MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 8/4/53

REFERRED TO:

1. Code 600 Room 4637
2.
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FOR:

..... Action	..... Recommendation
..... Approval	..... Record of .....
..... Comment	..... Referring to .....
..... Conference	..... Reply for signature of .....
..... Consideration	..... Rewriting
..... Filing	..... Signature
..... Instructions	..... Suggestions
..... Investigation	..... Your information
..... Initials	
..... Mailing	
..... Previous correspondence	

REMARKS: .....

Check (X) before the items needing attention. ilb

ROBERT E. ADAMS

Initials of sender.

GPO 16—63815-1

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

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2812 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are four copies of the final report on the subject docket, two copies of Form 3b and a copy of the letter of denial to the applicant.

W. H. King

A. H. Koschmann

Enclosures

DMEA-2812
Asbestos
Region IV

RAY SOUTHERN MINES, INC., PINAL CO., ARIZONA. Ray Southern Group, Pinal County, Arizona.
Field Report and Denial. The report was referred to the Commodity Group.

8-17-53

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

July 31, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, RMEA Docket 2812 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are nine copies of the final engineering report on the subject docket.

The applicant requested $18,300.00 to build an access road, 450 feet of drifting and 100 feet of raising.

The examiners conclude that insufficient mineralization is present to justify an exploration project and they recommend denial of the application.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

MINING DIVISION
REGION IV

July 27, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMMA-2812, Ray Southern Mines, Inc. (Asbestos), Pinal County, Ariz.

Enclosed are original and 8 copies of the above report by Lincoln A. Stewart of the Bureau of Mines. A separate report on the geology was submitted in June by the Geological Survey.

As there seems little chance of making a significant discovery of strategic asbestos at this property, the examiner recommends that a lease be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

cc W. H. King (8)
R. F. Robinson
DMMA-2812
DF

WRStorms:frj

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D.C.
Denver 2, Colorado

June 25, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2012, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and 8 copies of the geologic report by A. F. Shride of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 4121, University Station
Tucson 5, Arizona

June 22, 1953

Memorandum

To: [illegible] M. Koschmann, Denver, Colorado

From: R. F. Robinson, Tucson, Arizona

Subject: Geologic report, [illegible]A-2812, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and [illegible] copies of the above report by [illegible] F. Shride of the Geological Survey.

This report recommends that an exploration loan be denied because geologically significant amounts of asbestos are not likely to be discovered. The report and recommendations have my approval.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

Enclosures 9

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2012, Ray Southern Mines, Inc. (Asbestos)

Pinal County, Arizona

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

July 1953

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Lincoln A. Stewart[1/]

An application by the Ray Southern Mines, Inc. for an $18,300 exploration loan, docketed as DMEA-2812, was received in December 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration. The purpose of the loan was to explore 2,100 feet of outcrop by a combination cut and access road, and to prospect 3 favorable locations by a total of 450 feet of drifting and 100 feet of raising.

The property, comprising 5 unpatented mining claims owned by Lee Wall, box 144, Ray, Ariz. was assigned to the corporation. The claims are situated on the west slope of the Dripping Spring Mountains, about 1.5 airmiles southeast of Ray, Pinal County, Ariz.

The property was examined by the writer on Feb. 27, 1953, and again in company with A. F. Shride, geologist, U. S. Geological Survey, on May 22, 1953.

Four ore zone exposures were examined along the contact of a diabase sill intruded in Mescal limestone that is intermittently exposed across the width of 3 claims. The site of the major workings, a 27-feet cut and adit, was centrally located on the property. Five separate asbestos-bearing serpentine bands were present in a 12-feet limestone horizon. These mineralized zones were not all continuous,

1/ Mining Engineer, Bureau of Mines

contained variable, but small amounts of generally harsh fiber, and were not considered minable. Three other widely separated exposures contained only small amounts of harsh fiber.

It is concluded that there is insufficient mineralization present or expectable to justify an exploration project, consequently it is recommended that the application of the Ray Southern Mines, Inc., be denied.

RAY-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
DMEA-2012
ASBESTOS

Geology

By
Andrew F. Shride
Geologist, U. S. Geological Survey

[illegible]Y-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
ASBESTOS

DEC. 2012

CONTENTS

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Geology and Asbestos Deposits	1
Conclusions	4

INTRODUCTION

The Ray-Southern asbestos deposits, 1½ miles airline southeast of Ray, Arizona, are exposed along a north-trending outcrop at an altitude of approximately 2,900 feet. The most significant deposit, on the Ray-Southern No. 14 claim, is exposed by an opencut, 12 feet deep, and on a cliff face 120 feet long to the south of this main cut. Descriptive data through the remainder of this report are referenced geographically to this opencut. Two other deposits, approximately 350 and 800 feet south of the main cut, are exposed in shallow cuts and natural outcrops. One deposit, approximately 600 feet north of the main cut, is exposed in a quarry face 30 feet long. These are the only exposures on the applicant's claims that are known to the examiners.

It is recommended that the loan application be denied.

GEOLOGY AND ASBESTOS DEPOSITS

The asbestos-bearing serpentine zones parallel bedding in the pre-Cambrian Mescal limestone and are spatially related to diabase intrusions as is typical of the central Arizona asbestos deposits.

The main deposit, on the Ray-Southern No. 14 claim, occurs as 3 to 5 asbestos-serpentine zones in medium to thick-bedded limestones that dip 5° to 25° S. 60° E. These zones are included in a 10 to 30-foot thick section of limestone several hundred feet long and between two thick diabase sills. Five asbestos-serpentine zones are exposed in the main cut. The lowest serpentine zone, which is 7 feet above the underlying diabase sill, is 4 to 6 inches thick and in places contains

asbestos veins totaling 3/16 inch in thickness. No asbestos occurs in this zone except in the cut. The most persistent zone, 1½ feet above the lowest zone (8½ feet above the diabase at the opencut), averages 9 inches in thickness and contains asbestos veins, in the opencut and for 120 feet along the cliff face to the south of the cut, totaling ½ to 1½ inches in thickness. The average cumulative thickness of these veins is 3/4 inch. In the cut the asbestos is soft, elsewhere the asbestos is harsh. This zone contains more asbestos than the other zones.

A third zone, 3½ feet above the second zone (12 feet above the diabase at the cut) is 6 inches thick and contains veins of harsh asbestos totaling ½ inch. Away from the cut the zone contains asbestos only sporadically; in a few places as much as 1 inch of asbestos exists. Outside of the cut a non-persistent zone 3 feet above the third zone contains traces of asbestos in a few places.

In the cut a fourth 6-inch serpentine zone, 17 feet above the diabase, includes no asbestos in places; in a few places this zone includes as much as 2 inches of harsh fiber. A fifth zone, 19½ feet above the diabase, contains 1 to 2 inches of soft to semi-harsh fiber in a serpentine zone 6 to 8 inches thick. A few feet outside of the cut the fourth and fifth zones are barren of asbestos.

The underlying diabase sill is in general concordant. In a few places the diabase-limestone contact is discordant for a few inches to a few feet, but in general - as exposed along the outcrop - maintains an average distance of 7 feet below the second asbestos zone.

Commonly, for the central Arizona asbestos deposits, an increase in the degree of mineralization is noted adjacent to discordancies in a diabase intrusion. No such changes were observed for any of the Gay-Southern deposits. The overlying diabase sill is concordant over most of the outcrop area. Thirty feet north of the main opencut the upper sill transgresses down across the limestone and 100 feet north of the cut apparently joins the underlying sill. The outcrops are partly covered by debris to the north of the opencut, but apparently no significant increase in the degree of mineralization is associated with this discordant part of the overlying sill.

A shallow cut approximately 380 feet south of the main cut exposed a second deposit in limestones that dip 35° E. One serpentine-asbestos zone, 6 feet above a concordant diabase sill and probably to be correlated with the second zone of the main deposit, makes up this deposit. The serpentine is 18 to 24 inches thick at the trench and includes numerous narrow veins of harsh asbestos totaling 3/4 to 2½ inches in thickness. Twelve feet south of the trench the asbestos veins pinch out. To the north of the pit debris covers much of the outcrop; however, no asbestos-bearing float was noted north of the pit.

Approximately 600 feet south of the main cut a zone containing very little serpentine and asbestos is exposed at a horizon 12 feet above the diabase sill. Here a 3 to 6 inch serpentine zone contains traces to ½ inch of harsh asbestos along a 30-foot portion of the outcrop.

Approximately 800 feet north of the main cut an asbestos-bearing zone 30 feet above a diabase sill is exposed by a quarry face along a 30-foot strike length of the enclosing limestone beds. The limestones dip 35° S. 20° E. in this area. This serpentine zone is 3 to 6 inches thick and includes veins of very harsh asbestos totaling 3/16 to 1½ inches in thickness. The southern 10 feet of the exposure is barren of asbestos; traces of asbestos were seen at the northernmost part of the outcrop. North of the quarry face the outcrop is covered by debris.

In every exposure on the Ray-Southern claims the greatest concentrations of asbestos occurs where small-scale pre-mineral thrust faulting is obvious. The degree of pre-asbestos thrust and bedding-plane faulting evident in the exposures on the Ray-Southern properties is comparable to the degree of structural preparation seen in some of the largest deposits of the main part of the Arizona asbestos belt, yet little asbestos is seen in the Ray-Southern deposits.

The deposits are exposed on a steep hillslope, along which considerable bedrock creep has taken place. The outcrops of the main deposit have slumped downhill along joints in several places; slump offsets of as much as 5 feet were observed. Development experience under like conditions has shown that such asbestos deposits are difficult to explore or exploit, and that much of the fiber developed is likely to be of poor quality due to weathering.

CONCLUSIONS

Despite the existence of (1) competent limestones, (2) close proximity to diabase, and (3) good structural preparation - all factors

known to be favorable to the localization of large concentrations of asbestos - little asbestos is seen in the exposed portions of the Ray-Southern deposits. These exposures are likely typical of the mineralized area. Therefore it is recommended that the application for exploration be denied.

DMEA-2812, RAY SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZONA

Engineering Report

By Lincoln A. Stewart
Mining Engineer
Bureau of Mines

July 1953

DMEA-2812, RAI SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZ.

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Introduction ---------- 1
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Ownership and extent ---------- 2
Description of the deposits ---------- 2
Conclusions ---------- 5
Recommendations ---------- 6

ILLUSTRATIONS

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1 Location map ---------- 1

INTRODUCTION

An application was submitted to the Defense Minerals Exploration Administration for an $18,300 exploratory loan by the Ray Southern Mines, Inc. for its asbestos prospect. This application, docketed as DMEA-2812, was received by the Tucson, Ariz. office of the Defense Minerals Exploration Administration in December 1952. The purpose of the loan was to excavate a 2,100-foot combination exploration cut and access road along the outcrop and to drift a total of 450 feet at 3 favorable locations. A total of 100 feet of raising also was included.

A preliminary field investigation was made by the writer on February 27, 1953 in company with Lee Wall, the owner. Further investigation was delayed until a joint examination could be made with the Geological Survey member of the examining team. This was accomplished on May 22, 1953 when the writer was accompanied by A. F. Shride, geologist of the Survey and Robert W. Ageton of the Bureau of Mines. Mr. Wall again acted as guide.

The examiners investigated all exposures of the ore zone across the width of 3 claims.

LOCATION AND ACCESSIBILITY

The property is situated on the west slope of the Dripping Spring Mountains, 1.5 airmiles southeast of Ray, Pinal County, Ariz. (figure 1). It is reached by traveling south from Ray on the Kelvin

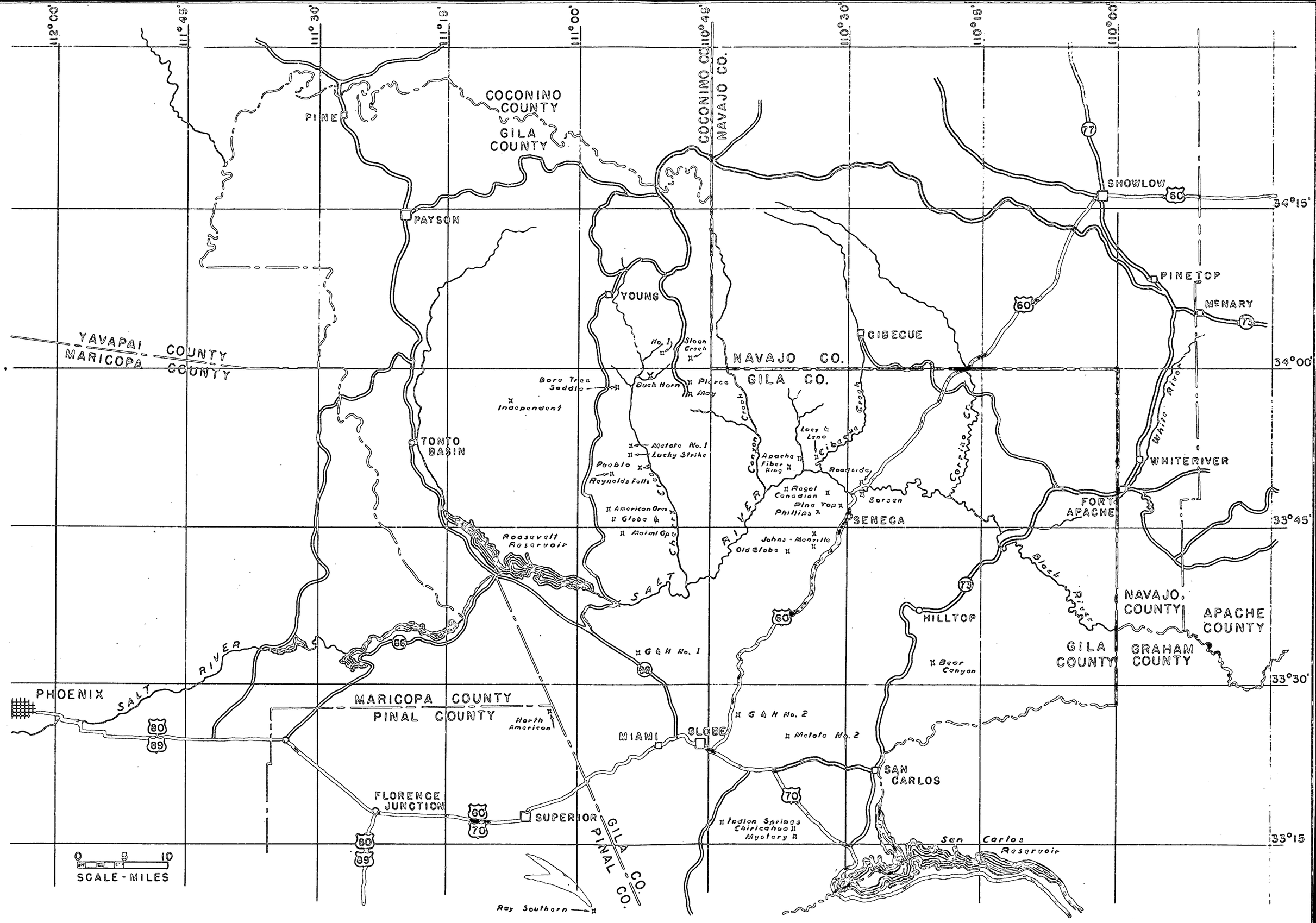

FIGURE 1. - LOCATION MAP - ASBESTOS DEPOSITS - CENTRAL ARIZONA DMEA 2812

road for 2 miles, turning left at Wall's house and going 2 miles easterly up a steep, winding, access trunk trail which ends at the main prospect cut. The claims lie in sec. 24, R. 13 E., and sec. 19, R. 14 E., T. 3 S., at an average altitude of 3,000 feet.

OWNERSHIP AND EXTENT

The 5 unpatented mining claims of interest to this application are part of a group owned by Lee Wall. These claims have been assigned to the Ray Southern Mines, Inc., Box 825, Florence, Ariz., a corporation composed of Lee Wall, Box 144, Ray, Ariz.; T. J. Mahoney, Box 835, Florence, Ariz.; and Stanley Parkyn, 1927 West Holly St., Phoenix, Ariz.

The claims are recorded in the Pinal County Courthouse, Florence, at the Recorders office as follows:

	Book of Mines	Page
Ray Southern No. 13	52	100
" " " 14	52	101
" " " 15	52	101
" " " 16	56	526
" " " 17	56	527

There has been no production from these claims.

DESCRIPTION OF THE DEPOSITS

A persistent, in general concordant, diabase sill has been intruded into the Mescal limestone beds that dip 5° to 37° southeast into the hill. This diabase contact can be traced intermittently along the hillside across the width of 3 claims.

The main deposit, on which most of the work has been done, is centrally located on claim No. 14. The work consists of an open cut about 17 feet long, from which a 10-foot adit has been driven. In this cut, 5 serpentine-asbestos zones can be seen, at 7, 8.5, 12, 17, and 19.5 feet above the diabase contact. The mineralized zones are parallel to the limestone bedding, which here dips 5° southeast.

The following description of the various veins is keyed to the distance above the diabase contact for reference. The lower serpentine band (7) is 4 to 6 inches in thickness, which in places in the open cut, contains fiber veinlets up to 3/16 inch in thickness. This zone is discontinuous; the fiber content is not present in the adit. The second zone (8.5)is more persistent, averages 8 inches of serpentine, and contains veinlets that total an average of 3/4 to 1 inch of soft fiber. The third zone (12) is a 6-inch serpentine band which has fiber veinlets that total about 1/2 inch of harsh fiber. This zone is carried on the roof of the adit.

In the face of the cut above the adit, the fourth zone (17) is an 8-inch serpentine zone containing discontinuous asbestos mineralization. Fiber content varies from 0 to nearly 2 inches of short, harsh fiber. The fifth zone (19.5) contains a total of 1 to 2 inches of semi-harsh, usually short fiber in an 8-inch band of serpentine.

None of these zones persist for more than a few feet north from the cut. Southward from the cut the second zone (8.5) is persistent for about 100 feet, showing similar quantity of mineralization, but of harsher quality. The third zone (12) occurs sporadically and contains only harsh fiber. The 2 upper zones (17 and 19.5) contain fiber for only a few feet south of the cut.

The next exposure investigated was about 380 feet south of the main workings where a shallow cut was made in the cliff face. The limestone dips 37° southeast into the hill. At 6 feet above the diabase sill, a 2-feet serpentine zone contains 25 or 30 asbestos veinlets that contain a total of 2 to 2½ inches of harsh fiber of low tensile strength. The largest vein is about 1/2 inch in thickness. This mineralization pinches out about 10 feet southward from the cut. To the north (toward the main workings) the zone is covered with hillside debris, but no float was found on the hillside.

One other exposure was found about 800 feet south of the main workings where a 3- to 6-inch serpentine zone, 12 feet above the diabase, contained only traces of 1/2 inch of harsh fiber for about 30 feet along a well exposed outcrop that dips 35° east.

About 800 feet northward from the main workings, a quarry face has exposed 30 feet of an asbestos-bearing zone that is approximately 30 feet above a diabase sill. The serpentine zone, 6 to 8 inches thick, contains veinlets that total 1/2 to 2 inches

of very harsh fiber, all of which has numerous partings. The veins pinch out in the south 10 feet of the cut. North of the cut, the zone is covered with overburden, but the mineralization appears to be pinching out in this direction. The limestone bedding in this vicinity strikes N. 70° E. and dips 35° southeast. This deposit is on gently sloping terrain.

The main workings and the deposits to the south are situated on a steep hillside slope. There is evidence in the cliff faces that considerable slumping has affected the attitude and elevation of the individual limestone bedding planes. As much as 5 feet of offset was observed between adjacent limestone blocks.

In a draw about 200 feet south of the main cut, there is inconclusive evidence that a discordant diabase sill cuts up across the favorable beds at about 50 feet within the hill.

CONCLUSIONS

In the Ray Southern area, the Mescal limestone seems to be less susceptible to asbestos mineralization than in the Salt River district. In the latter area, under the same favorable conditions that prevail at Ray Southern, an extensive asbestos deposit undoubtedly would be present. As it is, there is relatively little asbestos in the various exposures at Ray Southern. Only the second zone (8.5 feet above the diabase) is continuous for more than a few tens of feet, but the quantity of fiber present is too small to support a mining operation.

Variation of dips and irregularities of vein levels caused by slumping of large blocks would present a serious mining problem, even if sufficient mineralization were present.

RECOMMENDATIONS

In resumé, although all geologic conditions are present for localization of a significant deposit of asbestos at this property, the mineralization is relatively weak. Most of the serpentine-asbestos zones are non-persistent and most of the fiber is short and harsh. Any attempt at mining would involve serious difficulties, due to the presence of large, disconnected slump blocks.

For the above reasons, it is recommended that the application of the Ray Southern Mines, Inc., for exploration of its property be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

September 8, 1953

Memorandum

To: Lawrence G. Houk, Director, Non-Metallic Minerals Division, DMEA

From: Oliver Bowles, Commodity Specialist, Construction and Chemical Materials Branch

Subject: DMEA Docket No. 2812, Ray Southern Mines, Inc., Pinal County, Arizona

In view of the limited extent of the deposit as indicated in the engineer's report I concur in the recommendation that the application for an exploratory loan be denied.

Oliver Bowles, Commodity Specialist
Construction and Chemical Materials Branch

IN REPLY REFER TO:

G-MD-CNM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

August 6, 1953

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2812 (asbestos)

To: L. G. Houk, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant: Leo Wall, Box 144, Ray, Arizona.
Name of property: Ray Southern claims.
Location of property: Pinal County, Arizona.
Date of field team report: July 1953.
Authorship of field team report. A. F. Shride and L. A. Stewart.
Field team's recommendation: Denial.
Comments: None.
ACTION SUGGESTED: Follow field team's recommendation, - denial.

D. M. Larrabee

Larrabee:jeh
8/6/53
cc: Director's reading 4212
Branch reading 4212
DMEA 3
Larrabee files

6/13

600

August 5, 1953

Memorandum

To: Mr. C. O. Mittendorf

From: Lawrence G. Houk

Subject: Docket No. DMEA-2812 - Asbestos, Ray-Southern Mines, Inc.

The Nonmetallic Minerals Division concurs with the field team in the denial of this application which was handled under delegation of authority by Region IV.

LGHouk:gad 8/5/53

Copy to: Admr. R. File
Docket File
Mr. Houk

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

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Mr. T. J. Mahoney, Secretary
Ray Southern Mines, Inc.
Box 835
Florence, Arizona

Re: Docket DMEA-2812

Dear Mr. Mahoney:

Reference is made to your application for Government aid on the Ray Southern Group.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding material of acceptable grade, and in quantities that will significantly improve the mineral supply position for the National Defense Program.

A careful study of your property and data available to this agency reveals that the probability of disclosing mineable reserves of asbestos by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise that your application for exploration aid is denied.

Very truly yours,

/s/ W. H. King
W. H. King
Field Team, Region IV

/s/ A. H. Koschmann
A. H. Koschmann
Field Team, Region IV

HMC:cwm

cc: Administrator
WRStorms
RFRobinson
Subject
AHKoschmann (2)
Chron.

DATA REPORTS

DATE.....

MR. [illegible]

CHIEF, MINERALS DIVISION

CALVIN PIERSON

MT. WEATHER

FOR YOUR INFORMATION AND REVIEW.

CALVIN PIERSON

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

COPY

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2812 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are four copies of the final report on the subject docket, two copies of Form 3b and a copy of the letter of denial to the applicant.

/s/ W. H. King

/s/ A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE

(date)

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

COPY

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Mr. T. J. Mahoney, Secretary
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Very truly yours,

/s/ W. H. King
Field Team, Region IV

/s/ A. H. Koschmann
Field Team, Region IV

HMC:cwm
cc: Administrator
WRStorms
RFRobinson
Subject
AHKoschmann (2)
Chron.

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

July 31, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2812 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are nine copies of the final engineering report on the subject docket.

The applicant requested $18,300.00 to build an access road, 450 feet of drifting and 100 feet of raising.

The examiners conclude that insufficient mineralization is present to justify an exploration project and they recommend denial of the application.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE

(date)

MINING DIVISION
REGION IV

July 27, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2812, Ray Southern Mines, Inc. (Asbestos), Pinal County, Ariz.

Enclosed are original and 8 copies of the above report by Lincoln A. Stewart of the Bureau of Mines. A separate report on the geology was submitted in June by the Geological Survey.

As there seems little chance of making a significant discovery of strategic asbestos at this property, the examiner recommends that a loan be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC W. H. King (8)
R. F. Robinson
DMEA-2812
DF

WRstorms:frj

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
Denver 2, Colorado

June 25, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2812, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and 8 copies of the geologic report by A. F. Shride of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 4126, University Station
Tucson 5, Arizona

June 22, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: R. F. Robinson, Tucson, Arizona

Subject: Geologic report, DMEA-2812, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and 8 copies of the above report by A. F. Shride of the Geological Survey.

This report recommends that an exploration loan be denied because geologically significant amounts of asbestos are not likely to be discovered. The report and recommendations have my approval.

Raymond F. Robinson
Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

Enclosures 9

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2812, Ray Southern Mines, Inc. (Asbestos)

Pinal County, Arizona

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

July 1953

Reviewed by
DMEA OPERATING COMMITTEE

_____
(date)

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Lincoln A. Stewart[1]

An application by the Ray Southern Mines, Inc. for an $18,300 exploration loan, docketed as DMEA-2812, was received in December 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration. The purpose of the loan was to explore 2,100 feet of outcrop by a combination cut and access road, and to prospect 3 favorable locations by a total of 450 feet of drifting and 100 feet of raising.

The property, comprising 5 unpatented mining claims owned by Leo Wall, box 144, Ray, Ariz. was assigned to the corporation. The claims are situated on the west slope of the Dripping Spring Mountains, about 1.5 airmiles southeast of Ray, Pinal County, Ariz.

The property was examined by the writer on Feb. 27, 1953, and again in company with A. F. Shride, geologist, U. S. Geological Survey, on May 22, 1953.

Four ore zone exposures were examined along the contact of a diabase sill intruded in Mescal limestone that is intermittently exposed across the width of 3 claims. The site of the major workings, a 27-foot cut and adit, was centrally located on the property. Five separate asbestos-bearing serpentine bands were present in a 12-foot limestone horizon. These mineralized zones were not all continuous,

1/ Mining Engineer, Bureau of Mines

contained variable, but small amounts of generally harsh fiber, and were not considered minable. Three other widely separated exposures contained only small amounts of harsh fiber.

It is concluded that there is insufficient mineralization present or expectable to justify an exploration project, consequently it is recommended that the application of the Ray Southern Mines, Inc., be denied.

RAY-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
DMEA-2812
ASBESTOS

Geology

By
Andrew F. Shride
Geologist, U. S. Geological Survey

RAY-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
ASBESTOS

DMEA 2812

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INTRODUCTION

The Ray-Southern asbestos deposits, 1½ miles airline southeast of Ray, Arizona, are exposed along a north-trending outcrop at an altitude of approximately 2,900 feet. The most significant deposit, on the Ray-Southern No. 14 claim, is exposed by an opencut, 12 feet deep, and on a cliff face 120 feet long to the south of this main cut. Descriptive data through the remainder of this report are referenced geographically to this opencut. Two other deposits, approximately 380 and 800 feet south of the main cut, are exposed in shallow cuts and natural outcrops. One deposit, approximately 800 feet north of the main cut, is exposed in a quarry face 30 feet long. These are the only exposures on the applicant's claims that are known to the examiners.

It is recommended that the loan application be denied.

GEOLOGY AND ASBESTOS DEPOSITS

The asbestos-bearing serpentine zones parallel bedding in the pre-Cambrian Mescal limestone and are spatially related to diabase intrusions as is typical of the central Arizona asbestos deposits.

The main deposit, on the Ray-Southern No. 14 claim, occurs as 3 to 5 asbestos-serpentine zones in medium to thick-bedded limestones that dip 5° to 25° S. 60° E. These zones are included in a 10 to 30-foot thick section of limestone several hundred feet long and between two thick diabase sills. Five asbestos-serpentine zones are exposed in the main cut. The lowest serpentine zone, which is 7 feet above the underlying diabase sill, is 4 to 6 inches thick and in places contains

asbestos veins totaling 3/16 inch in thickness. No asbestos occurs in this zone except in the cut. The most persistent zone, 1½ feet above the lowest zone (8½ feet above the diabase at the opencut), averages 9 inches in thickness and contains asbestos veins, in the opencut and for 120 feet along the cliff face to the south of the cut, totaling ½ to 1½ inches in thickness. The average cumulative thickness of these veins is 3/4 inch. In the cut the asbestos is soft, elsewhere the asbestos is harsh. This zone contains more asbestos than the other zones.

A third zone, 3½ feet above the second zone (12 feet above the diabase at the cut) is 6 inches thick and contains veins of harsh asbestos totaling ½ inch. Away from the cut the zone contains asbestos only sporadically; in a few places as much as 1 inch of asbestos exists. Outside of the cut a non-persistent zone 3 feet above the third zone contains traces of asbestos in a few places.

In the cut a fourth 6-inch serpentine zone, 17 feet above the diabase, includes no asbestos in places; in a few places this zone includes as much as 2 inches of harsh fiber. A fifth zone, 19½ feet above the diabase, contains 1 to 2 inches of soft to semi-harsh fiber in a serpentine zone 6 to 8 inches thick. A few feet outside of the cut the fourth and fifth zones are barren of asbestos.

The underlying diabase sill is in general concordant. In a few places the diabase-limestone contact is discordant for a few inches to a few feet, but in general - as exposed along the outcrop - maintains an average distance of 7 feet below the second asbestos zone.

Commonly, for the central Arizona asbestos deposits, an increase in the degree of mineralization is noted adjacent to discordancies in a diabase intrusion. No such changes were observed for any of the Ray-Southern deposits. The overlying diabase sill is concordant over most of the outcrop area. Thirty feet north of the main opencut the upper sill transgresses down across the limestone and 100 feet north of the cut apparently joins the underlying sill. The outcrops are partly covered by debris to the north of the opencut, but apparently no significant increase in the degree of mineralization is associated with this discordant part of the overlying sill.

A shallow cut approximately 380 feet south of the main cut exposed a second deposit in limestones that dip 35° E. One serpentine-asbestos zone, 6 feet above a concordant diabase sill and probably to be correlated with the second zone of the main deposit, makes up this deposit. The serpentine is 18 to 24 inches thick at the trench and includes numerous narrow veins of harsh asbestos totaling 3/4 to 2½ inches in thickness. Twelve feet south of the trench the asbestos veins pinch out. To the north of the pit debris covers much of the outcrop; however, no asbestos-bearing float was noted north of the pit.

Approximately 800 feet south of the main cut a zone containing very little serpentine and asbestos is exposed at a horizon 12 feet above the diabase sill. Here a 3 to 6 inch serpentine zone contains traces to ½ inch of harsh asbestos along a 30-foot portion of the outcrop.

Approximately 800 feet north of the main cut an asbestos-bearing zone 30 feet above a diabase sill is exposed by a quarry face along a 30-foot strike length of the enclosing limestone beds. The limestones dip 35° S. 20° E. in this area. This serpentine zone is 3 to 6 inches thick and includes veins of very harsh asbestos totaling 3/16 to 1½ inches in thickness. The southern 10 feet of the exposure is barren of asbestos; traces of asbestos were seen at the northernmost part of the outcrop. North of the quarry face the outcrop is covered by debris.

In every exposure on the Ray-Southern claims the greatest concentrations of asbestos occurs where small-scale pre-mineral thrust faulting is obvious. The degree of pre-asbestos thrust and bedding-plane faulting evident in the exposures on the Ray-Southern properties is comparable to the degree of structural preparation seen in some of the largest deposits of the main part of the Arizona asbestos belt, yet little asbestos is seen in the Ray-Southern deposits.

The deposits are exposed on a steep hillslope, along which considerable bedrock creep has taken place. The outcrops of the main deposit have slumped downhill along joints in several places; slump offsets of as much as 5 feet were observed. Development experience under like conditions has shown that such asbestos deposits are difficult to explore or exploit, and that much of the fiber developed is likely to be of poor quality due to weathering.

CONCLUSIONS

Despite the existence of (1) competent limestones, (2) close proximity to diabase, and (3) good structural preparation - all factors

known to be favorable to the localization of large concentrations of asbestos - little asbestos is seen in the exposed portions of the Ray-Southern deposits. These exposures are likely typical of the mineralized area. Therefore it is recommended that the application for exploration be denied.

BMEA-2812, RAY SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZONA

Engineering Report

By Lincoln A. Stewart
Mining Engineer
Bureau of Mines

July 1953

DMEA-2812, RAY SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZ.

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Ownership and extent — 2
Description of the deposits — 2
Conclusions — 5
Recommendations — 6

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INTRODUCTION

An application was submitted to the Defense Minerals Exploration Administration for an $18,300 exploratory loan by the Ray Southern Mines, Inc. for its asbestos prospect. This application, docketed as DMEA-2812, was received by the Tucson, Ariz. office of the Defense Minerals Exploration Administration in December 1952. The purpose of the loan was to excavate a 2,100-foot combination exploration cut and access road along the outcrop and to drift a total of 450 feet at 3 favorable locations. A total of 100 feet of raising also was included.

A preliminary field investigation was made by the writer on February 27, 1953 in company with Lee Wall, the owner. Further investigation was delayed until a joint examination could be made with the Geological Survey member of the examining team. This was accomplished on May 22, 1953 when the writer was accompanied by A. F. Shride, geologist of the Survey and Robert W. Ageton of the Bureau of Mines. Mr. Wall again acted as guide.

The examiners investigated all exposures of the ore zone across the width of 3 claims.

LOCATION AND ACCESSIBILITY

The property is situated on the west slope of the Dripping Spring Mountains, 1.5 airmiles southeast of Ray, Pinal County, Ariz. (figure 1). It is reached by traveling south from Ray on the Kelvin

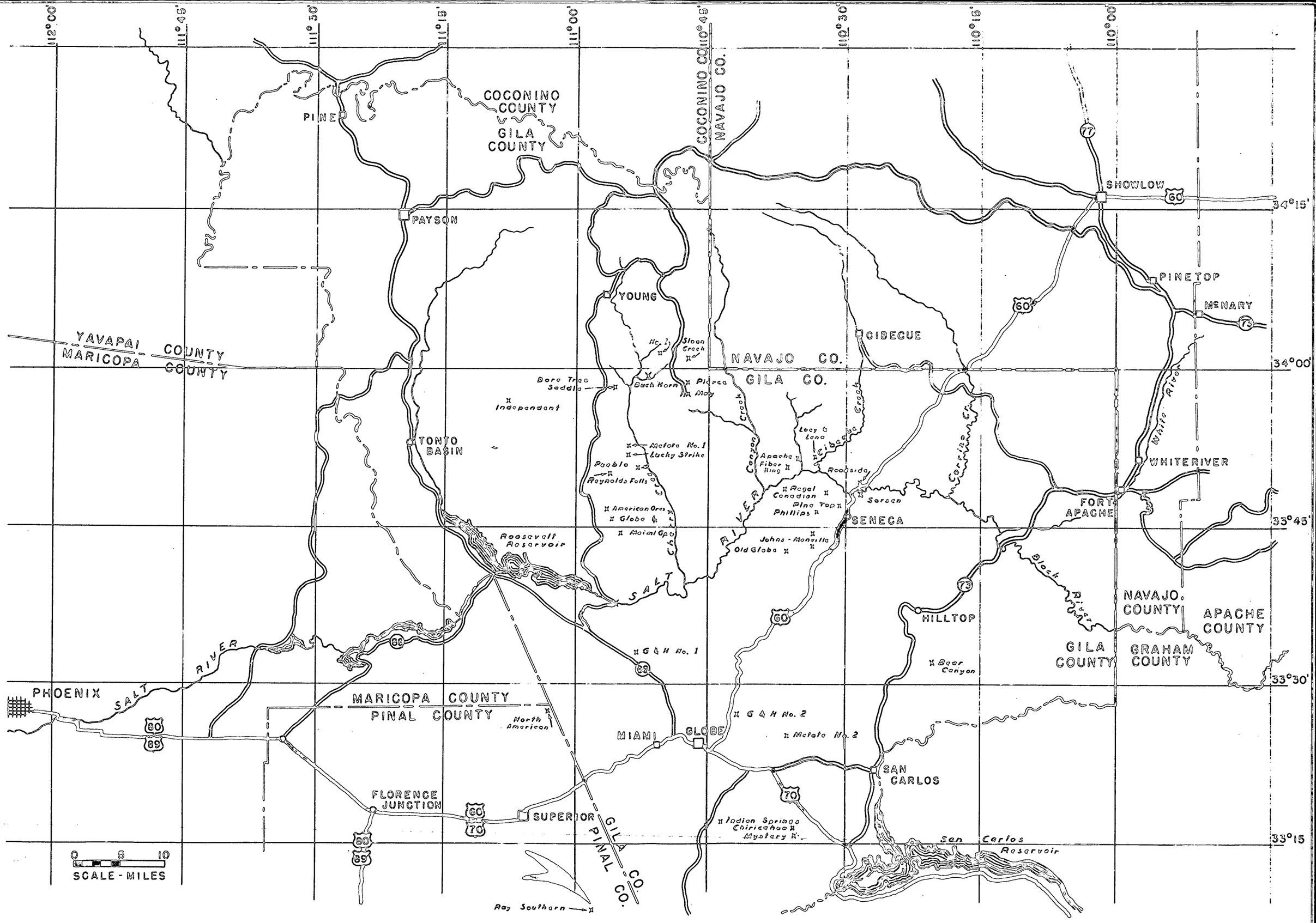

FIGURE 1.- LOCATION MAP - ASBESTOS DEPOSITS - CENTRAL ARIZONA DMEA 2812

road for 2 miles, turning left at Wall's house and going 2 miles easterly up a steep, winding, access trunk trail which ends at the main prospect cut. The claims lie in sec. 24, R. 13 E., and sec. 19, R. 14 E., T. 3 S., at an average altitude of 3,000 feet.

OWNERSHIP AND EXTENT

The 5 unpatented mining claims of interest to this application are part of a group owned by Lee Wall. These claims have been assigned to the Ray Southern Mines, Inc., Box 825, Florence, Ariz., a corporation composed of Lee Wall, Box 144, Ray, Ariz.; T. J. Maheney, Box 835, Florence, Ariz.; and Stanley Parkyn, 1927 West Holly St., Phoenix, Ariz.

The claims are recorded in the Pinal County Courthouse, Florence, at the Recorders office as follows:

	Book of Mines	Page
Ray Southern No. 13	52	100
" " " 14	52	101
" " " 15	52	101
" " " 16	56	526
" " " 17	56	527

There has been no production from these claims.

DESCRIPTION OF THE DEPOSITS

A persistent, in general concordant, diabase sill has been intruded into the Mescal limestone beds that dip 5° to 37° southeast into the hill. This diabase contact can be traced intermittently along the hillside across the width of 3 claims.

The main deposit, on which most of the work has been done, is centrally located on claim No. 14. The work consists of an open cut about 17 feet long, from which a 10-foot adit has been driven. In this cut, 5 serpentine-asbestos zones can be seen, at 7, 8.5, 12, 17, and 19.5 feet above the diabase contact. The mineralized zones are parallel to the limestone bedding, which here dips 5° southeast.

The following description of the various veins is keyed to the distance above the diabase contact for reference. The lower serpentine band (7) is 4 to 6 inches in thickness, which in places in the open cut, contains fiber veinlets up to 3/16 inch in thickness. This zone is discontinuous; the fiber content is not present in the adit. The second zone (8.5) is more persistent, averages 8 inches of serpentine, and contains veinlets that total an average of 3/4 to 1 inch of soft fiber. The third zone (12) is a 6-inch serpentine band which has fiber veinlets that total about 1/2 inch of harsh fiber. This zone is carried on the roof of the adit.

In the face of the cut above the adit, the fourth zone (17) is an 8-inch serpentine zone containing discontinuous asbestos mineralization. Fiber content varies from 0 to nearly 2 inches of short, harsh fiber. The fifth zone (19.5) contains a total of 1 to 2 inches of semi-harsh, usually short fiber in an 8-inch band of serpentine.

None of these zones persist for more than a few feet north from the cut. Southward from the cut the second zone (8.5) is persistent for about 100 feet, showing similar quantity of mineralization, but of harsher quality. The third zone (12) occurs sporadically and contains only harsh fiber. The 2 upper zones (17 and 19.5) contain fiber for only a few feet south of the cut.

The next exposure investigated was about 380 feet south of the main workings where a shallow cut was made in the cliff face. The limestone dips 37° southeast into the hill. At 6 feet above the diabase sill, a 2-foot serpentine zone contains 25 or 30 asbestos veinlets that contain a total of 2 to 2½ inches of harsh fiber of low tensile strength. The largest vein is about 1/2 inch in thickness. This mineralization pinches out about 10 feet southward from the cut. To the north (toward the main workings) the zone is covered with hillside debris, but no float was found on the hillside.

One other exposure was found about 800 feet south of the main workings where a 3- to 6-inch serpentine zone, 12 feet above the diabase, contained only traces of 1/2 inch of harsh fiber for about 30 feet along a well exposed outcrop that dips 35° east.

About 800 feet northward from the main workings, a quarry face has exposed 30 feet of an asbestos-bearing zone that is approximately 30 feet above a diabase sill. The serpentine zone, 6 to 8 inches thick, contains veinlets that total 1/2 to 2 inches

of very harsh fiber, all of which has numerous partings. The veins pinch out in the south 10 feet of the cut. North of the cut, the zone is covered with overburden, but the mineralization appears to be pinching out in this direction. The limestone bedding in this vicinity strikes N. 70° E. and dips 35° southeast. This deposit is on gently sloping terrain.

The main workings and the deposits to the south are situated on a steep hillside slope. There is evidence in the cliff faces that considerable slumping has affected the attitude and elevation of the individual limestone bedding planes. As much as 5 feet of offset was observed between adjacent limestone blocks.

In a draw about 200 feet south of the main cut, there is inconclusive evidence that a discordant diabase sill cuts up across the favorable beds at about 50 feet within the hill.

CONCLUSIONS

In the Ray Southern area, the Mescal limestone seems to be less susceptible to asbestos mineralization than in the Salt River district. In the latter area, under the same favorable conditions that prevail at Ray Southern, an extensive asbestos deposit undoubtedly would be present. As it is, there is relatively little asbestos in the various exposures at Ray Southern. Only the second zone (8.5 feet above the diabase) is continuous for more than a few tens of feet, but the quantity of fiber present is too small to support a mining operation.

Variation of dips and irregularities of vein levels caused by slumping of large blocks would present a serious mining problem, even if sufficient mineralization were present.

RECOMMENDATIONS

In resumé, although all geologic conditions are present for localization of a significant deposit of asbestos at this property, the mineralization is relatively weak. Most of the serpentine-asbestos zones are non-persistent and most of the fiber is short and harsh. Any attempt at mining would involve serious difficulties, due to the presence of large, disconnected slump blocks.

For the above reasons, it is recommended that the application of the Ray Southern Mines, Inc., for exploration of its property be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Library Branch Washington

September 8, 1953

Memorandum

To: Lawrence G. Houk, Director, Non-Metallic Minerals Division, DMEA

From: Oliver Bowles, Commodity Specialist, Construction and Chemical Materials Branch

Subject: DMEA Docket No. 2812, Ray Southern Mines, Inc., Pinal County, Arizona

In view of the limited extent of the deposit as indicated in the engineer's report I concur in the recommendation that the application for an exploratory loan be denied.

Oliver Bowles

Oliver Bowles, Commodity Specialist
Construction and Chemical Materials Branch

IN REPLY REFER TO:

G-MD-CNM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
AUG 7 1953

August 6, 1953

Memorandum

REVIEW OF FIELD TEAM REPORT ON APPLICATION DMEA-2812 (asbestos)

To: L. G. Houk, Defense Minerals Exploration Administration
From: D. M. Larrabee, U. S. Geological Survey
Applicant: Leo Wall, Box 144, Ray, Arizona.
Name of property: Ray Southern claims.
Location of property: Pinal County, Arizona.
Date of field team report: July 1953.
Authorship of field team report. A. F. Shride and L. A. Stewart.
Field team's recommendation: Denial.
Comments: None.
ACTION SUGGESTED: Follow field team's recommendation, - denial.

D. M. Larrabee

D. M. Larrabee

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C. 600

August 5, 1953

Memorandum

Noted
C. O. Mittendorf (for)

To: Mr. C. O. Mittendorf

From: Lawrence G. Houk L.G.H.

Subject: Docket No. DMEA-2812 - Asbestos, Ray-Southern Mines, Inc.

The Nonmetallic Minerals Division concurs with the field team in the denial of this application which was handled under delegation of authority by Region IV.

FILE COPY
SURNAME:

Houk

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
600
WASHINGTON 25, D. C.

August 5, 1953

Memorandum

To: Mr. C. O. Mittendorf

From: Lawrence G. Houk

Subject: Docket No. DMEA-2812 - Asbestos, Ray-Southern Mines, Inc.

The Nonmetallic Minerals Division concurs with the field team in the denial of this application which was handled under delegation of authority by Region IV.

LGHouk:gad 8/5/53

Copy to: Admr. R. File
Docket File
Mr. Houk

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

RECEIVED

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2812 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are four copies of the final report on the subject docket, two copies of Form 3b and a copy of the letter of denial to the applicant.

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

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

224 New Customhouse
Denver 2, Colorado

July 31, 1953.

Mr. T. J. Mahoney, Secretary
Ray Southern Mines, Inc.
Box 835
Florence, Arizona

Re: Docket DMEA-2812

Dear Mr. Mahoney:

Reference is made to your application for Government aid on the Ray Southern Group.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding material of acceptable grade, and in quantities that will significantly improve the mineral supply position for the National Defense Program.

A careful study of your property and data available to this agency reveals that the probability of disclosing mineable reserves of asbestos by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise that your application for exploration aid is denied.

Very truly yours,

W. H. King
W. H. King
Field Team, Region IV

A. H. Koschmann
A. H. Koschmann
Field Team, Region IV

HMC:cwm

cc: Administrator
WRStorms
RFRobinson
Subject
AHKoschmann (2)
Chron.

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

July 31, 1953.

Memorandum

To: Field Team, Region IV

From: Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2612 (Asbestos), Ray Southern Mines, Inc., Pinal County, Arizona.

Enclosed are nine copies of the final engineering report on the subject docket.

The applicant requested $18,300.00 to build an access road, 450 feet of drifting and 100 feet of raising.

The examiners conclude that insufficient mineralization is present to justify an exploration project and they recommend denial of the application.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

MINING DIVISION
REGION IV

July 27, 1953

Memorandum

To : W. H. King, Chief, Mining Division, Region IV

From : Chief, Mining Methods Br., Mining Div., Region IV

Subject : Report on Docket DMEA-2812, Ray Southern Mines, Inc. (Asbestos), Pinal County, Ariz.

Enclosed are original and 8 copies of the above report by Lincoln A. Stewart of the Bureau of Mines. A separate report on the geology was submitted in June by the Geological Survey.

As there seems little chance of making a significant discovery of strategic asbestos at this property, the examiner recommends that a loan be denied. I concur with this recommendation.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC W. H. King (8)
R. F. Robinson
DMEA-2812
DF

WRstorms:frj

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
W208 Post Customhouse
Denver 2, Colorado

June 25, 1953

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2812, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and 8 copies of the geologic report by A. F. Shride of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 4126, University Station
Tucson 5, Arizona

June 22, 1953

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: R. F. Robinson, Tucson, Arizona

Subject: Geologic report, DMEA-2812, Ray-Southern Mines, Inc., Pinal County, Arizona.

Enclosed are the original and 8 copies of the above report by A. F. Shride of the Geological Survey.

This report recommends that an exploration loan be denied because geologically significant amounts of asbestos are not likely to be discovered. The report and recommendations have my approval.

Raymond F. Robinson

Raymond F. Robinson
Acting District Supervisor
Arizona - New Mexico

Enclosures 9

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2812, Ray Southern Mines, Inc. (Asbestos)

Pinal County, Arizona

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

July 1953

Reviewed by
DMEA OPERATING COMMITTEE
8-7-53
(date)

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Lincoln A. Stewart[1]

An application by the Ray Southern Mines, Inc. for an $18,300 exploration loan, docketed as DMEA-2812, was received in December 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration. The purpose of the loan was to explore 2,100 feet of outcrop by a combination cut and access road, and to prospect 3 favorable locations by a total of 450 feet of drifting and 100 feet of raising.

The property, comprising 5 unpatented mining claims owned by Leo Wall, box 144, Ray, Ariz. was assigned to the corporation. The claims are situated on the west slope of the Dripping Spring Mountains, about 1.5 airmiles southeast of Ray, Pinal County, Ariz.

The property was examined by the writer on Feb. 27, 1953, and again in company with A. F. Shride, geologist, U. S. Geological Survey, on May 22, 1953.

Four ore zone exposures were examined along the contact of a diabase sill intruded in Mescal limestone that is intermittently exposed across the width of 3 claims. The site of the major workings, a 27-foot cut and adit, was centrally located on the property. Five separate asbestos-bearing serpentine bands were present in a 12-foot limestone horizon. These mineralized zones were not all continuous,

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1/ Mining Engineer, Bureau of Mines

contained variable, but small amounts of generally harsh fiber, and were not considered minable. Three other widely separated exposures contained only small amounts of harsh fiber.

It is concluded that there is insufficient mineralization present or expectable to justify an exploration project, consequently it is recommended that the application of the Ray Southern Mines, Inc., be denied.

RAY-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
DMEA-2812
ASBESTOS

Geology

By
Andrew F. Shride
Geologist, U. S. Geological Survey

RAY-SOUTHERN MINES, INC.
PINAL COUNTY, ARIZONA
ASBESTOS

DMEA 2812

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INTRODUCTION

The Ray-Southern asbestos deposits, $1\frac{1}{2}$ miles airline southeast of Ray, Arizona, are exposed along a north-trending outcrop at an altitude of approximately 2,900 feet. The most significant deposit, on the Ray-Southern No. 14 claim, is exposed by an opencut, 12 feet deep, and on a cliff face 120 feet long to the south of this main cut. Descriptive data through the remainder of this report are referenced geographically to this opencut. Two other deposits, approximately 380 and 800 feet south of the main cut, are exposed in shallow cuts and natural outcrops. One deposit, approximately 800 feet north of the main cut, is exposed in a quarry face 30 feet long. These are the only exposures on the applicant's claims that are known to the examiners.

It is recommended that the loan application be denied.

GEOLOGY AND ASBESTOS DEPOSITS

The asbestos-bearing serpentine zones parallel bedding in the pre-Cambrian Mescal limestone and are spatially related to diabase intrusions as is typical of the central Arizona asbestos deposits.

The main deposit, on the Ray-Southern No. 14 claim, occurs as 3 to 5 asbestos-serpentine zones in medium to thick-bedded limestones that dip 5° to 25° S. 60° E. These zones are included in a 10 to 30-foot thick section of limestone several hundred feet long and between two thick diabase sills. Five asbestos-serpentine zones are exposed in the main cut. The lowest serpentine zone, which is 7 feet above the underlying diabase sill, is 4 to 6 inches thick and in places contains

asbestos veins totaling 3/16 inch in thickness. No asbestos occurs in this zone except in the cut. The most persistent zone, $1\frac{1}{2}$ feet above the lowest zone ($8\frac{1}{2}$ feet above the diabase at the opencut), averages 9 inches in thickness and contains asbestos veins, in the opencut and for 120 feet along the cliff face to the south of the cut, totaling $\frac{1}{2}$ to $1\frac{1}{2}$ inches in thickness. The average cumulative thickness of these veins is 3/4 inch. In the cut the asbestos is soft, elsewhere the asbestos is harsh. This zone contains more asbestos than the other zones.

A third zone, $3\frac{1}{2}$ feet above the second zone (12 feet above the diabase at the cut) is 6 inches thick and contains veins of harsh asbestos totaling $\frac{1}{2}$ inch. Away from the cut the zone contains asbestos only sporadically; in a few places as much as 1 inch of asbestos exists. Outside of the cut a non-persistent zone 3 feet above the third zone contains traces of asbestos in a few places.

In the cut a fourth 6-inch serpentine zone, 17 feet above the diabase, includes no asbestos in places; in a few places this zone includes as much as 2 inches of harsh fiber. A fifth zone, $19\frac{1}{2}$ feet above the diabase, contains 1 to 2 inches of soft to semi-harsh fiber in a serpentine zone 6 to 8 inches thick. A few feet outside of the cut the fourth and fifth zones are barren of asbestos.

The underlying diabase sill is in general concordant. In a few places the diabase-limestone contact is discordant for a few inches to a few feet, but in general - as exposed along the outcrop - maintains an average distance of 7 feet below the second asbestos zone.

Commonly, for the central Arizona asbestos deposits, an increase in the degree of mineralization is noted adjacent to discordancies in a diabase intrusion. No such changes were observed for any of the Ray-Southern deposits. The overlying diabase sill is concordant over most of the outcrop area. Thirty feet north of the main opencut the upper sill transgresses down across the limestone and 100 feet north of the cut apparently joins the underlying sill. The outcrops are partly covered by debris to the north of the opencut, but apparently no significant increase in the degree of mineralization is associated with this discordant part of the overlying sill.

A shallow cut approximately 380 feet south of the main cut exposed a second deposit in limestones that dip 35° E. One serpentine-asbestos zone, 6 feet above a concordant diabase sill and probably to be correlated with the second zone of the main deposit, makes up this deposit. The serpentine is 18 to 24 inches thick at the trench and includes numerous narrow veins of harsh asbestos totaling 3/4 to 2½ inches in thickness. Twelve feet south of the trench the asbestos veins pinch out. To the north of the pit debris covers much of the outcrop; however, no asbestos-bearing float was noted north of the pit.

Approximately 800 feet south of the main cut a zone containing very little serpentine and asbestos is exposed at a horizon 12 feet above the diabase sill. Here a 3 to 6 inch serpentine zone contains traces to ½ inch of harsh asbestos along a 30-foot portion of the outcrop.

Approximately 800 feet north of the main cut an asbestos-bearing zone 30 feet above a diabase sill is exposed by a quarry face along a 30-foot strike length of the enclosing limestone beds. The limestones dip 35° S. 20° E. in this area. This serpentine zone is 3 to 6 inches thick and includes veins of very harsh asbestos totaling 3/16 to 1½ inches in thickness. The southern 10 feet of the exposure is barren of asbestos; traces of asbestos were seen at the northernmost part of the outcrop. North of the quarry face the outcrop is covered by debris.

In every exposure on the Ray-Southern claims the greatest concentrations of asbestos occurs where small-scale pre-mineral thrust faulting is obvious. The degree of pre-asbestos thrust and bedding-plane faulting evident in the exposures on the Ray-Southern properties is comparable to the degree of structural preparation seen in some of the largest deposits of the main part of the Arizona asbestos belt, yet little asbestos is seen in the Ray-Southern deposits.

The deposits are exposed on a steep hillslope, along which considerable bedrock creep has taken place. The outcrops of the main deposit have slumped downhill along joints in several places; slump offsets of as much as 5 feet were observed. Development experience under like conditions has shown that such asbestos deposits are difficult to explore or exploit, and that much of the fiber developed is likely to be of poor quality due to weathering.

CONCLUSIONS

Despite the existence of (1) competent limestones, (2) close proximity to diabase, and (3) good structural preparation - all factors

known to be favorable to the localization of large concentrations of asbestos - little asbestos is seen in the exposed portions of the Ray-Southern deposits. These exposures are likely typical of the mineralized area. Therefore it is recommended that the application for exploration be denied.

DMEA-2812, RAY SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZONA

Engineering Report

By Lincoln A. Stewart
Mining Engineer
Bureau of Mines

July 1953

DMEA-2812, RAY SOUTHERN MINES, INC. (ASBESTOS)
PINAL COUNTY, ARIZ.

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INTRODUCTION

An application was submitted to the Defense Minerals Exploration Administration for an $18,300 exploratory loan by the Ray Southern Mines, Inc. for its asbestos prospect. This application, docketed as DMEA-2812, was received by the Tucson, Ariz. office of the Defense Minerals Exploration Administration in December 1952. The purpose of the loan was to excavate a 2,100-foot combination exploration cut and access road along the outcrop and to drift a total of 450 feet at 3 favorable locations. A total of 100 feet of raising also was included.

A preliminary field investigation was made by the writer on February 27, 1953 in company with Leo Wall, the owner. Further investigation was delayed until a joint examination could be made with the Geological Survey member of the examining team. This was accomplished on May 22, 1953 when the writer was accompanied by A. F. Shride, geologist of the Survey and Robert W. Ageton of the Bureau of Mines. Mr. Wall again acted as guide.

The examiners investigated all exposures of the ore zone across the width of 3 claims.

LOCATION AND ACCESSIBILITY

The property is situated on the west slope of the Dripping Spring Mountains, 1.5 airmiles southeast of Ray, Pinal County, Ariz. (figure 1). It is reached by traveling south from Ray on the Kelvin

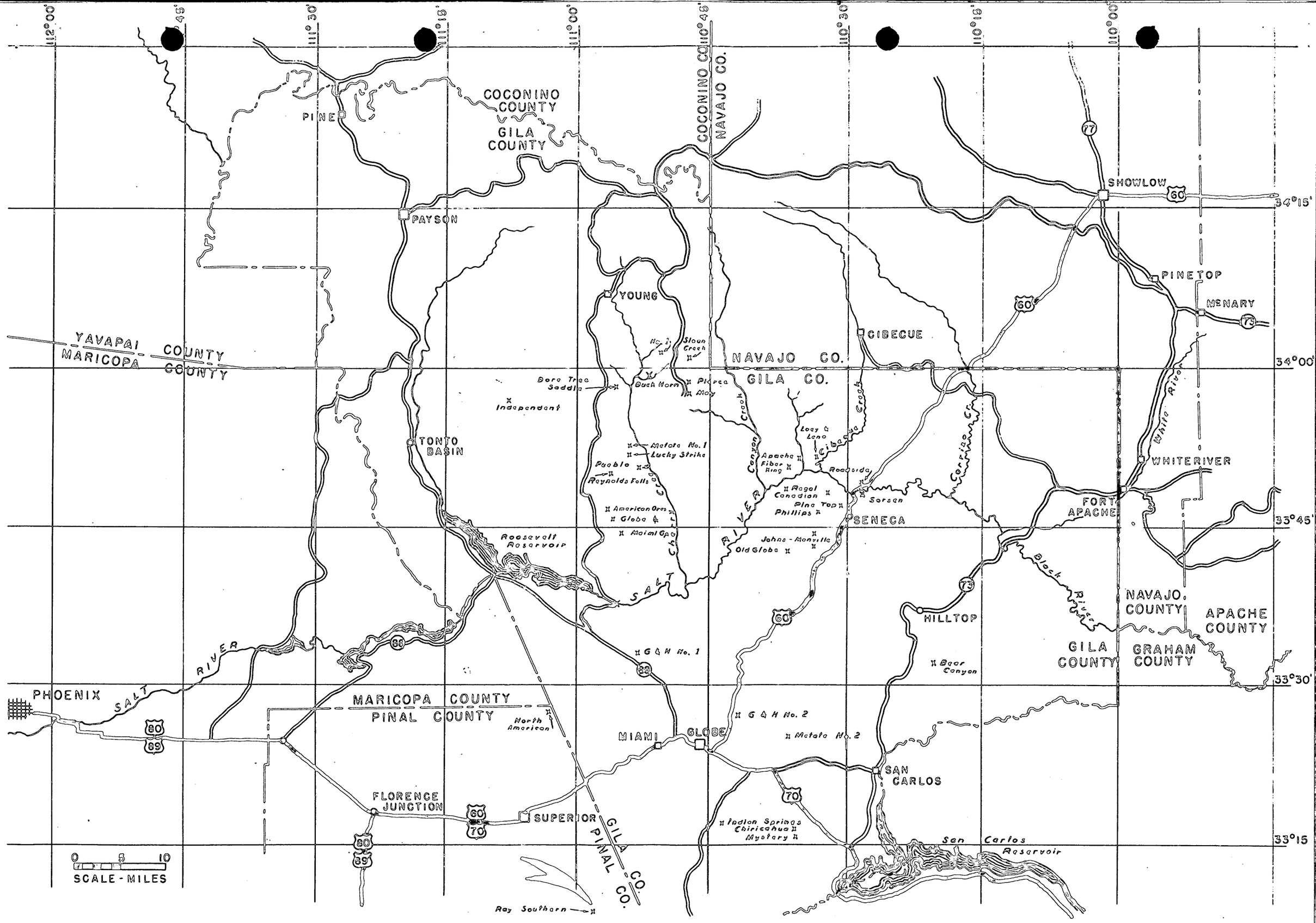


FIGURE 1. - LOCATION MAP - ASBESTOS DEPOSITS - CENTRAL ARIZONA DMEA 2812

road for 2 miles, turning left at Wall's house and going 2 miles easterly up a steep, winding, access trunk trail which ends at the main prospect cut. The claims lie in sec. 24, R. 13 E., and sec. 19, R. 14 E., T. 3 S., at an average altitude of 3,000 feet.

OWNERSHIP AND EXTENT

The 5 unpatented mining claims of interest to this application are part of a group owned by Leo Wall. These claims have been assigned to the Ray Southern Mines, Inc., Box 825, Florence, Ariz., a corporation composed of Leo Wall, Box 144, Ray, Ariz.; T. J. Mahoney, Box 835, Florence, Ariz.; and Stanley Parkyn, 1927 West Holly St., Phoenix, Ariz.

The claims are recorded in the Pinal County Courthouse, Florence, at the Recorders office as follows:

	Book of Mines	Page
Ray Southern No. 13	52	100
" " " 14	52	101
" " " 15	52	101
" " " 16	56	526
" " " 17	56	527

There has been no production from these claims.

DESCRIPTION OF THE DEPOSITS

A persistent, in general concordant, diabase sill has been intruded into the Mescal limestone beds that dip 5° to 37° southeast into the hill. This diabase contact can be traced intermittently along the hillside across the width of 3 claims.

The main deposit, on which most of the work has been done, is centrally located on claim No. 14. The work consists of an open cut about 17 feet long, from which a 10-foot adit has been driven. In this cut, 5 serpentine-asbestos zones can be seen, at 7, 8.5, 12, 17, and 19.5 feet above the diabase contact. The mineralized zones are parallel to the limestone bedding, which here dips 5° southeast.

The following description of the various veins is keyed to the distance above the diabase contact for reference. The lower serpentine band (7) is 4 to 6 inches in thickness, which in places in the open cut, contains fiber veinlets up to 3/16 inch in thickness. This zone is discontinuous; the fiber content is not present in the adit. The second zone (8.5) is more persistent, averages 8 inches of serpentine, and contains veinlets that total an average of 3/4 to 1 inch of soft fiber. The third zone (12) is a 6-inch serpentine band which has fiber veinlets that total about 1/2 inch of harsh fiber. This zone is carried on the roof of the adit.

In the face of the cut above the adit, the fourth zone (17) is an 8-inch serpentine zone containing discontinuous asbestos mineralization. Fiber content varies from 0 to nearly 2 inches of short, harsh fiber. The fifth zone (19.5) contains a total of 1 to 2 inches of semi-harsh, usually short fiber in an 8-inch band of serpentine.

None of these zones persist for more than a few feet north from the cut. Southward from the cut the second zone (8.5) is persisent for about 100 feet, showing similar quantity of mineralization, but of harsher quality. The third zone (12) occurs sporadically and contains only harsh fiber. The 2 upper zones (17 and 19.5) contain fiber for only a few feet south of the cut.

The next exposure investigated was about 380 feet south of the main workings where a shallow cut was made in the cliff face. The limestone dips 37° southeast into the hill. At 6 feet above the diabase sill, a 2-foot serpentine zone contains 25 or 30 asbestos veinlets that contain a total of 2 to 2½ inches of harsh fiber of low tensile strength. The largest vein is about 1/2 inch in thickness. This mineralization pinches out about 10 feet southward from the cut. To the north (toward the main workings) the zone is covered with hillside debris, but no float was found on the hillside.

One other exposure was found about 800 feet south of the main workings where a 3- to 6-inch serpentine zone, 12 feet above the diabase, contained only traces of 1/2 inch of harsh fiber for about 30 feet along a well exposed outcrop that dips 35° east.

About 800 feet northward from the main workings, a quarry face has exposed 30 feet of an asbestos-bearing zone that is approximately 30 feet above a diabase sill. The serpentine zone, 6 to 8 inches thick, contains veinlets that total 1/2 to 2 inches

of very harsh fiber, all of which has numerous partings. The veins pinch out in the south 10 feet of the cut. North of the cut, the zone is covered with overburden, but the mineralization appears to be pinching out in this direction. The limestone bedding in this vicinity strikes N. 70° E. and dips 35° southeast. This deposit is on gently sloping terrain.

The main workings and the deposits to the south are situated on a steep hillside slope. There is evidence in the cliff faces that considerable slumping has affected the attitude and elevation of the individual limestone bedding planes. As much as 5 feet of offset was observed between adjacent limestone blocks.

In a draw about 200 feet south of the main cut, there is inconclusive evidence that a discordant diabase sill cuts up across the favorable beds at about 50 feet within the hill.

CONCLUSIONS

In the Ray Southern area, the Mescal limestone seems to be less susceptible to asbestos mineralization than in the Salt River district. In the latter area, under the same favorable conditions that prevail at Ray Southern, an extensive asbestos deposit undoubtedly would be present. As it is, there is relatively little asbestos in the various exposures at Ray Southern. Only the second zone (8.5 feet above the diabase) is continuous for more than a few tens of feet, but the quantity of fiber present is too small to support a mining operation.

Variation of dips and irregularities of vein levels caused by slumping of large blocks would present a serious mining problem, even if sufficient mineralization were present.

RECOMMENDATIONS

In resumé, although all geologic conditions are present for localization of a significant deposit of asbestos at this property, the mineralization is relatively weak. Most of the serpentine-asbestos zones are non-persistent and most of the fiber is short and harsh. Any attempt at mining would involve serious difficulties, due to the presence of large, disconnected slump blocks.

For the above reasons, it is recommended that the application of the Ray Southern Mines, Inc., for exploration of its property be denied.

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

224 New Customhouse
Denver 2, Colorado

December 12, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 200

From: Executive Officer, Field Team, Region IV

Subject: Docketing for Exploration Assistance

Form 3a

Enclosed herewith in duplicate is DMA Form 3b and Form MF-103 in triplicate and supporting data pertaining to the following application for Government assistance in exploration work.

Ray-Southern Mines, Inc.
Box 835
Florence, Arizona

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 15 1952

W. H. King
W. H. King

Enclosures

MF-103 not submitted on form paper

DMEA-2812

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
Denver

DEC 15 1952

November 18, 1952

Mr. W. H. King
U. S. Department of the Interior
Defense Minerals Exploration Administrator
224 New Customhouse
Denver, Colorado

Dear Sir:

We herewith submit answers to questions to form MP-103.

1. (a) Ray-Southern Mines, Inc.
   Box 835
   Florence, Arizona
   (b) Corporation
   (c) T. J. Mahoney ---- Address Box 835, Florence, Arizona
   Leo Wall " Box 144, Ray, Arizona
   Stanley Parkyn " 1927 W. Holly Street, Phoenix, Ariz.
   (d) Not applicable

2.

3. (a) A group of claims known as Ray-Southern #13,14,15,16,17 located in Sec. 24, T3S, R13E and Sec. 19, T3S, R14E, Pinal County, Arizona, and Recorded in the office of the Pinal County Recorder as follows:

Ray-Southern	#13,	Page 100,	Book 52	of Mines
	#14,	---- 101,	---- 52	-- -----
	#15,	---- 101,	---- 52	-- -----
	#16,	---- 526,	---- 56	-- -----
	#17,	---- 527,	---- 56	-- -----

   (b) Ray - Southern
   (c) Owner Leo Wall assigns these claims to the Ray Southern Mines, Inc.
   (d) (Copy of Assignment)
   (e) None
   (f) See 3 (a)

4. (a) A 1 mile access road has just been completed to connect the center of the property with the county road at a point 2 miles from Ray. Five prospect holes have been excavated to expose the ore bearing strata. We are currently driving an adit and have reached a depth of 25' on the #14 claim. Foottrails lead to all workings.
   (b) Undeveloped prospect - no records.
   (c) The general structure of the exposures is very similar to that of the asbestos mines located in the Salt River

Canyon north of Globe, Arizona. A secondary diabase sill has formed 15 to 20 feet above the main or lower diabase sill. In the massive limestone strata between the two diabase sills, at least three horizons of serpentine carrying anywhere from two to fifteen feet above the lower diabase. The asbestos fibre exposed on the surface and in the tunnel indicates that with same depth, a good saft fibre should be developed. In mining, at least two asbestos horizons could be kept in the workings so a stope would recover the fibre from two veins. The lower two veins indicate a combined average width of fibre to be expected from mining to be two inches. The upper veins show longer grades of fibre and a combined average length of 4". The upper veins could be developed by raises from the lower level. The two levels would be separated by approximately 10 feet of massive limestone. Pillars on the two levels could be superimposed so as to provide maximum support.

We wish to explore this property on the basis of the showing we have exposed in our tunnel and prospect holes. The fibre is of spinning quality and there is a good percentage of the longer grades showing. The geologic features are favorable in that they correspond with what is found at the producing properties north of Globe. There has been considerable distortion of the limestone beds and variable dips along the outcrop indicate possible rolls or anticlinal structure beneath the surface. The geology would therefor indicate the possibility of several areas on this property being found with long fibre predominating.

(d) The center of the property is connected by 1 mile of access road and 2 miles of County Road to the city of Ray. The Ray-Kelvin R.R. is intersected by the access road 3/4 miles from the center of the property. Supply, labor, and residences can be found at Ray.

(e) Manpower, materials, supplies, and equipment are available at Ray. Power would be diesel or gas engines. A good spring is located on claim no. 16 and could be piped by gravity and pumping to the proposed mill site on claim #14.

5. (a) Chrysotile asbestos
(b) It is proposed that 2100' of combined exploration cut and access road to be excavated to expose the outcrop and make working sites accessible to equipment. Three tunnel sites would be chosen on the basis of what is exposed in the exploration cut, and 450 of tunneling and 100 feet of raises would be driven.
(c) The work will start within 90 days and be completed within 12 months from the starting date.
(d) Mr. Lee Wall has had 20 years of experience in prospecting and small mine developement. Mr. W. Sarson, a registered Mining Engineer, will supervise the operation on a visiting basis.

6. We would like to do the work on a unit bid basis with the

following unit prices:

1. 2100 feet exploration cust and access road @ $2.00/foot Stage 1 — $4200.00
2. 450 feet of 5 x 7' tunnel including timber where necessary at $28.00/foot — $12600.00
   100 feet of 4' x 4' raise at $15.00/foot — $1500.00

TOTAL CONTRACT $18300.00

6. (a,b,c,d,e,f,g,h) The entire cost is included in the above unit bid.

7. (a) Yes.
   (b) We will pay for the current work as it progresses, and be reimbursed 90% of the contract price for the work completed each month.

Yours very truly,

T. J. Mahoney

T. J. MAHONEY
Attorney for Ray Southern Asbestos Mines
Box 835
Florence, Arizona

mla

RECORDER'S CERTIFICATE.

STATE OF ARIZONA,)
)ss.
County of Pinal.)

I, SOPHIE M. SMITH County Recorder, in and for the County of PINAL, State of Arizona, do hereby certify that the within and following is a Photostatic Copy of

QUIT-CLAIM DEED

as the same appears of record in my office in Docket No. 70 of at page 64 thereof, or under file No. File of ; that I have compared the same with the original record and that the same is a true transcript and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of my office, this 5th day of December, 1952 at Florence, the County seat.

SOPHIE M. SMITH
County Recorder,

By Margaret K. Barnick
Deputy Recorder.

DOCKET 70 PAGE 64

STATE OF ARIZONA } ss.
County of Pinal

I hereby certify that the within instrument was filed and recorded DEC 1952, 19, at 9:30 A M.

In Docket No. 70 PAGE 64, at the request of T. J. Mahoney

When recorded mail to:

Witness my hand and official seal.
SOPHIE M. SMITH
County Recorder

By Margaret K. Barnick
Deputy Recorder

Fee No.: 87743

Indexed:

Compared:

Photostated:

Fee: $ 1.35

I. R. S.: $

Quit-Claim Deed

For the consideration of Ten Dollars, and other valuable considerations, ~~I~~ or we, Leo Wall and Mae Wall, husband and wife, hereby quit-claim to the RAY-SOUTHERN ASBESTOS MINES.

all right, title, or interest in the following real property situated in Pinal County, Arizona:

A group of claims known as Ray-Southern #13, 14, 15, 16, and 17 located in Sec. 24, T3S, R13E and Sec. 19, T3S, R14E, Pinal County, Arizona, and Recorded in the Office of the Pinal County Recorder as follows:

Ray-Southern #13, Page 100, Book 52 of Mines
#14, Page 101, Book 52 of Mines
#15, Page 101, Book 52 of Mines
#16, Page 526, Book 56 of Mines
#17, Page 527, Book 56 of Mines

Dated this ..... day of ....., 19 52

Leo Wall
Leo Wall

Mae Wall
Mae Wall

STATE OF Arizona } ss.
County of Pinal

This instrument was acknowledged before me this 3rd day of December, 1952, by

T. J. MAHONEY NOTARY PUBLIC PINAL CO. ARIZ.

My commission will expire 2-20-52

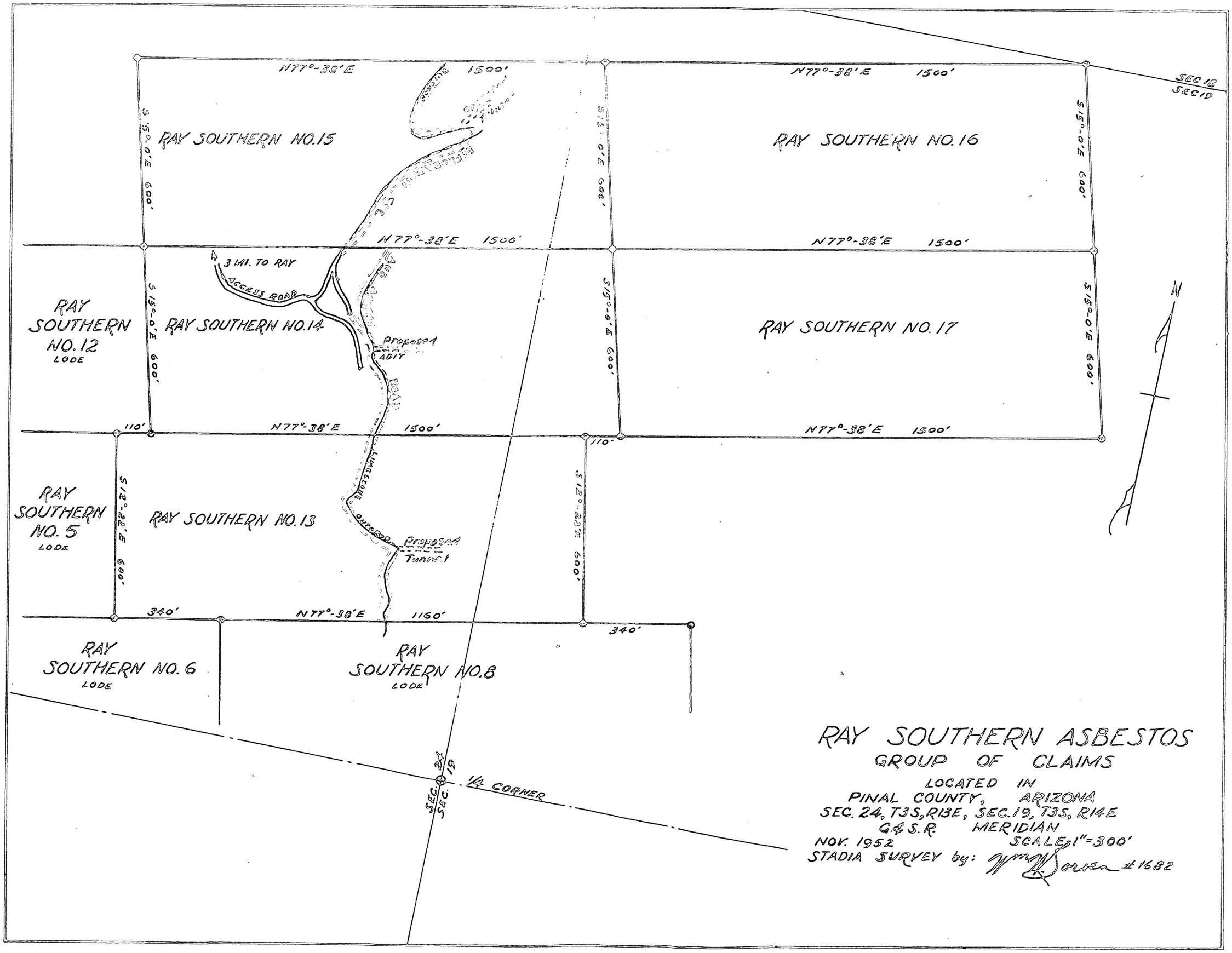
T J Mahoney
Notary Public.

STATE OF Arizona } ss.
County of Pinal

This instrument was acknowledged before me this ..... day of ....., 19....., by

My commission will expire

Notary Public.



RAY SOUTHERN ASBESTOS
GROUP OF CLAIMS

LOCATED IN
PINAL COUNTY, ARIZONA
SEC. 24, T3S, R13E, SEC. 19, T3S, R14E
G&S.R. MERIDIAN
NOV. 1952 SCALE 1"=300'
STADIA SURVEY by: Wm Lowen #1682

2/12-13 EW

WMEE-2812

~~Mr. Frank E. Johnson, Chairman~~
~~Operating Committee~~
~~Defense Minerals Exploration Administration~~
~~Interior Building~~
~~Washington 25, D. C.~~

Phil E. Ulrich

1st memorandum
2/1/52