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

224 New Customhouse
Denver 2, Colorado

October 13, 1952

Mr. S. J. Joseph and Mr. W. Francis Wilson
North American Asbestos Company
411 Phoenix National Bank Bldg.
Phoenix, Arizona

Re: DMEA Docket 2491

Dear Sirs:

Reference is made to your application for Government aid on your asbestos prospect in Pinal County.

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 strategic asbestos by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application for exploration aid is denied.

Very truly yours,

John F. Shaw for
W. H. King

A. H. Koschmann
A. H. Koschmann

HMC:ec
cc: Administrator (DMEA)
WRStorms
Subject
Chron.
Koschmann (2)

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

224 New Customhouse
Denver 2, Colorado

October 13, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2491 (Asbestos) North American Asbestos Company, Pinal County, Arizona

Enclosed are the original and three copies of the final report on DMEA-2491, the original and one copy of Form 3b, and a copy of the letter of denial to the applicant.

John F. Shaw
John F. Shaw for
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosures

DEPARTMENT
Defense
OCT 2 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

October 13, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2491, (Asbestos) North American Asbestos Company, Pinal County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-2491 by L. A. Stewart of the Bureau of Mines.

The applicant requested aid in the amount of $14,195.96.

Stewart recommends that the application be denied because of the poor quality of the fiber.

We concur in this recommendation.

John F. Shaw for
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
10-24-52
(date)

Mining Division
Date Rec'd.

AUG 22 1952

BUREAU OF MINES
Denver, Colorado

MINING DIVISION
REGION IV

August 20, 1952

Memorandum

To : W. H. King, Denver, Colorado

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

Subject : Final Report, DMEA Docket 2491, North American Asbestos Co., Pinal County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations, and the section on Engineering by L. A. Stewart of the Bureau of Mines. A. F. Shride of the Geological Survey has examined this property and eventually will submit a separate report although it seems that he wants to re-examine the area at a later date before submitting his report. As it may be several months before Shride can submit his report, we are forwarding Stewart's report to you.

Stewart recommends denial of the loan as the asbestos fiber all seems to be harsh with little possibility of finding better fiber at depth. I concur with his recommendations.

The brochure evidently will be returned to you by Mr. Shride at a later date.

Walter R. Storms

Walter R. Storms

CC: W. H. King (8)
A. F. Shride
DMEA-2491
DF

WRStorms:als

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

200 New Customhouse
Denver 2, Colorado

October 10, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2491, North American Asbestos Company, Pinal County, Arizona. Asbestos.

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.

The brochure is enclosed.

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

Enclosures (10)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

October 6, 1952

Memorandum

To: A. N. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, DMEA 2491, North American Asbestos Company, Pinal County, Arizona (Asbestos)

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

It is recommended that the application be denied because the deposits are of a geologic type that presents an insignificant target for exploration. The Bureau has also recommended denial.

The brochure is enclosed.

A. F. Shride
Acting District Supervisor
Arizona-New Mexico

Enclosures 10

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2491, North American Asbestos Company

Pinal County, Ariz.

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

August 1952

Reviewed by
DMEA OPERATING COMMITTEE

10-24-52
(date)

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By Lincoln A. Stewart[1]

An application for a $14,195.96 exploration loan, docketed as DMEA-2491, was received May 1, 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration. The estimated cost was detailed as follows: access road, $2,935.26; developing water supply, $553.60; 90 feet of shaft and 100 feet of drifts, $8,103.00; and administration and engineering, $2,604.10. The applicant stated "Although the outcrop exhibits harsh to semi-harsh chrysotile, it is believed that the character at depth will reveal soft spinning grade." The suggested exploration was confined to one area, although another area was considered favorable.

The property is in the Pinto Creek mining district of Pinal County, about 28 road miles northwest of Globe, Gila County, Ariz., an area not previously examined by either the Bureau of Mines or the Geological Survey. Only a little prospecting and no production is reported from this district. An examination was made by the writer on June 3, 1952 and by A. F. Shride[2] on July 20, 1952.

In this general area, the members of the Apache group, intruded by diabase, have been block-faulted, tilted and eroded into an intricate pattern. The formations vary considerably in strike and have dips ranging from 25° to 70°. On the Tom Cat No. 2 claim, where exploration was proposed, a steeply dipping, 12-foot stratum of Mescal limestone lies between

---

1/ Mining Engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

2 thick diabase sills. This stratum also is cut by thick diabase dikes so that only 4 relatively short, detached segments can be seen. One of the blocks shows 2 serpentine zones that contain asbestos veins for a length of about 20 feet. The maximum aggregate thickness of fiber is 5 to 7 inches, all of which is harsh or glassy harsh, the latter quality predominating. The other 3 blocks show the mineralization to be decreasing or entirely fading out. Across the gulch on the Chrysotile No. 1 claim the other area of mineralization appears as a localized deposit at the base of a tilted, 100-foot thick, limestone bed between heavy diabase sills. A 20-foot quarry cut shows a 12- to 14-inch serpentine zone that contains a total of $2\frac{1}{2}$ to 3 inches of harsh fiber in 20 to 30 irregular veinlets that vary from 1/32 to a maximum of 1 inch in thickness.

The applicant has suggested that the harsh fiber of these deposits will change at depth to soft spinning fiber. In the Gila County asbestos field it is an exception rather than a rule for harsh fiber at surface to change quality at depth. These exceptions have produced not soft fiber, but a semi-harsh grade at depth, part of which meets the lowered specifications for strategic grades.

The two deposits at the North American property contain fiber of a very harsh quality that is not due to surface weathering. In general the fiber is mostly short and has virtually no tensile strength. It is the opinion of the writer that the quality of this fiber would not improve at depth to a degree that would produce strategic grades.

It is thought that the potential of the deposit on the Tom Cat No. 2 claim is too limited and the quality of the fiber too harsh to justify an exploration loan of $14,000.

The deposit on the Chrysotile No. 1 claim is more promising in potential quantity. If this deposit were easily accessible, a more detailed study might be justified and the possibility of a small amount of exploratory work be given consideration. However, even a minor outcrop-stripping project would require a preliminary expenditure of $4,000 to $5,000 for an access road to reach the deposit. Because of this preparatory cost and the fact that the fiber is generally short and extremely weak, consideration of any sort of an exploration program does not appear feasible. It is doubtful that the quality of the fiber would improve sufficiently to make strategic grades.

For the foregoing reasons, it is recommended that the application of the North American Asbestos Co. be denied.

CHRYSOTILE #1 AND TOM CAT #2 CLAIMS
NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

DMEA 2491

ASBESTOS

Geology

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

CHRYSOTILE #1 AND TOM CAT #2 CLAIMS
NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

DMEA 2491

ASBESTOS

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INTRODUCTION

The North American Asbestos Company has applied for exploration aid on the Tom Cat No. 2 and the Chrysotile claims, which are in sec. 6, T. 1 N., R. 13 E., Gila and Salt River Base Line, Pinal County. The properties are approximately 3.9 miles airline west of the headquarters of Horrells Ranch, a well known ranch in the area. Relief of the surrounding area is 1000 feet, however none of the deposits examined are more than 200 feet above the canyon bottom. The following road log indicates the best access to the properties.

Miles	
0.0	Turn off U. S. Highway 60-70 onto paved Castle Dome road.
2.3	Turn left off Castle Dome Road onto dirt road.
4.4	Road fork, keep right.
5.0	Road fork, keep left.
5.3	Road fork, keep right.
8.2	Fork to Kennedy Ranch, keep right.
11.7	Horrell's Ranch, turn west across Pinto Creek and follow bed of Horrell Creek (poor road from here on).
14.0	Turn left out of Horrell Creek and follow tributary valley.
14.3	End of road. From this point the deposits may be reached by walking 1.7 miles up the canyon. At junction of canyons, approximately 1 mile up the canyon, follow the southern tributary.

GEOLOGY AND ASBESTOS DEPOSITS

The asbestos deposits on the subject claims are in medium to thick-bedded limestones of the lower part of the lower member of the pre-Cambrian Mescal limestone and spatially are closely associated with diabase dikes and sills. This environment was favorable for the localization of asbestos throughout the Arizona asbestos district. However, bedding-plane and thrust-faulting, a necessary factor for large concentrations of Arizona asbestos, is not apparent in the outcrops examined. The asbestos veins occur in serpentine zones which parallel the bedding of the Mescal limestone.

Chrysotile Claim

The deposits owned by the North American Asbestos Company are on both walls of an easterly-trending canyon. The deposit on the Chrysotile claim is exposed along a north-south outcrop on the south side of the canyon. A serpentine zone containing narrow veins of asbestos crops out $1\frac{1}{2}$ to 3 feet above an essentially concordant, thick diabase sill on the Chrysotile claim. The host limestone beds, which strike N. 30° W. and dip 30° SE, are truncated at the south end of the outcrop by a discordant "roll" in the diabase sill. The discordant diabase-limestone contact strikes approximately N. 35° E. Limestones favorable to the localization of asbestos do not crop out south of the discordant contact with diabase. Adjacent to and for a distance of 18 feet to the north of the discordant contact, veins (none over 3/8 inch in width) of harsh asbestos totaling 3 to 4 inches in cumulative thickness are distributed through a serpentine zone 7 to 9 inches in thickness and are exposed by a quarry face. To the north of the quarry face the serpentine-asbestos zone was traced by the writer for approximately 130 feet along the outcrop. Through most of this 130-foot interval the serpentine zone is 3 to 6 inches thick and includes asbestos veins totaling 1/16 to 3/8 inch in thickness. It is very likely that the concentration of asbestos in the quarry is the result of minor adjustment between limestone beds adjacent to a cross-cutting diabase intrusion. Small concentrations of this geologic habit are common in the asbestos district and seldom are productive of asbestos. Therefore exploration on the Chrysotile claim is not warranted.

Tom Cat #2 Claim

On the north side of the canyon, on the Tom Cat #2 claim, the diabase sill, estimated to be approximately 150 feet thick, dilates the limestone. This is the same sill that underlies the deposit on the Chrysotile claim. Within this sill two thin limestone "slivers" are

completely surrounded, in the plane of the outcrops, by diabase. The lowermost sliver, in which the beds strike N. 10° W. and dip 50° to 60° SW, is approximately 50 feet above the base of the diabase sill. The upper limestone sliver, which strikes N. 35° W. and dips 65° SW. is approximately 30 feet below the top contact of the sill.

The two slivers of limestone contain the asbestos deposits of the Tom Cat #2 claim. It is likely, but not readily demonstrable because of the degree of metamorphism and the type of outcrops, that the limestone beds of these slivers are the stratigraphic equivalents of those that contain asbestos on the Chrysotile claim. If the host slivers are the equivalents of the host on the Chrysotile claims, the down-dip extension of the limestone, away from the outcrop, is limited to a few tens of feet by cross-cutting diabase and the volume of rock available for exploration is negligible. The two slivers crop out through diabase in an echelon pattern so related to discordant parts of the generally concordant diabase-limestone contact at the top of the sill to suggest that this premise is correct. The general sequence of metamorphosed beds in the two slivers also suggests this interpretation.

Tom Cat #2 Claim (Lower Deposit)

The lower limestone sliver is approximately 115 feet in outcrop length and in most places is 12 to 15 feet in thickness, but tapers abruptly at either end. The sliver is divided into 3 segments by a 10-foot wide vertical diabase dike 35 feet from the south end of the sliver and a narrow (2-8 feet thick?) dike 50 feet from the north end of the sliver. Two serpentine-asbestos zones, one $2\frac{1}{2}$ feet and the other $9\frac{1}{2}$ feet above the lower contact of limestone and diabase, crop out in the

southernmost segment of the diabase sliver and parallel the bedding in the limestone. The lower serpentine zone averages 10 inches in thickness and includes veins of harsh chrysotile totaling 1 to 2 inches in thickness in the 20 foot interval of outcrop adjacent to the dike. In the upper zone and adjacent to the 10-foot diabase dike a shallow pit exposes $2\frac{1}{2}$ to 4 inches of harsh asbestos in a 12-inch thick serpentine zone. To the south from this dike and this pit toward the southern termination of the sliver, the average content of the upper zone is 1 inch of harsh asbestos in an 8-inch thick serpentine layer.

Adjacent to the diabase dikes at either end of the 30-foot long middle segment of the limestone sliver concentrations of asbestos crop out in the lower serpentine zone. The concentrations exposed contain a total of $\frac{1}{2}$ to $1\frac{1}{2}$ inch of harsh fiber in a 10-inch serpentine zone.

The 50 foot long northern segment of the lower sliver contains 1/16 to $\frac{1}{2}$ inch of harsh fiber in the lower serpentine zone. An upper incompletely serpentinized zone is poorly exposed in both the middle and northern segments of the sliver; however, no fiber was observed in the upper serpentine in these segments.

Tom Cat #2 Claim (Upper Deposit)

The upper limestone sliver is approximately 50 feet long and averages 12 feet in thickness. This sliver also includes two asbestos-serpentine zones. The lower zone, 6 to 8 inches thick, includes harsh asbestos veins totaling 1/8 to $\frac{1}{2}$ inch in thickness through most of the length of the outcrop. In the upper zone a concentration of harsh asbestos veins totaling 1 to $1\frac{1}{2}$ inches in thickness, in an 8 to 10-inch thick serpentine zone is exposed at the south end of the sliver. This concentration exists only near the cross-cutting diabase that terminates

the limestone block. In a few places through the rest of the upper zone veinlets of asbestos totaling 1/16 to 1/8 inch in thickness can be observed.

It is obvious that concentrations of asbestos exist on the Tom Cat #2 claim only where there was disruption of the limestones by cross-cutting diabase intrusions. Such deposits are likely to be of narrow lateral extent away from the intrusions, and therefore not minable.

Tom Cat #1 Claim

The applicant's engineer reported asbestos outcrops on the Tom Cat #1 claim. The writer found two pits in barren rock, but no indication of asbestos deposits.

CONCLUSIONS

The asbestos deposits on the Tom Cat No. 2 claim probably do not extend more than a few tens of feet into the hill from the outcrop. The bases for this interpretation are not wholly satisfactory. However, regardless of the correctness of the above interpretation the deposits on the Tom Cat #2 and the Chrysotile claims are unlikely subjects for exploration because they are of a geologic habit that seldom is productive in the Arizona asbestos region.

DMEA-2491, NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

Engineering Report

By Lincoln A. Stewart
Mining Engineer
Bureau of Mines

August 1952

DMEA-2491, NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

CONTENTS

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INTRODUCTION

An application for a $14,196.96 exploration loan, docketed as DMEA 2491, was received May 1, 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration from the North American Asbestos Co. This estimate was detailed as follows: Access road, $2,935.26; developing water supply, $553.60; 90 feet of shaft and 100 feet of drifts, $8,103.00; and administration and engineering, $2,604.10. The application states "Although the outcrop exhibits harsh to semi-harsh chrysotile, it is believed that the character at depth will reveal the soft spinning grade". The suggested exploration was confined to one area, although another area was considered favorable.

On June 3, 1952, accompanied by Samuel J. Joseph, geologist and co-owner, the writer examined the 2 areas suggested in the docket. Joseph did not consider it essential to investigate the minor showings elsewhere on the property. A. F. Shride of the Geological Survey examined the property on July 20, 1952.

LOCATION AND ACCESSIBILITY

The property is in the Pinto Creek mining district, about 28 road miles northwest of Globe, Ariz. The claims are in Pinal County, bordering upon Maricopa County, and about 2 miles west of the Gila County line (figure 1). The property is accessible from U. S. Highway 60-70 by taking the Castle Dome mine road for 2.4 miles, then turning left and going to the Horrell Ranch, a distance of 9.6 miles. From this ranch go west through a corral, cross Pinto Creek and follow an unimproved road along Horrell Creek for 2.7 miles to the end of the road. From there the

claims are reached by about 2 miles of mountain trail that follows the bed of a stream tributary to Horrell Creek.

The general area is dissected by numerous, normally dry stream beds, and because of block faulting and tilting, the topography is extremely rugged. Differences in altitude on the property vary from 3,400 to about 4,600 feet.

HISTORY AND PRODUCTION

Asbestos was discovered in this general area in 1903 by M. L. Shackelford. Wilson[1/] examined the original prospect in 1928. He states " - - - it was under location as the Lopez No. 3 claim by Messrs. Loftus, Clifford, Brocket and Lopez. No production is known to have been made. - - - only a small amount of assessment work has been done on the claim".

The applicant's claims are some 4 miles southwest of this original discovery. Joseph's docket report states that the Tom Cat and adjacent claims were located in 1944, then allowed to lapse. In 1951 the claims again were located by a Mrs. Jones from whom Messrs. Wilson and Joseph acquired the title. These claims then were relocated to form the present compact group, on which only assessment work has been done.

OWNERSHIP AND EXTENT

The property, consisting of 18 unpatented mining claims and a mill-site, is owned by Samuel J. Joseph, a geologist, and W. Francis Wilson, an attorney, both of Phoenix, Ariz.

1/ Wilson, Eldred D., Asbestos Deposits of Arizona, Ariz. Bur. of Mines, Bull. 126, pg. 85, 1928.

DESCRIPTION OF THE DEPOSITS

In this general area the members of the Apache group, intruded by diabase, have been block-faulted, tilted, and eroded into an intricate pattern. At various places on the North American Asbestos Co. property patches of asbestos-bearing zones are found in the Mescal limestone in proximity to the intrusive diabase sills or dikes. The formations vary considerably in strike and have dips ranging from 25° to 70°.

The applicant considered the outcrops on only 2 of the claims worthy of investigation:

Tom Cat No. 2 claim. A 12-foot limestone stratum, underlain and overlain by thick diabase sills, angles upward across the hillside. This stratum is cut by several near-vertical diabase dikes and the outcrop appears as a series of relatively short blocks that project above the diabase slopes. The formation has a general strike of N. 30° W. and dips westerly into the hill at about 70°. About 60 feet above the creek, a block 20 feet long contains 2 serpentine zones. The lower zone, 2 feet stratigraphically above the lower sill, is 8 inches wide and contains an aggregate of 2½ inches of harsh fiber in veinlets up to 3/8 inch. About 7 feet above this, or 2½ feet below the upper diabase sill, a 10-inch serpentine zone contains almost 50 percent fiber, mostly glassy harsh, except for the lower 1 to 2 inches which is harsh but not glassy. Midway between the 2 zones is a thin serpentine band that does not contain fiber (the next block south shows very little serpentine and fiber). About 60 feet north, another block similar to that first described shows

weakening mineralization: the lower serpentine zone is 2 inches wide and contains $\frac{1}{2}$ inch of fiber, the upper zone is represented by 3 inches of badly weathered serpentine with only a 1/8-inch streak of fiber. A 10-foot prospect hole midway of the length of the block indicates that mineralization has virtually faded out. This is the proposed site of the exploratory inclined shaft.

A few hundred feet westward and somewhat higher on the slope , another small block of limestone is present that is engulfed on 4 sides by diabase. At 5 feet above the lower sill, an 18-inch serpentine band contains a total of 1 inch of harsh fiber. It is likely that this block is part of the ledge previously described, but has been displaced to a greater degree.

Chrysotile No. 1 Claim. The docket rated this deposit as second best, but did not include exploratory work for it. This claim is across the creek south of the Tom Cat deposit.

In a long continuous sweep from the creek bed, a 100-foot thickness of Mescal limestone cuts across the hillside slope. Heavy diabase sills overlie and underlie the limestone, the bottom layers of which form a pronounced cliff. Well up on the hillside a quarry face has exposed a 12- to 14-inch serpentine zone that contains a total of $2\frac{1}{2}$ to 3 inches of harsh fiber in 20 to 30 irregular veinlets that vary from 1/32 inch to a maximum of 1 inch in thickness. This zone is about 3 feet stratigraphically above the lower diabase and has been exposed for the entire 20-foot length of the cut. The limestone beds strike N. 35° W. and dip southwesterly into the hill at 25°. This favorable limestone bed can be traced for about 2,000 feet along the hillside but except in the immediate area of the cut, little or no asbestos has been found.

CONCLUSIONS

The applicant states that although the surface outcrops show only harsh fiber, the primary purpose for exploration is to discover the soft spinning grade of chrysotile at depth. In the Salt River and Sierra Ancha areas, there have been a few exceptions to the general rule that harsh fiber at the outcrop predicates similar harsh fiber throughout the deposit. The exceptions have produced, not soft fiber, but a semi-harsh grade at depth, part of which meets the lowered specifications for strategic uses. For this reason DMEA examination of harsh deposits is warranted.

Of the 4 limestone blocks on the Tom Cat No. 2 claim that show asbestos mineralization, only one contains an appreciable thickness of fiber. These relatively short, thin limestone "slivers" that are engulfed in diabase would not be expected to persist in depth. Much of the exposed fiber is glassy harsh; the remainder is harsh of low tensile strength.

The deposit on the Chrysotile No. 1 claim on which no work was proposed, would be interesting if the fiber was considerably softer. The quantity of fiber shown by the 20-foot quarry face is sufficient to support a small operation on soft fiber, but unfortunately this fiber is harsh, mostly very short, and has virtually no tensile strength.

If the deposit were easily accessible, a small loan might be justified to delineate the total width of the deposit and secure more complete information. The applicant has estimated a cost of $3,000 (exclusive of supervision) to construct a truck trail to the Tom Cat. Additional road construction to reach the Chrysotile No. 1 deposit would require an

additional $1,000. Thus even a $1,000 exploration of the outcrop would cost at least $5,000, which cannot be considered justifiable.

The writer is of the opinion that the low tensile strength and harshness is an inherent physical characteristic of the fiber of each deposit and is not due to weathering.

These conclusions are not intended to discredit this general area, which is virtually unprospected. The above two deposits are the only ones that have been examined by either the Bureau of Mines or the Geological Survey. Eldred Wilson[2/] reported on one other occurrence. Arthur Martin, discoverer of the Tom Cat deposit, told the writer that there are numerous other outcrops of asbestos in the Pinto Creek region.

Samuel J. Joseph intends making a reconnaissance survey of this region in the near future and hopes to be able to bring more desirable deposits to the attention of the DMEA.

RECOMMENDATIONS

Because of the limited extent of asbestos mineralization and the harshness of the fiber in the small, discontinuous limestone blocks on the Tom Cat No. 2 claim, it is thought that a $14,000 exploratory program is not justified.

The Chrysotile No.1 deposit was examined as an undocketed, but possible alternative, location for exploration. Although this deposit contains a considerably greater potential quantity of asbestos than the Tom Cat, it is thought that the harshness and low tensile strength of the fiber precludes this deposit from consideration as a possible source of strategic grades of asbestos.

2/ Previously cited, footnote No. 1.

Therefore it is recommended that the application of the North American Asbestos Co. be denied.

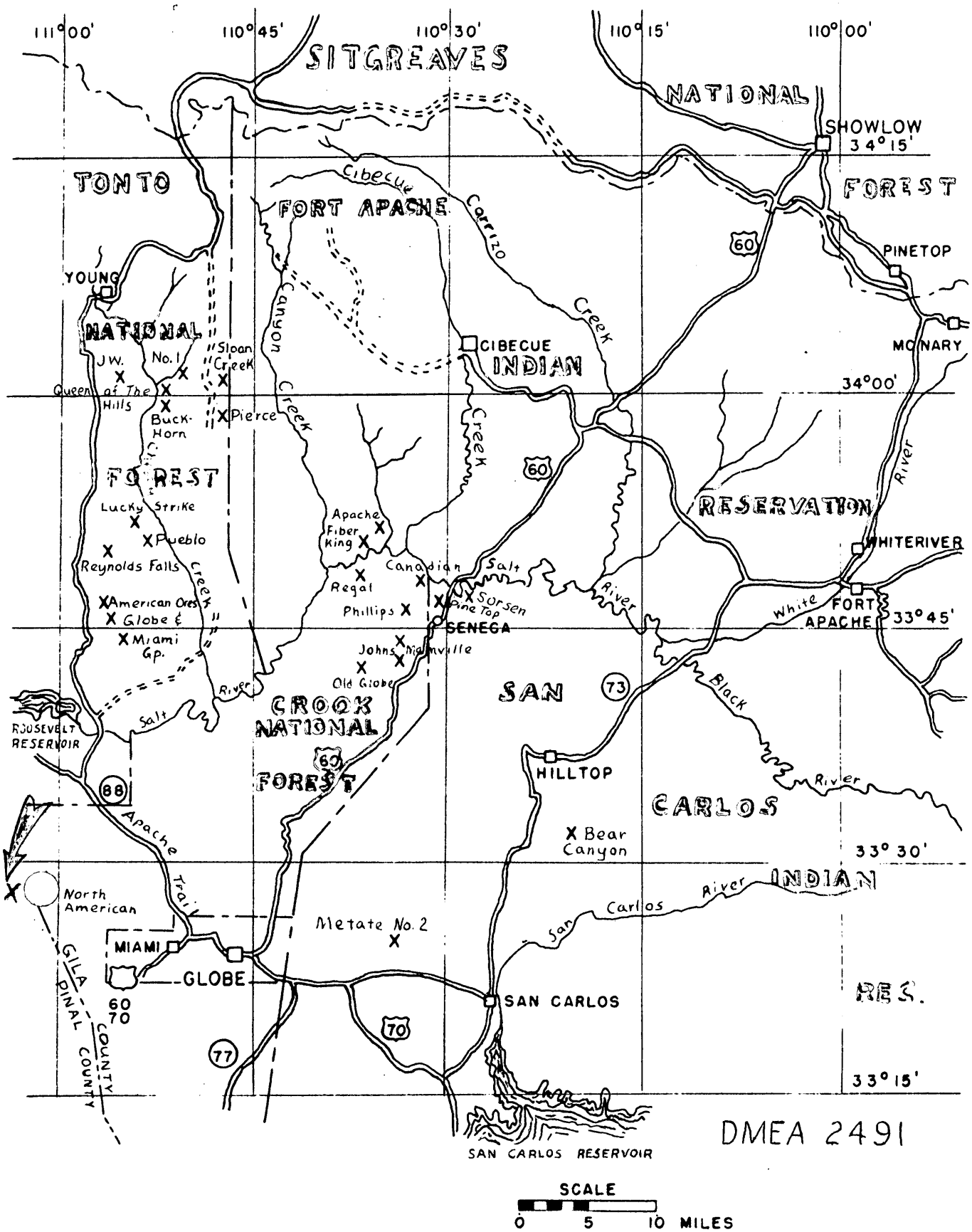

Fig. 1 — Location Map, Asbestos Deposits, Gila County, Arizona

690

October 23, 1952

Memorandum

To: Chairman, Operating Committee

From: Lawrence C. Houk, Chief, Nonmetallic Minerals Division

Subject: Docket No. MMC-2491 - Asbestos
North American Asbestos Company
Pinal County, Arizona

Recommended action:

This Division concurs in denial of subject application because the fiber is harsh and geologic habit of such deposits does not indicate significant tonnages.

LCHouk:gad

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

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 10/20

REFERRED TO:

1. ~~Op Comm~~
2. ~~Lambert~~
3. COPR 600 Rm. 4637
4.

FOR:

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

REMARKS: ~~Agenda 10/24~~
Regions 4

Check (X) before the items needing attention.

~~Frank E. Johnson~~

~~FEJ~~ Initials of sender.

Adams (AA)

GPO 16—63815-1

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

600

October 28, 1952

Memorandum

To: Chairman, Operating Committee

From: Lawrence G. Houk, Chief, Nonmetallic Minerals Division

Subject: Docket No. DMEA-2491 - Asbestos
North American Asbestos Company
Pinal County, Arizona

Recommended action:

This Division concurs in denial of subject application because the fiber is harsh and geologic habit of such deposits does not indicate significant tonnages.

LGHouk:gad

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

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

October 23, 1952

Memorandum

To: Chairman, Operating Committee

From: Laurence G. Houk, Chief, Nonmetallic Minerals Division

Subject: Docket No. DMEA-2491 - Asbestos
North American Asbestos Company
Pinal County, Arizona

Recommended action:

This Division concurs in denial of subject application because the fiber is harsh and geologic habit of such deposits does not indicate significant tonnages.

LGHouk:gad

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

P R O P O S A L

We, B. H. Callahan and Harold W. Long, doing business as Mexzona Mine Contractors, 3902 W. Hadley Street, Phoenix, Arizona, propose to do the following work for Samuel J. Joseph and W. Francis Wilson, doing business as The North American Asbestos Company, 411 Phoenix National Bank Building, Phoenix, Arizona, at their property in the Pinto Creek Mining District, Pinal and Maricopa Counties, Arizona:

Furnish all labor and materials as well as provide quarters for such labor necessary to perform such exploratory work directed by you according to the following schedule:

Moving all necessary mining equipment, hoist, compressor, pneumatic hammers, drill steel, bits, small tools, powder, caps, fuse, and other appurtenances to perform the necessary work ordered by you to and from the site on the Tom Cat #2. It is understood that a passable road to the working site be provided. We propose to do this work for the sum of Two Hundred Fifty and no/100 Dollars ($250.00). We propose to move all mining equipment from the Tom Cat #2 to the Chrysotile #1 for the sum of One Hundred and no/100 Dollars ($100.00).

Furnish all labor and material for the erection of one 18 foot headframe ("A" frame type) complete with collar set, sheave wheel, skids and dump. Leveling of the area for the hoist to be provided by the owners. We propose to do this work for the sum of Two Hundred Eighteen and no/100 Dollars ($218.00).

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Furnish all labor and materials necessary to sink an exploratory inclined shaft below collar set excluding timber square sets and lagging, but including skids and ladder for a 4' x 6' shaft in the clear which will provide a 4' x 4' haulage-way and 2' x 4' manway. We propose to do this work for the sum of Thirty-Seven and no/100 Dollars ($37.00) per foot.

If shaft timber is necessary, we will furnish all labor and materials necessary for the framing and setting square sets including 6" x 6" timbers for wall and end plates, and posts; 4" x 6" for dividers and 2" x 12" for lagging, and 5/8" tie rods. We propose to do this work for the sum of Fifteen and no/100 Dollars ($15.00) per foot of shaft.

We propose to furnish, frame and set where necessary half sets in tunnels using 8" x 8" posts and caps and 2" x 12" lagging for the sum of Eleven and no/100 Dollars ($11.00). All lumber is to be native pine.

We propose to furnish all labor and materials for the completion of driving 4' x 6' drifts and cross cuts as directed by you for the sum of Eighteen and no/100 Dollars ($18.00) per foot, timbering is excluded in this price. If 6" x 6" stulls and head boards are furnished and installed by us, we propose to do this for the sum of Four and no/100 Dollars ($4.00) per each set. If local round stulls are obtainable on the property, we propose to cut and install same for the sum of One and 75/100 Dollars ($1.75) per each. We propose to furnish mine wedges on the property for the sum of Fifteen Cents Only (15¢) each.

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Respectfully submitted,

MEXZONA MINE CONTRACTORS

By Harold W. Long
Harold W. Long

COPY

Supplement to the PRELIMINARY GEOLOGICAL REPORT ON THE ASBESTOS MINING CLAIMS OF THE NORTH AMERICAN ASBESTOS COMPANY:

RECOMMENDATIONS FOR THE EXPLORATION OF THE NORTH AMERICAN ASBESTS PROPERTY, ARIZONA.

This property SHOULD BE EXPLORED both along its dip and laterally along the strike of the veins of the Tom Cat #2 and the Chrysotile #1. The primary purpose for exploration would be the discovery of the "soft" variety of chrysotile of spinning grade. As previously stated, the chrysotile found at the outcrops is of the harsh to semi-harsh variety, which at other mines in the Globe area is very common. However, beyond the weathered surface soft chrysotile is found. Where the beds are horizontal, changes occur within a few feet to as much as twenty feet. It is believed that because of the attitude of the beds on this property, the effects of weathering may go to greater depths.

It is hereby recommended that an inclined shaft be sunk on the foot wall vein of the 10 foot zone on the Tom Cat #2. The collar of this shaft should be at the short tunnel. This ore should be traced down dip to a minimum depth of sixty feet. Should the chrysotile become softer, the shaft should be carried down to a depth of about 90 feet on the dip. At this point, the vein should be drifted on along the strike in both directions with at least two cross cuts into the hanging wall. The total amount of drifts and cross cuts should be about 100 feet.

The shaft should be 4' x 6' in the clear allowing a 4' x 4' haulage compartment and a 4' x 2' man way. The tunnel

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ways shall be a minimum of 4' x 6'.

A similar program should be scheduled for the vein at the Chrysotile #1. The collar of the inclined shaft should be set at the open cut at the discovery of this vein. The vein should be traced down dip to a minimum depth of 60 feet. Should any appreciable change in the character of the chrysotile be found, the shaft should be continued to a depth of approximately 100 feet along the dip of the vein, and thence drifts run in both directions for about 100 feet.

Although it is possible to run an adit above the creed bed to pick up the trace of the vein on the Tom Cat #2, it is believed more advisable to sink on the vein since most asbestos veins are variable in character and thickness, hence changes can be studied; also, this would eliminate driving through the thick talus which would be necessary if an adit tunnel is to be considered. Should the soft variety of chrysotile be found, the drift at the 90 foot level on this vein could be extended south to the surface, hence using it as a haulage way. The exploratory shaft could be used as a secondary access as well as a ventilation shaft.

Respectfully submitted,

Samuel J. Joseph

Samuel J. Joseph,
Geologist

March 10, 1952

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ESTIMATED COST OF ROAD

Bulldozer Caterpillar D7 or A.C. Model "L" or International HD10, $14.00 per hour fully operated, 8 hour per day, 14 working days	$1,568.00
Transportation of Bulldozer $1.00 per road mile (100 miles one way from Phoenix)	200.00
105 CFM Gasoline Powered Compressor, $47.00 per week, 2 weeks	94.00
Powder, caps and fuse: 250 lbs. of dynamite @ $24.00 cwt. - $60.00; 500' fuse @ $2.00 C ft. — $10.00; 100 caps @ $2.50 C - 2.50	72.50
2 - Jackhammers at $15.00 per week each, $30.00 for 2 weeks	60.00
300' Hose at $3.00 per week for 50 ', $18.00 for 2 weeks	36.00
Drill steel, 4 sets at $3.81 per set of 3 per week - $15.24 for 2 weeks	30.48
Replaceable bits, 50 at 50¢ each	25.00
Small Tools (shovels, picks, bars, etc.)	18.00
Gas and oil for compressor, 14 days at $5.00 per day	70.00
Transportation of equipment other than bulldozer	100.00
2 Men at $12.00 per day each (plus insurance and payroll taxes 15%)	345.00
Sales Tax 2% ($2,273.98)	45.48
Supervision and accounting, 2 weeks at $50.00 plus 15% insurance and taxes and travel expense on car	115.00
40 miles per day at $0.08 per mile, or $3.20 per day for 14 days	44.80
Engineering $35.00 per day plus traveling expense on car 2 days	70.00
Travel expense 2 trips 200 miles per roundtrip, or 400 miles at 8¢ per mile	32.00
	$2,935.26

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ESTIMATED COST OF EXPLORATION TOM CAT #2

Water line from Oak Springs to 500 gal. tank near collar of shaft:

800 L.F. of 2 inch line new 2" galv. pipe at $44.46 per C. Ft. (f.o.b. Phnx.)	$ 355.68
2 - 2" gate valv s at $7.08 ea.	14.16
250 L.F. 3/4" galv. pipe at $14.65 C. Ft.	36.63
2 - 3/4" gate valves at $2.43 ea.	4.86
Misc. pipe fittings	17.50
500 gallon tank	50.00
Transportation of materials	65.00
Rental of pump - 2" Centrifugal w/ gasoline engine $45.00 per month rental - 4 months	
Gasoline and oil	
Sales Tax 2% ($488.63)	9.77
Installation:	
2 men at $12.00 per day per man plus 15% insurance and payroll tax	55.20
Sub-total	$ 553.60

Exploration (see proposal from Mexzona Mining Contractors)

Moving mining equipment	$250.00
Headframe and collar set	218.00
90 ft. of shaft (inclined) at $37.00 per foot times 90 A.	3,330.00
Timbering 90' of shaft at $15.00 per ft. times 90 A.	1,350.00
5 Bulkheads at $2.00 each	10.00
100 ft. of drifting and crosscutting at $18.00 per foot	1,800.00
100 ft. of timber tunnels at $11.00 per foot	1,100.00
500 mine wedges at 15¢ each	45.00
Sub-total	$8,103.00

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ESTIMATED COST OF EXPLORATION TOM CAT #2 (Administrative Expense)

Supervision and accounting $50.00 per week, 19 weeks plus 15% insurance and payroll taxes	$1,092.50
Travel expense on car 40 miles per day, 7 days per week, 19 weeks at 8¢ per mile	425.60
Geological and Engineering $35.00 per day, 19 days;	
Car travel expense from Phoenix to property and return, 19 trips, 200 miles per roundtrip	665.00
at 8¢ per mile	306.00
Communications $5.00 per week for 19 weeks	95.00
Stationery, etc.	20.00
Sub-total	$2,604.10

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RECAPITULATION

Total Road Cost	$2,673.46	
Adminis. & Eng.	261.80	$2,935.26
Water Supply & tank to Shaft		553.60
Underground Exploration		8,103.00
Adminis., geo'l. & Eng.		2,604.10
Total Estimated Cost.		$14,195.76

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

Copy No. 3

MF-103 Should Be Filed With General Technical Data Form MF-100

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

Not To Be Filled in by Applicant

Docket No. DMEA-2491
Metal or Mineral
Date Received 4-21-52
Amount $
Participation (Government %)

Name and address of applicant

S. J. Joseph & W. Francis Wilson
dba
North American Asbestos Company
411 Phoenix National Bank Bldg.
Phoenix, Arizona

Date March 12, 1952

If you have already filed MF-100, give date filed Jan. 9, 1952, type of assistance requested None,

DMA Docket Number (if available) ~~M.D. 2852~~

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

North American Asbestos Co. (Name of company)

By Francis Wilson (Signature of authorized official)

April 5, 1952 (Date)

Partner (Title)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

S. J. Joseph and W. Francis Wilson
dba North American Asbestos Company
411 Phoenix National Bank Bldg.
Phoenix, Arizona

1. (a) The property involved in the proposed exploration project are the lode mining claims known as the Tom Cat #2 and the Chrysotile #1, which are part of a group of eighteen claims in the Pinto Creek Mining District, Pinal and Maricopa Counties, Arizona. This property is a prospect with no previous production record. The property is recorded.

(b) We are the owners.

(c) Exploration is proposed on the Tom Cat #2 Mining Claim about 100 feet north of the south end line, and about 300 feet west of the east side line. The collar of the inclined exploratory shaft to be located in the vicinity of the existing 10 foot exploratory tunnel. The area is unsurveyed.

(See attached sketches)

2. (a) We anticipate finding spinning grade chrysotile.

(b) The property is located in a belt of Apache Sediments, which are tilted, having northwesterly-southeasterly strike and a westerly dip. The Mescal Limestone is intruded by irregular diabase sills. Near the contacts of the diabase, the limestone exhibits serpentine veins along in the strike in several places. The serpentine varies in thickness and associated with the serpentine are varying bands of chrysotile at the outcrops. The occurrences are similar to those found in the Salt River Canyon and Sierra Anchas Districts, with one exception the general attitude of the beds. Although the outcrops exhibit harsh to semi-harsh chrysotile, it is believed that the character at depth will reveal the soft spinning grade.

(See accompanying Geological Report. This report may be retained)

3. (a) The proposed work consists of minor repairs to the existing road which terminates about one and three-quarter miles from the property to be explored. Recent heavy rains have made portions of this road impassable. From the terminus point, it is necessary to clear, grub and bulldoze a roadway to the claims on which work is proposed, and thence to Oak Springs in order to obtain water for domestic, as well as mining, purposes. The road repairs will total a distance of two and one-quarter miles new road;construction shall be approximately two and one-eighth miles, which will include leveling for head frame and mining machinery. This road is necessary to move equipment and materials to the project.

The proposed exploration work shall consist of an inclined 4' x 6' exploratory shaft to a depth of 90 feet along the dip of

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the vein and 100 feet of drifts and crosscuts on the Tom Cat #2 10 foot mineralized zone. The direction and length of the drifts shall be dependent upon the character of the ore body. The exploratory tunnels shall be a minimum of 4' x 6' in the clear. The above work shall be carried out if the chrysotile reveals the anticipated change to the soft spinning grade variety within 60 feet from the surface.

About 800 feet of 2 inch pipe line shall have to be run from Oak Springs to the collar of the shaft for drilling water. A pump will have to be provided to lift the water.

Total cost of project is estimated at $14,195.96.

(b) Time required to start is about one week on road. It will require about four and one-half months to complete the project.

4. (See attached sketch)

5. No existing facilities. This is a new operation.

6. No buildings to be furnished by owners. The mining contractor is to furnish housing for his men. See proposal Mexzona Mine Contractors attached hereto. Owners to furnish water supply, which is included in detailed cost breakdown. See schedule on estimated cost under Water Line from Oak Springs to 500 gallon tank near collar of shaft.

7. (a) Rented items - (See schedules on estimated cost)

Road construction:

Bulldozer and tractor - $14.00 per hour fully operated and maintained;
105 CFM Portable Compressor - $47.00 per week;
2 Jackhammers - $15.00 per week each;
300' Air Hose - $3.00 per week for 50' lengths;
4 sets of drill steel --$3.81 per set of 3 per week.

Water Lines:

2" centrifugal pump at $45.00 per month.

(b) None.

(c) None.

8. All mining to be done on contract (see proposal from Mexzona-Mine Contractors).

Labor on road work:

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Labor on road work (cont'd.:

2 - Jackhammer men - $12.00 per day;

Labor on water line:

2 - laborers - $12.00 per day;

1 - Combination Supervisor and bookkeeper - $50.00 per week and $0.08 per mile car travel expense;

1 - Geologist and Engineer (consultant) - $35.00 per day and $0.08 per mile car travel expense.

9. All items shown either above and in detail cost breakdown.

10. (a) We are prepared to invest in the project the sum of $1500.00.

(b) Yes, this amount is sufficient to pay our part of the cost of the project in accordance with the regulations on Government participation. (See 9 of MO-5)

11. It is believed that most of the timbering may not be necessary since the limestone should support itself. A new water line was figured, however, there is a possibility of obtaining used pipe. Some round stulls may be secured in the construction of the road. It is the intent of the owners that should no appreciable change occur in the character of the chrysotile at a depth of 60 feet, the project be abandoned. However, should the asbestos show up softer at depth as anticipated, the full program should be followed as proposed.

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PRELIMINARY GEOLOGICAL REPORT ON THE ASBESTOS MINING CLAIMS

OF

NORTH AMERICAN ASBESTOS COMPANY

COPY

Samuel J. Joseph,
Geologist

PRELIMINARY GEOLOGICAL REPORT ON THE ASBESTOS MINING CLAIMS OF NORTH AMERICAN ASBESTOS COMPANY

Introduction:

The North American Asbestos Company's property, consisting of eighteen mining claims and one millsite, is located in the Pinto Creek Mining District of Arizona about nineteen miles northwest of Miami by road and trail. It is located near the tri-corner section of Pinal-Maricopa-Gila Counties; however, all claims are in Pinal County with two extending into Maricopa County.

The property is accessible from Miami via U.S. Highway 60 and 70, taking the north cutoff to the Castle Dome Mine, thence following the graded road marked Horrell's Ranch. At the Horrell Ranch, it is necessary to go through the corral and cross the Pinto Creek, following the unimproved road along Horrell Creek for about two and a quarter miles. The approximate center of the property is reached by trail from the end of the unimproved road a distance of one and three-quarter miles along the bed of Beef Creek.

This report is a result of the writer's geological reconnaisance of the asbestos deposits in the Horrell Creek area. An aggregate of four days in the field was spent studying the economic possibilities of asbestos by locating and tracing serpentine and asbestos outcrops. Field surveying for this work was done with Brunton Compass and Paulin Altimeter. The work

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was greatly facilitated by the use of the U.S.G.S. Haunted Canyon Quadrangle 7.5 (Topographic) and aerial photographs. The writer wishes to acknowledge the invaluable assistance rendered him by Mr. Arthur G. Martin.

History:

The first asbestos discovered in Southern Arizona was made in this area in 1903 by a Mr. M. L. Shackelford four miles northwest of the Horrell Ranch. There is no indication of any production. In 1928 the Shackelford claims were held by Messrs. Loftus, Clifford, Brockett and Lopez.*

In 1944, Mr. Arthur G. Martin, while trailing a mountain lion, ran across an outcrop of asbestos to the southwest. He located this as the Tom Cat Mining Claim, and with the Cline Brothers, he later located several other claims near his original discovery. The work done was primarily that of prospecting. The area lay dormant as far as any activity until 1951, when the claims were again located by Clarine Jones. Messrs. Wilson and Joseph acquired the property from Mrs. Jones, and relocated these claims as well as additional ones to complete the present group. The acquisition of the Tom Cat Claims was made after the field examination showed that the surface showings indicated sufficient merit to warrant an exploration program.

Summary and Conclusions:

The claims are located in an area of Apache sedi-

*Wilson, Eldred D., Asbestos Deposits of Arizona; Arizona Bureau of Mines, Bull. No. 126, p. 85

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ments. The Mescal limestone is intruded by thick sills of diabase, and numerous outcrops exhibit to varying degrees the alteration of the limestone to serpentine, with and without asbestos. The formations differ from that of the Salt River deposits in that the latter are almost horizontal with local dips due to the intrusion of the diabase, whereas in this area the beds are tilted with dips up to 64°. It was not within the scope of this investigation to determine the numerous structural problems such as whether the tilting is due primarily to folding or block faulting. Also, whether the diabase intrusion is pre or post tilting. The answer will no doubt be revealed after a detailed investigation and large scale geological mapping and a comprehensive study of regional geology is completed. This work is recommended as essential in carrying out an intelligent development program.

Although the asbestos at the surface is of the harsh and semi-harsh variety, it is believed that the soft, silky chrysotile will be found below the surface, since elsewhere in Arizona much of the soft variety below the surface exhibits a harsh character at the surface. It is believed that harshness in part is due to absorbed moisture.

Known outcrops showing over one and one-half or more inches of fiber, in the aggregate counting seams over 1/8 inch, are found on the Tom Cat, Tom Cat #2 and the Chrysotile #1. Other claims have shown asbestos and serpentine. The principal zone on the Tom Cat #2 across a ten foot outcrop exhibits a lower member of twenty inches of serpentine, with upward to four inches of fiber,

COPY

a middle member of six inches of serpentine containing a few seams of asbestos and an upper member with twenty inches of serpentine with upwards of six inches of fiber. About 100 feet west of this outcrop is another zone with twenty inches of serpentine with over one and one-half inches of fiber. The Chrysotile #1 has a fourteen inch serpentine zone containing over three inches of fiber. The dips vary from 26° to 62° southwesterly. This factor will permit the use of mining methods other than the usual room and pillar employed in the Salt River and Sierra Ancha Districts. Sufficient backs can be developed for overhead stoping operations, hence lower cost mining methods can be used without losses in pillars.

The property is favorably located in its closeness to Miami and Globe, which are mining centers and which offer sources of labor and supplies.

Domestic water can be developed at Oak Springs. A bench in the creek on the property offers many advantages as a camp site.

It is recommended that the road from the Horrell Ranch be bladed and extended from its present terminus to the property; that an exploration loan from the Federal Government be applied for to explore the depth, length and width of the ore shoots which show such promise at the surface and are herein described. Such work should consist of inclined shafts on the

COPY

Chrysotile #1 and the ten foot zone of the Tom Cat #2. Open cuts, or short cuts, should be made along the strike of such veins to determine their lateral distribution. Drifts, or adits, should be run from surface along the strike of the Tom Cat vein, and the vein 100 feet west of Tom Cat #2 ten foot zone. Other outcrops should be more thoroughly prospected, and cuts made into those zones which exhibit well defined serpentine. Also, a shallow shaft should be dug through the talus near the Tom Cat #2 and Tom Cat #3 side line where loose fiber is found in the debris.

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Topography and Climate:

The terrain is rugged, and precipitous slopes make up the canyon walls. Elevations of the property range from about 3600 to 4400 feet. Climatological data is assumed to differ very little from Miami. The average annual precipitation is about fifteen inches. Torrential summer showers are not uncommon, expecially during July and August. Winter precipitation occurs from December through March, with an occasional light snow fall which does not remain on the ground for more than a day. Summer days are hot, but the nights are cool. Winter days are cool with occasional subfreezing spells of short duration; the winter nights are cold well below freezing. The creeks flow for several days after heavy downpours, making the unimproved roads impassable for several hours. Most of the springs in the district are of the wet weather type. Burro Springs is known to contain water

even after prolonged periods of drouth. Oak Springs may not flow after long drouth cycles, but always supports grassy patches, and can be developed for domestic water.

Flora and Fauna:

The vegetation in the creek bottom is lush. The slopes are more sparsely covered with flora except for local concentrations. Cacti are found above the creek bed in great abundance, including sahuaro, ocotilla, yucca, prickly pear and barrel cactus. Interspersed with the typical desert flora are juniper, manzanita, scrub oak, mountain laurel and hackberry. The creek beds contain much of these plants as well as walnut, cottonwood, ash, sycamore, wild grape and pinon.

Such game as deer, javelina, fox, mountain lion, quail, white wing dove, rabbit and other small animals and birds are known to inhabit the area.

Geology:

The rocks exposed in the immediate vicinity of the property are of the Apache group. They consist principally of Dripping Spring quartzite, and Mescal limestone. Thick diabase sills have intruded the Mescal limestone, and apparently completely enveloping some of the Mescal beds. The outcrop about 100 feet west of the 10 foot zone of the Tom Cat #2 described elsewhere in this report appears to be such an envelopment and is a remanent of limestone in the diabase.

The formations at the property dip westerly from 24°

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to 64°. The limestone makes a broad, gentle arc along its strike. From all appearances, the claims are on the west flank of an anticline. This becomes more apparent as one traverses the country along the creek trail from the Horrell Ranch to the claims. The beds at the beginning of the trail dip eastward with varying degrees. Below Burro Springs, the beds flatten out, and above this spring there is a marked westward dip. Walking westerly, along the trail, outcrops of a red, coarse grained granite are exposed. Locally, a reddish brown shale (Pioneer) rests on the granite. One exposure exhibits the diabase intruding the granite. Although there are numerous boulders of quartzite conglomerate in the creek bed, there is no exposure in situ. No attempt was made to measure formational thicknesses. The quartzite conglomerate boulders may represent the Barnes conglomerate, and may be covered by talus.

Detailed geologic mapping and the broader study of the regional geology will unfold the answer to the various structural problems. It is possible that what originally appears to be folding may be found to be tilting due to block faulting, which is evident in some areas.

The Pioneer shale is hard, sometimes having the appearance of an argillite. It is purplish red in color. The Dripping Spring quartzite is fine grained, varying in color from pink to deep brick red. Occasionally it exhibits ripple marks. The quartzite conglomerate boulders have a matrix similar in

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character as the Dripping Spring quartzite except that the grains are coarser and composed of well rounded pebbles to cobbles principally of quartz.

The Mescal limestone is of economic importance since it is in this formation that the chrysotile is found. The limestone is medium to thin bedded, hard dolomitic and locally cherty. It weathers gray to buff. Some outcrops exhibit dirty white color on the surface. Near one of the diabase contacts, the limestone contains thin bands of nodular magnetite. The limestone is split up into at least three members of the diabase sills.

The diabase had intruded the limestone as irregular sills. In places, the diabase appears to have completely enveloped the limestone.

The diabase is normally medium grained, greenish black in color and is even textured. Some magmatic segregation is noted. The diabase is much finer grained within six inches of the limestone contacts. No microscopic examination has been made of the diabase in this report.

The serpentine is found in the Mescal limestone near the diabase contacts; some places above and other places below. No serpentine has been found at the contact itself. The serpentine is dense and will vary in color and shade from dark green to light green; some outcrops display a red and green mottled appearance. The red may be due to a hematite staining. Some serpentine

COPY

has a cherty bleached appearance of dirty white to a greenish white with darker green blotches. Although the serpentine is variable in thickness, and the best development of chrysotile is found in the thicker and better developed zones. It is noted that the color of the serpentine at the various outcrops have but little to do with the quantity of fiber. The darker serpentine appears to contain longer fiber. It may indicate a better quality.

The chrysotile is cross fibered, harsh to semi-harsh, white to buff in color, and waxy in appearance. The veinlets of chrysotile are from microscopic to over one inch in thickness. The asbestos at the Rose Bud has a rose or pink cast, whereas some of the weathered asbestos on the Tom Cat #2 is found to be reddish brown at the immediate surface, but on a fresh surface, it becomes buff to white. Since all exposures are at the outcrop, it is believed that below the surface the soft silky variety will be found. Mines in the Salt River and Sierra Ancha Districts have generally found this to be a rule. However, there are some exceptions. Some fibrous calcite veinlets are found associated with some of the chrysotile. Only one instance of slip fiber asbestos is found; that being on the foot wall of the serpentine zone 100 feet west of the main ore body on the Tom Cat #2.

The more defined asbestos veins and serpentine zones are found on the Tom Cat, Tom Cat #2 and Chrysotile #1. Lesser defined zones are found on the Tom Cat #1, the Clarine, the

COPY

Chrysotile, Bonnie E and Rose Bud claims. Minor amounts of serpentine are found on the other claims.

The Tom Cat claim has an eight inch serpentine zone containing about one and one-half inches of fiber. The zone is traceable for about 30 feet along the strike, and becomes obscure by an overburden of talus. Measurements of the asbestos includes the aggregate of all fiber in the zone having a minimum dimension of one-eighth inch.

Two well defined zones are found on the Tom Cat #2. The lower zone is about 200 feet north of the south end line of the claim, and is about ten feet wide, containing three distinct serpentine bands. The lowest is about twenty inches wide, with about four inches of fiber; the middle bank of serpentine is about six inches wide with a few narrow seams of asbestos; the upper band measures about twenty inches of serpentine with upwards to six inches of fiber. Fiber over one inch in length was taken from this vein. Forty feet north of the outcrop a tunnel twelve feet long was driven; while the lower asbestos was encountered, the upper zone was not cut, yet this vein outcrops above. This zone is traceable for about 250 feet. The vein strike N20°W and dips 52°W. The upper zone is about 100 feet west of the above described zone, and the serpentine is about twenty inches wide with over two inches of fiber. Some slip fiber is noted on the foot wall of the serpentine. This outcrop is concealed in part by talus on the south, but appears to be completely enveloped by

COPY

the diabase, yet there appears to be no dislodgement of the enclosed block of limestone with relationship to its bedding with that of the other limestone. Additional field work will no doubt clarify this envelopment.

Near the east end line of the Tom Cat #2 some fiber is found in the overburden. This may be residual and indicate a concealed vein.

The vein on Chrysotile #1 contains about fourteen inches of serpentine enclosing over three inches of asbestos where best developed. The beds strike N32°W and dip 28°SW. This zone can be traced over 300 feet.

The showings at the various outcrops indicate that the property merits an extensive exploration program; especially should the fiber below the surface prove to be of the soft variety. The mining problems should be less than those properties possessing flat veins. This property would have a shorter haul to the railroad than other known asbestos properties. The present price of asbestos is very attractive. Known properties are being operated today with as little as one and one-half inches of fiber.

Respectfully submitted,

Samuel J. Joseph

Samuel J. Joseph,
Geologist

COPY

BLM-2491, NORTH AMERICAN ASBESTOS COMPANY
PIMA COUNTY, ARIZONA

Engineering Report

By Lincoln A. Stewart
Mining Engineer
Bureau of Mines

August 1952

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INTRODUCTION

An application for a $14,196.00 exploration loan, designated as DMEA 2491, was received May 1, 1952 by the Denver, Ariz. office of the Defense Minerals Exploration Administration from the North American Asbestos Co. This estimate was detailed as follows: Access road, $2,935.20; developing water supply, 3333.00; 50 feet of shaft and 100 feet of drifts, $8,103.00; and administration and engineering, $2,004.10. The application states "Due only the outcrop exhibits fibers to semi-harsh chrysotile, it is believed that the character at depth will reveal the soft spinning grade". The suggested exploration was confined to one area, although another area was considered favorable.

On June 3, 1952, accompanied by Carmel J. Joseph, geologist and co-owner, the writer examined the 2 areas suggested in the docket. Joseph did not consider it essential to investigate the minor showings elsewhere on the property. A. F. Lance of the Geological Survey examined the property on July 23, 1952.

LOCATION AND ACCESSIBILITY

The property is in the Pinto Creek mining district, about 23 road miles northwest of Globe, Ariz. The claims are in Pinal County, bordering upon Maricopa County, and about 2 miles west of the Gila County line (Figure 1). The property is accessible from U. S. Highway 60-70 by taking the Castle Hot Springs road for 2.6 miles, then turning left and going to the Morrell Ranch, a distance of 9.0 miles. From this ranch go west through a corral, cross Pinto Creek, and follow an unimproved road along Morrell Creek for 2.7 miles to the end of the road. From there the

claims are reached by about 2 miles of mountain trail that follows the bed of a stream tributary to Morrell Creek.

The general area is dissected by numerous, normally dry stream beds, and because of block faulting and tilting, the topography is extremely rugged. Differences in altitude on the property vary from 3,400 to about 4,600 feet.

GEOLOGY AND MINERALIZATION

Asbestos was discovered in this general area in 1903 by H. L. Blackelford. Wilson examined the original prospect in 1923. He states " - - - it was under location as the Lopez No. 3 claim by Messrs. Loftus, Gifford, Crocket and Lopez. No production is known to have been made. - - - only a small amount of assessment work has been done on the claim".[1]

The applicant's claims are some 4 miles southwest of this original discovery. Joseph's docket report states that the Tom Cat and adjacent claims were located in 1944, then allowed to lapse. In 1951 the claims again were located by a Mrs. Jones from whom Messrs. Wilson and Joseph acquired the title. These claims then were relocated to form the present compact group, on which only assessment work has been done.

OWNERSHIP AND TITLE

The property, consisting of 18 unpatented mining claims and a mill-site, is owned by Daniel J. Joseph, a geologist, and W. Francis Wilson, an attorney, both of Phoenix, Ariz.

1/ Wilson, Eldred D., Asbestos Deposits of Arizona, Ariz. Bur. of Mines, Bull. 126, pg. 88, 1928.

Identification of the Diabase

In this general area the members of the Apache group, intruded by diabase, have been block-faulted, tilted, and eroded into an intricate pattern. At various places on the North American Asbestos Co. property patches of asbestos-bearing zones are found in the Mescal limestone in proximity to the intrusive diabase sills or dikes. The formations vary considerably in strike and have dips ranging from 25° to 70°.

The applicant considered the outcrops on only 2 of the claims worthy of investigation:

<u>Ten Cat No. 2 claim</u>. A 12-foot limestone stratum, underlain and overlain by thick diabase sills, angles upward across the hillside. This stratum is cut by several near-vertical diabase dikes and the outcrop appears as a series of relatively short blocks that project above the diabase slopes. The formation has a general strike of N. 30° W. and dips westerly into the hill at about 70°. About 60 feet above the creek, a block 20 feet long contains 2 serpentine zones. The lower zone, 2 feet stratigraphically above the lower sill, is 8 inches wide and contains an aggregate of 2½ inches of harsh fiber in veinlets up to 3/8 inch. About 7 feet above this, or 2½ feet below the upper diabase sill, a 10-inch serpentine zone contains almost 30 percent fiber, mostly glassy harsh, except for the lower 1 to 2 inches which is harsh but not glassy. Midway between the 2 zones is a thin serpentine band that does not contain fiber (the next block south shows very little serpentine and fiber). About 60 feet north, another block similar to that first described shows

weakening mineralization: the lower serpentine zone is 2 inches wide and contains ½ inch of fiber, the upper zone is represented by 3 inches of badly weathered serpentine with only a 1/8-inch streak of fiber. A 10-foot prospect hole midway of the length of the block indicates that mineralization has virtually faded out. This is the proposed site of the exploratory inclined shaft.

A few hundred feet westward and somewhat higher on the slope, another small block of limestone is present that is engulfed on 4 sides by diabase. At 5 feet above the lower sill, an 18-inch serpentine band contains a total of 1 inch of harsh fiber. It is likely that this block is part of the ledge previously described, but has been displaced to a greater degree.

<u>Chrysotile No. 1 claim.</u> The docket rated this deposit as second best, but did not include exploratory work for it. This claim is across the creek south of the Ton Cat deposit.

In a long continuous sweep from the creek bed, a 100-foot thickness of Mescal limestone cuts across the hillside slope. Heavy diabase sills overlie and underlie the limestone, the bottom layers of which form a pronounced cliff. Well up on the hillside a quarry face has exposed a 12- to 14-inch serpentine zone that contains a total of 2½ to 3 inches of harsh fiber in 20 to 30 irregular veinlets that vary from 1/32 inch to a maximum of 1 inch in thickness. This zone is about 3 feet stratigraphically above the lower diabase and has been exposed for the entire 13-foot length of the cut. The limestone beds strike N. 35° W. and dip southwesterly into the hill at 25°. This favorable limestone bed can be traced for about 2,000 feet along the hillside but except in the immediate area of the cut, little or no asbestos has been found.

CONCLUSION

The applicant states that although the surface outcrops show only harsh fiber, the primary purpose for exploration is to discover the soft spinning grade of chrysotile at depth. In the Salt River and Sierra Ancha areas, there have been a few exceptions to the general rule that harsh fiber at the outcrop predicates similar harsh fiber throughout the deposit. The exceptions have produced, not soft fiber, but a semi-harsh grade at depth, part of which meets the lowered specifications for strategic uses. For this reason RMA examination of harsh deposits is warranted.

Of the 4 limestone blocks on the Tom Cat No. 2 claim that show asbestos mineralization, only one contains an appreciable thickness of fiber. These relatively short, thin limestone "slivers" that are engulfed in diabase would not be expected to persist in depth. Much of the exposed fiber is glassy harsh; the remainder is harsh of low tensile strength.

The deposit on the Chrysotile No. 1 claim on which no work was proposed, would be interesting if the fiber was considerably softer. The quantity of fiber shown by the 20-foot quarry face is sufficient to support a small operation on soft fiber, but unfortunately this fiber is harsh, mostly very short, and has virtually no tensile strength.

If the deposit were easily accessible, a small loan might be justified to delineate the total width of the deposit and secure more complete information. The applicant has estimated a cost of $3,000 (exclusive of supervision) to construct a truck trail to the Tom Cat. Additional road construction to reach the Chrysotile No. 1 deposit would require an

additional $1,000. Thus even a $1,000 exploration of the outcrop would cost at least $5,000, which cannot be considered justifiable.

The writer is of the opinion that the low tensile strength and harshness is an inherent physical characteristic of the fiber of each deposit and is not due to weathering.

These conclusions are not intended to discredit this general area, which is virtually unprospected. The above two deposits are the only ones that have been examined by either the Bureau of Mines or the Geological Survey. Mildred Wilson reported on one other occurrence. Arthur Martin, discoverer of the Ton Dat deposit, told the writer that there are numerous other outcrops of asbestos in the Pinto Creek region.

Samuel J. Joseph intends making a reconnaissance survey of this region in the near future and hopes to be able to bring more desirable deposits to the attention of the MMA.

RECOMMENDATIONS

Because of the limited extent of asbestos mineralization and the harshness of the fiber in the small, discontinuous limestone blocks on the Ton Dat No. 2 claim, it is thought that a $24,000 exploratory program is not justified.

The Chrysotile No. 1 deposit was examined as an undocketed, but possible alternative, location for exploration. Although this deposit contains a considerably greater potential quantity of asbestos than the Ton Dat, it is thought that the harshness and low tensile strength of the fiber precludes this deposit from consideration as a possible source of strategic grades of asbestos.

2/ Previously cited, footnote No. 1.

Therefore it is recommended that the application of the North American Asbestos Co. be denied.

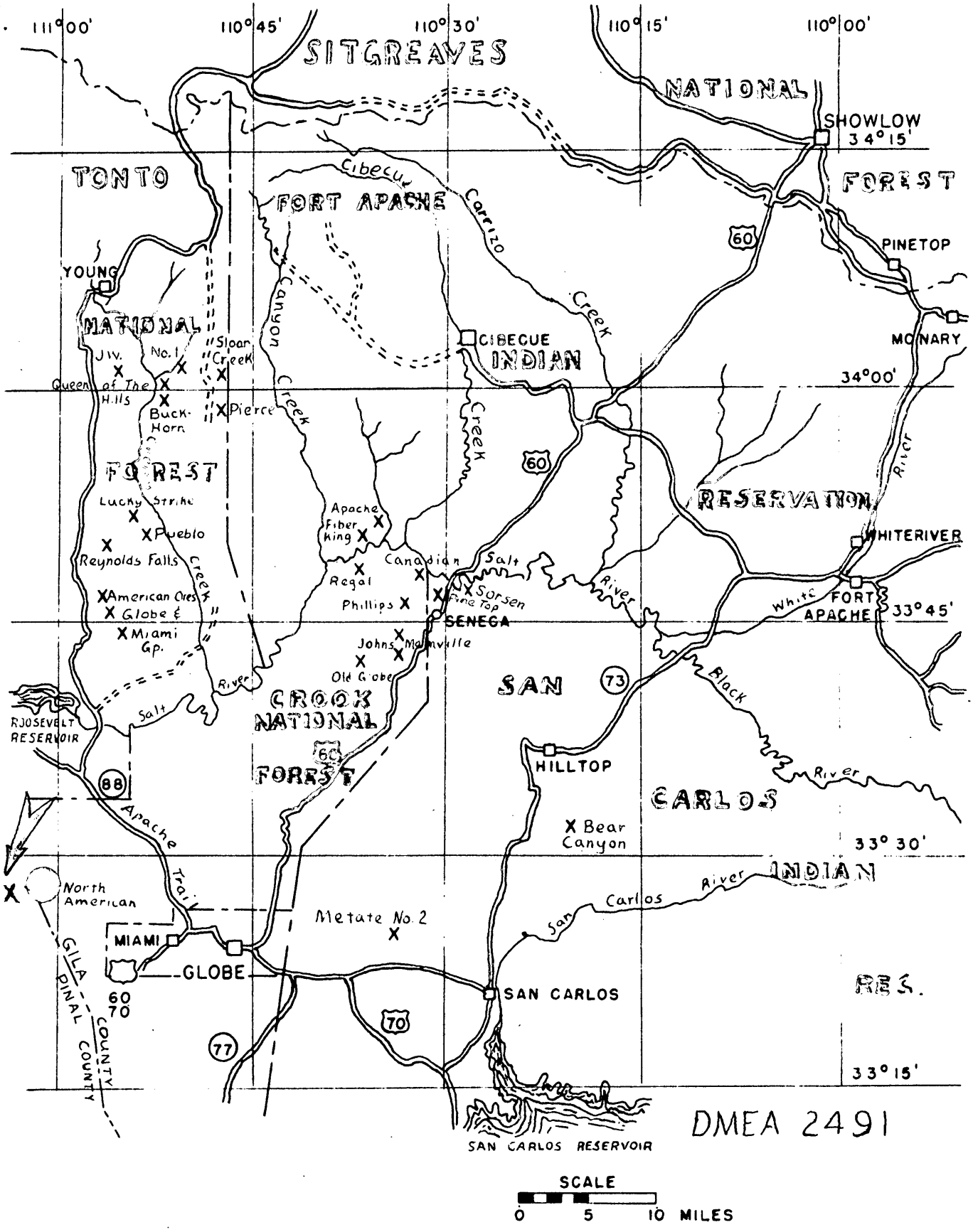

Fig. 1 — Location Map, Asbestos Deposits, Gila County, Arizona

Chrysotile Claim

The deposits owned by the North American Asbestos Company are on both walls of an easterly-trending canyon. The deposit on the Chrysotile claim is exposed along a north-south outcrop on the south side of the canyon. A serpentine zone containing narrow veins of asbestos crops out 1½ to 3 feet above an essentially concordant, thick diabase sill on the Chrysotile claim. The host limestone beds, which strike N. 30° W. and dip 30° NE, are truncated at the south end of the outcrop by a discordant "roll" in the diabase sill. The discordant diabase-limestone contact strikes approximately N. 35° E. Limestones favorable to the localization of asbestos do not crop out south of the discordant contact with diabase. Adjacent to and for a distance of 18 feet to the north of the discordant contact, veins (none over 3/8 inch in width) of harsh asbestos totaling 3 to 4 inches in cumulative thickness are distributed through a serpentine zone 7 to 9 inches in thickness and are exposed by a quarry face. To the north of the quarry face the serpentine-asbestos zone was traced by the writer for approximately 130 feet along the outcrop. Through most of this 130-foot interval the serpentine zone is 3 to 6 inches thick and includes asbestos veins totaling 1/16 to 3/8 inch in thickness. It is very likely that the concentration of asbestos in the quarry is the result of minor adjustment between limestone beds adjacent to a cross-cutting diabase intrusion. Small concentrations of this geologic habit are common in the asbestos district and seldom are productive of asbestos. Therefore exploration on the Chrysotile claim is not warranted.

Tom Cat #2 Claim

On the north side of the canyon, on the Tom Cat #2 claim, the diabase sill, estimated to be approximately 150 feet thick, dilates the limestone. This is the same sill that underlies the deposit on the Chrysotile claim. Within this sill two thin limestone "slivers" are

completely surrounded, in the plane of the outcrops, by diabase. The lowermost sliver, in which the beds strike N. 10° W. and dip 50° to 60° SW, is approximately 50 feet above the base of the diabase sill. The upper limestone sliver, which strikes N. 35° W. and dips 65° SW. is approximately 30 feet below the top contact of the sill.

The two slivers of limestone contain the asbestos deposits of the Tom Cat #2 claim. It is likely, but not readily demonstrable because of the degree of metamorphism and the type of outcrops, that the limestone beds of these slivers are the stratigraphic equivalents of those that contain asbestos on the Chrysotile claim. If the host slivers are the equivalents of the host on the Chrysotile claims, the down-dip extension of the limestone, away from the outcrop, is limited to a few tens of feet by cross-cutting diabase and the volume of rock available for exploration is negligible. The two slivers crop out through diabase in an echelon pattern so related to discordant parts of the generally concordant diabase-limestone contact at the top of the sill to suggest that this premise is correct. The general sequence of metamorphosed beds in the two slivers also supports this interpretation.

Tom Cat #2 Claim (Lower Deposit)

The lower limestone sliver is approximately 115 feet in outcrop length and in most places is 12 to 15 feet in thickness, but tapers abruptly at either end. The sliver is divided into 3 segments by a 10-foot wide vertical diabase dike 35 feet from the south end of the sliver and a narrow (2-3 feet thick?) dike 50 feet from the north end of the sliver. Two serpentine-asbestos zones, one 8½ feet and the other 9½ feet above the lower contact of limestone and diabase, crop out in the

southernmost segment of the diabase sliver and parallel the bedding in the limestone. The lower serpentine zone averages 10 inches in thickness and includes veins of harsh chrysotile totaling 1 to 2 inches in thickness in the 20 foot interval of outcrop adjacent to the dike. In the upper zone and adjacent to the 10-foot diabase dike a shallow pit exposes 2½ to 4 inches of harsh asbestos in a 12-inch thick serpentine zone. To the north from this dike and this pit toward the southern termination of the sliver, the average content of the upper zone is 1 inch of harsh asbestos in an 8-inch thick serpentine layer.

Adjacent to the diabase dikes at either end of the 30-foot long middle segment of the limestone sliver concentrations of asbestos crop out in the lower serpentine zone. The concentrations exposed contain a total of ½ to 1½ inch of harsh fiber in a 10-inch serpentine zone.

The 50 foot long northern segment of the lower sliver contains 1/16 to ½ inch of harsh fiber in the lower serpentine zone. An upper incompletely serpentinized zone is poorly exposed in both the middle and northern segments of the sliver; however, no fiber was observed in the upper serpentine in these segments.

Tom Cat #2 Claim (Upper Deposit)

The upper limestone sliver is approximately 50 feet long and averages 12 feet in thickness. This sliver also includes two asbestos-serpentine zones. The lower zone, 6 to 8 inches thick, includes harsh asbestos veins totaling 1/8 to ½ inch in thickness through most of the length of the outcrop. In the upper zone a concentration of harsh asbestos veins totaling 1 to 1½ inches in thickness, in an 8 to 10-inch thick serpentine zone is exposed at the south end of the sliver. This concentration exists only near the cross-cutting diabase that terminates

the limestone block. In a few places through the rest of the upper zone veinlets of asbestos totaling 1/16 to 1/8 inch in thickness can be observed.

It is obvious that concentrations of asbestos exist on the Tom Cat #2 claim only where there was disruption of the limestones by cross-cutting diabase intrusions. Such deposits are likely to be of narrow lateral extent away from the intrusions, and therefore not minable.

Tom Cat #1 Claim

The applicant's engineer reported asbestos outcrops on the Tom Cat #1 claim. The writer found two pits in barren rock, but no indication of asbestos deposits.

CONCLUSIONS

The asbestos deposits on the Tom Cat No. 2 claim probably do not extend more than a few tens of feet into the hill from the outcrop. The bases for this interpretation are not wholly satisfactory. However, regardless of the correctness of the above interpretation the deposits on the Tom Cat #2 and the Chrysotile claims are unlikely subjects for exploration because they are of a geologic habit that seldom is productive in the Arizona asbestos region.

COPY

224 New Customhouse
Denver 2, Colorado

October 13, 1952

Mr. S. J. Joseph and Mr.W. Francis Wilaon
North American Asbestos Company
411 Phoenix National Bank Bldg.
Phoenix, Arizona

DMEA Docket 2491

Dear Sirs:

Reference is made to your application for Government aid on your asbestos prospect in Pinal County.

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 strategic asbestos by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application for exploration aid is denied.

Very truly yours,

/s/ John F. Shaw for
W. H. King

/s/ A. H. Koschmann

EMC:oc
cc: Administrator (DMEA)
WRStorms
Subject
Chrom.
Koschmann (2)

62

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

October 13, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 5492, (Asbestos) North American Asbestos Company, Pinal County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-5492 by L. A. Stewart of the Bureau of Mines.

The applicant requested aid in the amount of $14,195.96.

Stewart recommends that the application be denied because of the poor quality of the fiber.

We concur in this recommendation.

John F. Shaw
John F. Shaw for
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
10-24-52

Mining Division
Date Rec'd.

AUG 22 1952

BUREAU OF MINES
Denver, Colorado

[illegible]
[illegible]

August 20, 1952

Memorandum

To : [illegible], Denver, Colorado

From : Chief, Western [illegible] Center, [illegible], [illegible]

Subject : Final report, [illegible] Mine, North Morenci Asbestos Co., Final County, Ariz.

Enclosed are original and 6 copies of the section on Summary, Conclusions and Recommendations, and the section on Engineering by L. C. Stewart of the Bureau of Mines. A. L. Grade of the Geological Survey has examined this property and eventually will submit a separate report although it seems that he wants to re-examine the area at a later date before submitting his report. As it may be several months before Grade can submit his report, we are forwarding Stewart's report to you.

Stewart recommends denial of the loan as the asbestos fiber all seems to be large with little possibility of finding better fiber at depth. I concur with his recommendations.

The papers evidently will be returned to you by Mr. Grade at a later date.

Walter R. Storms

Walter R. Storms

cc: A. L. Gray (6)
A. L. Grade
[illegible]
[illegible]

[illegible]:[illegible]

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

200 New Customhouse
Denver 2, Colorado

October 10, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2491, North American Asbestos Company, Pinal County, Arizona. Asbestos.

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.

The brochure is enclosed.

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

Enclosures (10)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

October 6, 1952

Memorandum

To: A. M. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, DMEA 2491, North American Asbestos Company, Pinal County, Arizona (Asbestos)

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

It is recommended that the application be denied because the deposits are of a geologic type that presents an insignificant target for exploration. The Bureau has also recommended denial.

The brochure is enclosed.

A. F. Shride
Acting District Supervisor
Arizona-New Mexico

Enclosures 10

Reviewed by
DMEA OPERATING COMMITTEE
10-24-52
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
Oscar L. Chapman, SECRETARY

DEFENSE MINERALS ADMINISTRATION
Jesse E. Wilson, ADMINISTRATOR

REPORT OF INVESTIGATION OF FIELD TRIP
PROJECT IV

DMA-2491, North American Asbestos Company

Pinal County, Ariz.

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

August 1952

[illegible], [illegible] and [illegible]

By Lincoln A. Stewart[1]

An application for a $14,195.96 exploration loan, docketed as [illegible]-2491, was received May 2, 1952 by the Tucson, Ariz. office of the Defense Minerals Exploration Administration. The estimated cost was detailed as follows: access road, $2,935.20; developing water supply, $953.00; 90 feet of shaft and 100 feet of drifts, $8,103.00; and administration and engineering, $2,654.10. The applicant stated "Although the outcrop exhibits harsh to semi-harsh chrysotile, it is believed that the character at depth will reveal soft spinning grade." The suggested exploration was confined to one area, although another area was considered favorable.

The property is in the Pinto Creek mining district of Pinal County, about 28 road miles northwest of Globe, Gila County, Ariz., an area not previously examined by either the Bureau of Mines or the Geological Survey. Only a little prospecting and no production is reported from this district. An examination was made by the writer on June 3, 1952 and by A. F. Shride[2] on July 20, 1952.

In this general area, the members of the Apache group, intruded by diabase, have been block-faulted, tilted and eroded into an intricate pattern. The formations vary considerably in strike and have dips ranging from 25° to 70°. In the Tom Cat No. 2 claim, where exploration was proposed, a steeply dipping, 12-foot stratum of Mescal limestone lies between

1/ Mining engineer, U. S. Bureau of Mines
2/ Geologist, U. S. Geological Survey

2 thick diabase sills. This stratum also is cut by thick diabase dikes so that only 4 relatively short, detached segments can be seen. One of the blocks shows 2 serpentine zones that contain asbestos veins for a length of about 20 feet. The maximum aggregate thickness of fiber is 5 to 7 inches, all of which is harsh or glassy harsh, the latter quality predominating. The other 3 blocks show the mineralization to be decreasing or entirely fading out. Across the gulch on the Chrysotile No. 1 claim the other area of mineralization appears as a localized deposit at the base of a tilted, 100-foot thick, limestone bed between heavy diabase sills. A 20-foot quarry cut shows a 12- to 14-inch serpentine zone that contains a total of 2½ to 3 inches of harsh fiber in 20 to 30 irregular veinlets that vary from 1/32 to a maximum of 1 inch in thickness.

The applicant has suggested that the harsh fiber of these deposits will change at depth to soft spinning fiber. In the Ojla County asbestos field it is an exception rather than a rule for harsh fiber at surface to change quality at depth. These exceptions have produced not soft fiber, but a semi-harsh grade at depth, part of which meets the lowered specifications for strategic grades.

The two deposits at the North American property contain fiber of a very harsh quality that is not due to surface weathering. In general the fiber is mostly short and has virtually no tensile strength. It is the opinion of the writer that the quality of this fiber would not improve at depth to a degree that would produce strategic grades.

It is thought that the potential of the deposit on the Ion Cat No. 2 claim is too limited and the quality of the fiber too harsh to justify an exploration loan of $14,000.

The deposit on the Chrysotile No. 1 claim is more promising in potential quantity. If this deposit were easily accessible, a more detailed study might be justified and the possibility of a small amount of exploratory work be given consideration. However, even a minor outcrop-stripping project would require a preliminary expenditure of $4,000 to $5,000 for an access road to reach the deposit. Because of this preparatory cost and the fact that the fiber is generally short and extremely weak, consideration of any sort of an exploration program does not appear feasible. It is doubtful that the quality of the fiber would improve sufficiently to make strategic grades.

For the foregoing reasons, it is recommended that the application of the North American Asbestos Co. be denied.

CHRYSOTILE #1 AND TOM CAT #2 CLAIMS
NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

INDEX MAP

ASBESTOS

Geology

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

CHRYSOTILE #1 AND TOM CAT #2 CLAIMS
NORTH AMERICAN ASBESTOS COMPANY
PINAL COUNTY, ARIZONA

IMEA 2491

ASBESTOS

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INTRODUCTION

The North American Asbestos Company has applied for exploration aid on the Tom Cat No. 2 and the Chrysotile claims, which are in sec. 6, T. 1 N., R. 13 E., Gila and Salt River Base Line, Pinal County. The properties are approximately 3.9 miles airline west of the headquarters of Morrells Ranch, a well known ranch in the area. Relief of the surrounding area is 1000 feet, however none of the deposits examined are more than 200 feet above the canyon bottom. The following road log indicates the best access to the properties.

Miles	
0.0	Turn off U. S. Highway 60-70 onto paved Castle Dome road.
2.3	Turn left off Castle Dome Road onto dirt road.
4.4	Road fork, keep right.
5.0	Road fork, keep left.
5.3	Road fork, keep right.
8.2	Fork to Kennedy Ranch, keep right.
11.7	Morrell's Ranch, turn west across Pinto Creek and follow bed of Morrell Creek (poor road from here on).
14.0	Turn left out of Morrell Creek and follow tributary valley.
14.3	End of road. From this point the deposits may be reached by walking 1.7 miles up the canyon. At junction of canyons, approximately 1 mile up the canyon, follow the southern tributary.

GEOLOGY AND ASBESTOS DEPOSITS

The asbestos deposits on the subject claims are in medium to thick-bedded limestones of the lower part of the lower member of the pre-Cambrian Mescal limestone and spatially are closely associated with diabase dikes and sills. This environment was favorable for the localization of asbestos throughout the Arizona asbestos district. However, bedding-plane and thrust-faulting, a necessary factor for large concentrations of Arizona asbestos, is not apparent in the outcrops examined. The asbestos veins occur in serpentine zones which parallel the bedding of the Mescal limestone.

Rg IV

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

October 28, 1952

Memorandum

To: Chairman, Operating Committee

From: Lawrence G. Houk, Chief, Nonmetallic Minerals Division

Subject: Docket No. DMEA-2491 - Asbestos
North American Asbestos Company
Pinal County, Arizona

Recommended action:

This Division concurs in denial of subject application because the fiber is harsh and geologic habit of such deposits does not indicate significant tonnages.

FILE COPY
SURNAME:

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

October 28, 1952

Memorandum

To: Chairman, Operating Committee

From: Lawrence G. Houk, Chief, Nonmetallic Minerals Division

Subject: Docket No. DMEA-2491 - Asbestos
North American Asbestos Company
Pinal County, Arizona

Recommended action:

This Division concurs in denial of subject application because the fiber is harsh and geologic habit of such deposits does not indicate significant tonnages.

LGHouk:gad

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

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

224 New Customhouse
Denver 2, Colorado

October 13, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2491 (Asbestos) North American Asbestos Company, Pinal County, Arizona

Enclosed are the original and three copies of the final report on DMEA-2491, the original and one copy of Form 3b, and a copy of the letter of denial to the applicant.

John F. Shaw for
W. H. King

A. H. Koschmann

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
OCT 2 0 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
E. 157 HOWARD ST.
Spokane 8, Wash.

OFFICIAL BUSINESS

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MR. FRANK E. JOHNSON
CHAIRMAN, OPERATING COMMITTEE
DEFENSE MINERALS EXPLORATION ADMINISTRATION
DEPARTMENT OF THE INTERIOR
WASHINGTON 25, D. C.