U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MINERAL RESOURCES OF THE GRAPEVINE MOUNTAIN WILDERNESS STUDY AREA, ESMERALDA COUNTY, NEVADA

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STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Area

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine the mineral values, if any, that may be present. 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 survey of the Grapevine Mountain (NV-060-355) Wilderness Study Area, Esmeralda County, Nevada.

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Abstract

At the request of the U.S. Bureau of Land Management, the 23,150-acre Grapevine Mountain Wilderness Study Area (NV-060-355) was evaluated for identified mineral resources (known) and mineral resource potential (undiscovered). In this report, the area studied is referred to as the "wilderness study area" or simply "the study area." Library research was conducted in 1990 to assess the mineral resources and resource potential of the area; no field work was conducted.

No mines, prospects, or mineral resources have been identified within the study area. The study area has moderate mineral resource potential for gold.

Character and Setting

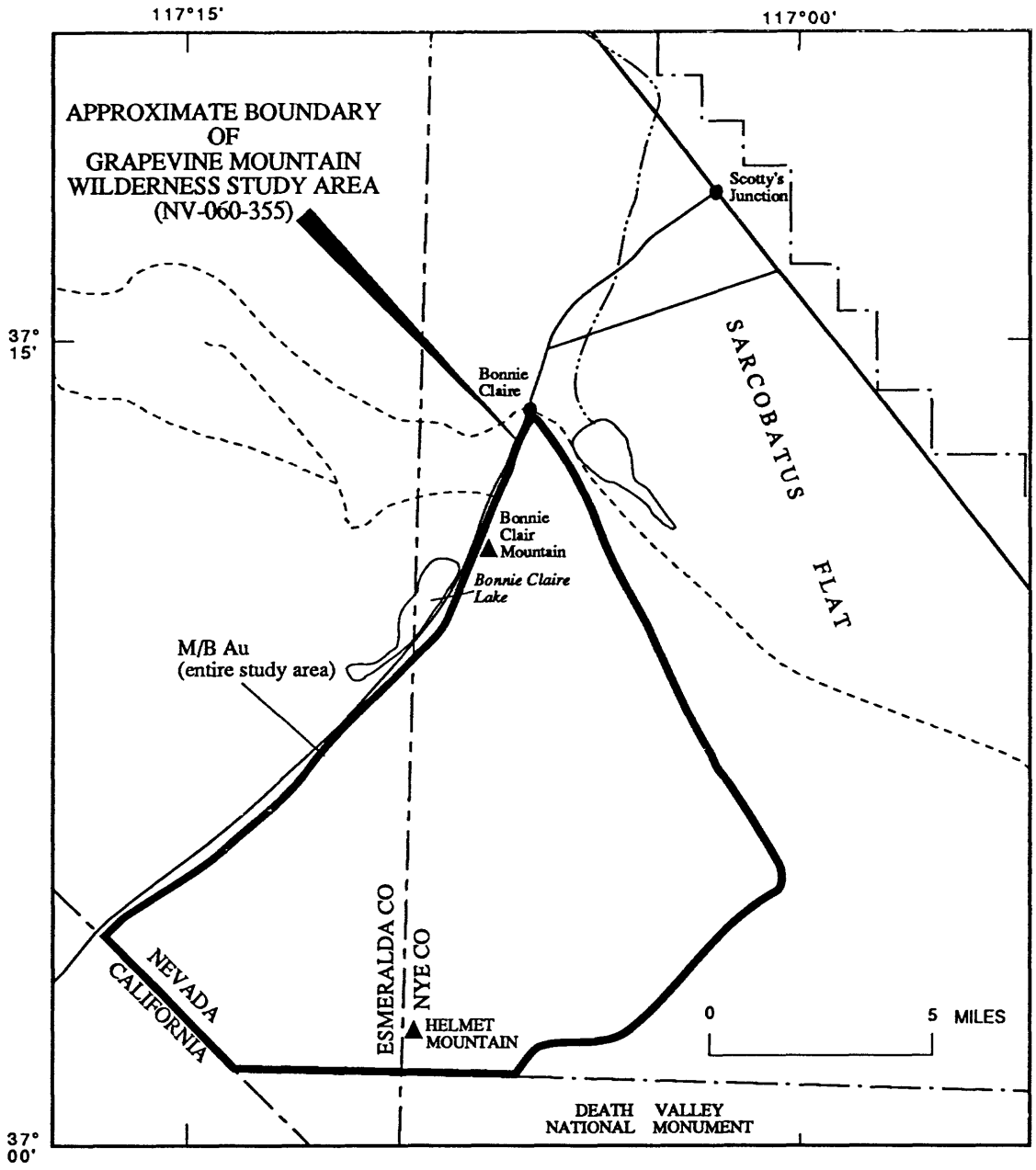
The Grapevine Mountain Wilderness Study Area, also known as the Bonnie Claire Flat Wilderness Study Area, (fig. 1) is approximately 23,150 acres in size. It is 25 miles west of Beatty, Nevada, and about 7 mi southwest of Scotty's Junction. The study area is underlain by Paleozoic shale and limestone, Mesozoic granitic rocks, and Tertiary tuff (see appendixes for geologic time chart). The terrain is rugged with elevations ranging from about 4,200 ft in the north, to more than 8,000 ft on the southern boundary. Access to the area is gained by Nevada State Route 267 from U.S. Highway 95.

INTRODUCTION

This mineral survey was requested by the U.S. Bureau of Land Management and represents the results of literature research cooperatively carried out by the U.S. Geological Survey and the U.S. Bureau of Mines. An introduction to the wilderness review process, mineral survey methods, and agency responsibilities was provided by Beikman and others (1983). The U.S. Bureau of Mines evaluates identified resources at individual mines and known mineralized areas by collecting data on current and past mining activities and through field examination of mines, prospects, claims, and mineralized areas. Identified resources are classified according to a system that is a modification of that described by McKelvey (1972) and U.S. Bureau of Mines and U.S. Geological Survey (1980). U.S. Geological Survey studies are designed to provide a scientific basis for assessing the potential for undiscovered mineral resources by determining geologic units and structures, possible environments of mineral deposition, presence of geochemical and geophysical anomalies, and applicable ore-deposit models. Goudarzi (1984) discussed mineral assessment methodology and terminology as they apply to these surveys. See appendixes for the definition of levels of mineral resource potential and certainty of assessment and for the resource/reserve classification.

Sources of Data

Wrucke and others (1984, 1985) presented reports on the mineral resources of the nearby Little Sand Springs Wilderness Study Area and Miller (1983) summarized the known deposits of that area. Leszcykowski (1990a, b) presented a preliminary appraisals of the known deposits within the Grapevine Mountain and Queer Mountain Wilderness Study Areas. An early treatment on the mining districts and mineral resources of Nevada was compiled by Lincoln (1923). Albers and Stewart (1972) and Cornwall (1972) presented the geology and mineral deposits of Esmeralda County, and southern Nye County, respectively. A preliminary resource study of the Grapevine Canyon area was done by Albers and Stewart (1983). Weimer-McMillion and others (1983) presented a bibliography of mineral information on Nevada and Wong (1983) presented a map of resource areas. Mineral resource data for this report are available through the Mineral Resource Data System (MRDS) summarized by Sherlock and Tingley (1985).



EXPLANATION

M Area having moderate mineral resource potential

Level of certainty of assessment

B Data suggest level of potential

Commodity

Au Gold

Figure 1.--Map showing location and mineral resource potential of the Grapevine Mountain Wilderness Study Area, Esmeralda County, Nevada.

Recommendations

As this assessment was done only through library research, the Wilderness Study Area should be studied as part of a comprehensive, field-work-based mineral survey by the U.S. Bureau of Mines and the U.S. Geological Survey.

APPRAISAL OF IDENTIFIED RESOURCES

By Andrew M. Leszcykowski

U.S. Bureau of Mines

Mining Activity

No record of past mining activity in the study area was found. According to current (April 1990) BLM location records, 57 claims have been located in the study area, but most are no longer valid. A large claim block is situated near the northeast corner. The nearest mining districts, Tokop and Bullfrog (Rhyolite), are 12 and 18 miles east of the study area.

Identified Mineral Resources

No mineral resources have been identified in the Wilderness Study Area.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

By Michael F. Diggles

U.S. Geological Survey

Geology

The Grapevine Mountains are situated just north of outcrops of Paleozoic sedimentary rocks consisting of the Cambrian Nopah Formation and Cambrian and Ordovician Pogonip Group, as well as a Mississippian sequence of shaley rocks. The older rocks rest in thrust contact on the Mississippian rocks; the thrust may be part of the Last Chance thrust. These strata and structures presumably are present at depth beneath the exposed rocks within the study area.

The study area itself is underlain by Tertiary rocks that include the Timber Mountain Tuff as well as dacite intrusions. Extensive Quaternary deposits are present that include stream sediments; these latter may host gold placers.

Mineral Resource Potential

The Grapevine Mountains Wilderness Study Area has moderate mineral resource potential, certainty level B, for gold in placers. Neither thermal springs, geothermal resources, nor young volcanic centers are shown in the study area by Bliss (1983), Muffler (1979), and Morton and others (1977), respectively, although Muffler (1979) shows Sarcobatus Flats, a few miles east of the study area, as favorable for the discovery of low-temperature geothermal water. The study area has aerial gamma-ray spectroscopy values of 2.0 to 2.7 percent potassium, 4.0. to 6.5 parts per million (ppm) equivalent uranium, and 16 to 30 ppm equivalent thorium. There are no uranium anomalies within the boundaries of the study area or in the immediate vicinity (J.S. Duval, written commun., 1990). Garside (1973) does not show any radioactive mineral occurrences in or near the study area. The rocks in the study area are not conducive to the accumulation of hydrocarbons, and Sandberg (1982, 1983) shows petroleum potential in the study area as zero.

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APPENDIXES

DEFINITION OF LEVELS OF MINERAL RESOURCE POTENTIAL AND CERTAINTY OF ASSESSMENT

LEVELS OF RESOURCE POTENTIAL

H **HIGH** mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of data indicate a high degree of likelihood for resource accumulation, where data support mineral-deposit models indicating presence of resources, and where evidence indicates that mineral concentration has taken place. Assignment of high resource potential to an area requires some positive knowledge that mineral-forming processes have been active in at least part of the area.

M **MODERATE** mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of data indicate reasonable likelihood for resource accumulation, and (or) where an application of mineral-deposit models indicates favorable ground for the specified type(s) of deposits.

L **LOW** mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics define a geologic environment in which the existence of resources is permissive. This broad category embraces areas with dispersed but insignificantly mineralized rock, as well as areas with little or no indication of having been mineralized.

N NO mineral resource potential is a category reserved for a specific type of resource in a well-defined area.

U **UNKNOWN** mineral resource potential is assigned to areas where information is inadequate to assign a low, moderate, or high level of resource potential.

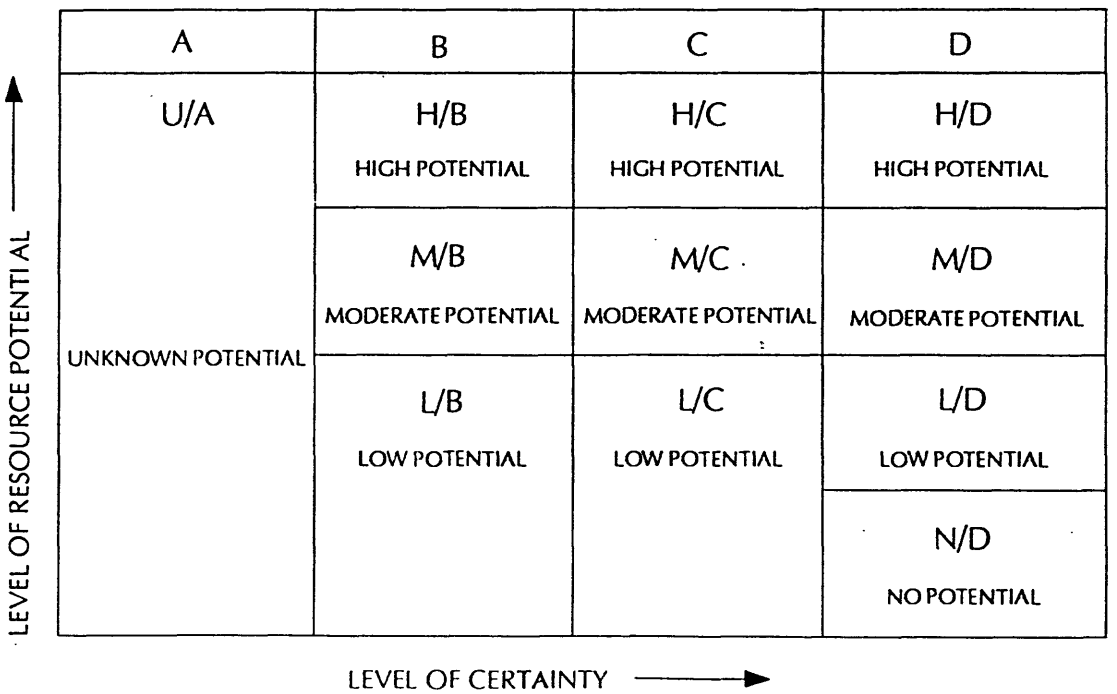
LEVELS OF CERTAINTY

A Available information is not adequate for determination of the level of mineral resource potential.

B Available information only suggests the level of mineral resource potential.

C Available information gives a good indication of the level of mineral resource potential.

D Available information clearly defines the level of mineral resource potential.



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RESOURCE/RESERVE CLASSIFICATION

	IDENTIFIED RESOURCES			UNDISCOVERED RESOURCES	
	Demonstrated		Inferred	Probability Range	
	Measured	Indicated		Hypothetical	Speculative
ECONOMIC	Reserves		Inferred Reserves		
MARGINALLY ECONOMIC	Marginal Reserves		Inferred Marginal Reserves		
SUB-ECONOMIC	Demonstrated Subeconomic Resources		Inferred Subeconomic Resources		

Major elements of mineral resource classification, excluding reserve base and inferred reserve base. Modified from McKelvey, V.E., 1972, Mineral resource estimates and public policy: American Scientist, v. 60, p. 32-40; and U.S. Bureau of Mines and U.S. Geological Survey, 1980, Principles of a resource/reserve classification for minerals: U.S. Geological Survey Circular 831, p. 5.

GEOLOGIC TIME CHART

Terms and boundary ages used by the U.S. Geological Survey in this report

EON	ERA	PERIOD		EPOCH	AGE ESTIMATES OF BOUNDARIES IN MILLION YEARS (Ma)
Phanerozoic	Cenozoic	Quaternary		Holocene	0.010
				Pleistocene	1.7
		Tertiary	Neogene Subperiod	Pliocene	5
				Miocene	24
			Paleogene Subperiod	Oligocene	38
				Eocene	55
				Paleocene	66
	Mesozoic	Cretaceous		Late	
				Early	96 / 138
		Jurassic		Late, Middle, Early	205
		Triassic		Late, Middle, Early	~240
	Paleozoic	Permian		Late, Early	290
		Carboniferous Periods	Pennsylvanian	Late, Middle, Early	~330
			Mississippian	Late, Early	360
		Devonian		Late, Middle, Early	410
		Silurian		Late, Middle, Early	435
		Ordovician		Late, Middle, Early	500
		Cambrian		Late, Middle, Early	[1]~570
Proterozoic	Late Proterozoic				900
	Middle Proterozoic				1600
	Early Proterozoic				2500
Archean	Late Archean				3000
	Middle Archean				3400
	Early Archean				
		(3800?)			
pre-Archean[2]					4550

[1]Rocks older than 570 Ma also called Precambrian, a time term without specific rank.
[2]Informal time term without specific rank.