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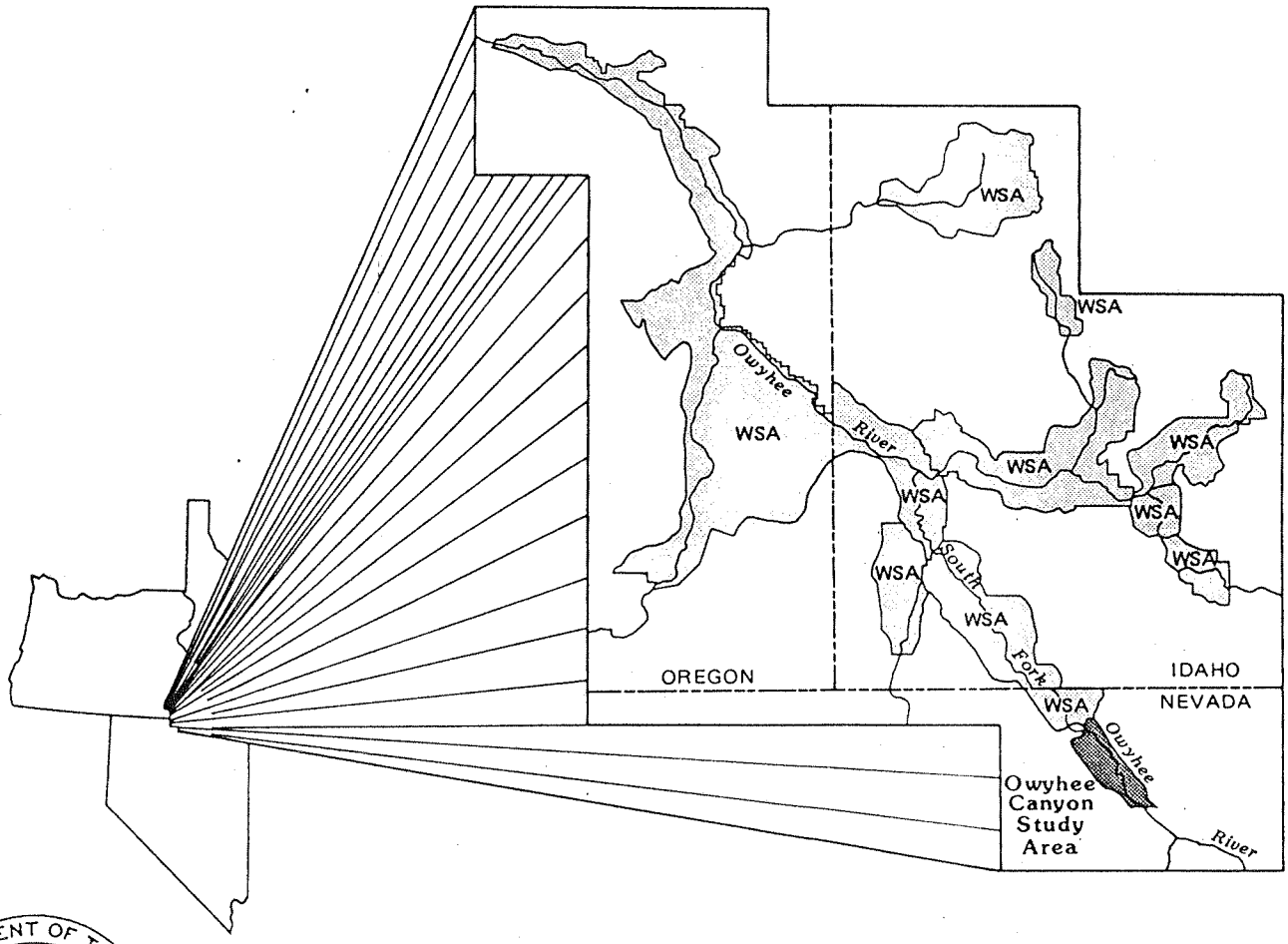
Open File Report

Mineral Resources of the Owyhee Canyon Study Area, Elko County, Nevada



BUREAU OF MINES

UNITED STATES DEPARTMENT OF THE INTERIOR

MINERAL RESOURCES OF THE OWYHEE CANYON STUDY AREA, ELKO 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 (WSA) ". . .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 northern portion of the Owyhee Canyon Wilderness Study Area (NV-010-106), Elko 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, East 360 Third Avenue, 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.

CONTENTS

ILLUSTRATIONS

SUMMARY

A mineral survey of a 13,525-acre portion of the 21,875-acre Owyhee Canyon Wilderness Study Area in northern Nevada was conducted by the U.S. Bureau of Mines in 1984.

Two samples from sand and gravel deposits in the study area contained minor placer gold typical of the Owyhee River area. The gold-bearing gravels are too low grade or of insufficient volume to support commercial placer mining operations. The sand and gravel deposits might have minor local construction uses.

Volcanic rocks that may be used as dimension stone occur in the study area, but do not have unique properties that would make them preferable to other, more accessible deposits closer to markets.

No mining claims have been located in the study area, nor have any minerals been produced. Oil and gas leases and lease applications cover a portion of the north end of the study area; no drilling has been done.

INTRODUCTION

A mineral survey of a portion of the Owyhee Canyon Wilderness Study Area (WSA) 1/ in north-central Nevada was conducted by the U.S. Bureau of Mines (USBM) and the U.S. Geological Survey (USGS) at the request of the U.S. Bureau of Land Management (BLM). Bureau of Mines personnel researched the mining and mineral exploration history and searched within and adjacent to the study area for unrecorded claims, prospects, and mineralized areas. The USGS studied the area by regional geochemical and geophysical surveys and geological mapping. Results of these investigations will be used to assist in determining the suitability of the study area for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure that the Nation has an adequate and dependable supply of minerals at reasonable cost.

Setting

The 13,525-acre Owyhee Canyon study area is about 90 miles (mi) northwest of Elko, NV, and 130 mi south of Boise, ID (fig. 1). It encompasses 12 mi of the northwest-flowing South Fork Owyhee River, including its canyon and adjoining upland for about 0.3 to 3 mi on either side (fig. 2).

1/ A WSA is a roadless area or island that has been inventoried by the U.S. Bureau of Land Management and found to have wilderness characteristics as described in section 603 of the Federal Land Policy and Management Act.

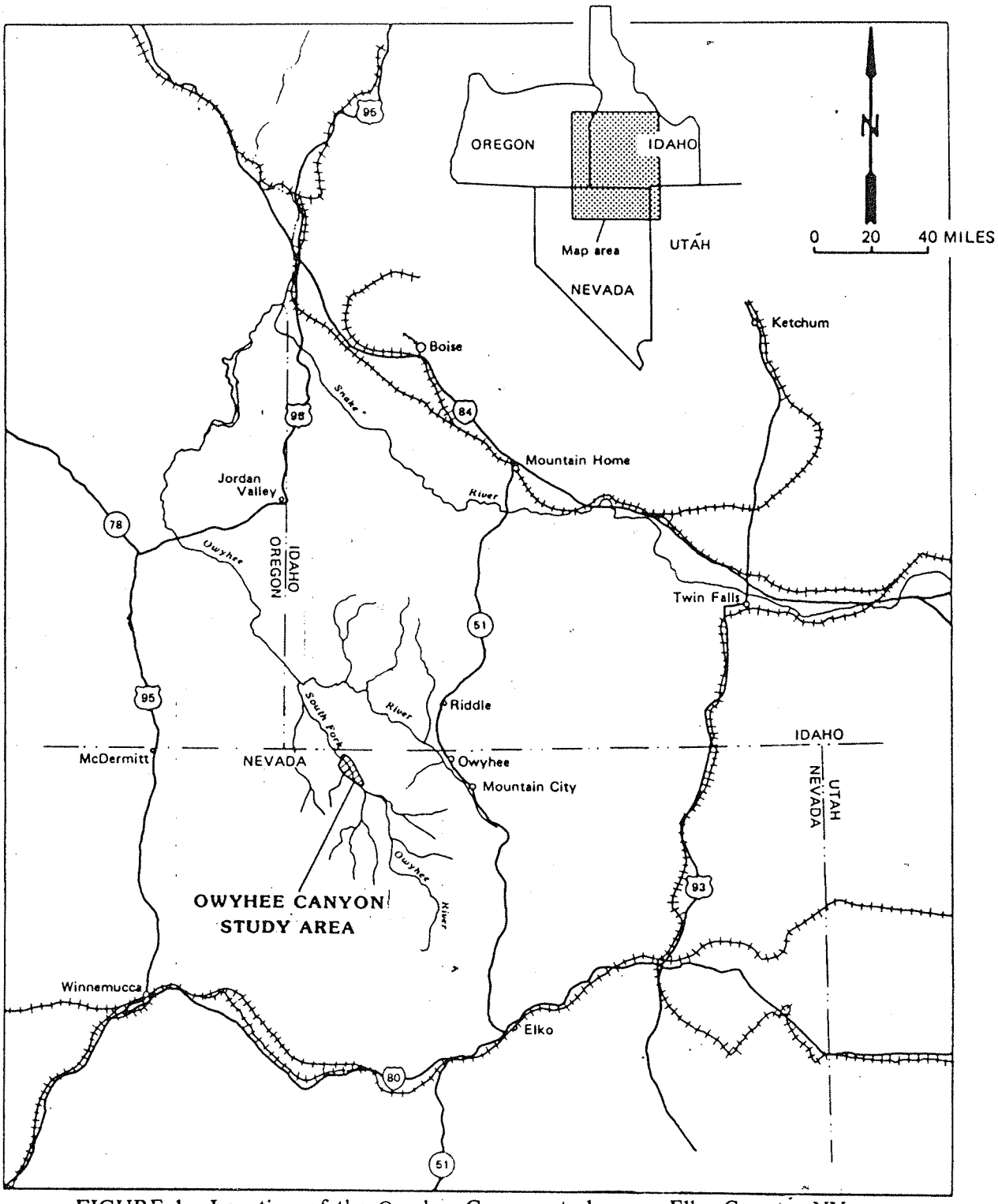

FIGURE 1.–Location of the Owyhee Canyon study area, Elko County, NV

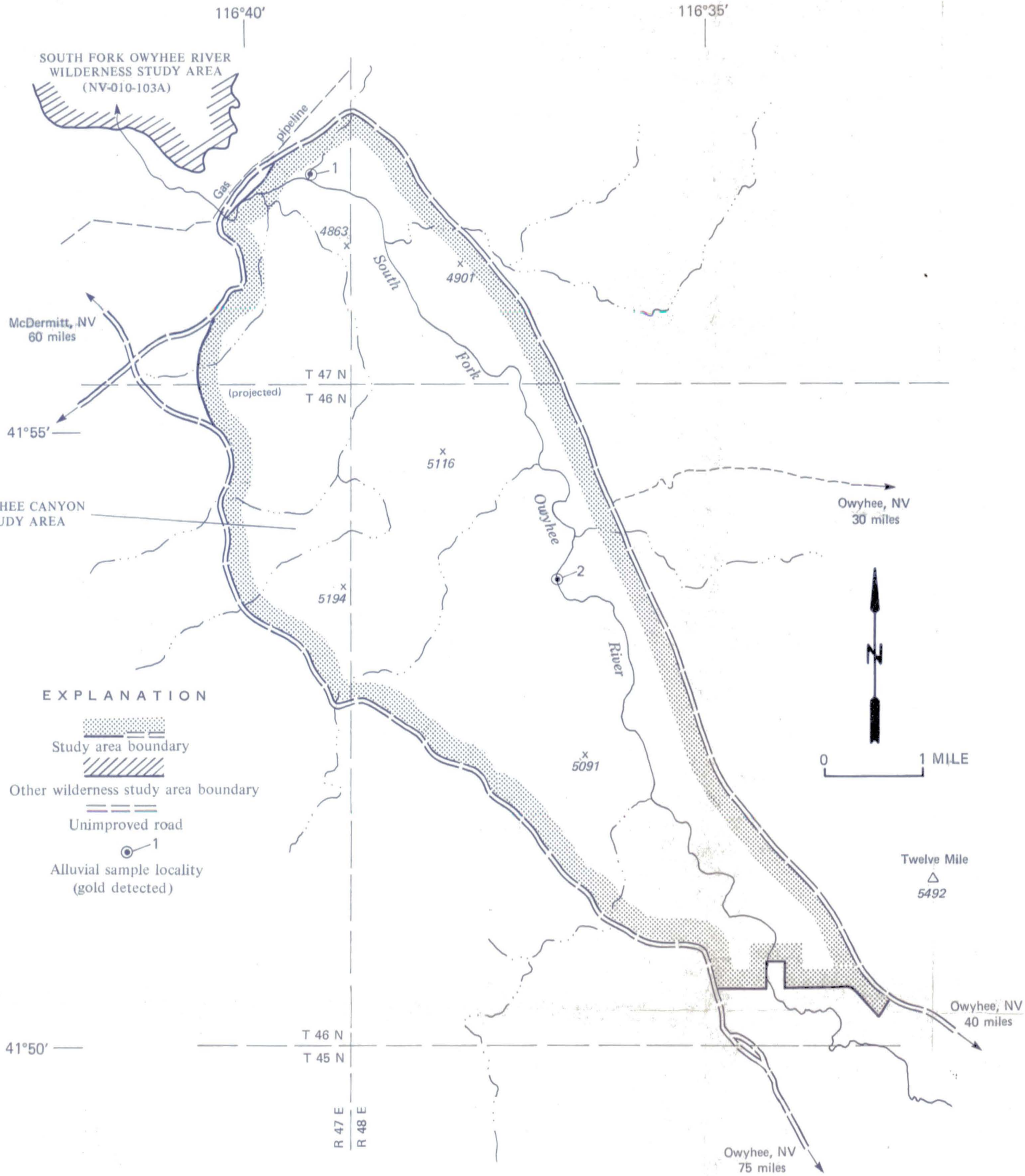

FIGURE 2. – Placer sample localities in the Owyhee Canyon study area

Access from Owyhee, NV, is westerly 30 mi by dirt road to the southeastern corner of the study area. From there, graded and ungraded dirt roads bound the east side. The western portion of the area can usually be reached during the drier parts of the year by fording the river at both the northern and southern ends. Other access to the western portion is by dirt road easterly about 60 mi from McDermitt, NV. Precipitation from spring and summer thunderstorms can easily make road access difficult, if not impossible, for a day or two following the rainfall.

The Owyhee Canyon study area is separated by a utilities corridor from the southern (Nevada) portion of the South Fork Owyhee River WSA which was studied concurrently (Mayerle and Gabby, 1985).

The study area is within the Owyhee Uplands, an uplifted volcanic region and part of the Columbia-Snake River Plateau. The terrain is flat to gently rolling, with an average elevation of about 5,100 feet (ft), except where the South Fork Owyhee River and its intermittent tributaries have cut deep canyons. Relief from the canyon rim, which in many places is nearly vertical, to the river ranges from about 300 to about 450 ft. The highest point in the study area, 5,281 ft, is down-slope from the Twelve Mile volcano (5,492 ft) at the southeast corner of the study area. (This topographic high is apparently one of several shield volcanoes in the region. They all have slopes of only a few degrees and rise only a few hundred feet above the surrounding terrain.) The lowest point, about 4,660 ft, is on the river at the northwest boundary of the study area.

Sagebrush, desert grasses, and a few scattered juniper trees grow in the area. Average annual precipitation is less than 10 inches (in.) per year, falling primarily between October and April. Summer months are hot with temperatures often exceeding 100°F. Most precipitation comes during the winter months, primarily as snow.

Previous Studies

There have been few geological studies in the general vicinity of the study area; most were broad, regional studies or have been for distant mineral-producing areas. Studies of the geology of the area include those by Hope and Coats (1976), Ekren and others (1981; 1984), and by various authors in Bonnichsen and Breckenridge (1982). Previous studies of the geology, energy, and mineral (GEM) resources of the WSA were by Mathews and Blackburn (1983). Reports on uranium potential for lands including the study area were prepared for the Department of Energy during their National Uranium Resource Evaluation (NURE) program, by Geodata International, Inc. (1980), Bendix Field Engineering, Corp. (1982), and Union Carbide Corp. (1982).

Present Study

Work by the USBM entailed pre-field, field, and report preparation phases. Pre-field studies, included library research and perusal of Elko County, NV, and BLM mining and mineral lease records, and a search of USBM production records. The area was searched by ground and aerial reconnaissance for evidence of prospecting activity or areas of mineral alteration where prospecting would most likely have occurred.

Two placer samples were collected. Each consisted of one level 14-in. panful of surficial sand and gravel partially concentrated on site to check for presence of visible gold or other heavy minerals. The panned samples were further concentrated on a laboratory-size Wilfley table. Resulting heavy mineral fractions were scanned with a binocular microscope to determine heavy mineral content; all gold detected was of very fine size and was recovered by amalgamation. Concentrates were also checked for radioactivity and fluorescence.

ACKNOWLEDGEMENTS

The authors are grateful to Tom Seiner, BLM Range Conservationist, who provided aerial photographs and much useful data, and to John Benedict, BLM Outdoor Recreation Planner, who guided a raft trip down the South Fork Owyhee River.

GEOLOGIC SETTING

The study area is within the Owyhee Upland subprovince of the Columbia-Snake River geologic province, an extensive volcanic plateau. Rocks exposed in the area are primarily Miocene, bimodal volcanic rocks with interbedded, lacustrine (lake) sediments (Hope and Coats, 1976, map).

The oldest rocks are ignimbrites, rhyolitic tuffs, and sedimentary rocks of the Idavada Formation found in or near the northwest corner of the study area. The sedimentary rocks, as well as the lacustrine materials, are overlain by basalts of the Banbury Formation which form the rims of the canyons (Hope and Coats, 1976, map).

APPRAISAL OF MINERAL RESOURCES

No mining claims have been located in the area, nor have any minerals been produced. Oil and gas leases and lease applications cover a portion of the north end of the study area; no resources of either energy source has been identified.

Minor gold (less than $\$0.02/yd^3$) was found in sand and gravel deposits. The placer gold is microscopic in size, and the occurrences are too low grade and too discontinuous, and in deposits of insufficient volume to be of commercial value. The probable source is from gold-bearing areas about 30 mi to the southeast in the headwaters of the South Fork Owyhee River in north-central Nevada. The sand and gravel occur as bars along the river and streams. The deposits are limited but

might have minor local construction uses. Volcanic rocks that may be used as dimension stone are widespread in the study area, but do not have unique properties that would make them preferable to other more accessible deposits closer to markets.

Regionally, zeolites occur in altered rhyolites, and diatomite occurs in lacustrine sediments. Although deposits of these materials are nearby (Buehler and Capstick, 1985) and in a related geological environment, no occurrences of zeolite or diatomite were found in the study area. Likewise, no jasper, chalcedony, or common opal were found in outcrops, although the geologic environment of the study area is also similar to that of adjacent or nearby wilderness study areas where these materials have been found (Buehler and Capstick, 1985).

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