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

MINERAL RESOURCES OF AN ADDITION TO THE BLACK ROCK DESERT WILDERNESS STUDY AREA, HUMBOLDT 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 an addition to the Black Rock Desert (NV-020-620) Wilderness Study Area, Humboldt County, Nevada.

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Abstract

At the request of the U.S. Bureau of Land Management, a 45,000-acre addition to the previously studied (Calzia and others, 1987) part of the Black Rock Desert Wilderness Study Area (NV-020-620) 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 mineral resources have been identified within the study area. The study area has moderate mineral resource potential for gold, silver, mercury, lithium, and geothermal energy as well as low resource potential for oil and gas.

Character and Setting

The addition of 45,000 acres to the area previously studied, and shown on figure 1, does not materially change the geologic setting. The terrane consists of Triassic and Jurassic phyllite, quartzite, and limestone, that are intruded by Cretaceous quartz monzonite, and all are unconformably overlain by Miocene and Pliocene tuff, and rhyolite and basalt flows. Except in the adjacent ranges, most of the bedrock terrane is obscured by a moderately thick layer of Quaternary aeolian and lacustrine sediments (see appendixes for geologic time chart). The study area is mainly flat, but relief locally amounts to as much as 1,000 ft in small intra-valley mountains with summits generally ranging from altitudes of about 4,000 to 5,000 ft. Main access is from Nevada State highway 140 that connects Winnemucca and Denio junction, near the Oregon border. The Leonard Creek Ranch Road, which intersects Nevada 140 at Quinn River Crossing about 70 mi northwest of Winnemucca, provides dirt-road access into parts of the study area.

INTRODUCTION

This mineral survey was requested by the U.S. Bureau of Land Management and is the result of a cooperative effort 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.

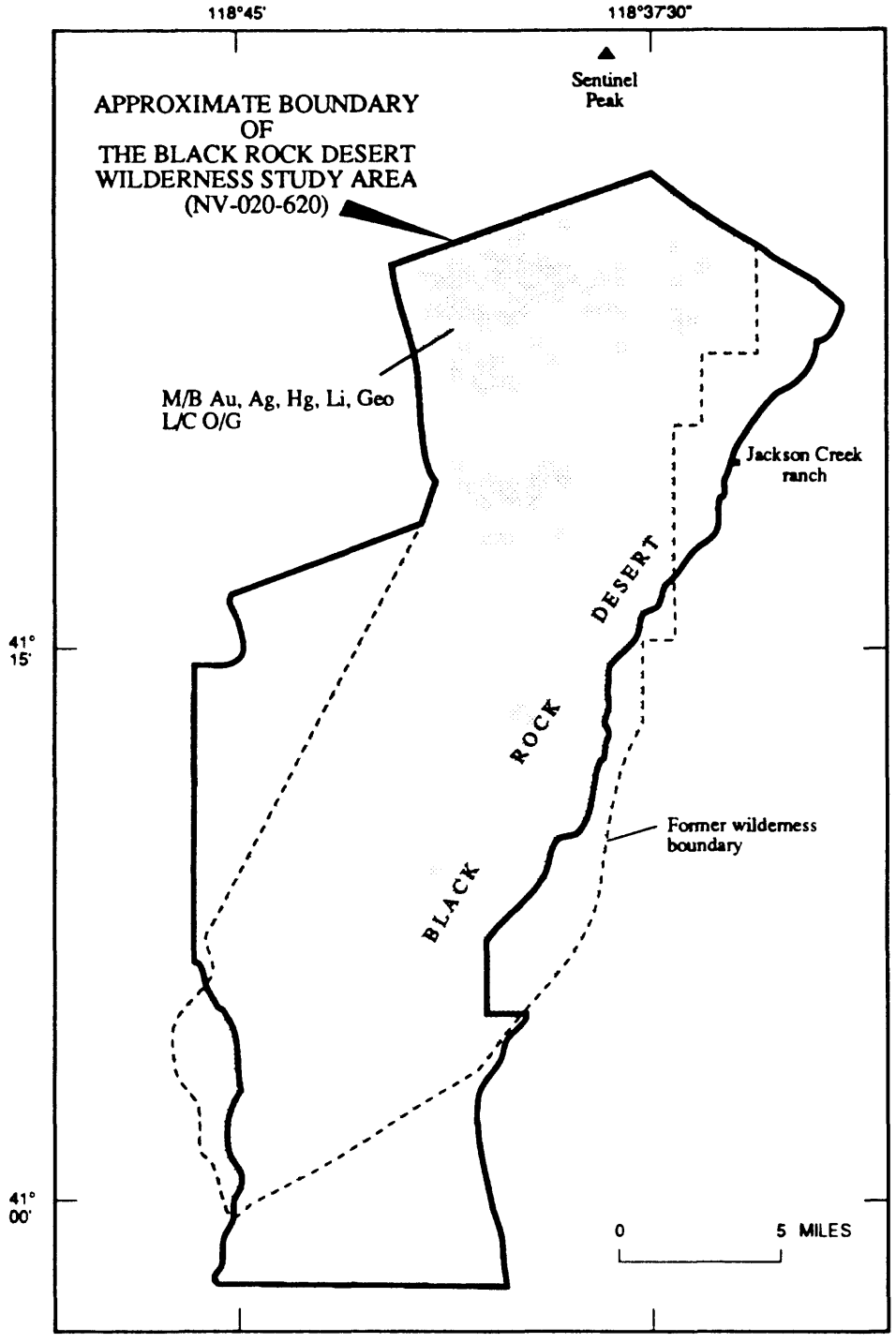

Figure 1--Map showing location and mineral resource potential of an addition to the Black Rock Desert Wilderness Study Area, Humboldt County, Nevada.

EXPLANATION FOR FIGURE 1

M Area having moderate mineral resource potential
L Area having low mineral resource potential

Level of certainty of assessment
B Data suggest level of potential
C Data give good indication of level of potential

Commodity

Ag Silver
Au Gold
Geo Geothermal Energy
Hg Mercury
Li Lithium
O-G Oil and Gas

Sources of Data

Calzia and others (1987) assessed the mineral resource potential and Olson (1985) appraised the known deposits of 174,300 acres of the Black Rock Desert Wilderness Study Area; See Calzia and others (1987) for the geologic map of the Black Rock Desert Wilderness Study Area. An early treatment on the mining districts and mineral resources of Nevada was compiled by Lincoln (1923). 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).

Recommendations

As only 174,300 acres of the 319,594-acre wilderness study area (NV-020-620) has been comprehensively studied as part of a mineral survey by the U.S. Geological Survey and the U.S. Bureau of Mines, further work is needed to assess the 145,294 acres (including the 45,000-acre addition) that constitute the balance.

APPRAISAL OF IDENTIFIED RESOURCES

By J.E. Olson

U.S. Bureau of Mines

Mining Activity

There is no known mineral activity within the study area. The Sulphur mining district, located near the southeastern portion of the study area, has produced silver, sulfur and mercury, and it is currently producing gold. The Crofoot/Lewis mine is a gold heap-leach operation operated by Hycroft Resources and Development Corp. Other industry exploration efforts in the area have reported significant gold content.

July 1989 U.S. Bureau of Land Management records showed about 50 mining claims in the study area, mostly in the northwestern part. Six oil and gas leases cover 19,560 acres of the study area, and six geothermal leases cover 12,026 acres. The Pinto Hot Springs Known

Geothermal Resource Area (KGRA) is located on the northwestern border of the area. The Double Hot Springs KGRA is 7 miles southwest of the study area.

Identified Mineral Resources

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

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

By C. Dean Rinehart

U.S. Geological Survey

Geology

The Black Rock Desert is in the Basin and Range physiographic province. This province is characterized by northwest-trending fault-bounded mountains separated by wide parallel valleys. The Black Rock Desert is within a down-dropped fault block that is filled by Cenozoic sediments. Hills and mesas northwest of the study area are underlain by Triassic and Jurassic phyllite, quartzite, and limestone, Cretaceous quartz monzonite, Miocene and Pliocene tuff, and rhyolite and basalt flows. Except in the adjacent ranges, most of the bedrock terrane is obscured by a moderately thick layer of Quaternary aeolian and lacustrine sediments.

Mineral Resource Potential

Geologic, geochemical, geophysical, and mineral surveys indicate that the study area has moderate potential, certainty level B, for gold, silver, mercury, lithium, and geothermal resources, and low potential, certainty level C, for oil and gas resources. Bliss (1983) shows several hot springs nearby, and in addition, two areas adjacent on the west are classified as known geothermal resource areas (Muffler, 1979). Garside (1973) shows a few radioactive mineral occurrences within a few miles of the study area, hence, the resource potential for uranium is considered to be low. The rocks in the study area are not conducive to the accumulation of hydrocarbons and Sandberg (1982, 1983) shows the petroleum potential in the study area as low.

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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.

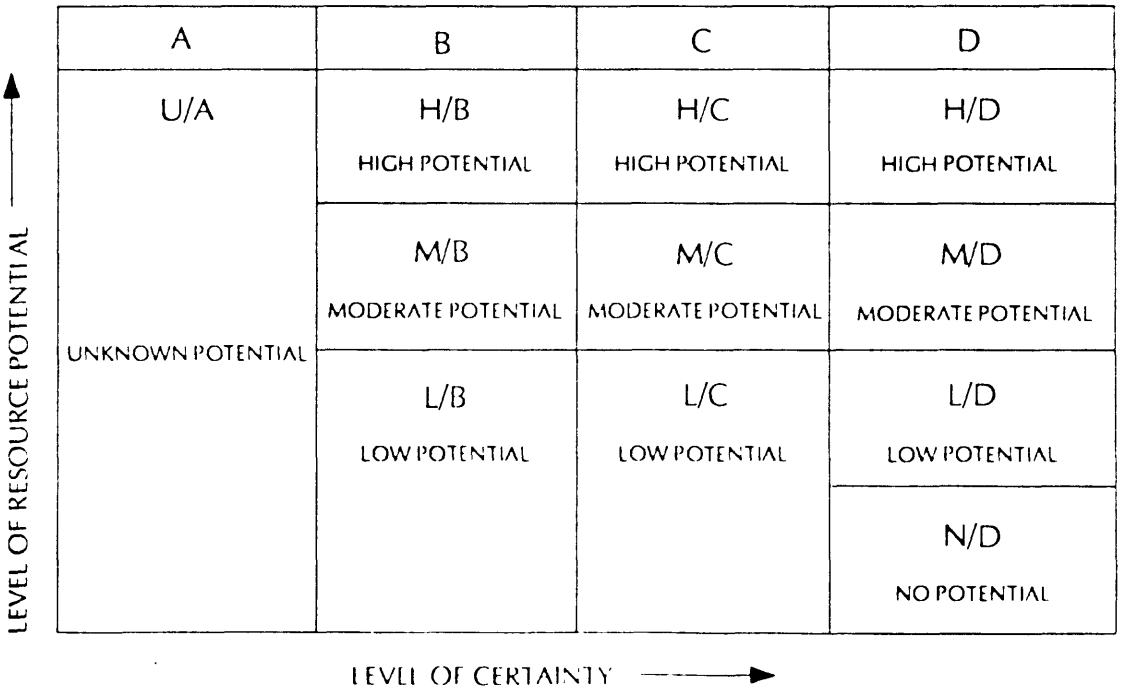
LEVELS OF CERTAINTY

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				
[2]pre-Archean		(3800?)			4550

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