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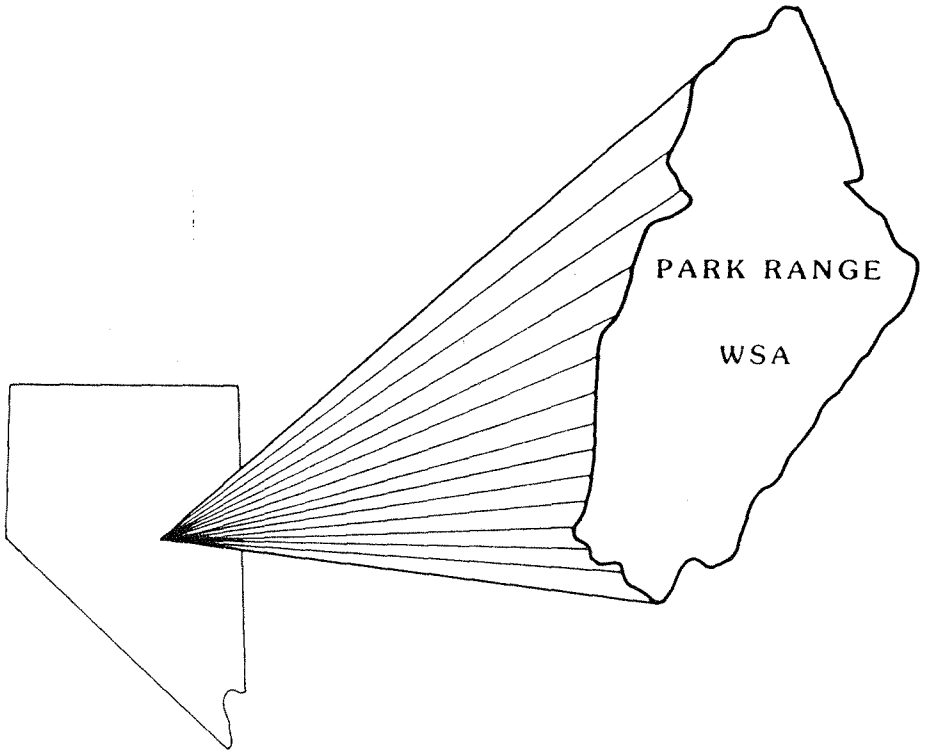
Open File Report

Mineral Resources of the Park Range Wilderness Study Area, Nye County, Nevada



BUREAU OF MINES
UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE PARK RANGE WILDERNESS STUDY AREA, NYE COUNTY, NEVADA

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UNITED STATES DEPARTMENT OF THE INTERIOR
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PREFACE

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 U.S. Bureau of Land Management administered land designated as Wilderness Study 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 Bureau of Mines mineral survey of the Park Range Wilderness Study Area (NV-040-154), Nye County, NV.

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, E. 360 Third Ave., Spokane, WA 99202. The report has been edited by members of the Branch of Mineral Land Assessment at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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SUMMARY

The Bureau of Mines, under Congressional mandate, conducted a mineral survey on the Park Range WSA (Wilderness Study Area) in 1984 and 1985. The WSA, located about midway between Tonopah and Ely, encompasses 47,268 acres. No mineral resources were delineated, nor were workings found, during the investigation. There has been, however, exploration in and near the north end of the study area. ASARCO is actively exploring a block of 41 claims for hot-spring type, low-grade, large-tonnage gold deposits. Their claim block is almost entirely in the study area. The Morey mining district, 7 miles southwest of the study area, produced silver and lesser amounts of gold and lead sporadically from the mid-1860's through the mid-1960's.

The WSA is underlain by Tertiary rhyolitic and latitic volcanic rocks and by Paleozoic sedimentary rocks. The Paleozoic rocks have been faulted, silicified, brecciated, and hydrothermally altered, and have anomalous concentrations of precious metals and pathfinder elements. Additional exploration in the north part of the Park Range WSA may lead to delineation of gold resources.

Extensive sand and gravel and stone deposits in the study area are suitable for many construction purposes; however, adequate material is available closer to major markets in the region. Oil and gas leases extend into the north part of the WSA, but are not evaluated in this report.

INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) portion of a cooperative study with the USGS (U.S. Geological Survey) to evaluate mineral resources and potential of the Park Range (NV-040-154) WSA (Wilderness Study Area). The USBM examined and evaluated mineralized zones; the USGS conducted broader geological, geochemical, and geophysical surveys.

Information from these mineral surveys relates to one aspect of the area's suitability for wilderness classification. Although the near-term goal is to provide data for land-use decisions, the long-term objective is to help ensure that the Nation has an adequate and dependable supply of minerals at reasonable cost.

Setting

The Park Range WSA encompasses 47,268 acres in central Nevada, about midway between Tonopah and Ely (fig. 1). It is bound on the west by the Antelope and Hot Creek Ranges, on the northeast by Little Smoky Valley, and on the southeast by Andesite Ridge (fig. 2). Elevations range from 9,131 ft (feet) near the center of the WSA to 6,400 ft at the south end. Dirt roads provide access to all sides of the study area. The semi-arid climate limits vegetation to grasses, sagebrush, mountain mahogany, juniper, and limber pine. Snowfall during the winter is usually light and would not impede access for more than short time intervals.

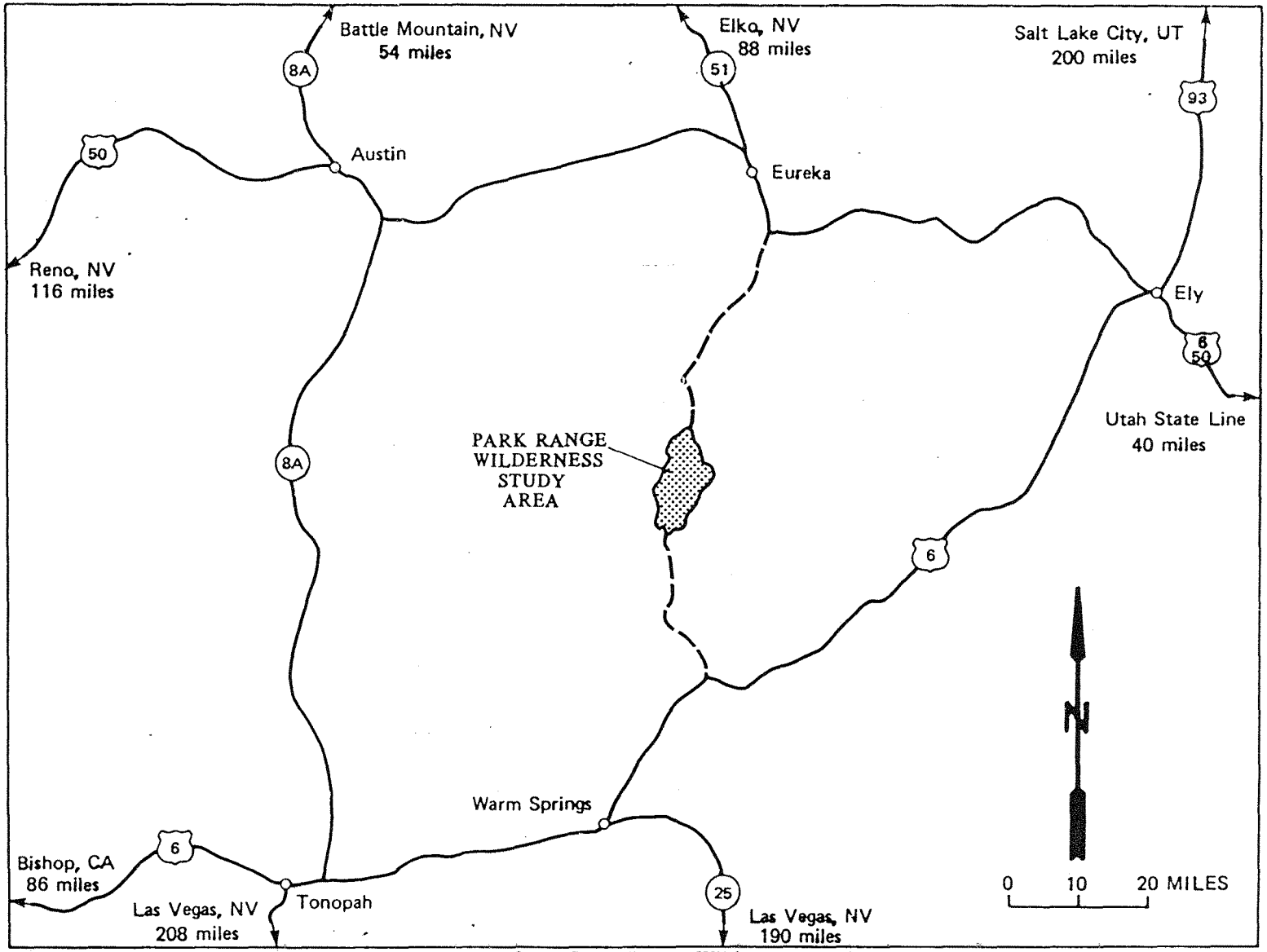

FIGURE 1. – Location of the Park Range Wilderness Study Area (NV-040-154), NV

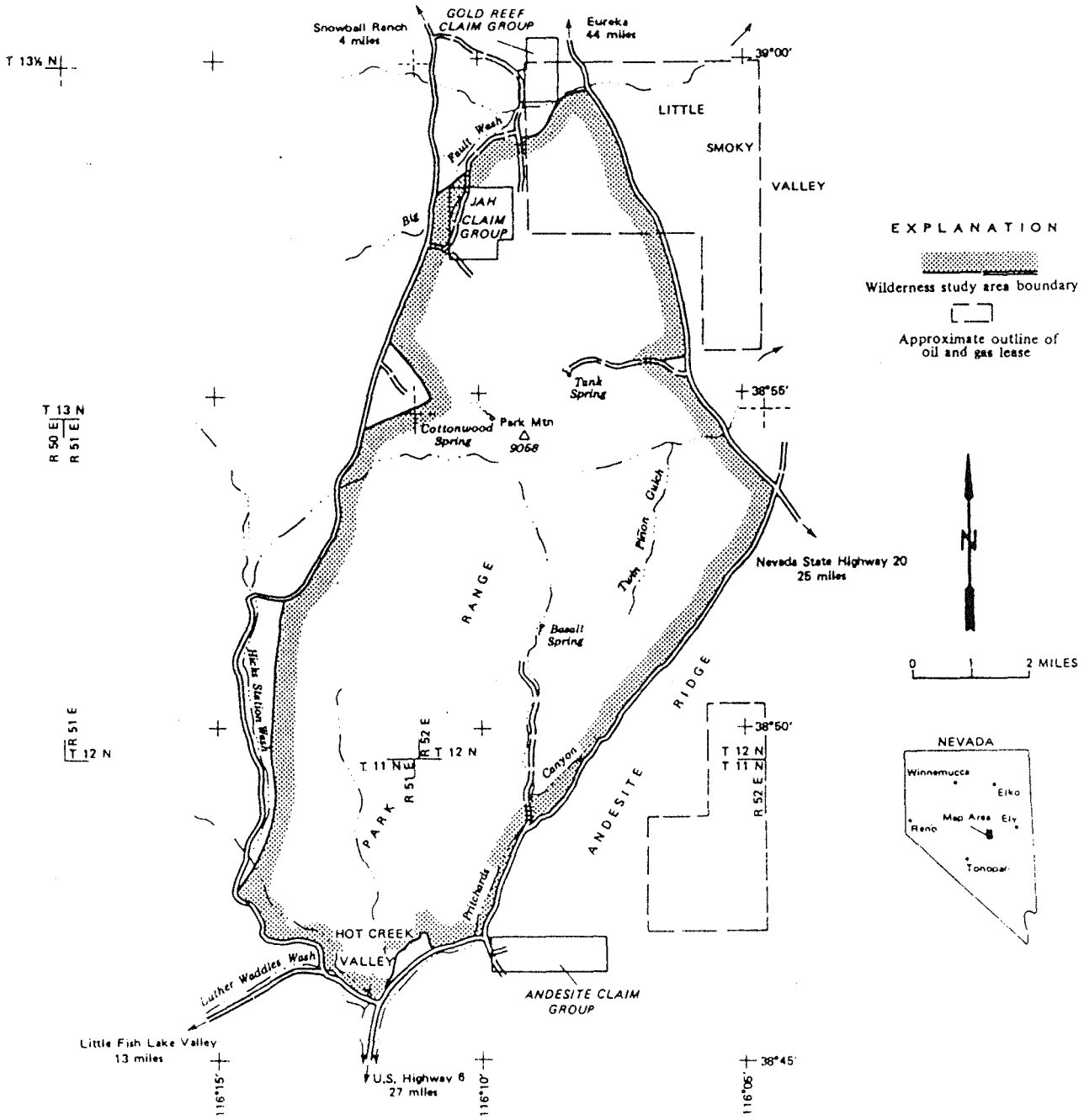

FIGURE 2. – Prospects, active mining claims, and mineralized areas in and adjacent to the Park Range Wilderness Study Area (NV-040-154), NV

Previous Studies

Some detailed work has been done in the WSA. Dixon and others (1972) mapped the geology in the Pritchards Station quadrangle, and Kleinhampl and Ziony (1967) mapped the geology of northern Nye County; both include the entire WSA.

The Tertiary history of Little Fish Lake Valley was studied in detail by Ekren and others (1974). In addition to stratigraphy, their report includes information about the Tulle Creek-Pritchards Station aeromagnetic lineament which passes just south and east of the WSA. The Morey mining district is located southwest of the south end of the WSA. Lenzer (1972) thoroughly discusses the district's rock formations, structural geology, and mineral deposits.

Present Study

During 1984 and 1985, personnel from the U.S. Bureau of Mines' Western Field Operations Center investigated the mineral resources of the Park Range WSA. All available information on geology, mining, and exploration in the area, including county mining claim records, was reviewed prior to field work.

Claimants were contacted, when possible, for permission to examine properties and publish the results. Field studies involved searches for all mines, prospects, and claims indicated by pre-field studies to be within the study area. Those found were examined and, where warranted, mapped and sampled. In addition, ground and air reconnaissance was done in areas of obvious rock alteration.

One hundred twenty-five samples were taken. They were of three types: 1) chip - a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2) random chip - an unsystematic series of chips taken from an exposure of apparently homogeneous rock; and 3) grab - rock pieces taken unsystematically from a dump or stockpile, or of float (loose rock lying on the ground). All samples were crushed, pulverized, mixed and split, and checked for radioactive and fluorescent minerals. Each sample was analyzed for gold and silver content by fire-assay and ICP (inductively coupled plasma) methods. The detection limit by these methods is 0.007 ppm (parts per million) gold and 0.3 ppm silver. One hundred samples were also analyzed for arsenic and mercury. The arsenic content was determined by ICP/atomic absorption methods. One of several special methods, determined by rock lithology and mercury concentration, was used for mercury analyses. The detection limit for arsenic and mercury by these methods is 2.0 ppm.

ACKNOWLEDGEMENTS

Mr. Bob Bennett, geologist with Long Lac Mineral Exploration (Texas), Inc., focused our efforts by familiarizing us with the rock formations, alteration, and mineralization at the Fandango deposit southwest of the WSA. ASARCO personnel were helpful in providing us with geologic

descriptions and maps of their claims in the north part of the area. We greatly appreciate pilot Jack Fulton, El Aero Services, Inc., for his expert flying ability and knowledge of the area.

GEOLOGIC SETTING

The Park Range Wilderness Study Area is in the Basin and Range province of central Nevada. The WSA covers an uplifted block, bounded by high angle faults on both its east and west sides. As defined by Tertiary volcanic flows, the block is tilted about 20° E.

The geology is dominated by volcanic rocks (fig. 3), chiefly those of the Oligocene Windous Butte Formation. This formation consists of rhyolitic welded tuff that grades upward to quartz latite (Ekren and others, 1974). Kleinhampl and Ziony (1967) dated the Windous Butte at between 33 and 35.3 m.y. (million years) while Gromme and others (1972) concluded that the formation was 30.7 m.y. old. These volcanic rocks are inferred to have been extruded from a caldera complex and area of volcanic subsidence about 40 mi (miles) long (north to south) and 30 mi wide (east to west) (U.S. Geological Survey, 1970). This complex extends to within 2 mi of the south end of the WSA (Ekren and others, 1973).

Sedimentary rocks, generally Paleozoic sandstone, siltstone, mudstone, limestone, dolomite, quartzite, and chert, outcrop at the north end of the WSA (Dixon and others, 1972).

The Tulle Creek-Pritchards Station lineament, an east-west aeromagnetic discontinuity, runs from Tulle Creek in the Monitor Range, east across the Antelope Range, and south and east of the Park Range (Ekren and others, 1974). At Tulle Creek, the lineament coincides with a major east-west fault (Ekren and others, 1974). In the Pritchards Station quadrangle, it coincides with an east-trending, left-lateral, transcurrent fault (Dixon and others, 1972). The Andesite claim group appears to be located along this lineament.

MINING HISTORY

The Morey mining district, about 7 mi southwest of the WSA, is the nearest area having recorded production. The first discovery there was in 1865 and the district was organized in 1866. Silver, along with small amounts of gold and lead, was produced sporadically until about 1966. The district was most active from 1866 to 1891 and from 1937 to 1947; total production is valued at less than $1 million (Kleinhampl and Ziony, 1984).

Exploration activity in the Park Range Wilderness Study Area has been low. A search of Nye County and Bureau of Land Management mining records revealed that only one block of active mining claims and no historical claims were located in the WSA. Many of the location descriptions for the historical claims, however, are very vague and some could have been located in the WSA. Oil and gas leases extend into the north part of the WSA, but are not evaluated in this report.

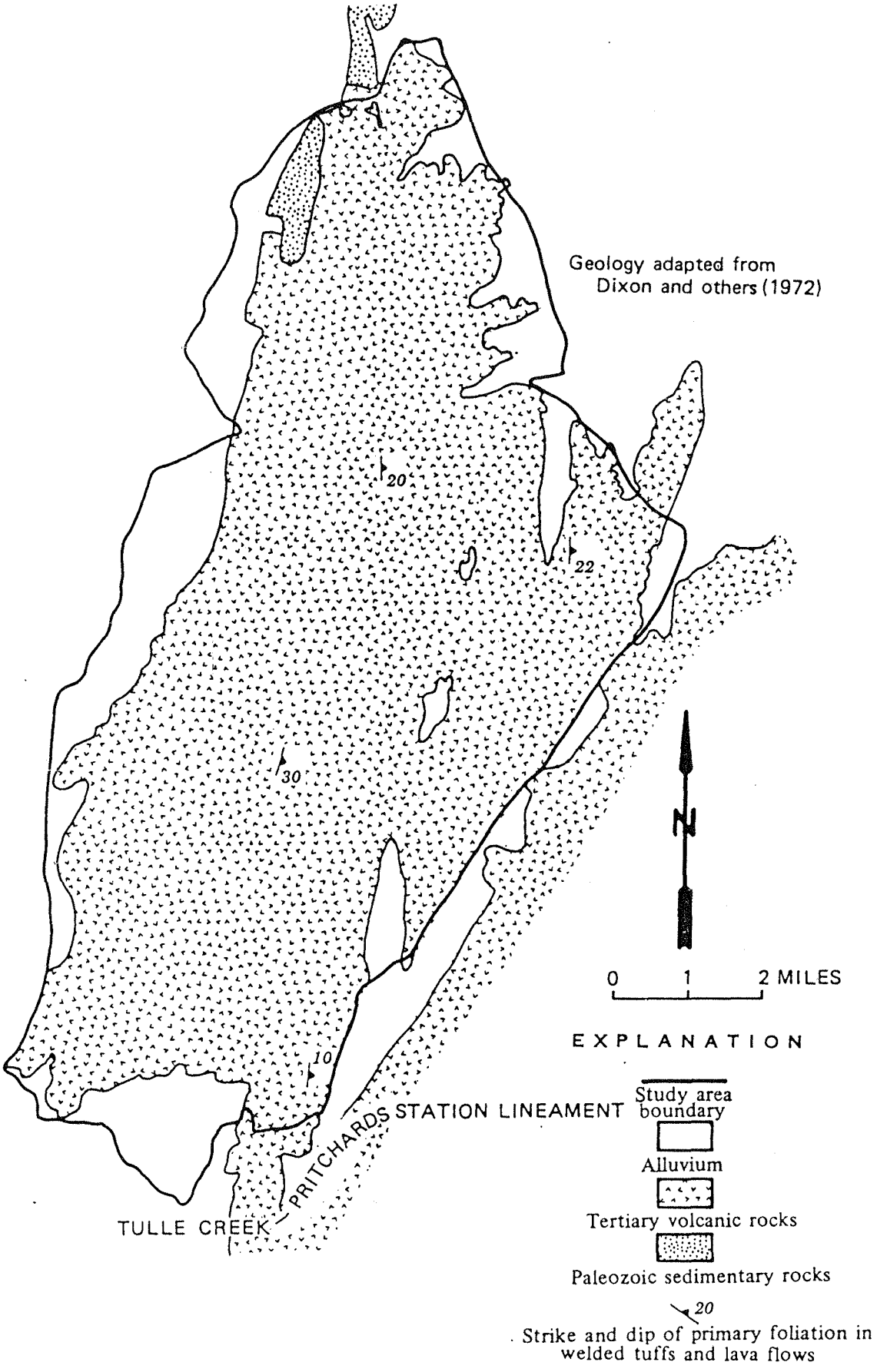

FIGURE 3. — Generalized geologic map, Park Range Wilderness Study Area (NV-040-154), NV

The active claim block (JAH claims) is held by ASARCO. They are actively exploring the area for hot-spring type, large tonnage, low-grade gold deposits. Their exploration program has included detailed geologic mapping and geochemical sampling.

Another active claim group (Andesite claims) held by Amselco (American Selco, Inc.), is located near the southeast edge of the WSA. They are also exploring for hot-spring type gold deposits. Their exploration program to date has been limited to geochemical sampling.

CLAIMS AND MINERALIZED AREAS

The JAH claim area has many of the features stated by Silberman (1982) to be associated with hot-spring-type, precious metal deposits. Those features are: 1) complex high-angle structures (caldera rim fracture zones and Basin and Range-type faulting); 2) strike-slip faults with high-angle splays near where there has been felsic volcanic activity; 3) areas of complex volcanic centers with a variety of flow rocks; 4) evidence of thermal spring activity, such as wide silicified zones; 5) argillically altered rock with alunite; 6) zones of stockwork quartz veins, particularly veins that are thin and discontinuous; 7) signs of repeated fracturing, veining, and brecciation; and 8) anomalous concentrations of gold, silver, arsenic, and mercury.

The south and east parts of the JAH claims are generally underlain by Tertiary andesite, dacite, ash, and tuff (fig. 4). In the southwest part of the claimed area, a light-colored ash bed is overlain by conglomerate containing angular and rounded clasts of limestone, chert, quartzite, and dolomite. The clasts are well cemented with sand, silt, and calcite. Locally, quartz crystals to 2 mm (millimeters) occur in the matrix.

The central part of the claim group is underlain by Paleozoic limestone, dolomite, quartzite, siltstone, and sandstone. The dolomite is generally arenaceous and locally contains quartzite clasts to 6 inches in diameter. All rocks have been faulted, brecciated, acid leached, and, locally, silicified. Silicification in many instances destroyed much of the original rock texture forming jasperoid. Hematite and limonite stains appear heaviest in the jasperoid areas. Barite was also found associated with the jasperoid.

Seventy-five samples were taken in the JAH claim area (fig. 5). Five (7%) contained gold, twenty-one (28%) contained silver, twenty-one (28%) contained anomalous arsenic (> 50 ppm), and nine (12%) contained mercury. Values were as much as 0.145 ppm gold, 8.529 ppm silver, 2800 ppm arsenic, and 4 ppm mercury. Those samples containing gold, silver, and mercury, and anomalous arsenic, clearly define a central "core" area on the JAH claims. Complete descriptions and analyses for these samples are available at the Bureau of Mines' Western Field Operations Center.

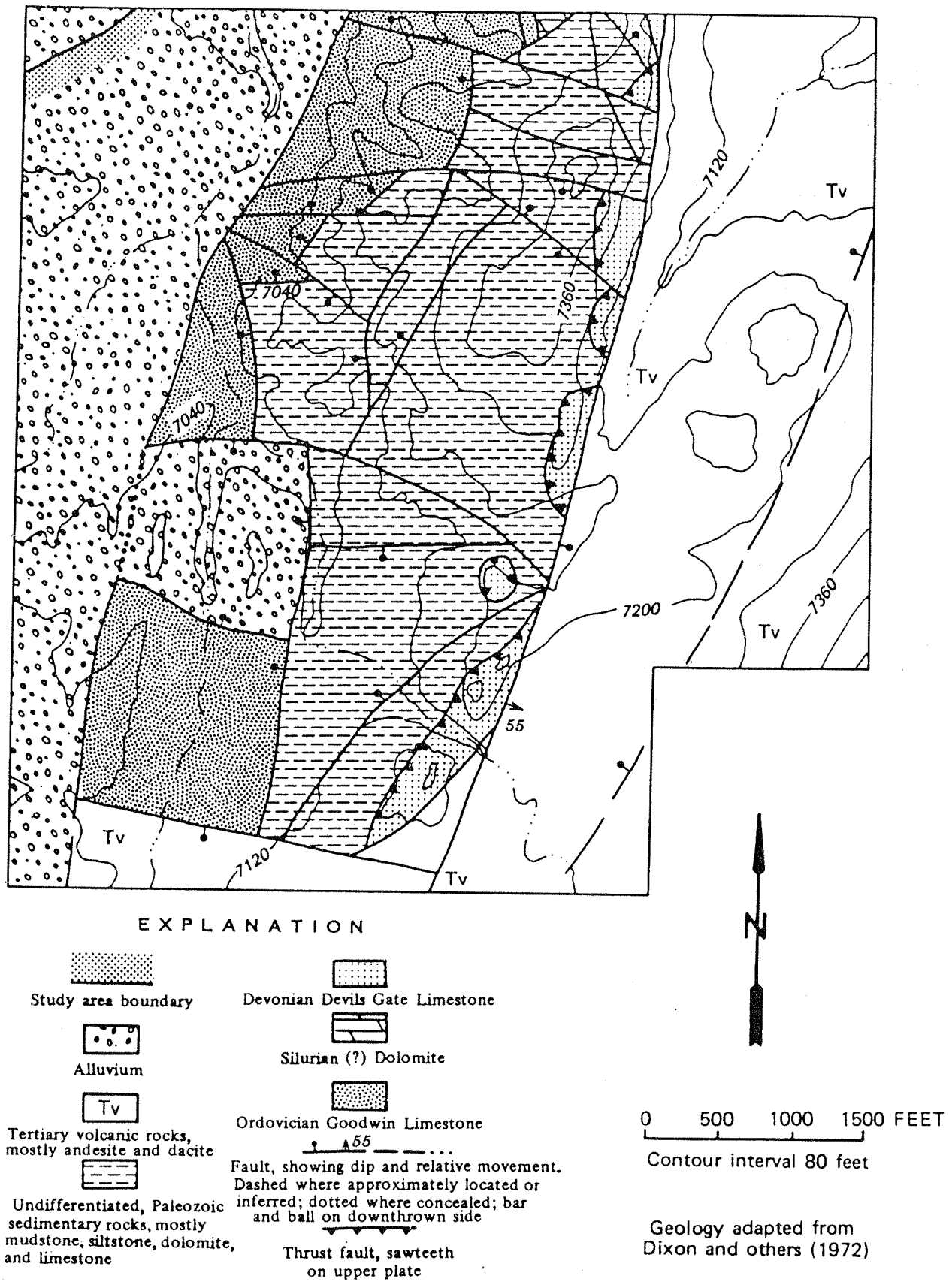

FIGURE 4. – Geologic map of the JAH claim area

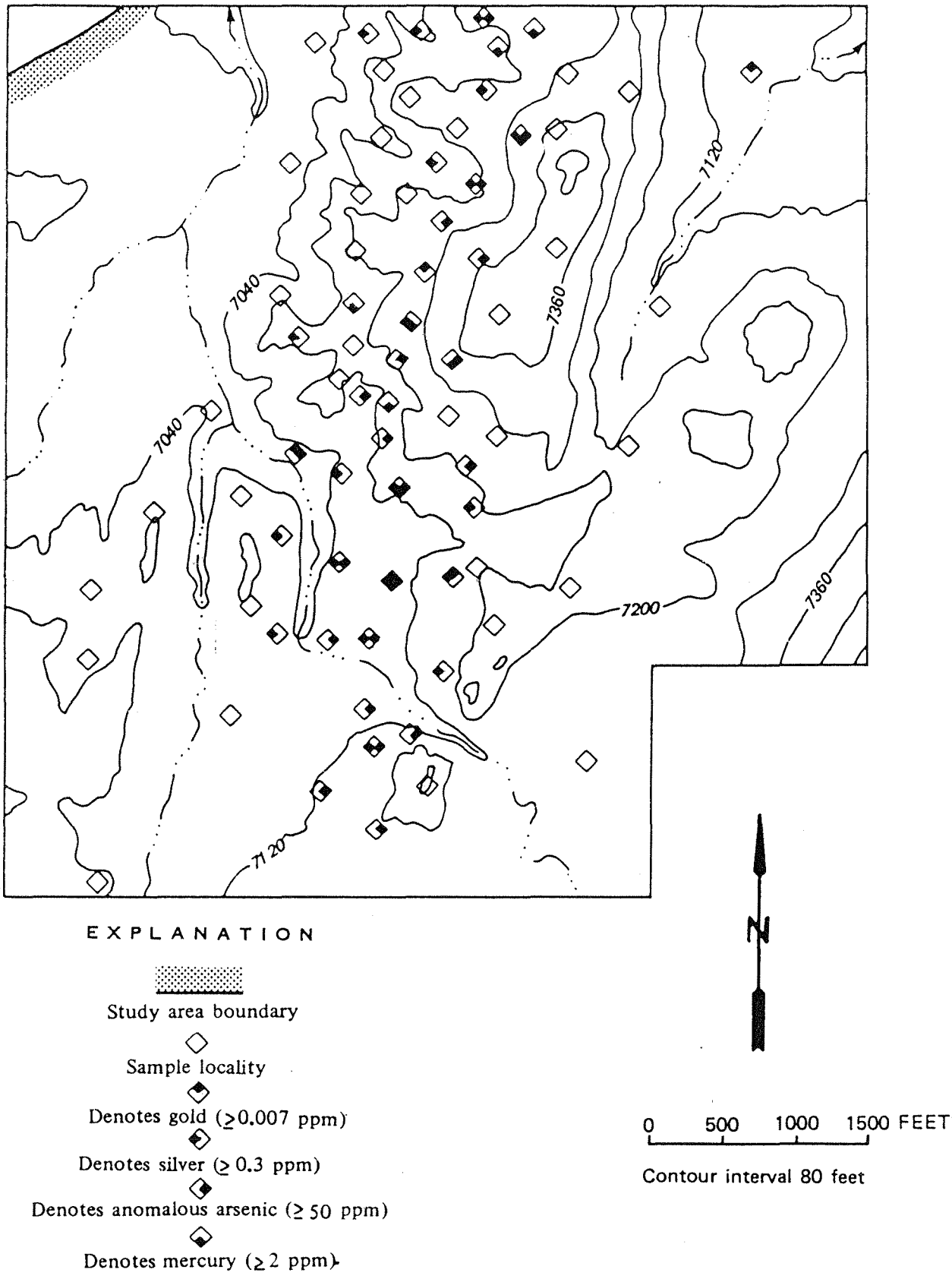

FIGURE 5. – Sample locations, JAH claim area

APPRAISAL OF MINERAL DEPOSITS

Although no resources were identified in the Park Range WSA during this study, the JAH claim area exhibits many of the favorable criteria for hot-spring type, large tonnage, low-grade gold deposits. The development of heap leaching gold recovery methods, combined with historically relatively high gold prices [about $350/oz (ounce)] and depressed prices for other metals, have made deposits of this type the current vogue in mining. Most new domestic mine openings, many of them in Nevada, have been on deposits of this type which exceed 1 million tons in size and 0.03 oz gold per ton (1.0 ppm) in grade.

Extensive sand and gravel and stone deposits in the study area are suitable for many construction purposes. However, transportation cost to current markets, a major part of total production cost for these high bulk - low unit value commodities, would far exceed the value. Adequate material is available closer to major markets in the region.

RECOMMENDATIONS FOR FURTHER WORK

The north part of the Park Range Wilderness Study Area warrants additional work. Those areas determined to contain anomalous concentrations of gold, silver, arsenic, mercury, thallium, or antimony should be resampled (both rock chip and soil) on a closely-spaced grid system. Areas with favorable results from resampling should be drilled.

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