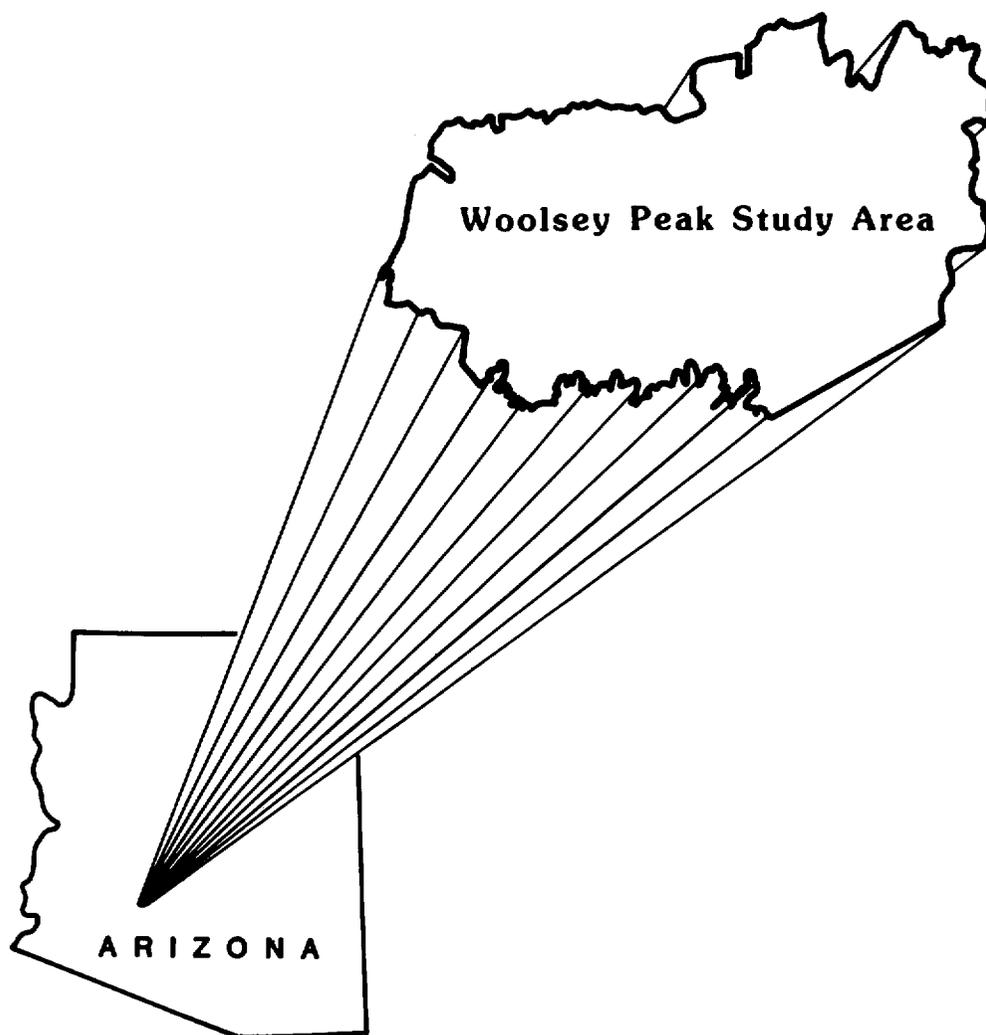


**MLA** 46-86

Mineral Land Assessment  
Open File Report/1986

**Mineral Investigation of a Part of the Woolsey  
Peak Wilderness Study Area (AZ-020-142/144),  
Maricopa County, Arizona**



**BUREAU OF MINES  
UNITED STATES DEPARTMENT OF THE INTERIOR**

MINERAL INVESTIGATION OF A PART OF THE WOOLSEY PEAK WILDERNESS  
STUDY AREA (AZ-020-142/144), MARICOPA COUNTY, ARIZONA

by

John R. McDonnell, Jr.

MLA 46-86  
1986

Intermountain Field Operations Center  
Denver, Colorado

UNITED STATES DEPARTMENT OF THE INTERIOR  
Donald P. Hodel, Secretary

BUREAU OF MINES  
Robert C. Horton, Director

## PREFACE

The Federal Land Policy and Management Act of 1976 (Public Law 94-579) requires the U.S. Geological Survey and the 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 a part of the Woolsey Peak Wilderness Study Area (AZ-020-142/144), Maricopa County, Arizona.

This open-file report summarizes the results of a Bureau of Mines wilderness study. The report is preliminary and has not been edited or reviewed for conformity with the Bureau of Mines editorial standards. This study was conducted by personnel from the Branch of Mineral Land Assessment (MLA), Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

°C	degree Celsius
ft	foot
lb	pound
mi	mile
oz/st	troy ounce per short ton (2000 pounds)
ppm	part per million
%	percent

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SUMMARY

In March and April 1985, the Bureau of Mines conducted a mineral investigation of the Woolsey Peak Wilderness Study Area in southwestern Maricopa County, Arizona, as required by Public Law 94-579. The wilderness study area comprises 73,930 acres, of which the Bureau studied 61,000 acres designated preliminarily suitable for inclusion in the National Wilderness Preservation System by the Bureau of Land Management. The investigation included a review of literature concerning mineral occurrences and mining activity, and a field examination of mines, prospects, and mineral occurrences inside and within 2 mi of the study area.

No mineral resources were identified in the study area. Trace to low values of gold, silver, copper, lead, manganese, niobium (columbium), platinum group metals, tantalum, thorium, titanium, uranium, yttrium, and zinc have been reported or were detected in a granite that extends into the study area, which suggests that these metals could occur inside the study area.

No geothermal or oil and gas resources are known inside the study area and the area is not considered favorable for their discovery and development.

INTRODUCTION

In March and April 1985, the Bureau of Mines, in cooperation with the U.S. Geological Survey (USGS), conducted a mineral investigation of a part of the Woolsey Peak Wilderness Study Area (WSA), Maricopa County, Arizona, on lands administered by the Bureau of Land Management (BLM) Phoenix District

Office. The WSA comprises 73,930 acres; the Bureau of Mines study focused on 61,000 acres designated preliminarily suitable for inclusion in the National Wilderness Preservation System by the BLM. "SA", as used in this report, refers only to the smaller acreage studied by the Bureau. The Bureau surveys and studies mines, prospects, and mineral occurrences to appraise reserves and identified subeconomic resources. The USGS assesses the potential for undiscovered mineral resources based on regional geological, geochemical, and geophysical surveys. This report presents the results of the Bureau of Mines study, which was completed prior to the USGS assessment; the USGS will publish the results of their studies. A joint USGS-Bureau report, to be published by the USGS, will integrate and summarize the results of both surveys.

#### Method of investigation

This investigation included a review of literature related to the mineral occurrences and mining activity in the Woolsey Peak SA and vicinity. Mining claim information and land status plats were obtained from the BLM State Office in Phoenix, Arizona. Minerals information and production data were assembled from Bureau of Mines files and other sources.

Two Bureau geologists conducted an eight-day field examination of mines, prospects, and known mineral occurrences inside and within 2 mi of the SA boundary. The examination included reconnaissance by fixed-wing aircraft, four-wheel-drive vehicle, and foot traverses across the area. Mining claim locations were examined and prospects within the study area were surveyed by tape and compass, mapped, and sampled.

Thirty-five samples (5 from within the SA), including chip, select, grab, and stream-sediment samples, were collected from workings and mineralized areas. Selected samples were analyzed by fire assay for gold and silver; by

fire assay combined with inductively coupled plasma-atomic emission spectrometry (ICP) for gold, silver, palladium, and platinum; by atomic absorption spectrophotometry for lead; by X-ray fluorescence for niobium (columbium) and tantalum; by ICP for copper, manganese, lead, and zinc; and by fluorometric analysis for uranium. Analysis for 40 elements by semiquantitative optical emission spectrography was also performed to disclose any unsuspected element concentrations. Sample data are summarized in tables 2-4 in this report; complete data for samples are available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

#### Geographic and geologic setting

The Woolsey Peak SA is in southwestern Maricopa County, Arizona, about 11 mi northwest of Gila Bend (fig. 1). The area is bounded on the south by the Painted Rock Reservoir, and by roads, state land, and private land elsewhere. The study area is at the southeast end of the Gila Bend Mountains and includes Woolsey Peak, Bunyan Peak, Spring Mountain, and the alluvial slopes between them. Elevations range from about 560 ft along the western boundary to 3,171 ft on Woolsey Peak. Access is by unimproved roads from Old U.S. Highway 80 (fig. 1); four-wheel-drive roads and foot trails provide access within the study area.

The study area is in the Basin and Range physiographic province. Rocks within the area are Precambrian granite, mid-Tertiary andesites, Quaternary-Tertiary basalts, and eroded sediments (Krason and others, 1982).

#### MINING HISTORY

The Woolsey Peak SA is not in any organized mining district and there has been no recorded mineral production from within the study area. The study

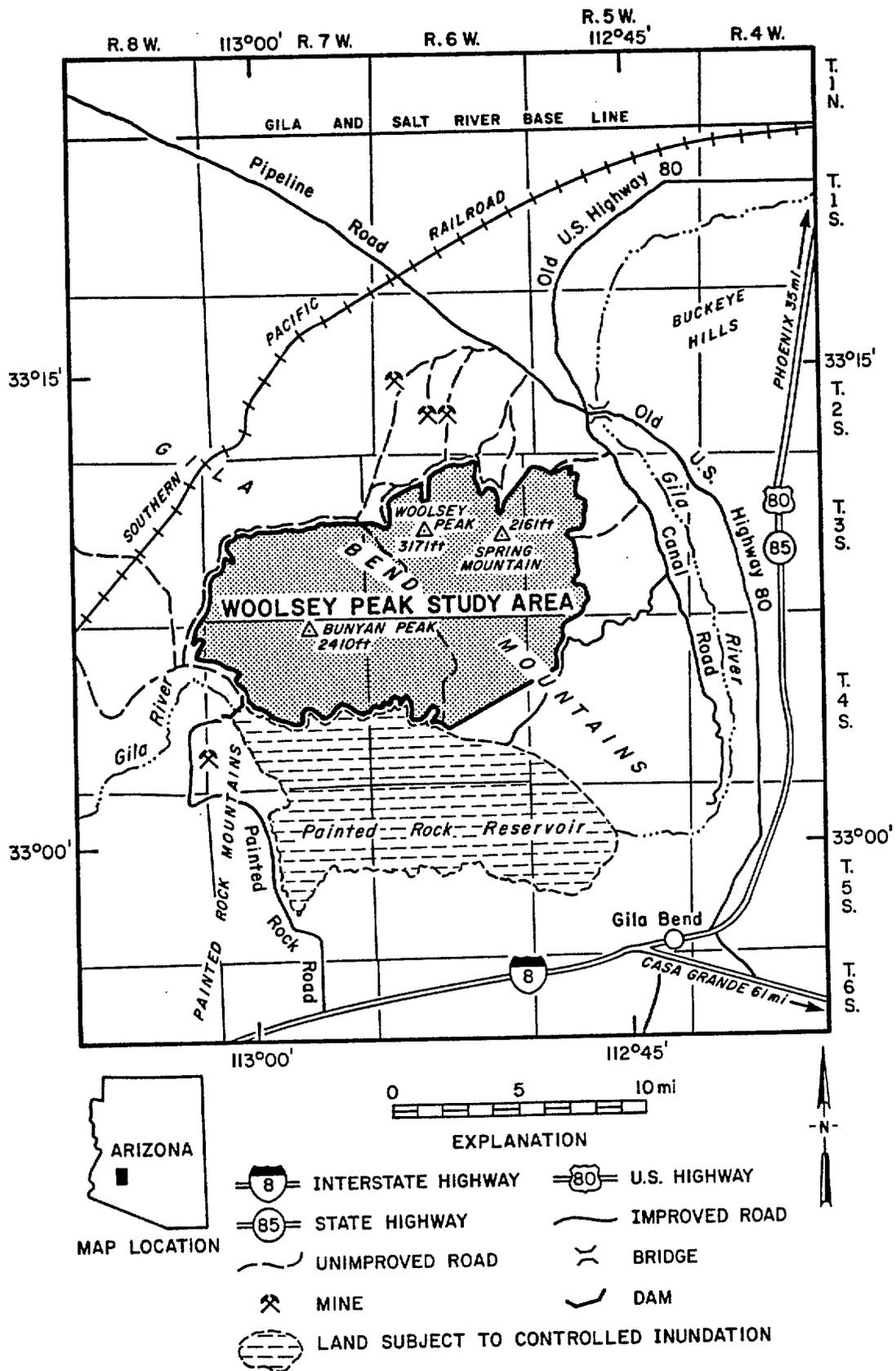


Figure 1.--Index map of the Woolsey Peak study area, Maricopa County, Arizona.

area lies at the southern boundary of the Webb mining district and is 1 mi northeast of the Painted Rock mining district (pl. 1). The Webb district has had recorded production of copper (Cu), silver (Ag), and gold (Au) (table 1), and includes bismuth and barium occurrences. Mineralization occurred in quartz veins in Precambrian schist and gneiss that were intruded by granite, diorite, and andesite (table 2). The Painted Rock district has had recorded production of copper, lead (Pb), molybdenum, silver, and gold (table 1) from quartz and barite veins that strike N. 30-37° W. and dip about 45° NE. in Tertiary volcanic rocks. Although the deposits are proximate to the study area, the mineralized veins are not known to extend into the area.

Table 1.--Production data for the Webb and Painted Rock mining districts.

[Data from Keith and others, 1983, p. 40, 54, except as noted.]

District	Duration	Base and/or precious metal ore (tons)	Cu (lb)	Pb (lb)	Au (oz)	Ag (oz)
Webb	1935-1951	400	27,000	--	50	200
Painted Rock	1913-1923	300	37,000	79,000	10	1,200

In addition, Krason and others (1982, p. 72) reported "30 tons of 18% MoO<sub>3</sub> (molybdenum trioxide) ore" from the Rowley Mine in the Painted Rock district.

Placer and lode mining claims are north, east, and southwest of the study area (pl. 1) and extend into it along the eastern boundary. No active mining operations were observed in the SA during the Bureau's field investigation; however, preparations were being made on the STAMSCO and contiguous claims along the eastern SA boundary for an exploratory drilling program for gold and platinum group metals to begin in late 1986 (Scott Hazen, claimant, oral and written commun., 1985).

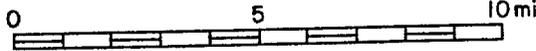
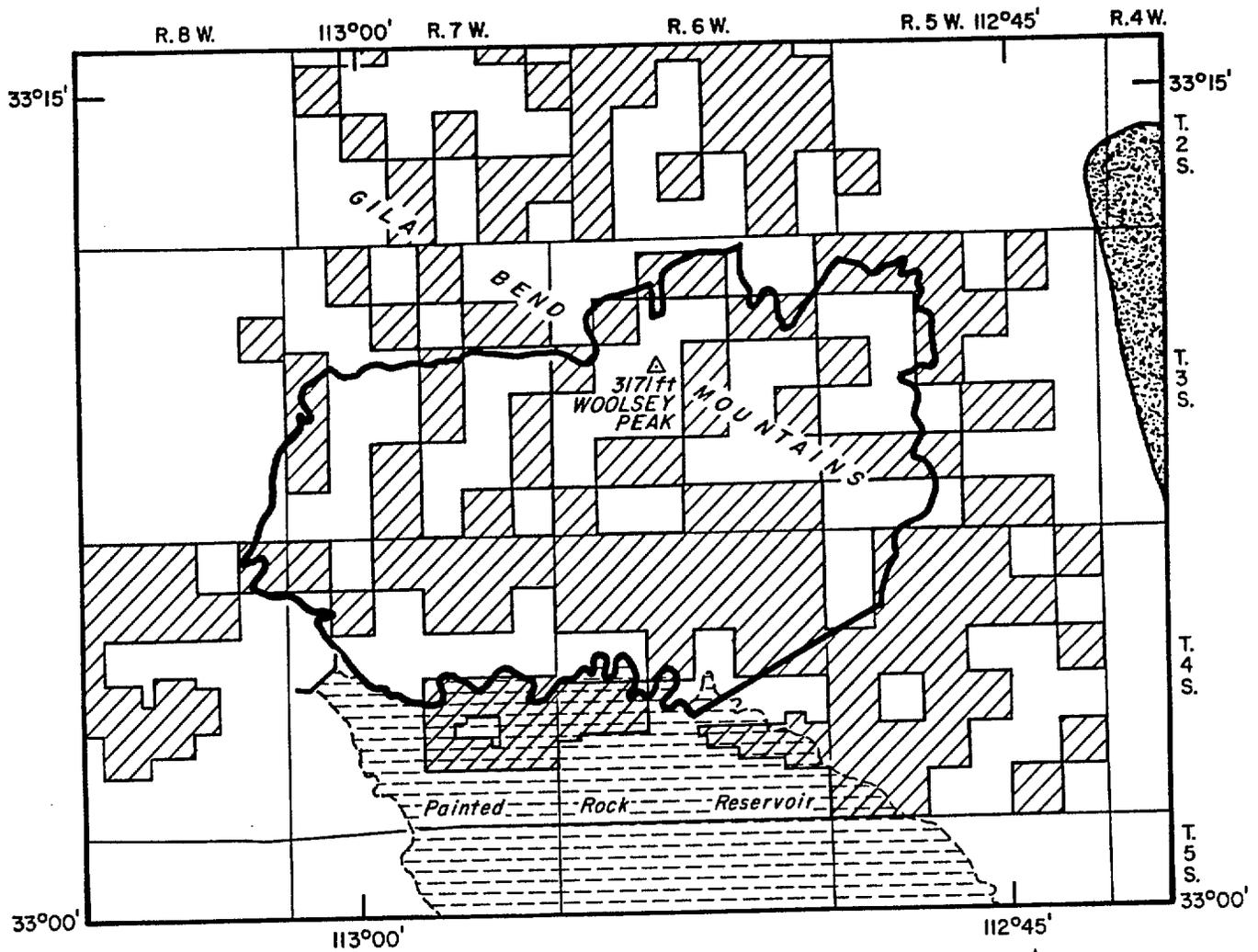
## ENERGY RESOURCES

No oil or gas discoveries have been reported, but scattered Federal leases are in and near the Woolsey Peak SA (fig. 2). Ryder (1983) evaluated the petroleum potential of wilderness lands in Arizona on the basis of structural and petroleum geology derived from published literature. The evaluation included the study area in a zone that was rated at "low to zero" potential. Ryder (1983, p. C20) concluded that the only part of the zone where hydrocarbons could accumulate was in the sediment-filled basins and that the reservoir rock depths are generally shallow. The SA primarily consists of plutonic and volcanic rocks, which are not conducive to hydrocarbon accumulation, and any accumulation in nearby sediments would have been subject to migration or destruction by tectonic and magmatic activity.

No geothermal waters or leasing activity are known within the study area. A statewide inventory and evaluation of Arizona's geothermal resources by the Arizona Bureau of Geology and Mineral Technology (1982) considered two areas as favorable for the discovery and development of low-temperature (less than 100°C) geothermal resources in the vicinity of the study area, one 4 mi east (fig. 2) and the other 12 mi southeast at Gila Bend. No thermal springs or wells were shown in the SA, and it was not considered as favorable for the discovery and development of geothermal resources.

No uranium or thorium has been produced from inside the study area, but the results of geochemical reconnaissance and nearby prospecting suggest that uranium- and thorium-enriched rocks occur within the SA.

The National Uranium Resource Evaluation program collected and analyzed hydrogeochemical and stream sediment samples from localities in and near the study area (Bennett, 1981). Several sediment samples from drainages in the



EXPLANATION

-  APPROXIMATE BOUNDARY OF THE WOOLSEY PEAK STUDY AREA
-  OIL AND GAS LEASES--On file with the Bureau of Land Management; current as of April 1985
-  AREA FAVORABLE FOR DISCOVERY AND DEVELOPMENT OF LOW TEMPERATURE (LESS THAN 100°C) GEOTHERMAL RESOURCES--From Arizona Bureau of Geology and Mineral Technology, 1982
-  LAND SUBJECT TO CONTROLLED INUNDATION
-  DAM

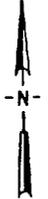


Figure 2.--Oil and gas leases, and geothermal favorability in and near the Woolsey Peak study area, Maricopa County, Arizona.

northeastern and southeastern parts of the study area contained uranium and thorium values at or above the regional mean values. The values indicate the presence of above background levels of uranium and thorium in rocks inside the eastern half of the SA, but would not be considered regionally anomalous.

A uranium-bearing pegmatite deposit was reported by Krason and others (1982, p. 98, 198) on the Detectron (pl. 1, samples 31-33) and Pegmatite claims along the eastern boundary of the SA (pl. 1). The report was based on correspondence from the claimant to the BLM, and included assay values from "representative samples" of the pegmatite ranging from 0.085% to 0.12%  $U_3O_8$  (BLM file data). Three samples taken across the pegmatite by the Bureau, contained 5.5-29.0 ppm (0.00055% to 0.0029%)  $U_3O_8$  (table 4, samples 31-33).

#### MINERAL APPRAISAL

Occurrences of gold, silver, lead, niobium (columbium), platinum group metals, tantalum, thorium, titanium, uranium, and yttrium have been reported within 1 mi of the eastern SA boundary (Krason and others, 1982; BLM file data; Scott Hazen, claimant, oral and written commun., 1985). The occurrences are in faults, pegmatite dikes, and granite enriched in platinum group metals. Bureau samples taken from the faults and pegmatites in the granite contained trace to low values of gold, silver, copper, lead, manganese, niobium (columbium), platinum, uranium, and/or zinc (tables 3 and 4); the exposures were insufficient and the values too erratic to make resource estimates. The granite, which hosts the faults and pegmatites, is exposed in the study area, and if the mineralizing events occurred throughout the granite, then these metals could occur in the SA.

## CONCLUSION

No mineral resources were identified in the Woolsey Peak SA by the Bureau's investigation. Trace to low values of gold, silver, copper, lead, manganese, niobium (columbium), platinum group metals, tantalum, thorium, titanium, uranium, yttrium, and zinc, however, have been reported or detected along the eastern boundary of the study area. The occurrences are in a granite that is present in the study area, which suggests that these metals could occur in the SA.

There have been no reported oil or gas discoveries in the study area. The area primarily consists of plutonic and volcanic rocks, which are not conducive to hydrocarbon accumulation, and any accumulation in the surrounding sediments would have been subject to migration or destruction by tectonic and magmatic activity.

No geothermal waters or leasing activity are known inside the SA, and the area is not considered favorable for the discovery and development of geothermal resources.

## REFERENCES

- Arizona Bureau of Geology and Mineral Technology, 1982, Geothermal resources of Arizona: map, scale 1:500,000.
- Bennett, C. B., 1981, Phoenix 1° X 2° NTMS area, California and Arizona, Data report (abbreviated) for the National Uranium Resource Evaluation program; Prepared for the U.S. Department of Energy by E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC, GJBX-315(81), 20 p.
- Keith, S. B., Gest, D. E., DeWitt, Ed, Toll, N. W., and Everson, B. A., 1983, Metallic mineral districts and production in Arizona: Arizona Bureau of Geology and Mineral Technology Bulletin 194, 58 p.
- Krason, J., Wodzicki, A., and Cruver, S. K., 1982, Geology, energy and mineral resources assessment in the Kofa area, Arizona: Geoexplorers International, Inc., Denver, Colorado, prepared for: U.S. Dept. of the Interior, Bureau of Land Management, 207 p.
- Ryder, R. T., 1983, Petroleum potential of wilderness lands in Arizona, in Petroleum potential of wilderness lands in the western United States: U.S. Geological Survey Circular 902 A-P, p. C1-C22.

Table 2.--Analytical data for samples 1-7 taken from the Buckeye Copper Mine in the Webb mining district north of the Woolsey Peak study area, Maricopa County, Arizona.

[xx, not applicable; tr, trace; ---, analyzed for but not detected; copper (Cu), manganese (Mn), uranium (U), zinc (Zn); lower detection limits; gold (Au) 0.01 oz/st, silver (Ag) 0.2 oz/st, lead (Pb) 30 ppm; samples also contained less than 0.01% niobium and tantalum.]

No.	Sample		Assay data							Remarks
	Type	Length (ft)	Au (oz/st)	Ag (oz/st)	Cu (ppm, unless noted as %)	Mn (ppm, unless noted as %)	Pb (ppm, unless noted as %)	U (ppm, unless noted as %)	Zn (ppm, unless noted as %)	
1	select	xx	tr	---	550	0.15%	31	1.7	120	Dump material; schist with quartz veinlets, pyrite, and chalcopyrite.
2	chip	4.0	tr	---	39	260	34	1.7	74	Outcrop; vein in schist, N. 40° E. strike, 65° SE. dip; limonite and hematite.
3	do.	4.0	---	---	37	240	---	1.7	61	Do.
4	do.	3.0	tr	---	690	.68%	130	1.7	3.4%	Adit; leached and oxidized vein in schist, north strike, 50-60° E. dip; calcite and quartz veinlets and pods, pyrite, chalcopyrite, siderite, and malachite(?).
5	do.	2.0	0.01	0.2	0.21%	1.7%	0.16%	3.1	5.1%	Do.
6	do.	4.0	.01	---	1.1%	.23%	850	4.3	1.4%	Do.
7	do.	2.0	tr	.3	.34%	.46%	880	4.2	3.0%	Opencut; quartz and calcite vein in schist, N. 30° E. strike, 60° SE. dip; minor pyrite and malachite(?).

Table 3.—Analytical data for samples 8-21 taken from the STAMSCO and contiguous claims in and near the Woolsey Peak study area, Maricopa County, Arizona.

[xx, not applicable; ---, analyzed for but not detected; lower detection limits: gold (Au) 0.007 ppm, silver (Ag) 0.3 ppm, niobium (Nb) 30 ppm, lead (Pb) 30 ppm, palladium (Pd) 0.01 ppm, platinum (Pt) 0.01 ppm.]

No.	Sample		Assay data						Remarks
	Type	Length (ft)	Au	Ag	Nb (ppm)	Pb	Pd	Pt	
8	stream sediment.	xx	---	---	---	---	---	---	Granitic detritus.
9	do.	xx	---	---	---	---	---	---	Select of "black sands" at same site as sample 8.
10	chip	random	---	---	---	---	---	---	Weathered granite outcrop.
11	do.	random	---	---	30	---	---	---	Do.
12	stream sediment.	xx	---	---	---	---	---	---	Granitic detritus.
13	do.	xx	---	---	---	---	---	---	Select of "black sands" at same site as sample 12.
14	do.	xx	---	---	30	---	---	---	Granitic detritus.
15	chip	random	---	---	---	---	---	---	Quartz pod in granite outcrop.
16	do.	random	---	---	30	---	---	---	Bulldozer cut in granite.
17	do.	1.5	0.041	5.401	---	---	---	---	Pit in granite, minor chrysocolla and azurite along fractures.
18	do.	random	---	---	---	---	---	---	Quartz pod in granite outcrop.
19	do.	random	---	---	---	---	---	---	Weathered granite outcrop.
20	stream sediment.	xx	---	---	---	---	---	---	Granitic detritus.
21	do.	xx	---	---	---	---	---	---	Do.

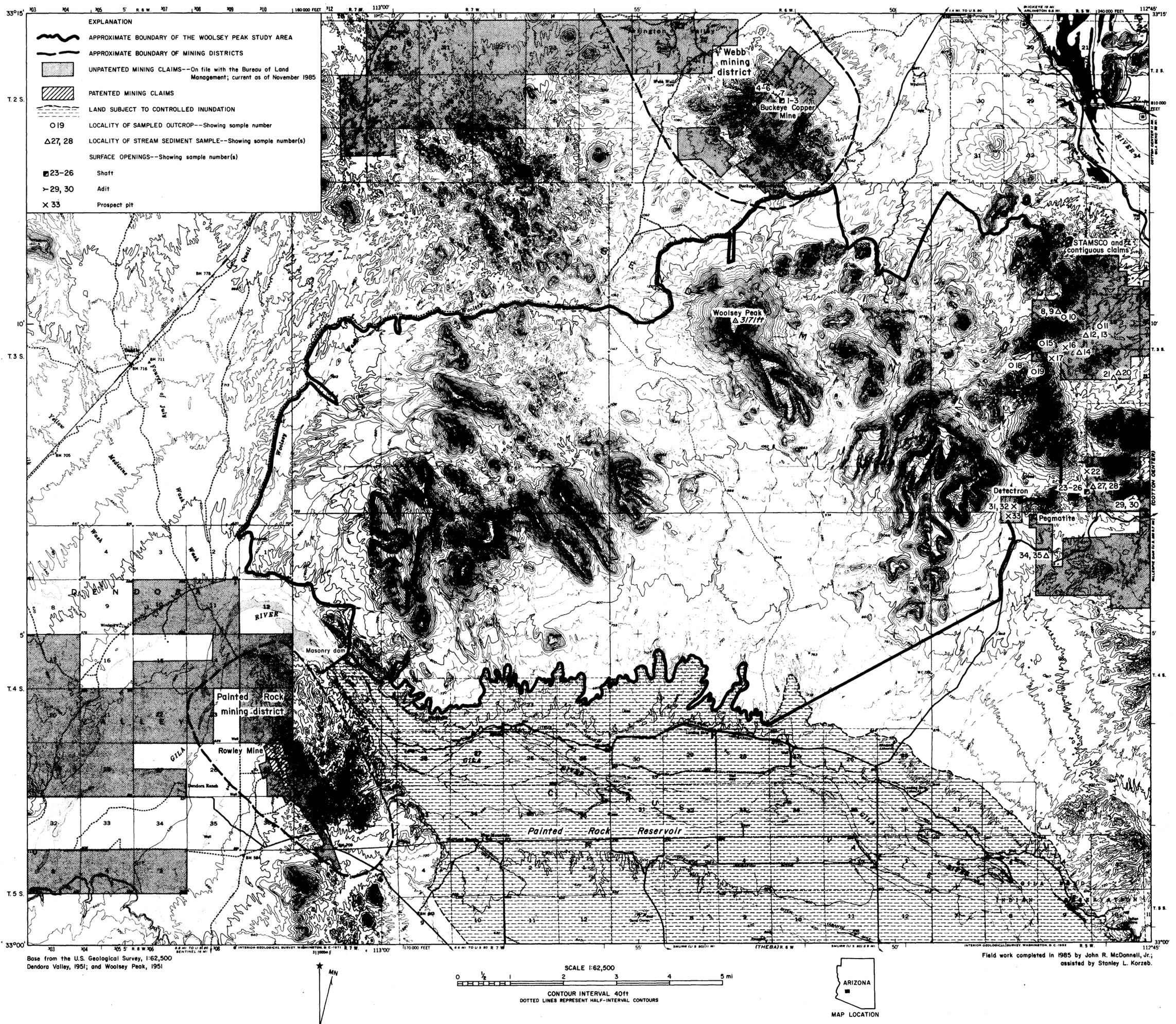
Table 4.--Analytical data for samples 22-35 taken on claims, and from workings near the southern part of the eastern boundary of the Woolsey Peak study area, Maricopa County, Arizona.

[xx, not applicable; ---, analyzed for but not detected; na, not analyzed for; lower detection limits: gold (Au) 0.007 ppm (\* denotes less than 0.01 oz/st), silver (Ag) 0.3 ppm (# denotes less than 0.2 oz/st), lead (Pb) 30 ppm, palladium (Pd) 0.01 ppm, platinum (Pt) 0.01 ppm.]

No.	Sample		Assay data						U <sub>3</sub> O <sub>8</sub>	Remarks
	Type	Length (ft)	Au	Ag (ppm, unless otherwise noted)	Pb	Pd	Pt			
22	chip	1.5	---	1.230	31	---	0.039 <sup>g</sup> x .03 0.00117	---	Pit; fault zone in granite, N. 15° E. strike, vertical dip; chrysocolla along fractures.	
23	grab	xx	0.04 oz/st	---#	1.1%	na	na	24.8	Shaft dump; granite and gneiss, quartz-rich, abundant iron-oxide, minor copper mineral coatings; additional assay data: 1.3% copper, 4.3% manganese, 670 ppm zinc.	
24	chip	2.0	---	---	.019%	---	---	---	Trench; pegmatite in granite, N. 70° E. strike, 80° NW. dip; magnetite, garnet, and muscovite.	
25	select	xx	---	.430	.022%	---	---	---	Shaft dump; select of fault gouge material; heavily oxidized.	
26	chip	3.0	.051	.530	.043%	---	---	---	Shaft; fault zone in granite, N. 70° E. strike, 80° NW. dip; heavily oxidized.	
27	stream sediment.	xx	---	---	---	---	---	---	Volcanic and granitic detritus.	
28	do.	xx	---	---	---	---	---	---	Select of "black sands" at same site as sample 27.	

Table 4.--Analytical data for samples 22-35 taken on claims, and from workings near the southern part of the eastern boundary of the Woolsey Peak study area, Maricopa County, Arizona--Continued

No.	Sample		Assay data						U <sub>3</sub> O <sub>8</sub>	Remarks
	Type	Length (ft)	Au	Ag (ppm, unless otherwise noted)	Pb	Pd	Pt			
29	chip	2.5	tr*	---#	260	na	na	3.7	Adit; fault zone in granite, N. 65° E. strike, 65° SE. dip; minor garnet, malachite, and limonite; additional assay data: 49 ppm copper, 0.11% manganese, 450 ppm zinc.	
30	do.	3.5	tr*	---#	56	na	na	7.1	Same as sample 29; additional assay data: 21 ppm copper, 160 ppm manganese, 130 ppm zinc.	
31	do.	2.0	---	---	---	---	---	12.0	Pit; pegmatite in granite; biotite and muscovite; additional assay data: 0.013% niobium, 31 ppm thorium.	
32	do.	2.5	0.168	---	---	---	0.051	5.5	Pit; pegmatite in granite; minor chrysocolla, manganese-oxide, red iron-oxide stained; additional assay data: 41 ppm thorium.	
33	do.	3.0	---	---	---	---	.039	29.0	Pit; pegmatite in granite; biotite, minor hematite along fractures; additional assay data: 0.021% niobium, 37 ppm thorium.	
34	stream sediment.	xx	---	---	---	---	---	1.2	Volcanic and granitic detritus; additional assay data: 8 ppm thorium.	
35	do.	xx	---	---	---	---	---	6.2	Select of "black sands" at same site as sample 34; additional assay data: 30 ppm niobium, 34 ppm thorium.	



MINE AND PROSPECT MAP OF THE WOOLSEY PEAK STUDY AREA, MARICOPA COUNTY, ARIZONA

BY

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