34558

44-1

UNITED STATES
DEPARTMENT OF THE INTERIOR
US Geological Survey
Washington
1944

Strategic minerals investigations Prelim report

GEOLOGY AND ORE DEPOSITS OF THE KOKO WEEF MOUNTAIN AREA SAN BERNARDINO COUNTY, CALIFORNIA

(unnumbered)

1909 Arnold Leslie

AMS By Arthur Richards and A. L. Brokaw, 1911-

Koko Weef Mountain is in the extreme northeastern corner of San Bernardino County, Calif. The Carbonate King mine, on the west slope of the mountain (fig. 1), is the only mine within the area here considered. It can be reached by a 5-mile dirt road that branches from U. S. Highway 91 midway between Wheaton Springs and Mountain Pass. The ore deposit was first discovered about forty-five years ago, but no mining was done until 1940, when W. F. Huston of Nipton, Calif., leased the property from the Crystal Cave Mining Co. of Las Vegas, Nev. Since 1940 Mr. Huston has produced about 4,000 tons of ore, averaging 35.5 percent zinc, 1.0 percent lead, and 10 ounces of silver to the ton.

Geology

The oldest rocks of the region are pre-Cambrian schists and gneisses, which crop out along the lower east slope of Koko Weef Mountain. They are faulted against the Paleozoic limestones and dolomites which make up the greater part of the mountain (fig. 1). The Paleozoic formations range in age from Cambrian to Pennsylvanian and correlate with part of the sequence described by Hewett in the Goodsprings district, 25 miles to the north.1/

The oldest sedimentary unit mapped in the area comprises a great thickness of dark gray to black dolomite and limestone, overlain by thin-bedded light-gray limestone, which forms the prominent cliffs at the top of Koko Weef Mountain. The observed thickness of this unit exceeds 1,000 feet, and its base is not exposed. These rocks have not been subdivided in mapping, but they include the Goodsprings dolomite, of Cambrian to Devonian (?) age, and the Sultan limestone of Devonian age.

Upon the Goodsprings-Sultan unit rests the Monte Cristo limestone, of Mississippian age. In this area the Monte Cristo is 500

1/ Hewett, D. F., Geology and ore deposits of the Goodsprings quadrangle, Nev.: U. S. Geol. Survey Prof. Paper 162, 1931.

Released Feb. 13, 1944

feet thick and consists largely of massive gray to black fine-grained limestone. Locally the limestone is altered to dolomite which is coarser-grained and lighter in color. Beds of lenticular chert are abundant in the lower part of the formation. In the upper part, a persistent 6-inch zone containing tabulate corals has been recognized and mapped (fig. 1).

The Monte Cristo is overlain by the Bird Spring formation, of Mississippian and Pennsylvanian age, which consists of light- to medium-gray limestone with some interbedded sandy limestone. Individual beds of the limestone are from a fraction of an inch to 10 feet or more in thickness. The sandy limestone weathers to a buff color and shows cross bedding. The most prominent of the sandy zones is shown on the map (fig. 1). The total thickness of the Bird Spring formation is not known, but more than 1,000 feet is present in the area mapped.

The main structural feature of Koko Weef Mountain is a syncline that plunges northwestward and is overturned to the north. The south or overturned limb of the fold is broken by a series of tear faults along which the beds have been rotated to a more southwesterly strike. The northeast limb is also broken by tear faults but along these the strike of the beds has not been appreciably rotated.

Along the northeast side of the mountain a normal fault, dipping 85° S.W., has brought the Paleozoic rocks against pre-Cambrian schists and gneisses.

A thrust fault striking north and dipping 30° to 38° W. emerges near the top of the mountain, and it is also exposed in the lower workings of the mine. The exact direction and amount of movement on the thrust are not known. The offset on a cherty zone in the Monte Cristo limestone indicates a displacement of 80 to 120 feet parallel to the dip of the fault, and, although there may be a strike slip component, it is believed that the major displacement was along the dip.

Ore deposits

The ore body of the Carbonate King mine is in the Yellowpine limestone member of the Monte Cristo limestone. Surface showings are limited to a few small stringers; the main ore body was encountered at a depth of 60 feet. The mineralized zone is elongate parallel to the strike of the beds and has a strike length of 120 feet. In the north end of the mine it dips a little more steeply than the bedding, but at the south end it is irregular and its relation to the bedding is obscure. Minor fractures essentially parallel to the bedding or slightly steeper are believed to have acted as conduits for the mineralizing solutions. The ore wedges out laterally into unmineralized limestone and dolomite. At its base the ore body is cut off abruptly by the thrust fault (figs. 2 and 3), below which lies barren limestone. Where the thrust fault crosses the third level it is clear that the ore body bottoms cleanly on the fault surface. That the faulting is postmineral is further indicated by the unaltered condition of the limestone in and below the shear zone, and by the occurrence of drag ore along the fault zone itself.

The ore consists dominantly of rather loosely coherent crystals of calamine with some smithsonite. Along the bottom of the stope the ore is bluish-white botryoidal smithsonite locally altered to white hydrozincite. A few residual pods of galena are present in the southwest end of the stope, and mining operations revealed some fine-grained sphalerite.

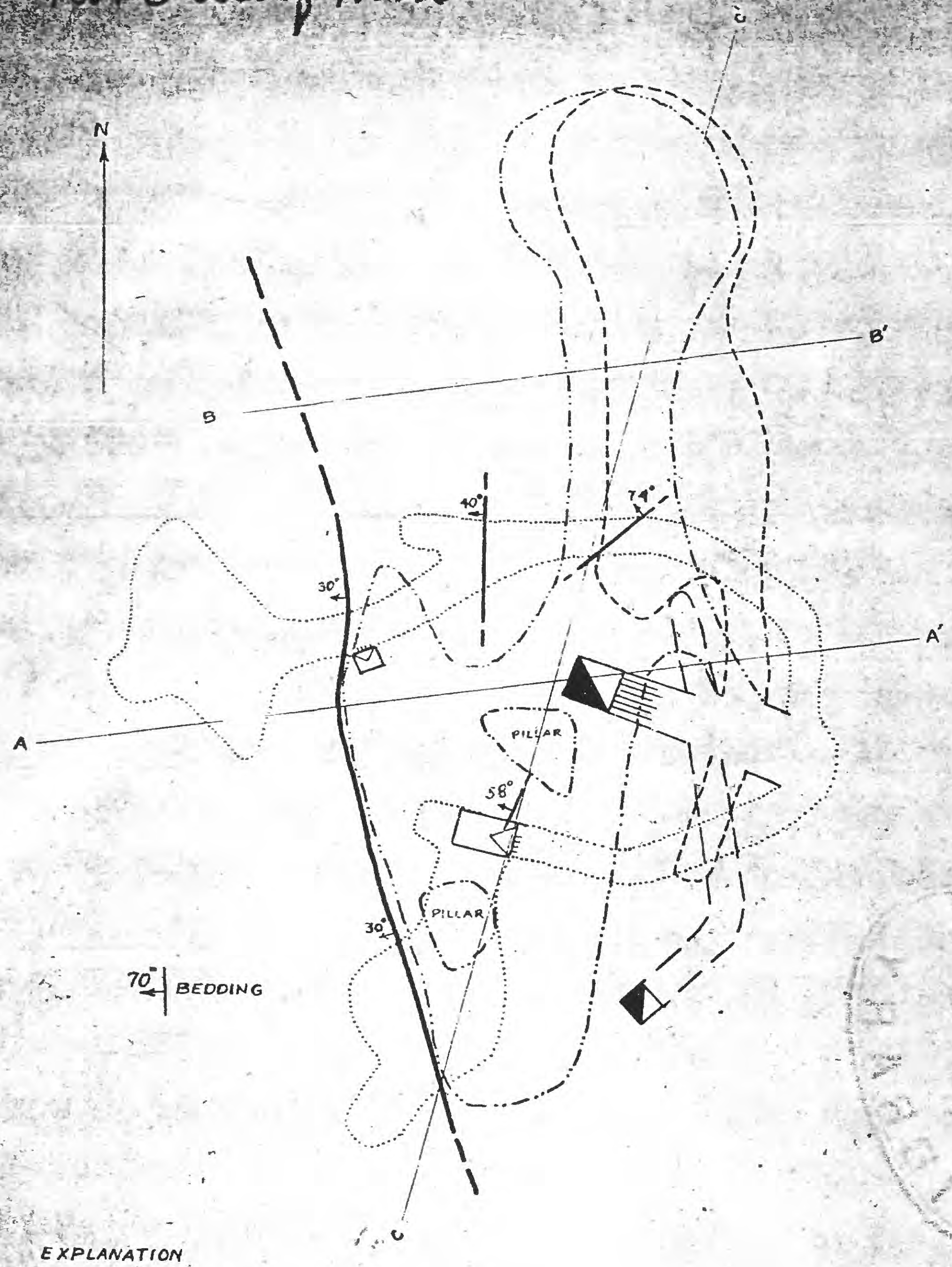
Reserves

The known ore body has been nearly mined out, and there are no reserves in the present mine workings. Since the ore body is cut off below by a postmineral thrust fault, it is logical to assume that there is a fault segment of ore in the footwall block. The position of this footwall segment depends upon the direction and amount of displacement on the thrust fault. As already noted, the component of the displacement that lies parallel to the dip of the thrust is 80 to 120 feet. If, as is believed, this component constitutes virtually all the displacement, the position of the footwall segment would be as shown on fig. 4. Any component of the displacement parallel to the strike of the thrust would throw the center of the footwall ore body off the line of the section (fig. 4) by the amount of this component. As the elongation of the ore body is parallel to this unknown displacement, however, the strike slip component would have to be fairly large in order to remove all of the hidden segment from the line of the section. The chance of finding this segment is believed to be good enough to warrant exploration.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STRATEGIC MINERALS INVESTIGATIONS
PRELIMINARY MAP

Kokoweef Mtn



EXPLANATION

"ADIT" LEVEL

FIRST LEVEL

SECOND LEVEL (STOPE BOTTOM)

THIRD LEVEL

FAULTS ON THIRD LEVEL

CHUTE

SHAFT

CARBONATE KING MINE

SAN BERNARDINO COUNTY, CALIFORNIA

COMPOSITE PLAN OF WORKINGS SHOWING GEOLOGY OF THIRD LEVEL

BY

ARTHUR RICHARDS AND A. L. BROKAW

SCALE

0' 10' 20'

SEPTEMBER 1943