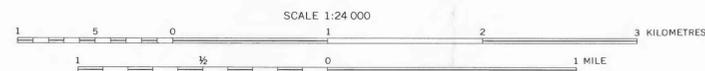




Base from U.S. Geological Survey
Hamilton, 1972; Mountain Pine, 1966

Geology by C. G. Stone and B. R. Haley, 1976



MAP SHOWING GEOLOGY AND MINERAL RESOURCE POTENTIAL OF THE LITTLE BLAKELY ROADLESS AREA, GARLAND COUNTY, ARKANSAS

By
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1983

CORRELATION OF MAP UNITS

Obf	} ORDOVICIAN
Ow	
Oby	
Om	

Middle Ordovician
Middle and Lower Ordovician
Lower Ordovician

DESCRIPTION OF MAP UNITS

- Obf** BIGFORK CHERT (MIDDLE ORDOVICIAN)--Thin beds of medium-gray and black shattered chert interbedded with medium-gray to dark-gray siliceous and carbonaceous shale and black siliceous sandstone beds. Probably deposited in deep water as siliceous and limy ooze contaminated by silty clastic material. Maximum thickness 800 ft
- Ow** WOMBLE SHALE (MIDDLE AND LOWER ORDOVICIAN)--Light to dark-gray, fissile shale interbedded with thin beds of fine-grained quartzitic sandstone. Contains quartz and calcite veins. Maximum thickness 3,500 ft
- Oby** BLAKELY SANDSTONE (LOWER ORDOVICIAN)--Gray shale, sandstone, and fine-to coarse-grained quartzite that is calcareous in places. Contains several conglomerate layers and quartz veins; locally contains deeply weathered igneous boulders. Maximum thickness 450 ft
- Om** MAZARN SHALE (LOWER ORDOVICIAN)--Black, clayey, fissile, banded shales; thin layers of green shale and small quantities of sandstone; thin-bedded, bluish-gray limestone; and laminated siltstone. Maximum thickness 3,000 ft

- THRUST FAULT
— CONTACT
--- APPROXIMATE BOUNDARY OF ROADLESS AREA-- Dashed where crosses water
- V100
X2
R,S
SAMPLE LOCALITY-- Vanadium content in parts per million; R, rock sample; S, stream-sediment sample
- ✱ QUARTZ-CRYSTAL MINING AREA--Represents one or more prospects
- ▨ AREA OF HIGH POTENTIAL FOR QUARTZ-VEIN DEPOSITS
- 60° STRIKE AND DIP OF BEDS

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geological and mineral survey of the Little Blakely Roadless Area in the Ouachita National Forest, Garland County, Ark. The Little Blakely Roadless Area (08004) was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

MINERAL RESOURCE POTENTIAL SUMMARY

There are no patented or unpatented mining claims, and no recent mining has been done within the Little Blakely Roadless Area. Quartz crystals were produced between 1890 and 1943 from privately owned land in the northern part of the roadless area. In 1981 quartz was being mined by the open-pit method from the Blakely Sandstone on Miller Mountain, about 0.5 mi north of the roadless area. The Little Blakely Roadless Area has a high potential for quartz-crystal deposits in the Blakely Sandstone.

Although phosphate and vanadium occur in two areas about 4 mi and 6 mi outside the roadless area, it appears unlikely that they are present in the roadless area in sufficient concentration and areal extent to constitute a resource.

A Fischer assay of a sample of Womble Shale from the roadless area indicated a trace of oil. The Little Blakely Roadless Area has a low potential for oil and gas.

INTRODUCTION

During 1981 the U.S. Geological Survey and the U.S. Bureau of Mines conducted field investigations to evaluate the mineral resource potential of the Little Blakely Roadless Area. The roadless area covers about 5,140 acres in the Ouachita National Forest in Garland County, Ark., about 10 mi northwest of Hot Springs, Ark. About 2,415 acres in the roadless area are either under the jurisdiction of the U.S. Army Corps of Engineers or privately owned.

The Little Blakely Roadless Area is made up of two northeast-trending ridges bordered on the north, west, and south by Lake Ouachita. Its east border follows the Ouachita National Forest boundary. The roadless area is densely timbered by pine and sparse hardwoods. Access to most of it is by boat; unimproved logging roads provide access to the eastern parts. Elevation of the roadless area ranges from 578 ft on Lake Ouachita to 1,035 ft on Mill Creek Mountain.

We appreciate the cooperation of the personnel of the U.S. Forest Service, U.S. Bureau of Land Management, and U.S. Army Corps of Engineers. We especially thank Charles G. Stone, Arkansas Geological Commission, and Boyd R. Haley, U.S. Geological Survey, for providing geologic information and assistance in sample collection.

GEOLOGY

Formations that crop out in the Little Blakely Roadless area are the Lower Ordovician Mazarn Shale and Blakely Sandstone, Lower and Middle Ordovician Womble Shale, and Middle Ordovician Bigfork Chert (Arkansas Geological Survey, 1942; Haley and others, 1979). The roadless area is in the core of the folded and thrust-faulted Ouachita Mountains of west-central Arkansas. Recumbent and overturned folds and high- and low-angle thrust faults are common. According to Haley and others (1979), there were two or three periods of folding in this area. Some folds are overturned toward the north and some toward the south (Haley and others, 1979).

GEOCHEMISTRY

Spectrographic analyses of rock samples and stream-sediment samples from the Little Blakely Roadless Area do not indicate an anomalously high metal content at the surface. Although some samples contain a slightly higher vanadium concentration than the background value of 200 ppm, they do not indicate a significant concentration of vanadium. The analyses indicate that there are no major areas of surface metallic mineralization within the roadless area.

GEOPHYSICS

No detailed magnetic or gravimetric surveys have been made of the Little Blakely Roadless Area. A Bouguer gravity map of Arkansas (Hendricks and others, 1981) shows no anomalies within the roadless area, though gravity and magnetic highs are associated with the Magnet Cove alkaline igneous complex about 20 mi southeast of the roadless area (Erickson and Blade, 1963; Hendricks and others, 1981).

MINING DISTRICTS AND MINERALIZED AREAS

The Little Blakely Roadless Area is within the Arkansas quartz-crystal belt. Several dozen mines within this belt have yielded high-quality crystals satisfactory for optical, oscillator, jewelry, and mineral-specimen use. Most of the quartz-crystal deposits within this belt are in vertical to near-vertical fractures that are approximately parallel to the crests of folds. Even though quartz-crystal deposits occur throughout the Paleozoic shales, sandstones, and cherts within the quartz-crystal belt, most of the high-grade quartz has been obtained from deposits in the Blakely and Crystal Mountain Sandstones (Engel, 1951). The Blakely Sandstone occurs throughout most of the roadless area and is exposed in fold apexes on most of the ridgetops. A sample taken across a 1-foot quartz vein in the Blakely Sandstone was assayed for gold and silver, but showed none (Wood, 1982).

No patented or unpatented mining claims are on public lands within the roadless area. Two unpatented mining claims are about 0.5 mi north of the roadless area near the Miller Mountain quartz-crystal diggings in the SW1/4SW1/4 sec. 1, T. 1 S., R. 21 W. (Wood, 1982).

Located on private property inside the roadless area, the W. T. Beard quartz-crystal mine is within the northern part of the roadless area in the NW1/4SW1/4 sec. 12 and the NE1/4SE1/4 sec. 11, T. 1 S., R. 21 W. Workings at the mine consist of a series of open pits on several crystal-bearing veins and vein systems in the Blakely Sandstone. This area was extensively mined between 1890 and 1940 for display specimens. Production recorded in 1943 consisted of 500 lbs of quartz crystals (Engel, 1951).

The Miller Mountain mining area is on private property about 0.5 mi north of the roadless area. More than 800 ft of underground workings and a series of open pits and trenches are near the crest of Miller Mountain anticline. These workings are on a series of steeply dipping quartz-crystal veins in the deeply weathered, argillaceous lower Blakely Sandstone.

Phosphate rock occurs in the Mazarn and Womble Shales and in the Bigfork Chert in Garland County, outside the Little Blakely Roadless Area. Although these formations crop out in the roadless area, it is unlikely that phosphate is present in sufficient concentrations and areal extent in the roadless area to constitute a resource (J. B. Cathcart, oral commun., Jan., 1983). Wavellite, a complex hydrated aluminum phosphate mineral containing 35.2 percent P₂O₅, is found in the Bigfork Chert near Avant and Mountain Pine, Ark. (Stroud and others, 1969).

Vanadium-bearing wavellite occurs in the Bigfork Chert on Dug Hill north of Avant, Ark., about 6 mi west of the roadless area, and near Mountain Pine, Ark., about 4 mi southeast of the roadless area. These occurrences of wavellite are of interest to mineral collectors, but they have not been mined for phosphate or vanadium.

A sample of Womble Shale assayed by the Fischer method contained a trace of oil. Although some gas has been produced from the 25-1 Weyerhaeuser well in the Ouachita Mountains core area in southeastern Oklahoma, the core areas, including the region of the Little Blakely Roadless Area (Haley and others, 1976), have low potential for commercial amounts of gas or oil (Goldstein, 1975). Recrystallization of rocks in the core area in Oklahoma destroyed the original porosity, and the small amount of gas produced from the Weyerhaeuser well came from a fracture, probably along a fault zone. Possibly the Ouachita Mountains area in Arkansas has not been tested adequately to ascertain the presence or absence of gas or oil (Caplan, 1963), but, based on available information, the potential for gas or oil in the Little Blakely Roadless Area is low.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

The Little Blakely Roadless Area has a high potential for occurrence of quartz vein deposits in the Blakely Sandstone. The roadless area has a low potential for oil and gas. Although phosphate rock is present in formations in Garland County, outside the roadless area, no phosphate has been mined in the county. It seems unlikely that phosphate is present in the roadless area in sufficient concentration and areal extent to constitute a resource. Vanadium-bearing wavellite present in Garland County has been collected for mineral specimens, but no vanadium or phosphate has been produced from these occurrences. Based on available information, the potential for vanadium and phosphate in the roadless area is low.

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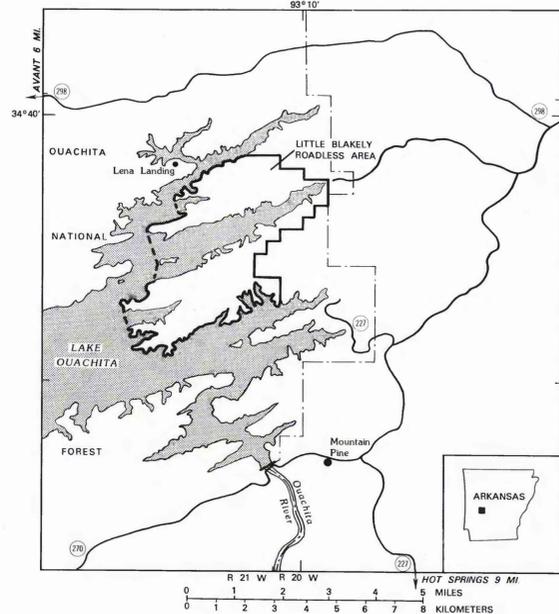
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INDEX MAP OF THE LITTLE BLAKELY ROADLESS AREA (08004), GARLAND COUNTY, ARK.