UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Preliminary Report on the Mineral Resource Potential of the Red Rocks Escarpment Instant Study Area, Clark County, Nevada

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This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards.

Mineral Surveys
Related to Bureau of Land Management
Instant Study Areas

In accordance with the provisions of the Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976), the Geological Survey and the Bureau of Mines have conducted mineral surveys on certain areas, which formally had been identified as "natural" and "primitive" areas prior to November 1, 1975. This report discusses the results of a mineral survey of the Red Rocks Escarpment, Clark County, Nevada.

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Summary

Geologic and geochemical evidence indicate there are no mineral deposits in the Red Rocks Escarpment Instant Study area that are of economic importance. Evidence suggests that abundant and concentrated ore-forming solutions responsible for metallic mineral deposits in the Goodsprings district, south of the area, did not migrate along the Keystone thrust into the Instant Study area. The gypsum bed, mined at Blue Diamond mine and east of the study area, projects westward under the area at a depth of about 5,000 ft (1,500 m) and could not be mined from within the Instant Study area boundary.

Other commodities such as silica sand, cement rock, and sand and gravel are not important commodities of the study area due to their abundance and accessibility elsewhere.

Hydrocarbon and geothermal resources are not known within or near the Instant Study area, although no exploratory drilling for either resource has been conducted within the Instant Study area boundary. Also, there are no known seeps within the study area.

The absence of hot springs and intrusive igneous rocks indicate probable lack of geothermal resources in the Red Rocks area.

Introduction

The Red Rocks Escarpment Instant Study area in Clark County, Nevada, is 20 mi (32 km) west of Las Vegas and covers about 31,000 acres (12,500 ha) of the rugged Sandstone Bluffs area in the Spring Mountains (fig. 1). It includes the crest of the range, which is slightly higher than 7,200 ft (2,190 m), the Sandstone Bluffs east of the crest where steep cliffs as high as 2,500 ft (760 m) occur, and part of the gently sloping western range front. The Instant Study area (fig. 2) is within land administered by the U.S. Bureau of Land Management.

Geology

The structural geology of the study area is dominated by the north-south-trending Cretaceous and Tertiary(?) Keystone thrust, a low-angle fault along which lower Paleozoic carbonate rocks overlie Mesozoic clastic rocks (pl. 1). This thrust is one of the lowest and most southern of a series of thrusts of similar age within the Sevier thrust belt. The Keystone thrust is exposed in steep cliffs east of the crest of the Spring Mountains where dark-colored, resistant, upper-plate carbonate rocks in the highest peaks form a cap above more easily eroded, light-colored, lower-plate rocks.

The stratigraphy of the study area includes Cambrian through Permian marine-carbonate rocks, Permian nonmarine clastic and gypsiferous rocks, Triassic rocks, Triassic(?) and Jurassic eolian sandstone, Tertiary(?) nonmarine limestone, and Quaternary surficial deposits. Paleozoic rocks are exposed in the upper plate of the Keystone thrust in the western half of the area. Mesozoic rocks occur in the eastern half of the area beneath the Keystone thrust. Tertiary(?) nonmarine limestone rests unconformably on the Mesozoic beds in the southeast part of the area.

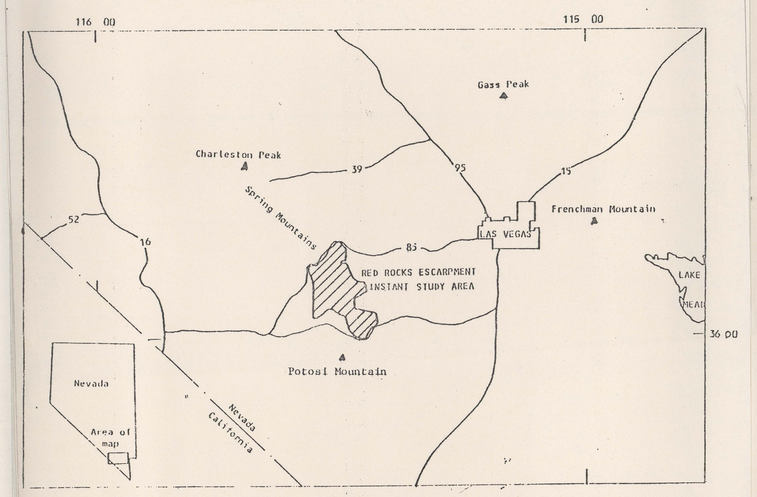

Figure 1.--Index map for the Red Rocks Escarpment Instant Study area.

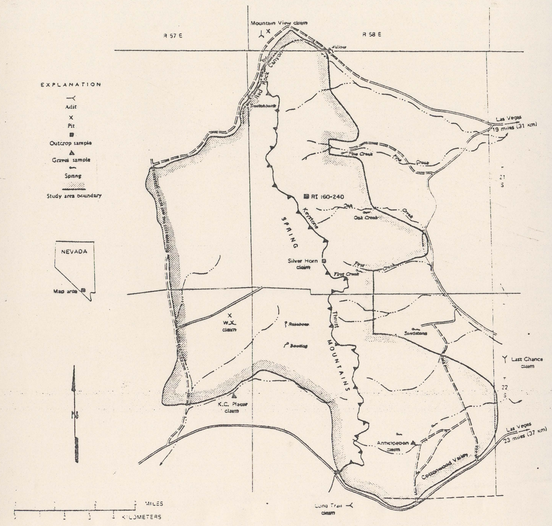

Figure 2.--Map of Red Rocks Escarpment Instant Study area, with localities and geologic features mentioned in Summary.

Geochemical samples were obtained from the study area by sampling recent alluvium in channels, streams, and canyon bottoms at roughly 1-mi (1.6-km) intervals. The results of sampling alluvial material suggest that no significant economic mineralized zones are present within the Red Rocks Escarpment Instant Study area. Semiquantitative spectrographic analysis did not detect any zinc, gold, or silver in any samples. Lead, copper, nickel, vanadium, and molybdenum were detected in some samples, but not in anomalous amounts. Atomic absorption analyses of alluvium samples were also low.

Several outcrop samples were taken from the gouge zone of the Keystone thrust to test the possibility that ore-forming solutions may have migrated along that thrust from the Goodsprings District. Samples of fault gouge from the Keystone thrust are not anomalously high. Semiquantitative spectrographic analyses indicate that only one sample, RI 160 24D, is slightly anomalous in copper, nickel, lead, and molybdenum.

A scintillometer was carried in the field to test for radioactive anomalies. Scintillometer readings were rarely above a background of about 50 counts per second, and no reading was higher than 150 counts per second.

Mines and prospects

Two important mining areas are located near the Red Rocks Escarpment Instant Study area. These are the Goodsprings mining district and the Blue Diamond mine. The Goodsprings district is about 12 mi (19 km) south of the southern border of the study area and occurs in the same age rocks and a similar structural setting. A major difference between the two areas is the abundance of Tertiary igneous rocks at Goodsprings. It is thought (Hewett, 1931) that the igneous rocks at Goodsprings played an important role in the development of the ore bodies there. Zinc, copper, lead, cobalt, vanadium, gold, nickel, silver, and uranium have been produced from the Goodsprings

district since 1907 (Hewett, 1931). The Blue Diamond mine, the other important mining area, 5 mi (8 km) to the east of the study area, produces gypsum from a member of the Kaibab Limestone (Longwell and others, 1965), which does not crop out within the Instant Study area boundary.

County records indicate that approximately 30 claims have been located within the study area, but none are currently being held. Claim location descriptions in the courthouse records were vague, and those shown on the sample locality map are only approximate (see fig. 2). No claim posts, monuments, or major workings were found while traversing the study area, although several sites described in the records were sampled and are located on the map. The only known mining activity took place about 1963. Fifty to 60 metric tons of thin-bedded sandstone were quarried as flagstone and used for decorative purposes (Nephi Hancock, oral commun., 1979). The site of this operation was not found during this study.

The Silver Horn claim contains a 1-ft by 2-in. (0.3-m by 5-cm) iron-oxide zone in a face of gray limestone. No anomalous metal values were found by analysis of this sample.

Anticipation and K.C. claims are along intermittent stream beds where gravel samples were taken to test for placer values. The K.C. claim is in the southwestern part of the study area, while the Anticipation claim is at the junction of two drainages in the southeastern part of the area. No claim corners were found in either area, and no evidence of any placer work was noted. Samples contained no detectable gold or silver.

Many circular depressions, ranging from 10 ft (3 m) to 70 ft (21 m) in diameter, occur within the western part of the study area. WX sample was from two such features and is shown on the map (fig. 2). These samples contained no metal values and no evidence of anomalous radioactivity.

There are two theories regarding formation of the circular depressions: The abundance of carbon at each depression suggests high temperatures and explosive impact on the local area of the depressions. Possibly these depressions are the result of a fireball or some other of meteoric impact. Or, these features may be prospect pits formed by burying dynamite at shallow depths and exploding it.

Mineral resources potential

Geologic and geochemical evidence (pl. 1) indicate there are no mineral deposits in the Red Rocks Escarpment Instant Study area that are of economic importance. Zinc, copper, lead, cobalt, vanadium, gold, nickel, silver, and uranium have been produced from the Goodsprings district south of the Instant Study area since 1907 (Hewett, 1931). Intrusive igneous rocks like those responsible for the metallic mineral deposits in the Goodsprings mining district are absent within the study area making it extremely unlikely that similar deposits will be found. Evidence suggests that abundant and concentrated ore-forming solutions did not migrate along the Keystone thrust from the Goodsprings district into the study area. The Blue Diamond mine, the other important mining area, 5 mi (8 km) to the east of the study area, produces gypsum from a member of the Kaibab Limestone (Longwell and others, 1965), which does not crop out within the study area boundary. The gypsum bed, mined at Blue Diamond mine, projects westward under the area at a depth of about 5,000 ft (1,500 m) and could not be mined from within the study area boundary. Gypsum is common and easily accessible at many nearby localities and need not be considered a resource of the study area. Likewise, other commodities such as silica sand, cement rock, and sand and gravel should not be considered important commodities of the study area due to their abundance and accessibility elsewhere.

Hydrocarbon and geothermal resources are not known within or near the study area, although, to our knowledge, no exploratory drilling for either resource has been conducted within the study area boundary. One dry hole was drilled in bedrock about 10 mi (16 km) west of the study area, and several dry holes have been drilled in Las Vegas Valley to the east (Schilling and Garside, 1968). Also, there are no known seeps within the study area. Although hydrocarbons have been extracted from the Railroad Valley oil field 180 mi (290 km) due north of the study area (Schilling and Garside, 1968), this field is within deep valley fill in a structural and stratigraphic setting very unlike that of the Red Rocks area.[1/] The absence of hot springs and intrusive igneous rocks indicate the lack of geothermal resources in the Red Rocks area.

[1/] Structural interpretations by Birchfiel and others (1974) indicate that the Keystone thrust dips steeply in the subsurface and offers very limited potential for development of structural traps in the study area, although these are known in other parts of the Sevier orogenic belt.

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