UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver, Colorado

Air Mail

September 7, 1951

Memorandum

To: Executive Secretary, Defense Minerals Administration

From: DMA Field Team, Region IV

Subject: Final Report, DMA Docket 1606, F. . S hahan, Dixie Copper Mine, Maricopa County, Arizona

Enclosed herewith is original and two copies of the report as indicated above.

We concur with the conclusions and recommendations of the examining team.

J. H. East, Jr.

A. H. Koschmann

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

September 6, 1951

Memorandum

To: DMA Field Team, Region IV, Defense Minerals Administration

From: Chief, Mining Division, Region IV

Subject: Final Report, DMA Docket 1606, F. L. Shahan, Dixie Copper Mine, Maricopa County, Arizona

The application with the subject docket for a production loan of $136,119.26 for the construction of a road, camp and 75-ton flotation plant.

The deposits consist of a 100 foot limonite stained zone in schist. No secondary copper oxide minerals or copper staining was found at any place on the surface. The only evidence of copper was in an adit driven on a band of fissile shale in the center of the limonite stained zone. Two samples taken in the back of this adit averaged 0.29 percent copper over a width of 6.5 feet.

The examining engineer recommends denial of the loan, with which we concur.

Paul T. Allsman

Paul T. Allsman

Mining Division
Date Rec'd.

SEP 4 1951

BUREAU OF MINES
Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
MINING DIVISION
REGION IV

SOUTHWEST EXPERIMENT STATION
Box 4097
UNIVERSITY STATION

TUCSON, ARIZONA

August 29, 1951

Memorandum

To : Paul T. Allsman, Denver, Colorado

From : Chief, Arizona-New Mexico Br., Mining Div., Region IV

Subject : Final Report, Docket DMA-1606, F. L. Shahan's Dixie Copper Mine, Maricopa County, Ariz.

Enclosed are original and 7 copies of the above report by Lincoln A. Stewart of the Bureau of Mines. No separate geological report by the Geological Survey will be submitted.

This report has my approval.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC P. T. Allsman (7)
C. A. Anderson
DMA-1606
DF

FOR VICTORY
BUY
UNITED
STATES
SAVINGS
BONDS
AND
STAMPS

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMA-1606, F. L. Shahan's Dixie Copper Mine

Maricopa County, Arizona

Lincoln A. Stewart, Mining Engineer
U. S. Bureau of Mines

August 1951

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Lincoln A. Stewart[1]

A production loan application under the Defense Production Act of 1950, made by F. L. Shahan for his leased Dixie copper mine in Maricopa County, Ariz., was received by the Defense Minerals Administration in Washington on June 5, 1951. It was for Government aid in the amount of $136,119.26 and was assigned docket DMA-1606. This money was to build a 7-mile road and power line, provide hoisting and mining facilities, construct and equip a 75-ton flotation mill, camp, etc. After the request for a field examination had been forwarded to the Field Team, Region IV, the applicant submitted an entirely revised budget, raising the requested amount of the loan to $258,139. The property was examined August 13 and 14, 1951.

The surface indication of the vein is an iron-stained zone in schist that can be traced on the surface for only a few hundred feet. The only accessible mine workings are the so-called 70-foot adit level and crosscuts therefrom. The vein appears to be a leached 5-to-7-foot band of fissile schist that has been mineralized with slightly cupiferous pyrite. Copper oxide staining is meager but there are thin bands of copper sulfate at various places along the drift. Unaltered, disseminated pyrite is present in the more siliceous schist bands of the footwall. There is no commercial copper ore to be seen in the 350 feet of accessible workings.

1/ Mining Engineer, Bureau of Mines

A crosscut connects these workings with a vertical shaft at 70 feet from the surface. The shaft is said to be 240 feet deep. It is filled with water to the adit level, as is a 50-foot winze sunk on the vein near the portal of the adit. There is no authentic report of the extent of the lower workings of the shaft. Neither the owner of the Dixie mine nor the applicant has seen other than the adit level.

The only production from this mine appears to have been two 11-ton shipments of 5 percent hand-sorted copper ore from the 125-foot level in 1940. The applicant bases his request on the existence of a nebulous ore body from hearsay reports.

It is obvious that this application does not qualify as a development loan and the applicant is not interested in 50 percent participation in an exploratory project. The writer does not believe the property justifies any sort of an exploratory program if it should be requested later.

It is recommended that the application for Government aid to F. L. Shahan's leased Dixie copper mine be denied, and that no further consideration be given to the property by the Government.

F. L. SHAMAN'S DIXIE COPPER MINE
MARICOPA COUNTY, ARIZONA
DMA DOCKET 1606

Engineering Report

By Lincoln A. Stewart
Mining Engineer
U. S. Bureau of Mines

August 1951

F. L. SHAHAN'S DIXIE COPPER MINE
MARICOPA COUNTY, ARIZONA
DMA DOCKET 1606

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INTRODUCTION

A request for examination of the property of the Dixie Mining Co. in Maricopa County, Ariz., RMA Docket No. 1606, was received by the Tucson office July 8, 1951. Letter of transmittal from the Field Team, Region IV, stated "--but since it is a production loan no action should be taken as long as you have exploration projects to investigate". An engineer became available and the property was examined August 13 and 14, 1951.

The original application received in Washington on June 5, 1951 requested aid in the form of $136,119.26. After the request for field examination had been forwarded to the Field Team the applicant submitted an entirely revised budget raising the requested loan to $258,183. This money was to be used to build a 7-mile road and power line, provide hoisting and mining facilities, construct and equip a 75-ton flotation mill, camp, etc.

In the request for examination dated June 25, 1951, submitted to the Field Team, Region IV by the Chairman of the Coordinating Committee, the examining engineer was requested to determine:

1. Feasibility of the project;
2. Is there enough measured and indicated ore to warrant this loan;
3. The correctness of the applicant's proposed expenditures.

LOCATION AND ACCESSIBILITY

The Dixie Mining Company's property is located on the east slope of the McDowell Mountains about 6 air miles west of Fort McDowell, the agency headquarters of the Salt River Indian Reservation. It is at the foot of precipitous hills and ridges that rise to the summit of McDowell Peak 1½ miles to the west. The corner common to secs. 25, 36, and 30, 31 of R. 5 and 6 E, respectively, in T. 4 N., lies within the property.

The mine is 28 road miles northeast of Scottsdale, of which 4 miles are paved, 17 miles graded, and 7 miles poor truck trail that ends at the mine workings. The mine is at an altitude of approximately 2,500 feet. The main workings are near the bottom of an unnamed dry wash that drains southeasterly to the Verde River. Mesa, the nearest shipping point, is said to be about 25 miles from the mine but this road was not investigated by the writer.

The climate of the area is moderate in winter and hot in summer.

OWNERSHIP AND EXTENT

The Dixie group consists of a block of 10 contiguous unpatented mining claims owned jointly by C. A. Gillespie, 912 E. Durango, Phoenix, Ariz., and Mrs. Gertrude Barkley, Box 847, Mesa, Ariz., each of whom inherited their interest from their respective fathers who appear to be the original locaters.

On May 19, 1951, F. L. Shahan (the applicant) and C. A. Gillespie secured a 10-year lease and option from the owners. On May 31, 1951, Gillespie (one of the owners) assigned his interest in the option to Shahan.

HISTORY AND PRODUCTION

No definite information could be gained relative to the early history. Copy of a report[1] furnished with the docket indicates that the 70-foot adit level and the 240-foot shaft were in existence in 1917. According to the Hauser report,[2] also furnished with the docket, the above report is referred to as being made by the Department of Mineral Resources, State of Arizona. However, since the Department of Mineral Resources was created in August 1938, this statement is erroneous. The Hauser report is merely a "rubber stamp edition" of the earlier report and contains no additional information.

Since the lower workings were inaccessible at the time of Meyers' report, his conclusions are based on hearsay evidence and therefore are high inferential.

A request for a Bureau of Mines examination of this mine was made by a Glen W. Wood in November 1942. For the name of the mine Wood stated "formerly Red Mountain" and claimed "ownership by location." He furnished pictures "taken in 1918" that showed a headframe in process of erection with a compressor and hoist being hauled to the site. What work was accomplished at that stage is not known, but Shahan stated he was told that when the

1/ Meyers, C. E., Report on property of the Dixie Mining Group, undated but refers to examination request of Apr. 3, 1917.
2/ Hauser, W. M. Dixie mine, Jan. 2, 1947

work was well underway, the operator was arrested and sentenced to a jail term for misappropriation of funds, whereupon all work ceased.

The shaft must have been unwatered to the 125-foot level about 1940, as two settlement sheets from the International Smelting & Refining Co. of Miami, Ariz., show the following shipments:

Date	Dry tons	Percent Cu	Percent SiO_2	Oz/ton Au	Oz/ton Ag	Net smelter returns per ton
1/24/40	11.76	4.34	31.4	0.2725	19.33	$24.06
3/2/40	10.92	5.54	28.9	.170	25.71	26.10

Abandonment of work following these shipments, as explained by Shahan, was due to the fact that the operator "became an alcoholic" and his backer withdrew from the leasing arrangements.

In 1942, application was made by C. A. Gillespie (one of the owners) for a $5,000 Reconstruction Finance Corporation loan to dewater and repair the shaft and workings, and to extend the drifts from the lower levels. The examining engineer recommended only a $2,000 loan, which proved insufficient to accomplish the desired results.

A Bureau of Mines engineer visited the property on Jan. 15, 1943 and reported[3/] that the shaft and winze were filled with water.

DESCRIPTION OF THE DEPOSIT

The property lies in a northeasterly trending schist belt that rises out of the desert alluvium on the east and is in contact

3/ Phelps, Harlow D., Red Mountain Copper Mine, Bur. of Mines War Minerals Memorandum, Jan. 1943

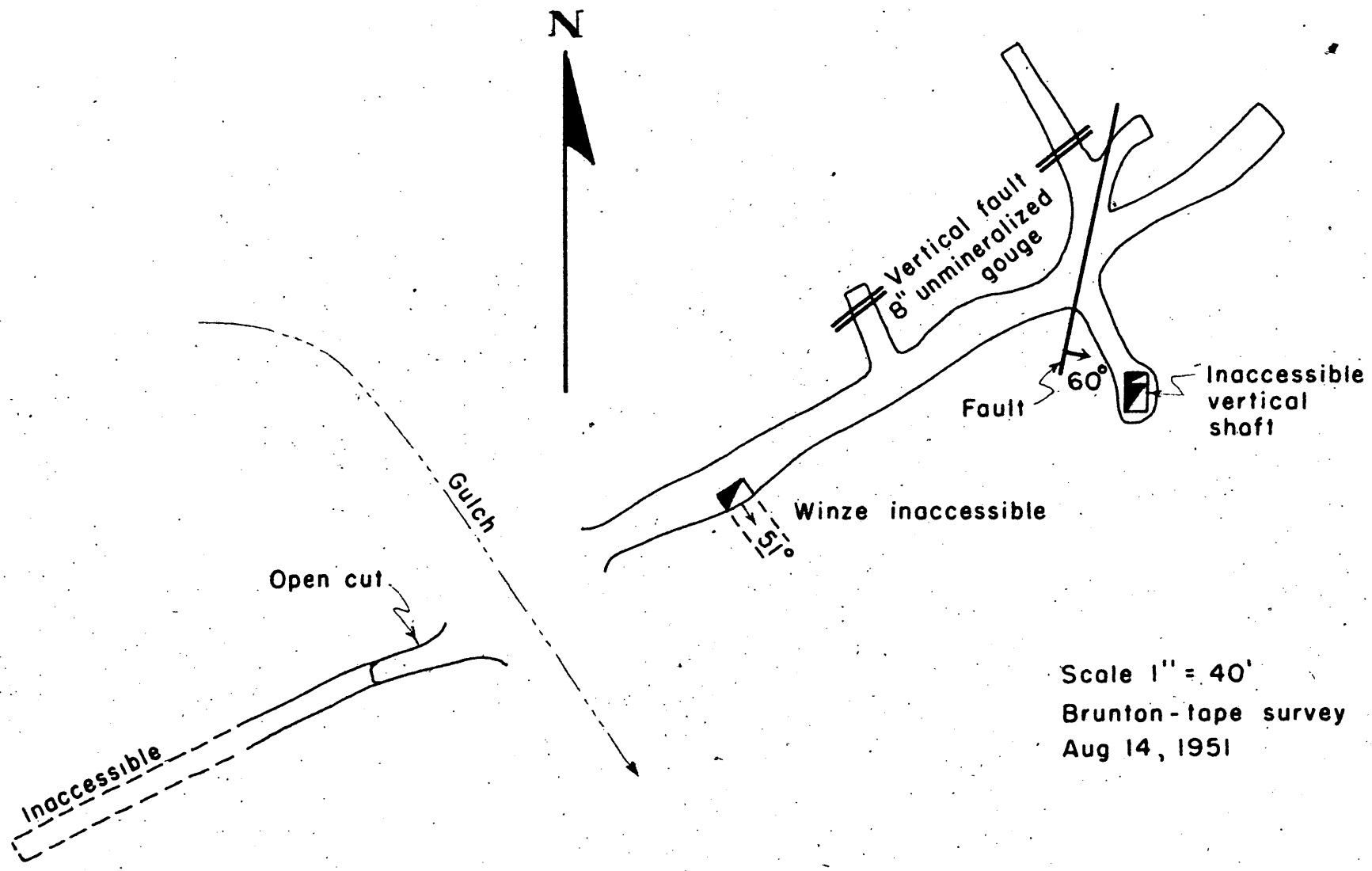
with granite about a mile to the north and west. In the area of the Dixie mining claims the formation is composed of bands of thin-bedded, sericitic schist alternating with sericitized quartzitic bands.

A limonite-stained zone nearly 100 feet wide has been exposed by erosion in the bottom of the gulch and can be traced for a short distance up each slope. The leaching of pyrite has produced a noticeable yellow to brown color. No secondary copper oxide minerals or staining was seen at any place on the surface.

At about the center of this mineralized zone, a band of fissile shale, 5 to 7 feet wide, stained a brighter yellow than elsewhere, was the locus of prospecting. On each side of the gulch at about 10 feet above the bottom, an adit has been driven on this "vein".

On the southwest side, a drift has been driven approximately 100 feet. It is accessible only for 30 feet, beyond which there is considerable caved material covered with a profusion of cholla balls and spines brought in by rats. The face of the drift can be seen, and there are no stopes or crosscuts. Only a faint suggestion of copper staining could be noted.

The main workings are located on the opposite side of the gulch (fig. 1) where an adit has been driven for 204 feet in a general direction of N. 60° E. This adit connects with the shaft at 70 feet below the collar and therefore is called the 70-foot level.



DMA 1606 FIG. 1 DIXIE MINE, 70 ft. level Maricopa County, Ariz.

The first copper staining is noted at about 20 feet from the portal. At 35 feet from the portal, a winze, inclined at 50° southeast, was sunk on the vein. It is said to be 50 feet deep, but is filled with water. Several rounds have been blasted above the winze to accommodate the hoisting equipment that was used. The back of the drift there appears to be barren. Further along in the drift, chalcanthite can be seen along some of the planes of schistosity, generally being more abundant near the footwall contact of the thin-bedded schist against the underlying quartzitic member.

Midway along the length of the drift there are several small, discontinuous pods or lenses composed of somewhat siliceous material. These have a concentrically banded appearance and contain thin coatings of copper carbonates with copper sulfate around nodules of sulfides that were mainly pyrite with a little admixed chalcopyrite. In the two crosscuts northwest from the drift, very slight copper staining is visible along some fractures in the schist beyond a small fault. Unaltered, disseminated pyrite occurs in some of the more siliceous schist bands.

A fault, striking N.10°E., and dipping about 60° E., has displaced the vein a few feet northward. Copper sulfate, forming a thin band, has leached downward to the footwall of the fault. This break was prospected for about 30 feet in one of the crosscuts.

Very little copper mineralization is evident in the face of the main drift.

Delicate, white, fibrous or capillary efflorescence of epsomite (mangnesium sulfate) mark the lines of schistosity and fracture planes at numerous places in the drift and crosscuts. Another efflorescent material is common on portions of the drift floor. It occurs as yellow scales or incrustations in loose aggregations up to several inches thick, and has been identified as copiapite, a ferric sulfate. Chemical tests for copper were negative on both these incrustations. This ferric sulfate deposition is abundant along the floor of the drift across the gulch.

It is evident that this deposit was prospected first by the adit and winze, followed by sinking of the shaft, so located as to intersect the deposit at some point below the adit. A crosscut connects the adit with the shaft. Water stands at 5 feet below the adit level.

There is no commercial or even marginal ore on the 70-foot adit level. Consequently no sampling was necessary. Samples were taken during a previous investigation by a Bureau Engineer 4/ who reported as follows: "Two samples were taken across the back of the tunnel at places where there was a showing of copper.

"Sample No. 853, 6 feet wide, assayed 0.24 percent copper.

"Sample No. 854, 7 feet wide, assayed 0.34 percent copper."

One other prospect hole was sunk on the vein about 200 feet northeasterly up the slope from the shaft. It is an accessible 40-foot incline in which the vein lacks the intense yellow color

4/ Phelps, Harlow D., previously mentioned in footnote 3.

shown in the adit level. No copper staining or copper minerals appear in the vein material. Further up the slope on the strike of the formation, the mineralized zone cannot be distinguished.

MINE WORKINGS

Only the adit level is accessible for examination. It has a length of 204 feet. There are 3 crosscuts, one of which connects with a shaft from the surface at 70 feet below the shaft collar. This 70-foot level is described under the chapter "Description of the deposit". There is no map of the lower workings. Neither the owner nor the applicant (a lessee since May 1951) has seen the workings that are under water. Likewise no examining engineer has seen the lower levels. Consequently these workings are described by hearsay evidence only.

The vertical, 2-compartment shaft is said by Shahan to be 240 feet deep, intersecting the vein at 125 feet, where there is a 90-foot drift on the vein from which a 40-foot raise-stope was driven. On the 235-foot level, 10-foot stub drifts were driven on each side of the shaft. Shahan states in the docket that "the station cut at 235 feet is in shipping bornite copper ore". The writer called his attention to the fact that the vein conforms with the plane of schistosity of the country rock and that the vein is said to pass through the shaft at the 125-foot level. The question was asked "how could the vein likewise appear on the 235-foot level?" Shahan hadn't thought of that, but immediately stated that it must be another vein.

Except for the two small shipments, there are no assay records available for any ore below the present water level.

PRESENT STATUS

Exploration and development has been detailed in the chapter on "Mine Workings." The headframe over the shaft has deteriorated to the point where it would be dangerous to use. Phelps[5/] reported in 1943 that "the hoist and compressor, installed in 1918, are still at the property and appear to be in good working condition". Since that time vandals have stripped this equipment of piping, valves, cylinder heads, etc., to the point where the machinery now is useless.

CONCLUSIONS

The Dixie property is located in a schist belt where there are no mineral showings other than the one zone where the workings are located. The 100-foot mineralized zone contains the more intensely leached and iron-stained vein that can be traced only a couple of hundred feet on each side of the transecting gulch. No copper staining can be seen on the surface. In the 70-foot adit level there is a little copper oxide staining and thin bands of chalcanthite. The copper content at a few scattered places in the adit is on the order of 0.1 to 0.4 percent across the vein.

The basis of the application for a loan is hearsay evidence only, as the workings below the 70-foot level are under water. Neither the applicant nor the owner has seen these workings. Two reports by mining engineers were contained in the docket, but only the 70-foot level was seen by these men.

5/ Previously cited in footnote 3.

Smelter settlement sheets show that two 11-ton shipments were made some 10 weeks apart, each assaying approximately 5 percent copper. This production was said to have come from the 125-foot level. Had there been any appreciable volume of ore on this level, it would appear that shipments of greater quantities would have been made. A natural assumption is that the vein was very narrow or that scattered ore lenses were found, and that in either case hand sorting was necessary. The conclusion drawn is that there was a lack of profitable ore.

The writer inquired relative to the statement in the docket that antimony would be produced as a by-product. Shahan explained that he had been told by a man who worked in the mine years ago that there was a separate, distinct vein off to the side that had a peculiar yellowish color. The operators were not interested in this vein, but the narrator had an assay made that showed 32 percent antimony. Hence the listing of antimony in the docket as an additional recoverable metal.

Apparently the only reason this development loan docket was sent to the field was the fact that the applicant claimed to have a minimum of 55,000 tons of measured ore averaging 4 percent copper, plus gold, silver, and antimony, and several hundred thousand tons of indicated ore.

Field examination shows that there is no commercial ore in sight, either measured or indicated. What is in the workings below the water level is problematical. The documented shipments

from the 125-foot level would tend to indicate a weak vein at that level. The possibility of truth relative to "shipping grade bornite ore" on the 235-foot level seems remote, as indications of such a parallel vein should have been seen at the face of the crosscut which explores the formations for 100 feet northwestward from the shaft.

RECOMMENDATIONS

The fact that there is no ore in sight necessarily excludes this application from consideration as a development loan.

As a matter of routine, the writer asked the applicant if he would be willing to consider participation on a matching basis in an exploratory program in which the shaft would be dewatered. It was further explained that to be eligible for such a loan the dewatering job would have to be combined with additional exploratory functions such as diamond drilling, drifting, or crosscutting. The applicant definitely was not willing to put up any money for such a venture. The writer does not believe that such an exploratory project would be warranted at the present state of information.

A development loan is not justified for F. L. Shahan's Dixie Copper Mine and an exploration loan is not to be considered. It is therefore recommended that the application for Government assistance under Docket No. 1686 be denied.