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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: BUCKEYE EAST

ALTERNATE NAMES:

KENNECOTT COPPER CLAIMS 27

PINAL COUNTY MILS NUMBER: 177

LOCATION: TOWNSHIP 3 S RANGE 12 E SECTION 26 QUARTER SE  
LATITUDE: N 33DEG 08MIN 06SEC LONGITUDE: W 111DEG 05MIN 19SEC  
TOPO MAP NAME: TEAPOT MOUNTAIN - 7.5 MIN

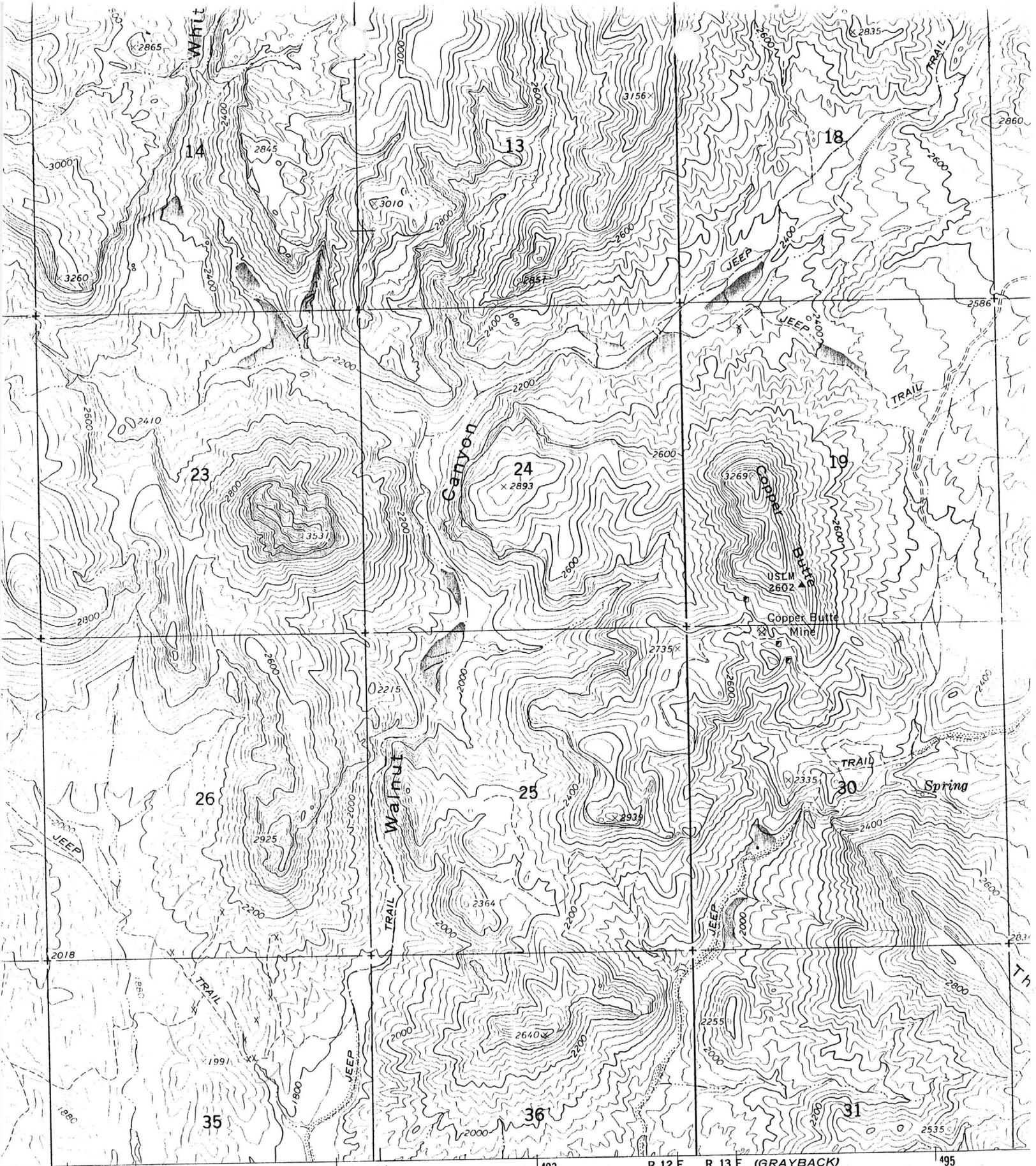
CURRENT STATUS: EXP PROSPECT

COMMODITY:

COPPER OXIDE

BIBLIOGRAPHY:

BLM AMC FILE 18981  
ADMMR BUCKEYE EAST FILE  
USGS SURVEY MAP GQ 1559, 1983.  
USGS OPEN-FILE REPORT 79-716, P 10,11.  
USBM RI 3914, 1946.



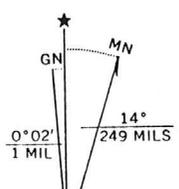
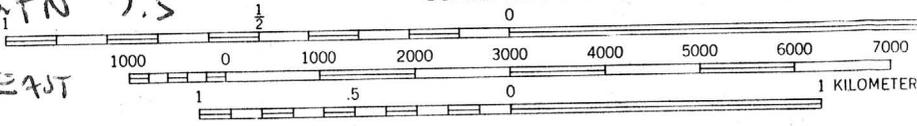
750 000 FEET      492   5'      493      R. 12 E.   R. 13 E. (GRAYBACK)      495

SCALE 1:24 000

TEAPOT ATN 7.5

BUCKETE EAST

T3S R12E Sec 26



CONTOUR INTERVAL 40 FEET  
DATUM IS MEAN SEA LEVEL

zone

## EXECUTIVE SUMMARY

White Canyon -- AZ-02-187

WSA Acreage 6,968 Acres

BLM Proposal - No Wilderness

Acres suitable	0
Not suitable	6,968
Private mineral rights	0
Private land	0
Active mining claims	419

The Bureau of Land Management's Final Environmental Impact Study recommended no wilderness for the White Canyon area.

Location

The White Canyon WSA is located approximately 5 miles west of the mining complex at Ray, Arizona, and within the Arizona porphyry copper belt.

Mineral Potential

Three major copper deposits, the Copper Butte, Buckeye East and Buckeye West are currently under development along the southern boundary of this WSA. Proven economic copper ore reserves at the Copper Butte deposit are 22 million tons. Proven reserves at the Buckeye East deposit are 20 million tons with a potential resource of 40 million tons. Copper reserves in the Buckeye West deposit are currently being assessed. These deposits are located within eight patented and 190 unpatented mining claims held by ASARCO Incorporated. Other mining companies have 81 claims located within the WSA.

Copper mineralization occurs on the surface and in drill holes throughout the WSA. All indications are that the WSA contains favorable exploration targets.

If the White Canyon WSA is designated a wilderness area, significant mineral resources and favorable exploration targets will be lost.

AMA Recommendation

The Arizona Mining Association supports the BLM recommendation of no wilderness for the White Canyon WSA and recommends that the area be released for multiple-use management.

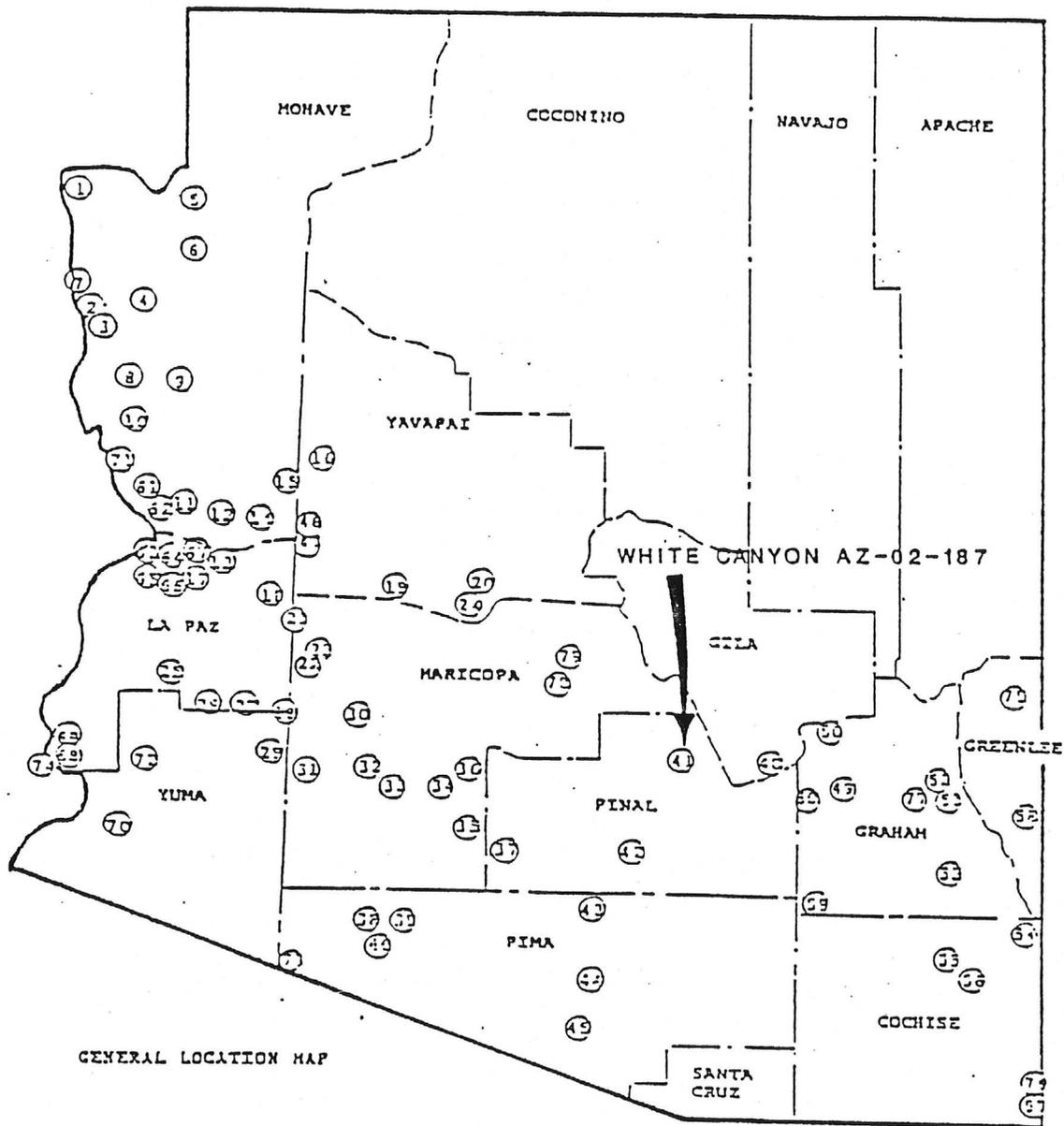
In addition to the mapped locations of mines and prospects within and near the White Canyon WSA which the AMA has identified as very high mineral potential, the area should be returned to multiple-use for the following reasons:

1. The unit occurs within the highly mineralized copper and precious metal zones of Arizona.
2. The unit occurs within the significant Metallic Mineral Districts of Arizona as defined by the Arizona Bureau of Geology and Mineral Technology.

Arizona Mining Association's Mineral Rating

White Canyon (02-187)

VERY HIGH MINERAL RATING



WHITE CANYON AZ-02-187

## Introduction

The White Canyon WSA is located on the most favorable geologic trend for the discovery of economic mineral deposits in the state of Arizona. It is unfortunate that the forces that combine to make scenic areas are the same which create economic mineral deposits. Like the need for wilderness, the need for a viable mineral industry is paramount to maintaining the future of this free land. Reserves at the existing copper mines will be depleted within 50 to 75 years. Future generations need access to the deeper and as yet undiscovered deposits which will supply them with copper.

Two mineral deposits which have been discovered by industry exploration efforts and will be developed into mines are located along the southern boundary of the WSA. Evidence of mineralization has also been found within the WSA. Noise of mining, barren rock dumps, roads, and activity at the developing mines, as well as at the existing Ray Mine, will be easily sensed from within the WSA.

As stated in the BLM Phoenix District Final Environmental Statement, "Nondesignation would allow development of the WSA's extensive copper deposits. Development of these copper deposits is expected to result in a large scale copper mine described as world class. Development of this mine would provide needed jobs and income to the local economy.

The proven copper ore deposits along the southern edge of the BLM White Canyon WSA are located within eight (8) patented and 190 unpatented mining claims held by Asarco Incorporated. Other mining companies have 81 mining claims within the WSA. Location of the WSA, mineral deposits, mining claims, exploration holes, and planned open pits are shown on Figure 1. Additional roads and diamond drill holes within the WSA are also shown. Copper Butte and Buckeye East are the deposits drilled well enough to plan mining operations. Buckeye West is an area where wide spaced drilling indicates extensive sulfide mineralization.

This document presents site specific information on the mineral deposits and mineral potential of the WSA. Proven and potential deposits demonstrate the significance of the White Canyon WSA to the future mineral self sufficiency of our nation.

Although federal land management regulations recognize valid existing mineral rights within and near wilderness areas, the additional requirements of operating within or near a designated wilderness area completely alter the economics of mineral deposits and can regulate previously viable ore bodies out of existence. Wilderness designation also precludes exploration for mineral deposits. Thus, hidden deposits which may exist but are merely awaiting technological advances in exploration techniques to become apparent to the prospector will not be found if the area is designated as wilderness.

## Geologic Description

### General Geology

The White Canyon WSA is a region of complex geology, only a brief outline of which is presented here. The reader is referred to the comprehensive geological articles listed in the bibliography for a more complete geological understanding. Most of the geological units favorable for the development of mineral deposits are covered by younger unmineralized rock.

### Precambrian Age

#### Pinal Schist

Pinal schist is the oldest rock type in the WSA. It is of older Precambrian Age and is a strongly foliated metasedimentary rock exposed as exhumed hills on the east edge of the study area. This unit which hosts much of the mineralization at the Ray deposit is the basal rock beneath most of the WSA as evidenced by numerous diamond drill holes which bottom in this formation, and the basement rocks exposed in windows through the more recent formations. Unaltered and unmineralized Pinal schist is a gray-green chlorite, muscovite schist.

#### Ruin Granite

Ruin Granite is a coarse-grained porphyritic rock of older Precambrian age intruded into Pinal schist. The boundary between Pinal schist and a major body of Ruin Granite extends from the Gila River at the southwest of the WSA to the Ray deposit. This contact probably controlled the location of the igneous intrusive rocks which generated the Ray copper deposit and is a prime zone along which to hunt for other mineral deposits.

#### Apache Group

Rocks of the Apache group outcrop as steeply dipping sedimentary beds intruded by diabase dikes and sills along the northern edge of the WSA. These units also host much of the mineralization in the Ray Mine. Faulting and folding have prepared them for mineralization.

### Paleozoic Rocks

Paleozoic rocks outcrop with the Apache group rocks along the northern edge of the WSA. Most of these units are limestone which is an excellent host for mineralization. Extensive limestone replacement deposits exist in the Magma mine at nearby Superior.

## Tertiary Rocks

### Granite Mountain Porphyry

The Granite Mountain Porphyry is exposed along the eastern edge of the WSA and in several drill holes. This biotite quartz granodiorite with a coarse crystalline, granitoid texture is felt to be the igneous intrusion which created the hydrothermal system responsible for deposition of the Ray deposit. Hydrothermal quartz-pyrite veins are present at the intrusive contact with Pinal schist. A copper deposit was generated on the east edge of this intrusion. The other peripheral areas remain unexplored. More work is needed to fully explore this potential.

### Whitetail Conglomerate

After intrusion of the Granite Mountain Porphyry, 61 - 63 million years ago, erosion began wearing away the mountains. A canyon with at least 2000 feet of relief was cut beneath the Copper Butte, Buckeye East and Buckeye West areas.

This canyon filled with conglomerate during mid-tertiary time, 33 to 21 million years ago. A part of the conglomerate fill was debris flows of mineralized and partially oxidized, leached capping and secondary enrichment blanket from a nearby porphyry copper system. The only known deposit is the Ray deposit some four miles away. It is reasonable to expect that a sulfide deposit exists closer to the exotic copper deposit, probably to the north.

Following the filling of the canyon with Whitetail conglomerate, normal Basin and Range type faulting offset various portions of the Whitetail Conglomerate Basin. Tilting of the individual basins in the typical east side down fashion accompanied the faulting. The fault block furthest to the east, stretching from the Ray deposit to the Copper Butte deposit, was rotated and elevated and the Whitetail conglomerate eroded away. Copper Butte rests on the remains of the smallest fault block. Buckeye East is in the adjacent block and is offset between 1000 and 1500 feet by faulting. Another offset basin exists to the west of the Buckeye West deposits.

### Apache Leap Tuff

Faulting, erosion and deposition left a rugged surface in the area. Onto the surface the Apache Leap Tuff was deposited by massive volcanic eruptions of ash and tuff. This material fell as a hot glowing cloud upon the surface and individual pieces were welded by the retained heat into a relatively dense rock. The Apache Leap Tuff is up to 1500 feet thick, covering the northern portion of the WSA.

### Gila Conglomerate (Big Dome Formation)

Following deposition of the Apache Leap Tuff, erosion and deposition resumed. Deposition of the Big Dome Conglomerate was restricted to the lowlying basins with thicknesses varying from 0 to 1000 feet. Normal faulting continued during deposition resulting in several landslide blocks of older rocks.

### Rhyolite Tuff

The youngest major geologic unit still remaining is rhyolite tuff. This formation lies with angular unconformity on all of the older units. Thickness varies from 0 to 400 feet. The tuff is a series of air fall volcanic ash units of rhyolite composition. Uplift and erosion have been the major geologic forces at work during the past 10 million years.

## Mineral Potential

### Copper Butte Deposit

The small inactive mine workings at Copper Butte represent only the fringe of the deposit. A map of the diamond drill holes, pit outline and ore zone is shown as Figure 2. This is a copper deposit which will yield much copper to the economy of our country. Asarco, Incorporated is going ahead with plans, laid years ago, to immediately place this mine into production.

Origin of the copper within the Copper Butte deposit is debris flows which came off of a combined leached-capping, secondary enrichment blanket into the Whitetail conglomerate basin. Following deposition of these debris flows which consisted almost totally of mineralized Pinal schist, the contained copper was mobilized by acid generated from residual pyrite within the mineralized rock. Groundwater moved the copper out of the mineralized rock into adjacent rocks with contained acid neutralizing minerals. The copper dropped out at the sites of neutralization and formed an exotic copper deposit. Exotic copper deposits are those formed by copper moved from the original site to a second site by mechanical (debris flow) and/or chemical (acid groundwater) means.

Proven mineable reserves at Copper Butte are 22,000,000 tons with a grade of 1.09 percent copper or 240,000 tons of contained copper. Because the contained copper occurs as oxide and silicate minerals, recovery of copper from these minerals is by the leaching process. Leaching and electrowinning do not require smelting to recover nearly pure copper.

Buckeye East is the faulted and folded continuation of the Copper Butte deposit. The debris flows probably thinned and narrowed as they continued down the canyon. Buckeye East is more constrained within the old canyon bottom. Proven tonnage and grade of mineralization is 20,000,000 tons at 0.65 percent copper (Figure 3). Projections of indicated reserves of that much more mineralized rock give a potential resource of 40,000,000 tons.

250,000 Cu (4)

Buckeye West exhibits sulfide enrichment in Pinal schist. This resource covers a large area and is one of the reasons for the speculation that a world class porphyry copper deposition may exist in the covered rocks to the north of the canyon cut into the older rocks. Figure 1 shows the location of sulfide mineralization found in the bedrock beneath the gravels. This mineralization is secondary enrichment of copper within a large low grade system. Location of the higher grade center is not known. This is to be a major emphasis of exploration in the area in the future.

### Mineralization Within the WSA

Mineralization consisting of copper is indicated throughout the WSA. Success in finding the large deposit which is felt to be present has not materialized. Active exploration was stopped in the main body of the WSA by the regulations related to wilderness study. Exploration at a slower pace than previously conducted was forced upon the mining companies by the recently ended depression of copper prices. Assessment work requirements of 100 dollars per year per claim caused most mining companies, already strapped for cash, to drop blocks of mining claims they would have liked to have kept valid. Only the most favorable deposits were retained. Thus, the proven mineral resources along the southern edge of the WSA were retained. The search for a large deposit was put on the back burner.

Evidence for the large deposit consists of:

1. Mineralized rock found in small areas where erosion has removed the post-mineral cover. These areas are mostly in Pinal schist and are found along the Gila River at the old Cochran area and on the east and west edges of the WSA.
2. Pebbles and cobbles of mineralized rock of types not found at the Ray mine \*discovered while conducting geological mapping of the conglomerates which eroded off the highlands now covered by volcanic rock.
3. Sulfide mineralization found in several diamond drill holes drilled near the WSA. Asarco Incorporated does not have all the results from holes drilled by competitors, but evidence is available to encourage further exploration.

These evidences have been favorable enough for several mining companies to expend sizeable sums of money in making geological and geophysical surveys, building roads in rough terrain, and drilling diamond drill holes. Unfortunately, geologists cannot see through rocks any better than the next man. They must deal with scientific projection, not certainties. Geophysical methods are not overly effective at "seeing" through rock such as the post-mineral rocks of the WSA. The only way to be sure is to drill expensive holes at the most logical and favorable sites. Thus far, the results have been encouraging but not definitive. Exploration has found mineralization in the covered areas. This

mineralization is evidence enough to convince the mining companies that a large deposit may exist.

### Recommendations

Mineable minerals are extremely rare and randomly distributed in nature. Extensive exploration is necessary to locate and define deposits and their potential for economic development. The same geologic forces that create areas suitable as wilderness are also responsible for the formation of ore deposits.

White Canyon WSA has a very high potential for the discovery of a large economic mineral deposit. This potential is sufficient to retain the area in a multiple use classification. If the planned exploration is successful, the mineral potential will be wisely utilized. Wise utilization of all our nation's resources is essential to keeping the nation we love strong, and the standard of living we enjoy high. White Canyon should not be designated as wilderness in whole or in part, but should be released to multiple use for all the citizens to use not just the small group of people who have the time, money, and health to visit the wilderness.

### Proposed Expansion of The White Canyon WSA

Some groups are advocating that the area of proposed wilderness be expanded into Tonto National Forest land which borders the White Canyon WSA to the north. Size of the proposed wilderness is enlarged from 6,968 acres to 16,464 acres. This is an increase to two and one-third times the original. All the statements made concerning the mineral potential of the WSA apply to the expanded area. Presence of mineralization and a high mineral potential is attested to by 206 unpatented mining claims held by twelve (12) individuals, partnerships, and corporations located in the proposed expansion area. The number of mining claims per section is shown in Figure 5. Enlargement of the proposed wilderness is rigorously opposed by the Arizona Mining Association and all the affected parties.

### References

Asarco Incorporated file reports.

Bear Creek Mining Company file reports.

—Creasey, S. C., Peterson, D. W. and Gambell, N. A., 1983, Geologic Map of the Teaport Mountain Quadrangle, Pinal County, Arizona, U.S. Geological Survey Map GQ 1559.

—Keith, W. J. and Theodore, T. G., 1979, Tertiary Volcanic Rocks of the Mineral Mountain and Teapot Mountain Quadrangles, Pinal County, Arizona, U.S. Geological Survey Open-file Report 79-716, P. 10-11.

Kennecott Copper Corporation file reports.

Kennecott Exploration Services file reports.

—Phelps, H. D., 1946, Exploration of the Copper Butte Mineral Creek Mining District, Pinal County, U. S. Bureau of Mines, R.I. 0914.

RIIE  
RIZE

Younger Precambrian  
and  
Paleozoic Rocks

Post Mineral Cover

Premineal rocks  
exposed through cover

COPPER BUTTE

Tertiary Intrusive and  
Older Precambrian Rocks

Edge of Post Mineral Cover

BUCKEYE EAST

BUCKEYE WEST

Figure 1

WHITE CANYON AREA, UNIT 2-187

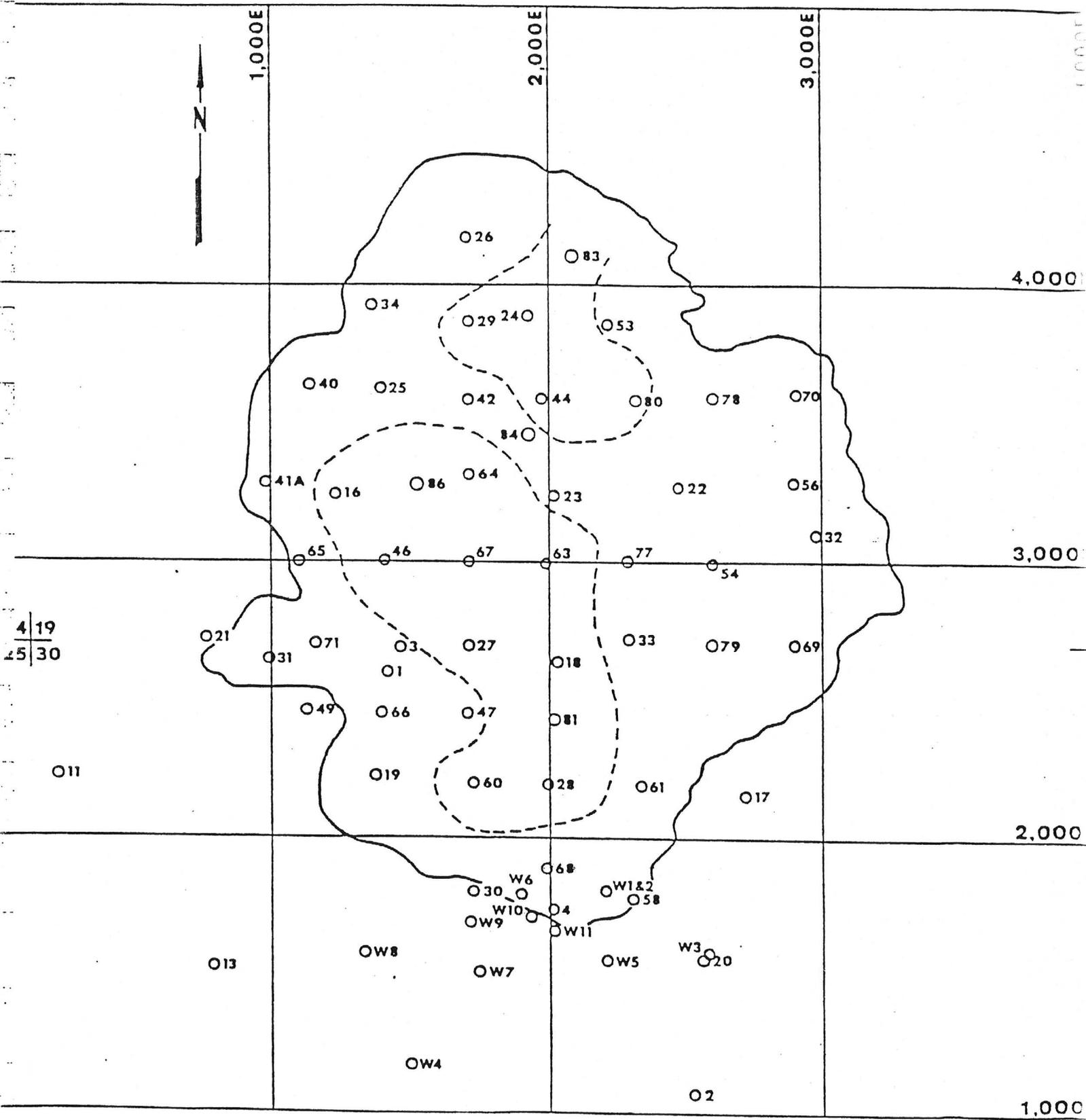
-  PROPOSED WILDERNESS STUDY AREA BOUNDARY
-  PATENTED MINERAL CLAIMS
-  UNPATENTED LODGE CLAIMS-PROSPECTING PERMITS

- DEVELOPMENT OR EXPLORATION DRILL HOLE
- VALIDATION DRILL HOLE

ROAD

- KNOWN DEPOSITS  
- EDGE of <sup>Post</sup> ~~Post~~ MINERAL COVER

RIIE  
RIZE



4 19  
25 30

### COPPER BUTTE

○ DRILL HOLE

--- ORE ZONE

Figure 2





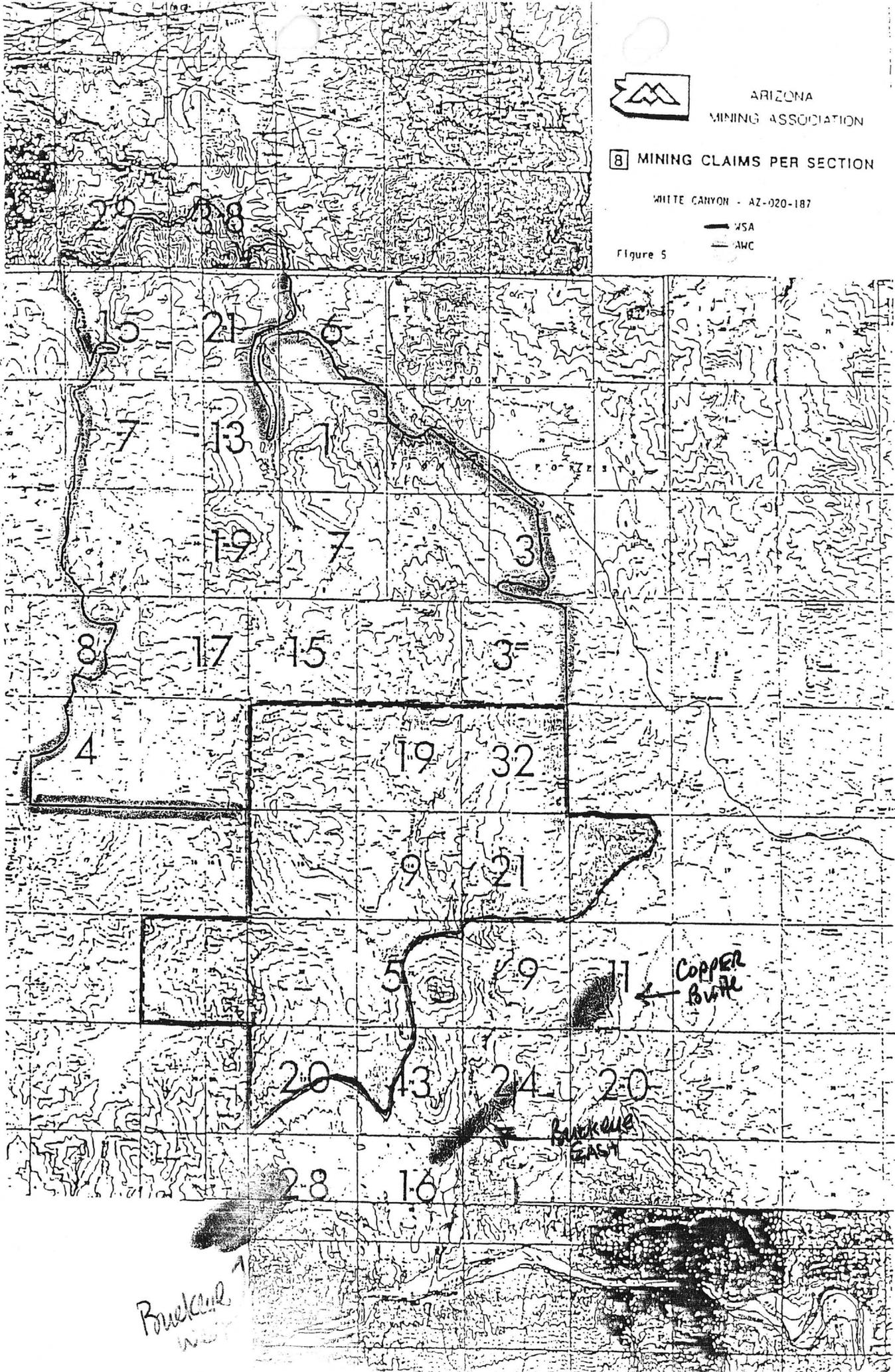
ARIZONA  
MINING ASSOCIATION

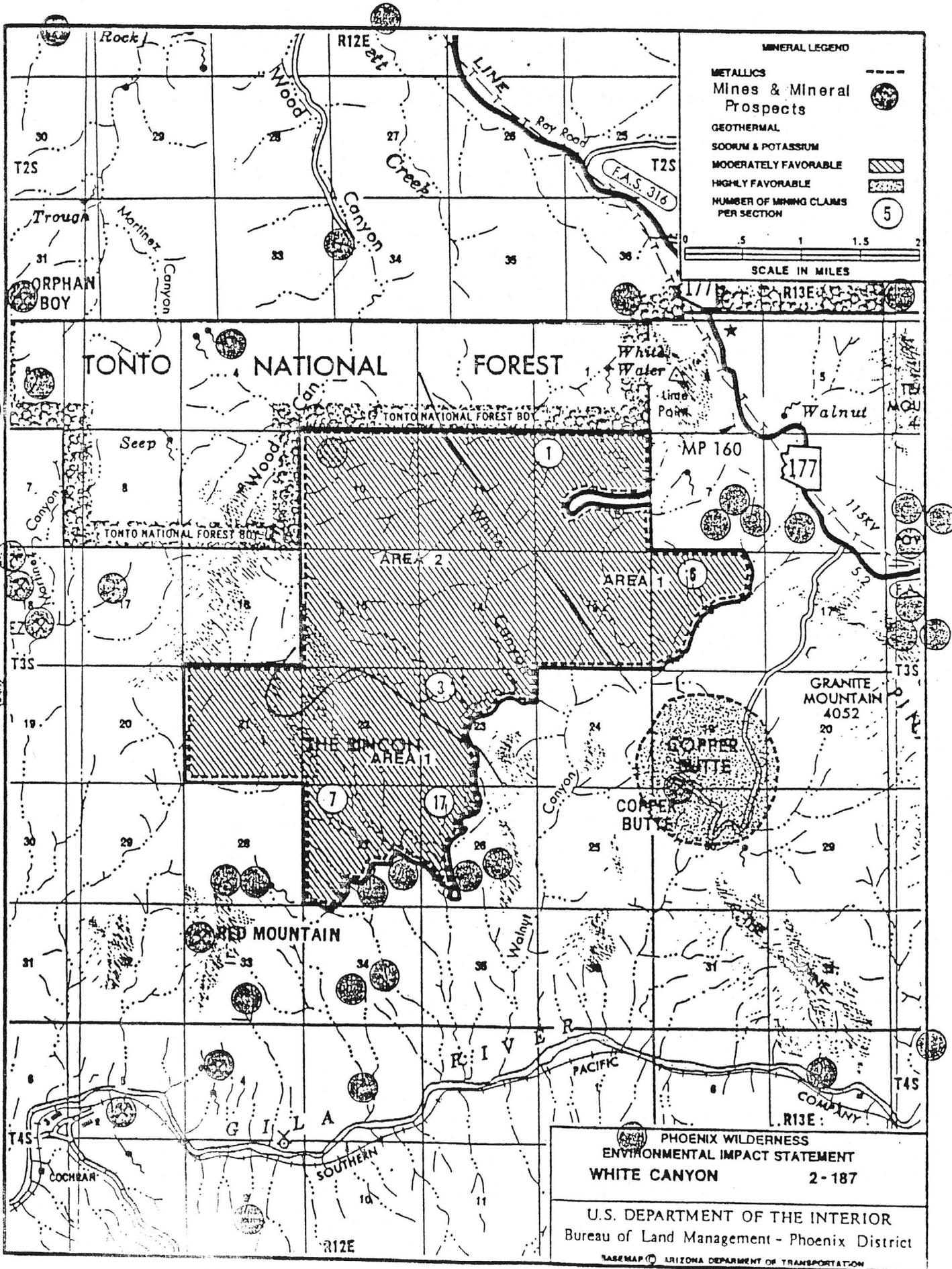
**8** MINING CLAIMS PER SECTION

WHITE CANYON - AZ-020-187

— XSA  
— AWC

Figure 5





**MINERAL LEGEND**

- METALLICS**
- Mines & Mineral Prospects 
- GEOTHERMAL**
- SODIUM & POTASSIUM 
- MODERATELY FAVORABLE 
- HIGHLY FAVORABLE 
- NUMBER OF MINING CLAIMS PER SECTION 



SCALE IN MILES

PHOENIX WILDERNESS  
 ENVIRONMENTAL IMPACT STATEMENT  
 WHITE CANYON 2-187

U.S. DEPARTMENT OF THE INTERIOR  
 Bureau of Land Management - Phoenix District

BASE MAP © ARIZONA DEPARTMENT OF TRANSPORTATION