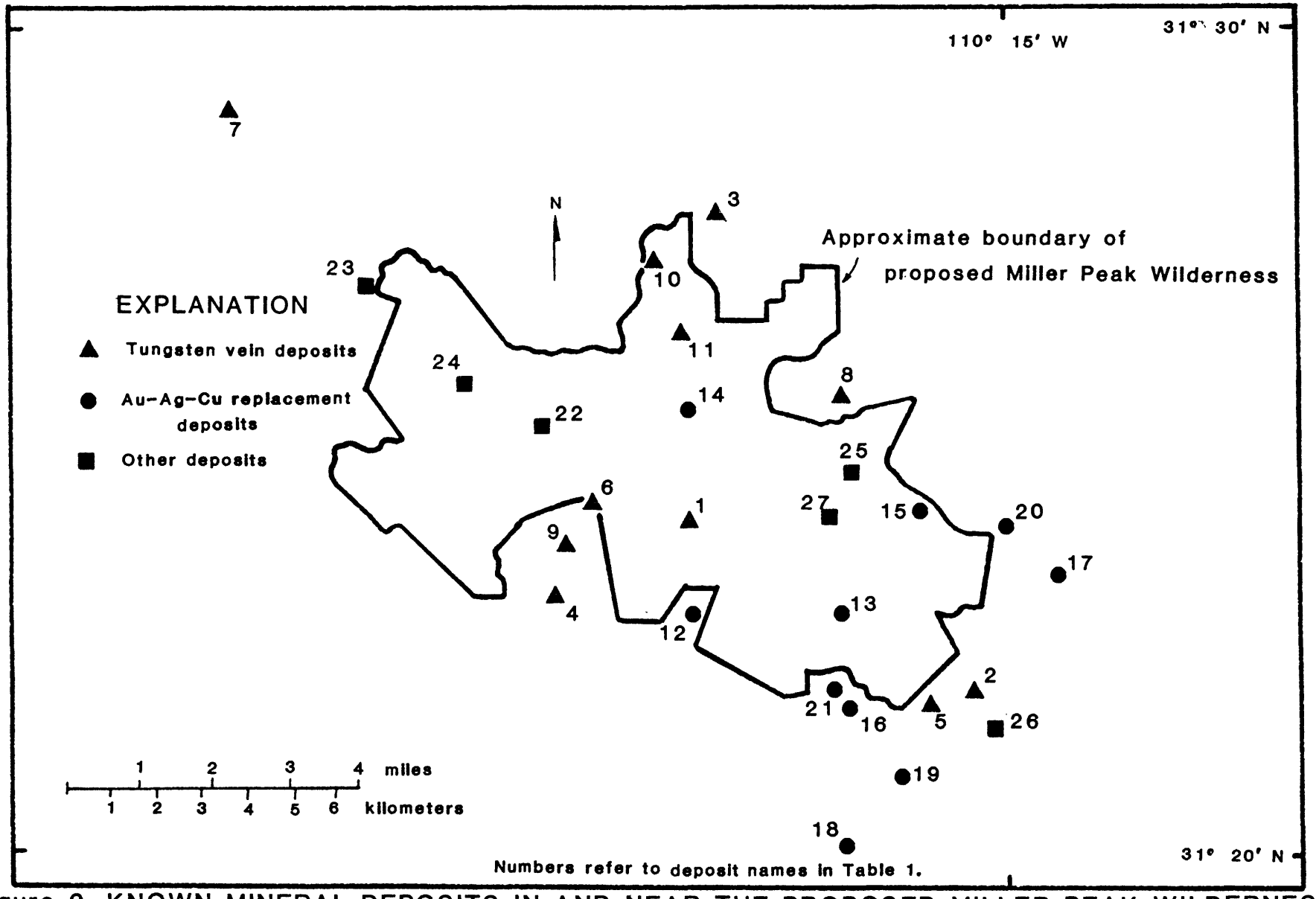


Figure 2. KNOWN MINERAL DEPOSITS IN AND NEAR THE PROPOSED MILLER PEAK WILDERNESS

AREAS FAVORABLE FOR UNDISCOVERED DEPOSITS

Tungsten

In the Miller Peak area, there is potential for undiscovered tungsten deposits of two types. The eleven mines in the area that have produced tungsten in the past are small vein deposits that also contain other metals, most commonly gold and silver, but including lead, copper, zinc, and tellurium. The deposits commonly are located near one of the many thrust faults in the area. No single deposit of this type is likely to be a major source of tungsten. Tracts A, B, and C (Figure 3), which include all the known deposits, are favorable for the occurrence of undiscovered vein deposits.

Several lines of evidence suggest that the area is favorable for the occurrence of one or more undiscovered large, disseminated tungsten deposits. The widespread occurrence of tungsten minerals in this area is uncommon, there are many faults that may serve as depositional sites, and there are many Tertiary intrusive rocks, some of them silicic. Tract A is perhaps more favorable than B or C, because of the clustering of deposits near the rhyolite porphyry intrusive center at Sutherland Peak, to which the deposits may be related.

Information necessary to further evaluate the potential for tungsten deposits includes detailed information about the mineral assemblages in the known deposits, relative and absolute age determinations on the known deposits and possibly associated intrusive rocks, and chemical studies of the intrusive rocks, particularly the rhyolite porphyry near Sutherland Peak.

Copper-silver-gold replacement deposits

Although in some cases these deposits include fissure veins, they are virtually restricted to exotic blocks of limestone (megabreccia?) in the Triassic and Jurassic volcanic rocks surrounding the pluton of Huachuca Quartz Monzonite (Figure 4). The deposits were presumably formed by fluids emanating from the quartz monzonite pluton that reacted with the limestone blocks. Production has been small, and, because of the lithologic control, any undiscovered deposits are also likely to be small. Tract D, shown in Figure 4, is favorable for the occurrence of undiscovered deposits of this type.

These deposits could be found by careful examination of the exotic blocks mapped by Hayes and Raup (1968), and by drilling in areas that contain high concentrations of exotic blocks.

Other Deposits

Three deposits in the northwest part of the area consist of fissure veins containing copper, gold, and silver that appear to be related to a large, conformable granodiorite pluton and its associated sills. Tract E, shown on Figure 5, is favorable for the occurrence of undiscovered vein deposits.

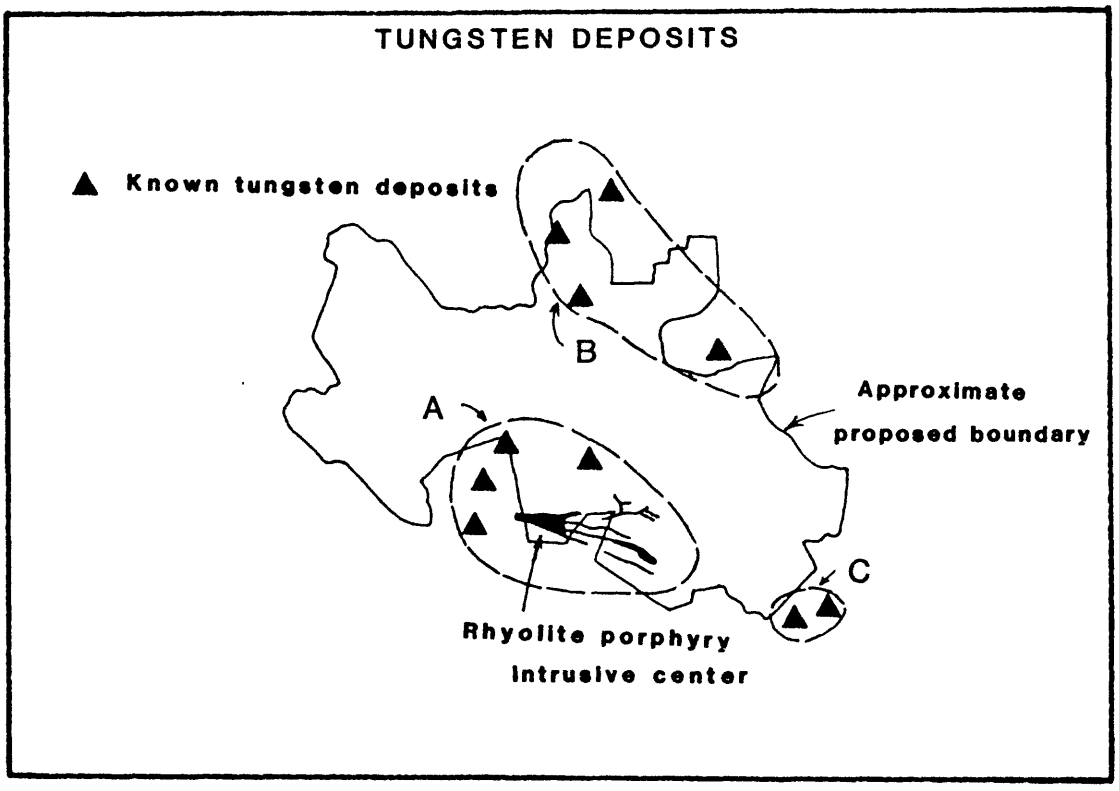
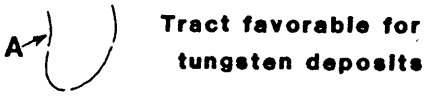


Figure 3. SKETCH MAP SHOWING TRACTS FAVORABLE FOR TUNGSTEN DEPOSITS

EXPLANATION



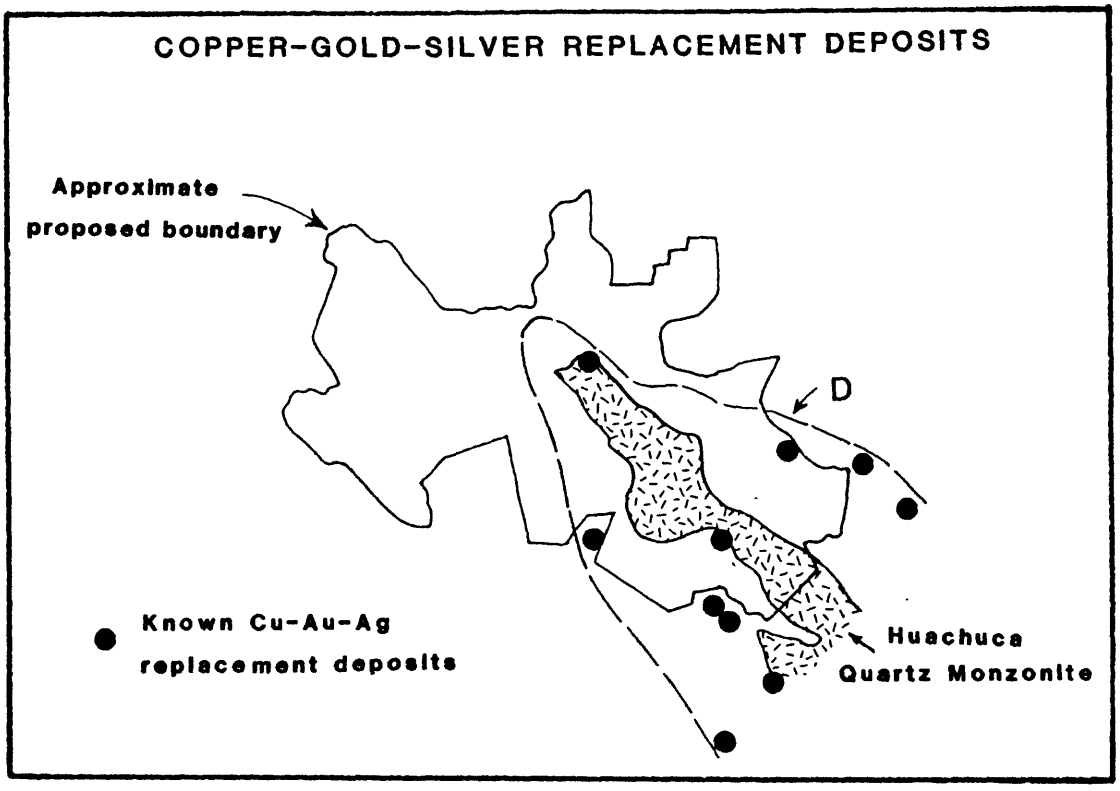
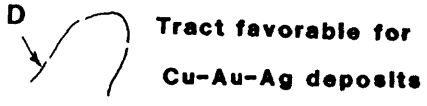


Figure 4. SKETCH MAP SHOWING TRACTS FAVORABLE FOR COPPER-GOLD-SILVER REPLACEMENT DEPOSITS

EXPLANATION



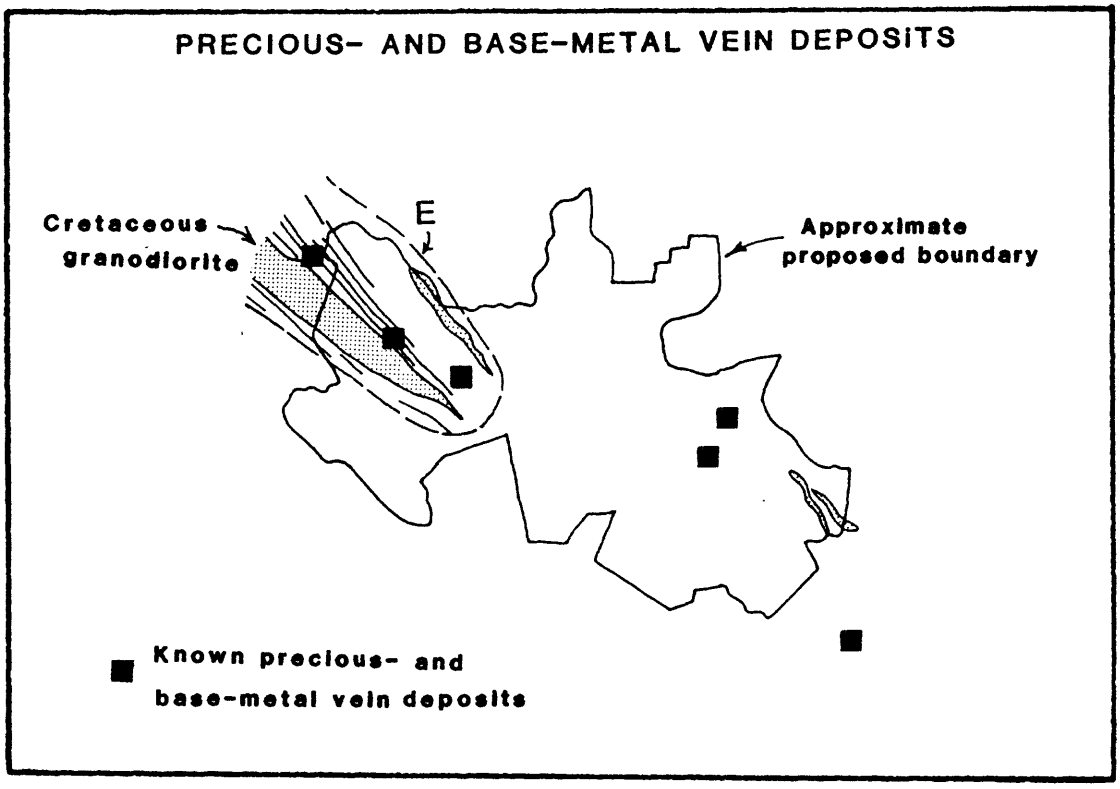
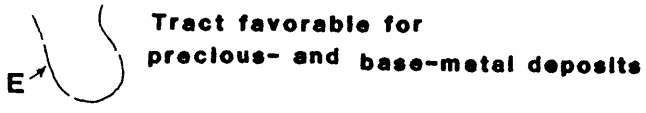


Figure 5. SKETCH MAP SHOWING TRACT FAVORABLE FOR PRECIOUS- AND BASE-METAL VEIN DEPOSITS

EXPLANATION



Three other vein deposits are possibly related to the Huachuca Quartz Monzonite, but are all small, and no obvious criteria are known by which other similar occurrences may be predicted.

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