NON-METALLICS

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SUBJECT
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MINERALS AVAILABILITY SYSTEM

ARIZONA ASBESTOS

ARIZONA DEPARTMENT

OF

MINERAL RESOURCES

Phoenix, Arizona

GRANT NO. GO254012

June 25, 1976

ARIZONA ASBESTOS

MAS PROJECT

Summary and Conclusions

The Arizona Asbestos Project was started about January 1, 1976 with Robert C. Goodmundson assigned to all properties south of the Salt River and Victor E. Kral assigned to those north of the Salt River. During the month of March, Goodmundson went on to other work and Kral took on the entire project. Work was first concentrated on the Salt River district as it appears to be the principal area of potential resources. The field work was essentially completed in early June. Both the examination of properties and writing of reports was done on an intermittent schedule.

In the examination of the asbestos properties priority was given those of greater importance. Considerable effort was made to eliminate by study of Stewart's work those deposits appearing to have little or no potential. One area, May Mine at Rock House, that may have minor potential, was not examined as it could not be found on the trip made into the area. Should further information be obtained, the report will be updated.

To say the least, the study of asbestos deposits by a geologist never exposed to this mineral is difficult, however, Stewart's publications 1/ were of great aid, as were comments by those people of the Globe area experienced in the business. Stewart did such an excellent job, and had so much experience in this field, that private reports were not sought. The writer feels that the average consultant is simply not prepared to intellegently evaluate asbestos; after nearly six months a little knowledge of Arizona asbestos is just beginning to accumulate.

A total of 28 individual property reports were written on about 37 occurrences. Coding was done on 30 properties or groups (in a few cases one written report covers more than one coded property). The coding consists of seven "Resources" (R) codings and 21 "Location" (L) codings; the "Resources" codings were usually carried almost to "Complete" codings, although none are actually felt to be "Complete".

Essentially all Arizona asbestos is in Gila County, in two mining districts, the Salt River Canyon district and the Sierra Ancha district. Asbestos also occurs in the Grand Canyon about 4000 feet below the rim; due to inaccessibility it has not been examined. The asbestos occurs in the Unkar group believed to be equivalent to the Apache group.

Total asbestos production from Arizona (1914-1975) is about 50,000 short tons of fiber. During the past several years production has probably been near 2,000 tons per year by one producer, Jaquays Mining Corp. This study infers resources of about 40,000 metric tons, almost half of which is assumed to have less than 50% probability. In short, the outlook for Arizona asbestos is not encouraging. In spite of this, if the commodity becomes extremely critical, this resource figure could probably be doubled by working small bodies in properties now assumed to have no resources. If the various health and safety regulatory bodies will be reasonable, and the small miners cooperate, much asbestos could be mined; assuming economics make it worthwhile.

1/ See referrences at end.

The present operators have been somewhat successful in increasing their market, however, they state that two large markets are not open to them as Arizona asbestos simply will not work. Asbestos-cement is the largest market, and friction materials are also important; Arizona fiber does not seem to meet the requirements. The principal use for Arizona fiber is as a filter media.

All non-metallic minerals are plagued with a similar problem, specifications do not necessarily determine a mineral's adaptability to a particular use; it must be tried. Because of this peculiarity the consumer is wary of a new supplier. First, it is costly to determine that the new raw material will work. Second, if it does work, the consumer is not assured that the characteristics and supply will be consistent. These problems make it difficult for small producers, such as would be the case in Arizona.

Much has been said about another mill. First, can such a mill get a market? Second, can it get the mill feed? Jaquays Corp. is experienced and has not been able to increase its market to any great extent. If appears that a second mill would merely split the market. To feed another mill would require mining several sources simultaneously. Unless the regulatory attitude toward asbestos changes, and the price rises comparably, it is doubtful that such mining on the small deposits can be done.

In going over correspondence given by Jaquays Mining Corp. and talking with D. W. Jaquays, president, and Nelson Muncy, manager, it appears that although much has been done, much more is yet to be done, to fully understand the effect of asbestos dust on humans. The file information indicates that testing of Indians working in the mines found that many had serious problems, possibly associated with their work. However, analysis of these data by others indicates that the results actually do not indicate problems due to asbestos exposure. It appears that the industry needs considerable unbiased careful work in this field to find out just what the hazards may be. Oddly, what appears to be one of the most unbiased, honest evaluations of the tests made on Indian asbestos miners was by a third year medical student. He indicates that the test results were misinterpreted, and his statements seem reasonable.

Considerable research has been done in the Thetford Mines and Asbestos regions of Quebec. The results indicate that chrysotile asbestos poses no problem to humans if reasonable precaution to dust is taken. "This work was undertaken with the assistance of a grant from the Institute of Occupational and Environmental Health of the Quebec Asbestos Mining Association"; from mortality in the Chrysotile Asbestos mines and mills of Quebec, Archives of Environmental Health, June 1971, Vol. 22, American Medical Assn. Considering that for many years Canada supplied most of the asbestos of the world and still produces 24% of the world's supply, one can understand an organization contributing rather heavily to such a study. In contrast the US produces 2% and consumes 20% of the total world's supply. Nearly all our imports come from Canada. Of the asbestos produced in the US about 3% comes from Arizona, in short the less than 2,000 tons of asbestos being produced in Arizona is rather small compared to the Quebec industry. Yet, Arizona has the same problem, some group must pay the cost for an elaborate study to determine just what the health hazards of Arizona chrysotile actually are.

Those in the Arizona asbestos industry think they already know the answer; after all, the Globe-Miami area is rather small; there aren't many strangers, and everyone pretty well knows the other fellow's business. Therefore, these people have a fair idea of what if anything, has happened to Joe's health after he worked in an asbestos mill on and off for 20 years. as an example they know of one individual who came into the area many years ago with active TB; worked in the asbestos mills and recuperated. They say they know of no one who died from any problem associated with asbestos.

What the man on the street remembers is hardly a scientific analysis, however, his recollection and knowledge can't be completely discarded. When added to this knowledge we have the cold fact that two out of three mills in the area were forced to close and the one left is harrased and its market damaged by environmental regulations, the man in the asbestos industry becomes bitter. "Bitter" is an understatement.

Although industry helped pay for the health study in Quebec, it is hardly logical that this should be the case here. It is felt that this is a responsibility of government. Further, one operator can hardly be expected to pay for this information; Jaquays has already paid for considerable work in this field.

It is suggested that the U. S. Bureau initiate a proposal that a complete study be made of the effects of various types of asbestos on the human under various conditions. It is doubtful that this industry, or any other for that matter, can long exist under the principle that; "the Clean Air Act requires the EPA Administrator to control entry into the air of substances which may be hazardous." (underlining by EPA).

The whole matter may be pretty well summed by the statement too often heard "What's the use of making any study of reserves if they won't let us mine". This attitude is hard to combat when attempting to obtain information that may help the future of the industry.

A reproduction of a Canadian editorial is attached.

NORTHERN MINER

May or June 1976

Common sense would help in asbestos controversy

The celebration of Asbestos Corporation's 50th Anniversary is a reminder that the asbestos industry represents one of the oldest segments of Canadian mining. Actually, the corporation's history goes back almost 100 years, for it was in 1876 that the asbestos deposits were first discovered in Quebec's Eastern Townships. As with the discovery of oil in Petrolia, there was no ready market in those days – in the case of asbestos, for a wooly mineral that could be woven into a fire-resistant cloth.

But, Andrew Johnson commenced mining operations in 1877, incorporated Johnson's Company in 1885, which was operated as a private company until taken over by Asbestos Corporation twenty years ago. Today, with the possible exception of the Soviet Union, Canada is the largest producer of asbestos; it is certainly the world's biggest exporter, and accounts for approximately 30% of the world's supply.

During the war years, asbestos was rated as a strategic material and its production was allocated under strict government control. For the mining companies, this meant the loss of traditional markets, but with the cessation of hostilities they were faced with an unprecedented demand for asbestos-cement grades used in the construction industry, and inventories which had accumulated during the war melted away.

Nowadays, asbestos goes into a multitude of uses adding up to a total of over 3,000 products. But, this mineral, which has done so much for mankind, has been subjected to unprecedented attack in recent years, much of it uninformed, some of it completely erroneous, going to such extreme lengths as that its use should be banned and its mining prohibited. For the record, it might be noted that 90% of the asbestos used in the U.S. is in products in which the asbestos is "locked in" or bound with cement, plastics or other binders so that there is no release, or at least no significant release, of fibres in work areas or to the environment.

Asbestos, it is freely acknowledged, presents an industrial health hazard, which has been recognized by the industry and government authorities for years. But, there is absolutely no excuse for the scare tactics and emotional hysterics indulged in by Mr. Septhen Lewis, leader of Ontario's New Democratic Party. He recently appeared on CBC's TV network castigating the provincial authorities and bemoaning the fact that they wouldn't be around in 15 years to "pick up the bodies" (presumably the workers' bodies, who would die from asbestos exposure in a Northern Ontario mine). Now, if Mr. Lewis really wants to shock the public, why wait for 15 years – why not make a trip now down to the Eastern Townships where they've been mining asbestos for a whole century. If the picture he paints is true, he shouldn't have any difficulty in "picking up a few bodies." Incidentally, studies have shown that the incidence of cancer in those asbestos areas is no greater than in the rest of the population.

A quarter of a century or more ago, an asbestos mill was characterized by a beautiful plume of white smoke issuing from a stack at each plant – only it wasn't "smoke," it was air laden with asbestos dust. And, the unwary visitor might have found when he came out of the hotel in the morning that his car had become suitably fire-resistant with a coating of white asbestos which, by the way, was not easily removed. But, those days are long since past.

All the mills now are equipped with dust collecting equipment – which is not to say that they are completely dust-free. The very nature of the asbestos milling process is a dust producing procedure. The ore is crushed and cracked as gently as possible so as not to break up the fibres any more than necessary, and the asbestos fibres are separated from the rock by elutriation i.e. a low vacuum which lifts the fibres into sheet metal piping. In a modern mill, the process is kept under cover as completely as possible, but there are always possibilities of leaks and equipment breakdowns.

Respirators for the workers in areas where there is a risk to exposure to unsuitably high concentrations of dust are an obvious answer, and a suitable way to control the health hazard. But, some union leaders and their political supporters contend that the use of respirators should not be necessary under any circumstances.

Knowledgable people find it hard to be dogmatic on this subject. For instance, the limit of two fibres per c.c. which is imposed by some jurisdictions may be more than necessary for adequate health protection; and the same can be said for the five fibre limit required by other jurisdictions. When dealing with such microscopic quantities, the accuracy of measurement and sampling are open questions. Whether some of these limits are technologically possible, even if they were necessary, is another matter on which firm answers are lacking.

Under no circumstances should a worker's health be knowingly put in jeopardy. On the other hand, there is nothing to be gained by destroying jobs for the sake of health standards which have no justification. The whole subject is hugely complex and the public is ill-served by those who would jump to rash conclusions, based on inadequate, or even inaccurate, information. As is so often the case, it is an area where the application of a little common sense would pay real dividends for the benefit of the common good.

The asbestos-bearing strata are in the Mescal limestone formation of the Apache group, which from bottom to top consists of the Scanlon conglomerate, Pioneer shale, Barnes conglomerate, Dripping Spring quartzite, Mescal limestone, and Troy quartzite. The latter formation is Cambrain, the remainder are pre-Cambrian.

In this region only the three upper formations of the Apache group have been extensively exposed by erosion. The Mescal limestone is divisible into three members: A lower member 175 to 200 feet thick; an algal member 80 to 150 feet thick; and an upper member 10 to 80 feet thick, composed of siltstone, shales and shaly limestone.

In the lower member the individual beds vary from 1 inch to as much as 6 feet thick. The thin beds are of impure dolomitic limestone; the thicker, more massive beds are of relatively pure crystalline limestone. Some of the limestone strata contain nodules and masses of chert. Most of the massive beds occur within the topmost 45 feet of this member.

Overlying the lower member, the so-called algal member is massive-bedded and usually is composed almost entirely of spheroidal masses that have a concentric, shell-like structure with a maximum diameter of several inches. This member generally forms cliffs and is the only readily recognized horizon marker in the Mescal. At a few places in the region the upper beds lack the algal structure, and the bedding planes are smooth, rather than wavy.

The upper member consists of layers of siltstone (usually brown to black), thin shale, and sandy or shaly limestone beds. This member is present in only a few places in the region.

The Apache group has been intruded by diabase sills a few inches to several hundred feet thick. These sills usually are found along bedding planes, but locally they cut across the bedding. Diabase dikes, most of which are only a few feet wide, have been intruded into the limestone.

The regional structure of the Salt River and Sierra Anch districts is a broad, nearly horizontal plateau, gently downwarped toward the east, as shown in the three cross sections by Darton.

Diabase intrudes all members of the Apache group and is particularly prevalent in the Mescal limestone, where it is predominantly in the form of sills that vary from a few inches to several hundred feet in thickness. Some of the larger sills extend laterally for several miles. There was no stoping or assimilation of the limestone; the diabase pushed the beds apart. Consequently, the same stratigraphic units may occur at different elevations within a relatively small area.

If diabase sills or dikes cut across or closely approach a favorable horizon in the limestone, a commerical deposit of asbestos is most likely to have been formed. Most commerical deposits are within 25 feet stratigraphically above or below diabase. The proximity of diabase seems to have been an important factor in the localization of asbestos deposits, not because the diabase was a near source or channelway for serpentine- and asbestos-forming solutions, but because the diabase intrusion fractured and folded the limestone. Postintrusion bedding-plane and thrust faulting caused much fracturing of the limestone in beds that had been folded. Faulting began before diabase intrusion and continued until after mineralization ceased. Therefore, faulting, the effects of which were more intense in massive beds, was a factor in localizing diabase sills and dikes near the favorbedding planes that were mineralized in adjacent areas.

Bedding-place faulting was the greatest single factor in determing the size of the asbestos deposits. If such faulting is not extensive, the asbestos deposits are likely to be limited to the limestone that was deformed by diabase intrusion. Most of the deposits in the region are limited to such folded limestones; in general, only a few tens of tons of asbestos can be mined from such deposits.

In a few areas, the intrusion of numerous dikes and crosscutting sills caused many folds in the limestone. Any one of these folds was relatively unimportant in localizing a large deposit of asbestos. In an area containing many such structures, the possibilities for the formation of large asbestos deposits were good. Multi-structural areas of this sort are rare; the Chrysotile area is an example.

The above material on the general geology was extracted from Stewart's work in IC 7706 and IC 7745 (see references at end).

References

Stewart, L. A., Chrysotile - Asbestos Deposits of Arizona: Bureau of Mines, I.C. 7706, 1955, 124 pp.

Stewart, L. A., Chrysotile - Asbestos Deposits of Arizona: Bureau of Mines, I.C. 7745, 1956, 41 pp.

(The section on geology has been excerpted entirely from the above two publications.)

Stewart, L. A. and Haury, P. S., Arizona Asbestos Deposits, Gila County, AZ.: Bureau of Mines, R.I. 4100, 1947.

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Li, Ta M., Environmental Compliance Assures Future Production at Jaquays Asbestos Operation, Mining Engineering, March 1975, 7 pp.

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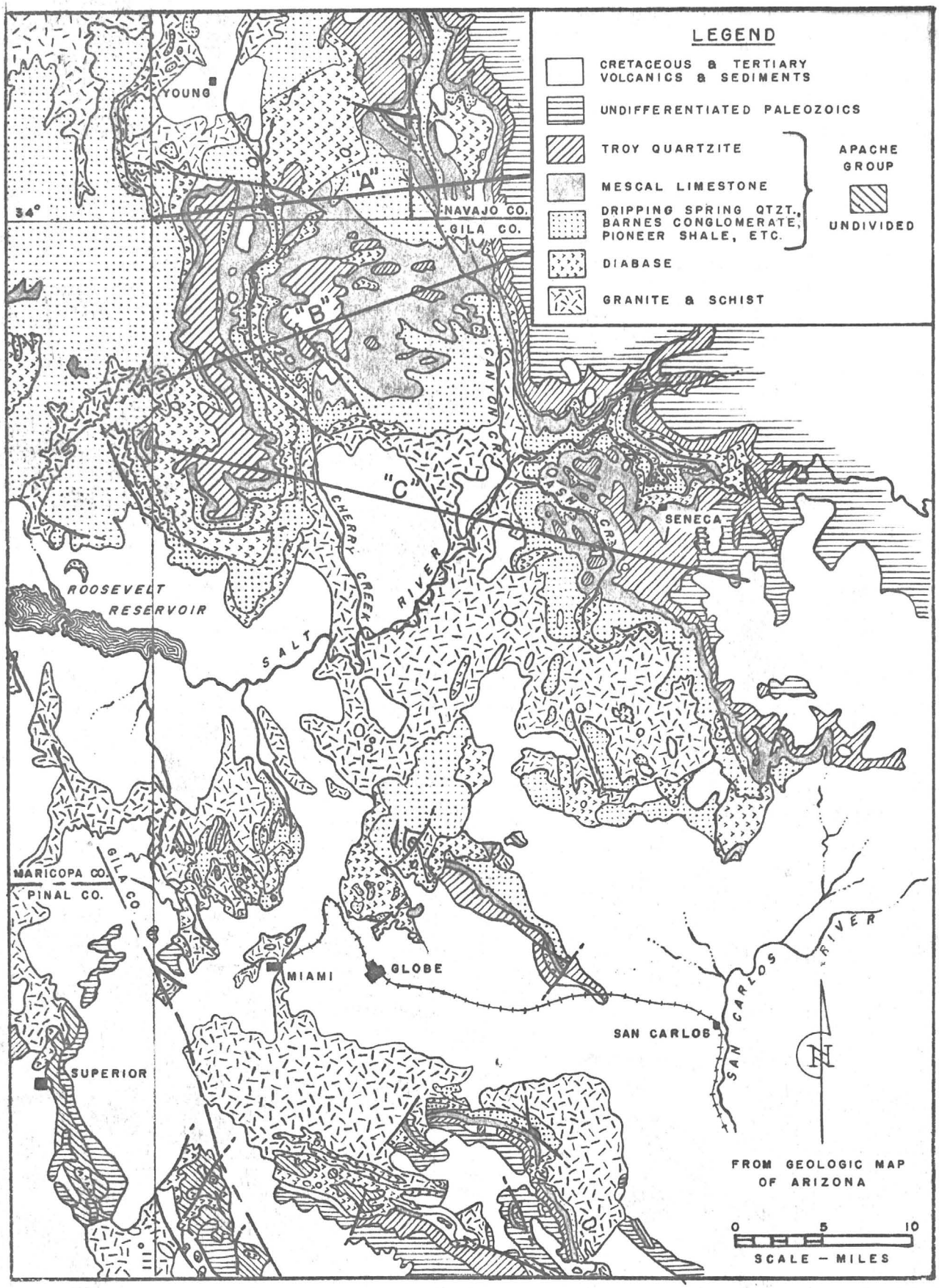
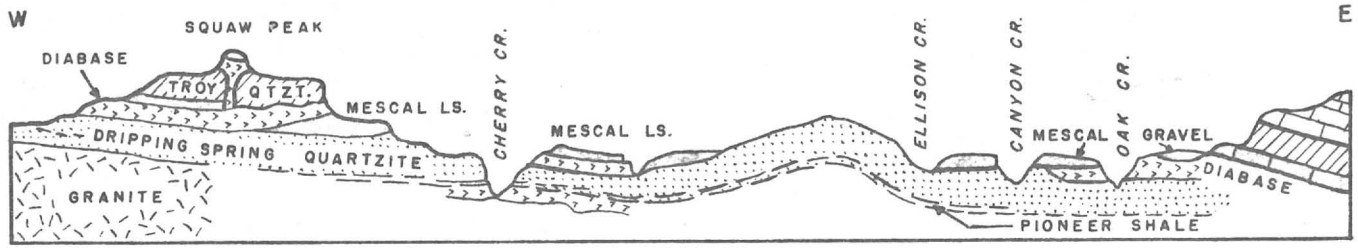
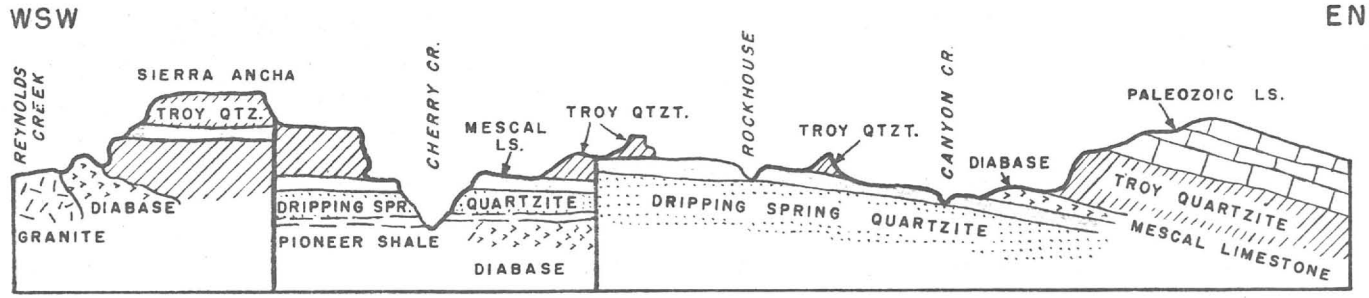


FIG. 4, - GEOLOGIC MAP OF THE CENTRAL ARIZONA ASBESTOS REGION



SECTION "A"



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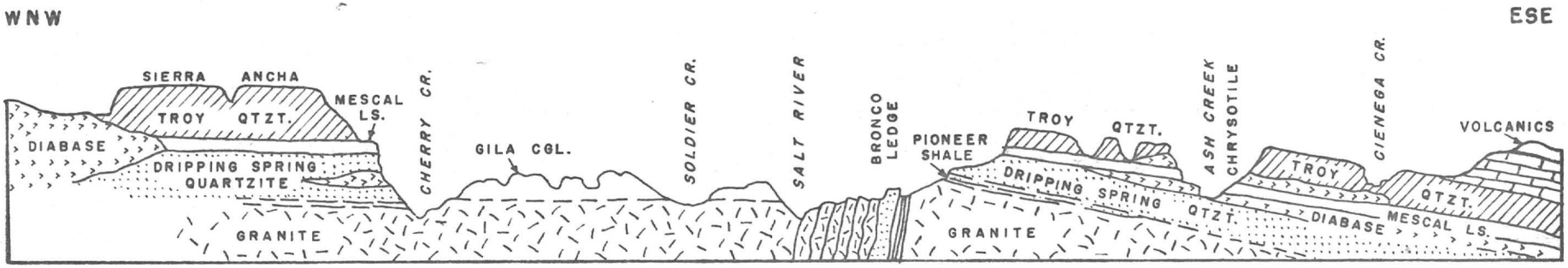


SECTION "C"

0 5 10

SCALE - MILES

FIGURE 5. - SECTIONS ACROSS THE ASBESTOS REGION

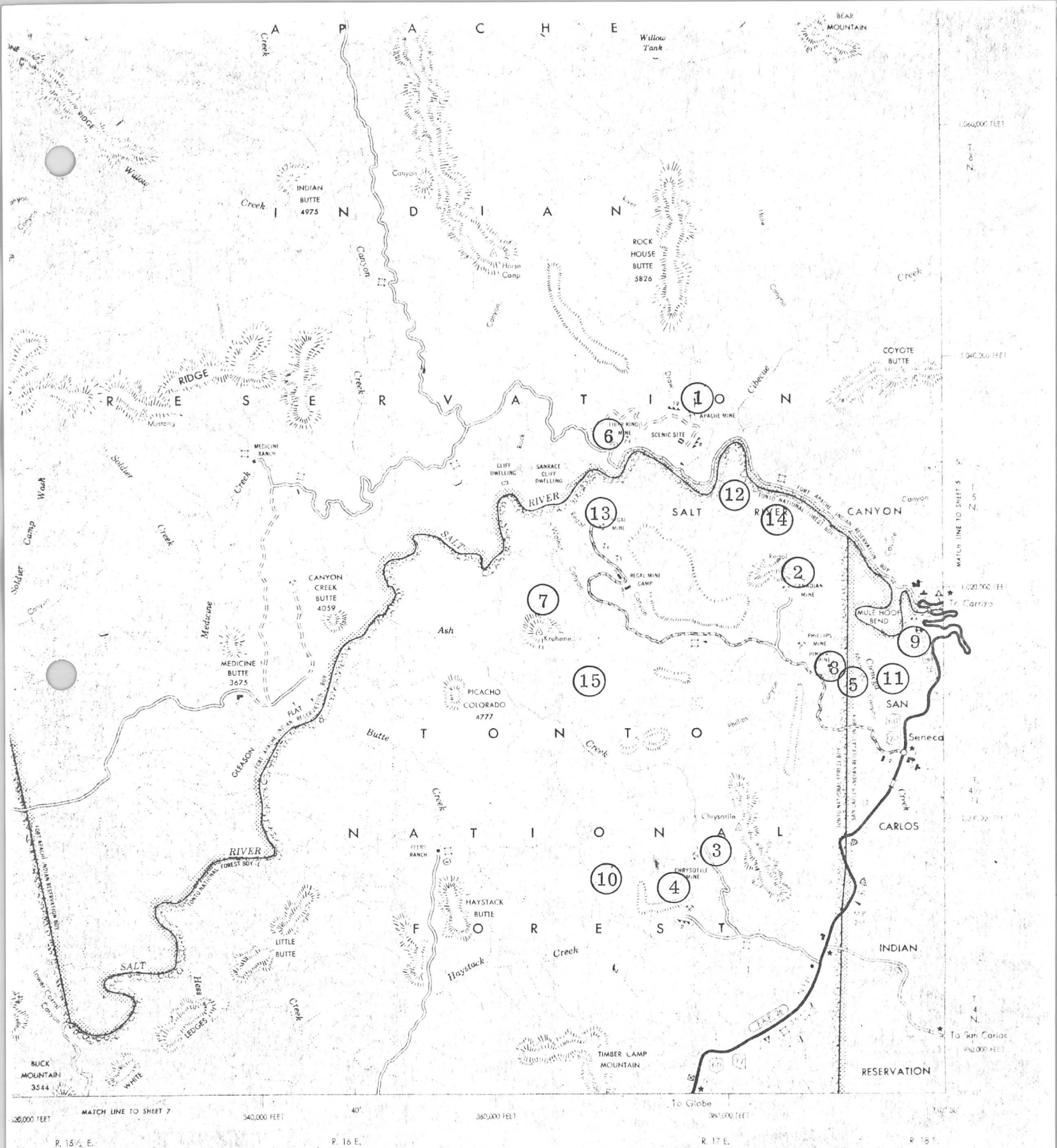
AFTER N. H. DARTON, ARIZONA BUREAU OF MINES BULLETIN 119, PAGE 229

List of Asbestos Reports

Salt River District	Type Code
1 Apache Mine	L
2 Canadian	R
3 Chrysotile Mines	
Eldorado	R
Victory	R
4 Donato	L
5 Emsco	L
6 Fiber King Area	L
7 Fourth of July	L
8 Grand View (Phillips)	L
9 Great View	L
10 Locke Mine	L
11 Pine Top	R
12 Punto Negro	L
13 Regal Mine	L
14 Salt River Group	L
15 Wonder Prospect	L

Sierra Ancha District	Type Code
16 Asbestos Peak	R
17 Bore Tree Saddle	L
18 Buckhorn Mine	R
19 Home	L
20 Kyles Sloan Creek	
Blue Jay Jr.	L
Last Chance-Cowboy	L
21 May Mine	L
22 No. 1 Mine	L
23 No. 2 Mine	L
24 Reynolds Falls	R
25 Rock House Gr. Nend	L

Globe District	Type Code
26 Chromo Butte Prospect	L
27 G & H Prospect #2	L
28 Indian Springs Mine	L

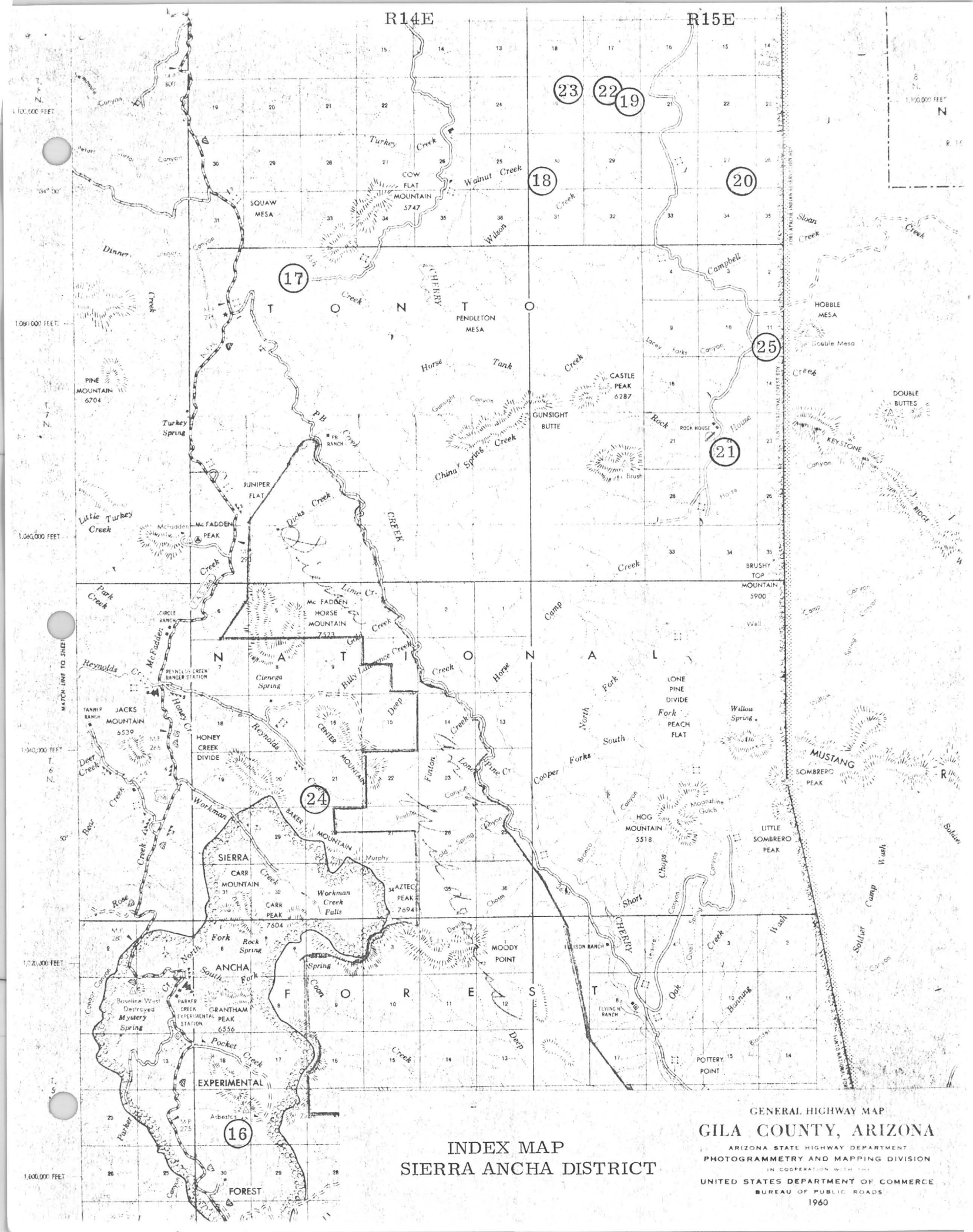


GENERAL HIGHWAY MAP

GILA COUNTY, ARIZONA

ARIZONA STATE HIGHWAY DEPARTMENT
PHOTOGRAMMETRY AND MAPPING DIVISION
IN COOPERATION WITH THE
UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
1960

INDEX MAP
SALT RIVER DISTRICT



INDEX MAP
SIERRA ANCHA DISTRICT

GENERAL HIGHWAY MAP

GILA COUNTY, ARIZONA

ARIZONA STATE HIGHWAY DEPARTMENT
PHOTOGRAMMETRY AND MAPPING DIVISION
IN COOPERATION WITH THE
UNITED STATES DEPARTMENT OF COMMERCE
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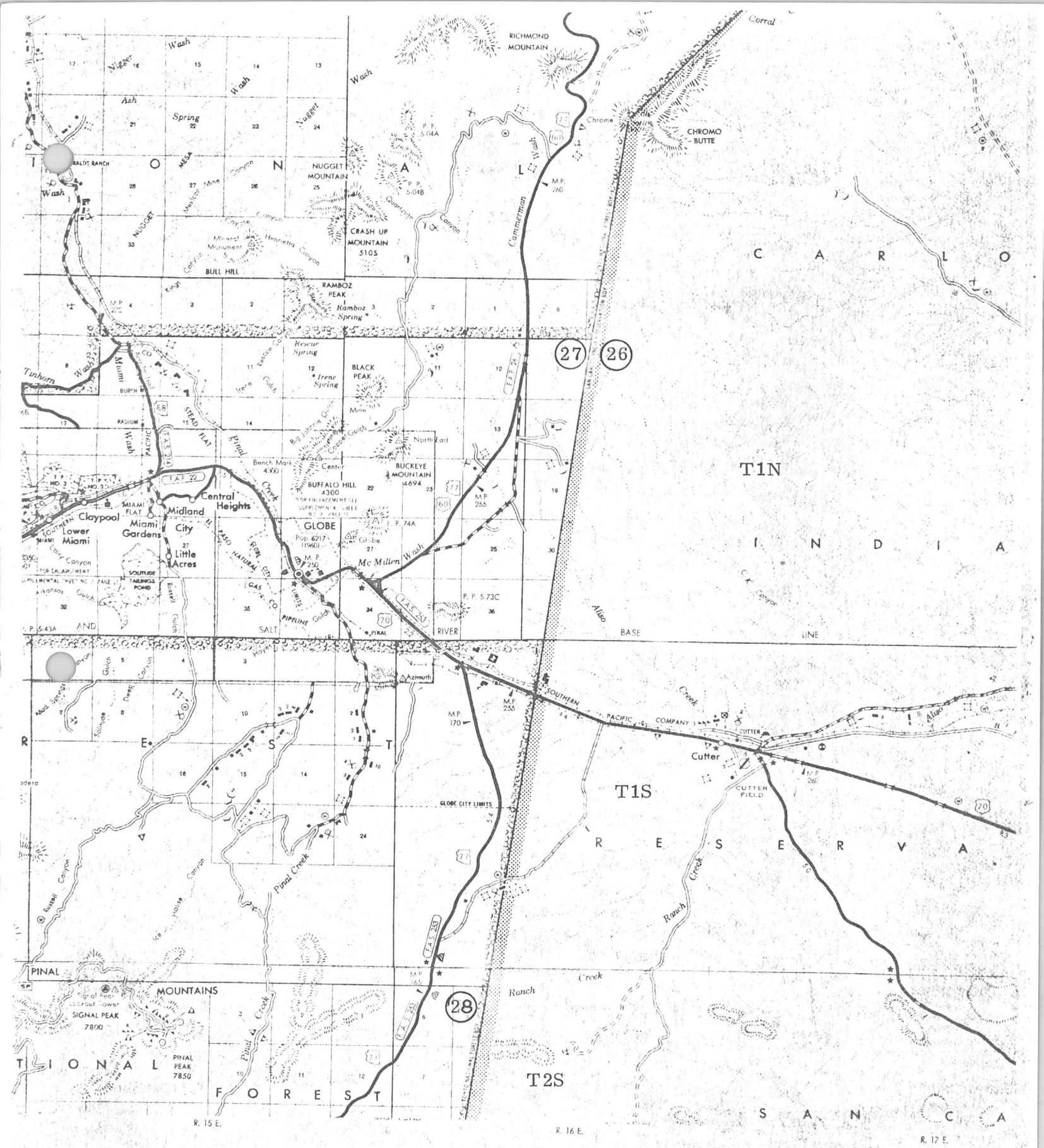
1960



GENERAL HIGHWAY MAP

GILA COUNTY, ARIZONA

ARIZONA STATE HIGHWAY DEPARTMENT
PHOTOGRAMMETRY AND MAPPING DIVISION
IN COOPERATION WITH THE
UNITED STATES DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
1960

INDEX MAP
GLOBE DISTRICT

Arizona
Asbestos

Salt River Group

Summary:

Although the 1.6 miles of road north of the Canadian mine is steep, a little improvement would make this property fairly accessible. The thin seams of fiber noted over 6 to 8 inches of serpentine total 3/4 inch of soft to harsh fiber. Some production has been made but the resource potential is minor for such small quantities of fiber. As the hillside is steep exploration can be done only by drifting.

Dripping Springs quartzite is about 50 feet below the asbestos; the property may be of interest for uranium.

Introduction:

Road Log from U.S. 60

0.0 U.S. 60 at Seneca Lake road.

0.9 Cross Seneca Creek take Regal mine road

1.4 Forest - Ind. Res. Bdy.

3.9 Old Phillips buildings and road to Phillips mine.

4.3 Turn north off Regal road

5.1 Road east to corrals

5.6 Canadian mine, road fork, keep right.

6.4 Road fork, Punto Negro west, Salt River group north

7.4 On dozer cut at two adits, Salt River group.

Last 1.6 miles steep, requires 4-wheel drive.

On Blue House Mtn. USGS 15' topo. quad., at 3900 feet in SE/SW section 16, T5N, R17E unsurveyed (sectionalizing

2

data from Tonto National Forest map). The property is in the Tonto National Forest on the southside of, and overlooking the Salt River Canyon. Topography here is quite steep, side hill is 22° up and 31° down.

History, Ownership and Production:

Stewart states that the claims were originally located in 1922 by Roger Kyle, father of the apparent present owner, Bill Kyle, 704 Sycamore, Globe, AZ, phone (602) 425-2974. The property appears to have had a small production, probably after Stewart's examination in about 1953.

Geology and Workings:

The fiber zone is about midway in a 100-foot thickness of limestone underlain by Dripping Springs quartzite and overlain by a thick diabase sill. Total fiber is as much linch of short poor grade.

The principal work noted is in two adits about 45 feet apart that apparently join. The southeasterly adit is about 50 feet long and bears S60°W; the northwesterly adit bears S 30°W and at about 60 feet has a gobbed stope. Additonal work may have been done beyond that noted. The ground is blocky, partly caved and dangerous.

Potential Resources:

Under present asbestos economics this property has no potential, however, should the demand warrant working with one inch or less of such fiber, additional exploration by drifting would be warranted. The steep hillside precludes drilling.

Examined 5/9/76

Victor E. Kral
May, 1976

Apache Mine (Crown Asbestos)

Summary:

The Apache mine was not examined; the last operator Jack Neal of Globe was consulted and an attempt to reach the mine by 4-wheel drive vehicle was unsuccessful. Neal states that they mined out all the fiber that could be found and further mining would require additional exploration. This would indicate that no potential resources may be assumed for this property.

Introduction:

Road Log from center of Salt River bridge on US 60

0.0 Center bridge

0.2 Turn off on river road, head west (downstream)

6.4 Ford Cibecue Creek

8.0 Corrals, road up Salt River Draw, old road to Apache now grown in.

9.4 Road left "Salt Banks 1"

10.1 Fiber King mine on right

10.9 Washed road to right to Apache

11.6 Turn around, too many boulders to move, estimate about 3 miles to Apache mine.

The property is shown on the Blue House Mtn. 15' USGS topog. quad. at an elevation of 3750 feet. The road shown on this quad. is an old road built in 1943, not now accessible. A better road, also not now accessible, was built in 1951.

A serpentine zone is usually present near the top of the unit and is generally fiber bearing. This fiber zone is about 40 feet stratagraphically below the algal member and where mined contained several inches of soft fiber.

In the main workings (No. 1 mine) the fiber zone has been developed to a depth of 500 feet with a maximum stoped width of 250 feet. The limestone dips about 3° NW; as the adits drive southerly this is a near ideal situation.

Thrust faulting usually prepares the limestone for more fiber; Stewart's following statement is significant: "The deformation caused by the thrust faulting decreases at depth; the most advanced faces expose 1 to 3 inches of fiber, which, because of partings, usually is short."

Neal says that most of their production came from workings several hundred feet north of the No. 1 mine.

Potential Resources:

In the light of Neal's statement that they mined out all they could find and more exploration is necessary, and Stewart's comment above, it appears logical to consider no potential resources here unless better information is obtained.

Attach: Map 1- 8½ x 11

Victor E. Kral
May 1976

The property is in the approximate center of the NE/4 section 7, T5N, R17E, unsurveyed (sectionalizing data from the Tonto National Forest map).

Ownership:

The Apache mine is in the Fort Apache Indian Reservation and the last operator states the lease reverted to the reservation.

History and Production: (Entirely from Stewart)

The original claims were located in 1923. As no proper road was built until 1943, production prior to this was minor. In 1951 the present road and a camp was built near the mine. Production from them to the time of Stewart's records in 1953 was considerable.

Jack Neal, operating as the Metate Asbestos Corp., operated here during approximately 1958 - 1969. He states the production was not large; they produced about 4 to 5 tons per day of cobbed mill feed that resulted in about 40% fiber. It is assumed that production was sporadic. Neal states that part of this production was shipped to Switzerland.

Geology and Workings: (from Stewart)

The entire Mescal formation is exposed here. A thick diabase sill separates the Mescal from the overlying Troy quartzite and two generally concordant sills split the lower Mescal member leaving a 10 to 20-foot stratum of limestone between them.

This limestone unit is traceable for over 3000 feet.

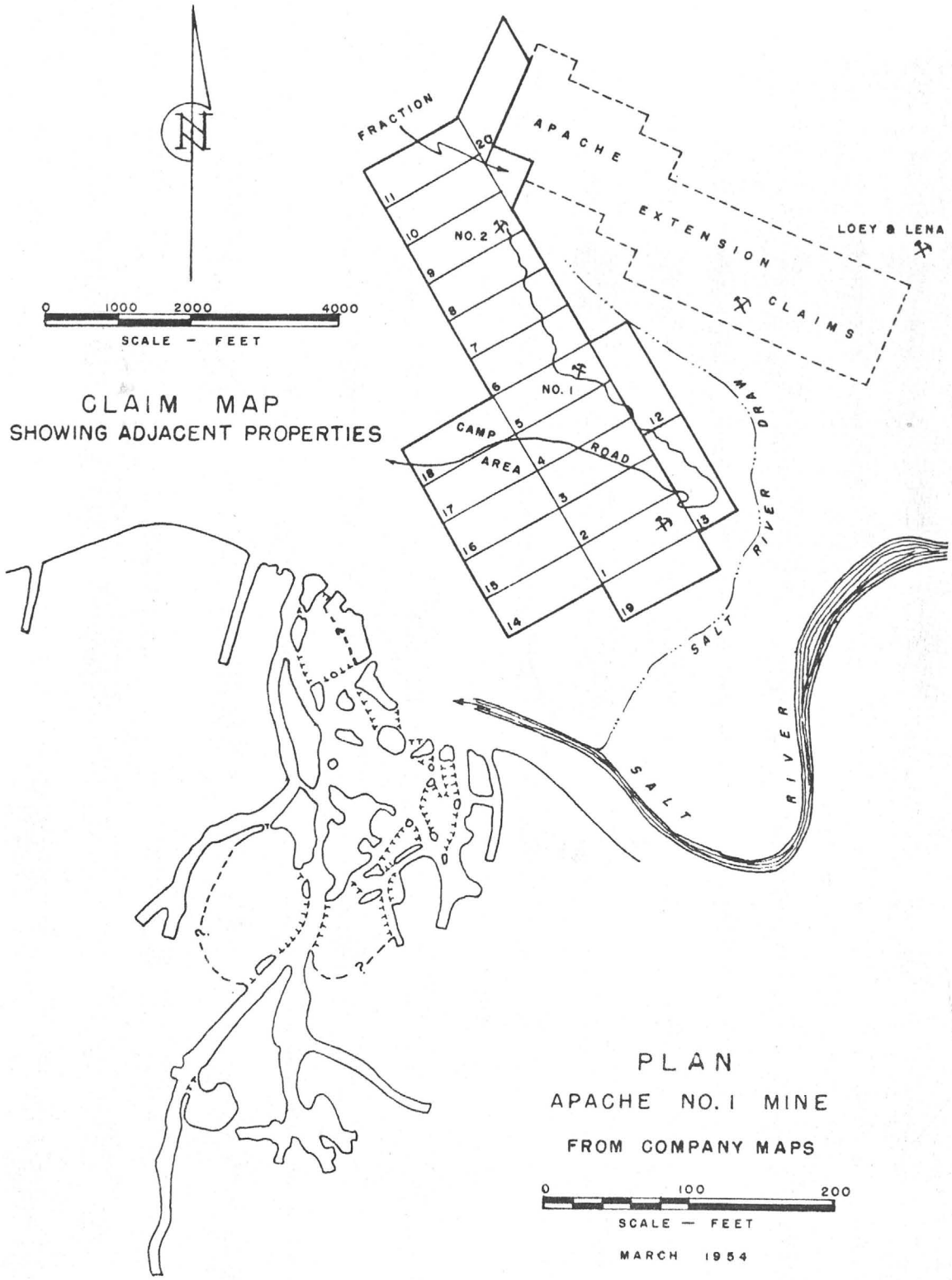


Figure 15. - Apache mine and claim map, Crown Asbestos Mines, Inc.

Diabase 12 ft. limestone

F

CANADIAN (Asbestos King)

Summary:

This property is one of several owned by Jaquays Mining Corp. of Globe. It is 42 miles north of Globe; of the 5.6 miles off the highway only 1.3 miles is poor road and this can be easily improved. The fiber quality and quantity make this a marginal venture, and it has had little production. As the fiber is consistant and one can infer anywhere from 2,000 to 12,000 tons of fiber, this property may be a producer, if the general problems of asbestos mining do not become more severe.

Introduction:

Altho the Canadian was visited, no detailed inspection of the workings was made, and little data was obtained from the owner as Jaquays wishes to give no more than minimum information on its asbestos operation.

The property consists of unpatented mining claims, several of which have been surveyed for patent and application made. The principal work is on the west side of a steep canyon draining northerly to the Salt River Canyon. The property is about 42 miles north of the US60-Az70 highway junction at the east edge of Globe; of this distance 4.3 miles is on the Regal mine road from the Seneca Lake US60 junction just past the Phillips mine buildings, then 1.3 miles north to the mine. The entire road is negotiable with a two wheel drive vehicle. The principal part of the workings is at about 4600 feet elevation on the Blue Mtn. 15' USGS topog.

quad., in the SW/SE of Section 21, T 5 N, R 17 E, unsurveyed (as sectionalized on the Tonto National Forest map). The claims are in the Tonto National Forest.

Ownership:

The property is owned by the Jaquays Mining Corp. of Globe, which also owns the Regal mine about 3 miles to the west.

History and Production: (largely form Stewart)

The original claims were located in 1916 and the property passed through several owners, making only small production and finally reverted to the public domain about 1942. In 1949 they were again located and in 1952 Jaquays secured a lease; some production followed. In 1953, with the help of the DMEA, exploration consisting of 600 feet of drifting in three adits was done and exposed marginal fiber more or less similar to that found elsewhere in the mine. Small production has been made since the DMEA project.

Geology and Workings: (largely from Stewart)

The fiber is found in two serpentine zones, the upper zone is at the contact between the lower mescal limestone and the algal member; two feet of limestone separates the two zones. The lower zone is about 2 feet above the diabase sill. The amount and quality of fiber is remarkably consistant throughout the workings altho long fiber is relatively scarce. Stewart mentions average total fiber as 2 inches and the DMEA report states "less than 2 inches".

The workings cover an area about 1200 feet N-S and 300 feet E-W, however, the stoping is always less than 200 feet deep and

usually less than 100 feet deep. The bedding dips about 6°N at the south end of the deposit and is about horizontal over the northern two thirds of the workings.

Across the canyon about 1000 feet southeast of the principal workings is a continuation of the same occurrence, however, the fiber content decreases to the east and is cut off by a discordancy in the diabase near the west end.

Potential Resources:

During the exploratory drifting, Jaquays slabbed 4 feet from each side of one of the drifts for about 100 feet for a mill sample. This sample, said to represent 1000 square feet, returned 10.6 pounds of fiber per square foot. Oddly, two inches of fiber should return about 26 pounds per square foot (6.5 tons per inch per 1000 square feet). This would infer that the total fiber in the sample was less than one inch.

Based on the sample results one might infer about 2000 tons of fiber however, if one assumes almost 2 inches of fiber, and a better mill recovery, this figure would about double.

Actually it has been reported that the Canadian may have about 10,000 to 12,000 tons of fiber; this may be but the probabalistic percentage for this should be rather low.

Conclusions:

Altho it appears marginal, the Canadian may well be a profitable venture if handled with other production so that it can operate at its most efficient pace.

Victor E. Kral
May 1976

Attach: Map 1- 8½ x 11
Photo 1

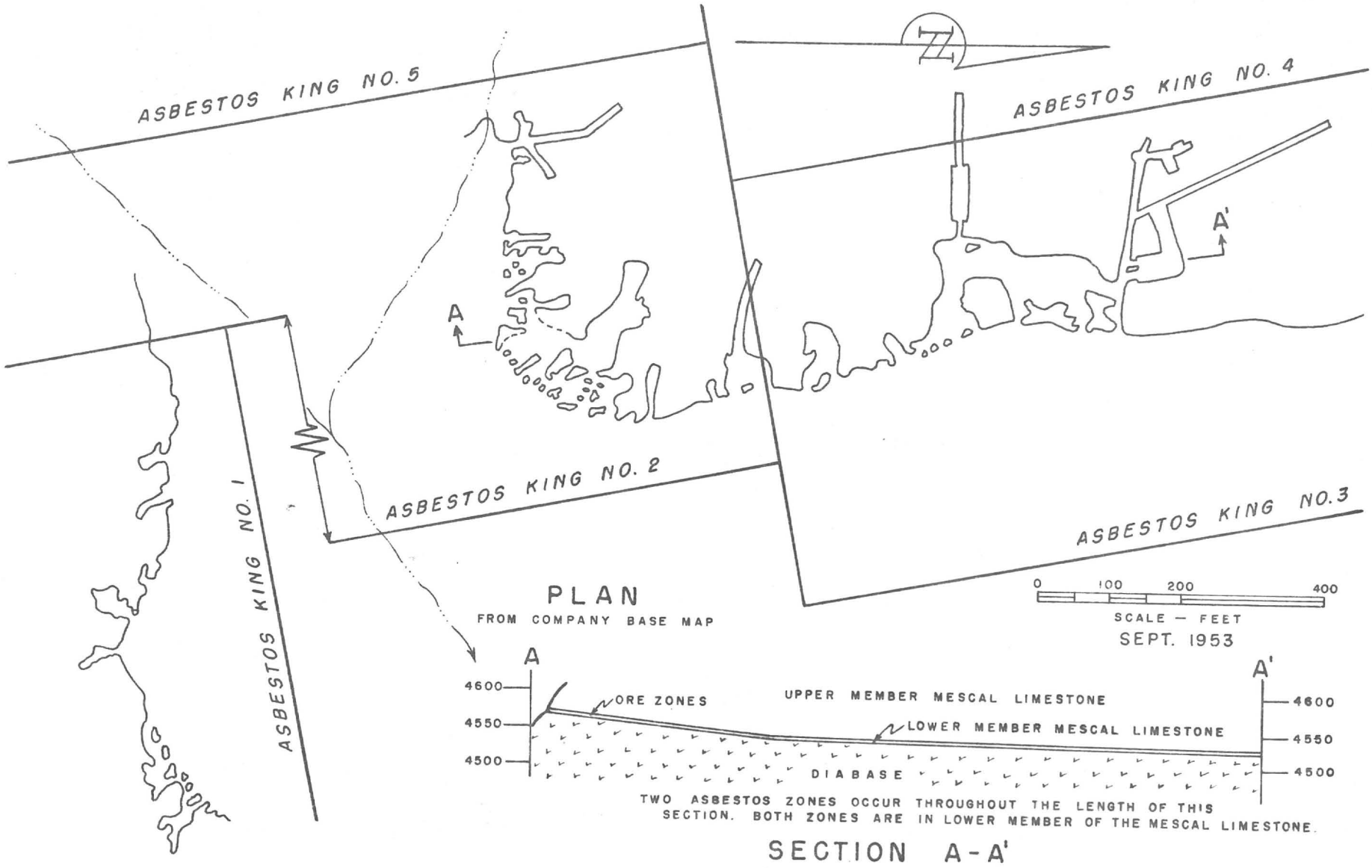


FIGURE 8. - PLAN & SECTION - CANADIAN (ASBESTOS KING) MINE - JAQUAYS MINING CORP.

Arizona
Asbestos

CHRYSOTILE MINES (Johns-Manville)

Summary:

The Chrysotile mines owned by Jaquays Mining Corp. are about 35 miles north of Globe and only 3 miles off US60. The group consists of the Victory and Eldorado previously operated by Johns-Manville which produced heavily until the end of World War II. Total production is estimated at 25,000 to 30,000 tons and potential resources are inferred at 10,000 to 20,000 tons, based on meager information. It is assumed the fiber will be found over much of the 4000 feet southwesterly to the Donato occurrence. It is reported that present Eldorado workings extend about 3600 feet into the mountain, therefore, they are probably over half way to the Donato at the present time.

Introduction:

The Chrysotile mines, known as the old Johns-Manville are actually a complex of the Victory and Eldorado, of which only the Eldorado has had recent production. Jaquays is also doing some work at an old adit about one half mile north of the Eldorado to which they refer as the El Dorado North.

The El Dorado is at an elevation of 4900 feet on the Chrysotile 7½' USGS topog. quad. It is in the NW/SW of Section 34, T 4½N, R 17E, unsurveyed (sectionalized from the Tonto National Forest map). It is in the Tonto National Forest.

The property is about 35 miles north of globe of which 3 miles is a fair graded dirt road off US60.

Ownership:

The property consists of 22 patented claims with a large group of unpatented claims, several of which patent has been applied for, all owned by the Jaquays Mining Company. The mine product is handled in the Jaquays mill on US70 just east of Globe, built in 1959.

History and Production:

The first claims in the area, located in 1913, were part of the Victory. Stewart states that these discoveries were the prelude to asbestos prospecting. By 1916 they came under the John-Manville ownership and the Chrysotile mine complex became the largest asbestos mine in the US. A modern fiberizing plant was built in 1942 which treated dump material and stope gob as well as new ore. By 1945 the mines were considered exhausted for large-scale mining and the mill and mine plant were dismantled. The 22 patented claims were retained but the unpatented claims were abandoned. In the early fifties the property was purchased by Western Chemical Co. who built a mill and also took custom ore. In 1958 the property was purchased by the Jaquays Mining Corp.

Altho it is known that the Chrysotile mines had a large production, no available records give the actual amount, however, rough calculations indicate that the total production is about 25,000 to 30,000 tons. This estimate is based on stope area in 1945 and the assumption that about 2 inches average total fiber (probably low) was removed from the stopes. To this are added estimated and known production figures.

Geology and Workings:

In general the geology is best explained by a paragraph from Stewart's I.C 7986, p. 42.

> In general, the underlying diabase sill is in contact with a horizon of the lower member of the Mescal formation, approximately 40 to 60 feet below the base of the algal limestone. Asbestos-bearing zones occur in the bedding of the lower member at three constant intervals. The topmost zone is immediately under the base of the algal limestone, and two other zones occur 33 and 39 feet lower in the section. Thus the ore horizons are virtually in the same position as at the Regal mine. The oscar marker bed likewise is present in much of the area.

Little can be said about the Victory other than there seems to be no mention of mining since the forties, therefore, the 1945 map of the workings is probably fairly accurate. Stewart states that during 1943-45 Johns-Manville reworked the gob and robbed part of the pillars causing many workings to cave.

As the Eldorado has produced continuosly since about 1958 and in more recent years produced 1000 to 2000 tons of fiber per year, the old 1945 maps are far out of date. Jaquays does not wish to give detailed information regarding its asbestos operation, therefore, little is known regarding the workings. It is reported, however, that the workings now extend about 3600 feet into the mountain. As the general dip of the beds is at a low angle to the east, the main entry and haulage level is below the ore horizons and is farther separated from the stopes as mining progresses to the west.

Potential Resources:

Exploration in these mines is actually development work as the only way to look for ore is to drift. In the Eldorado the drivesare advanced under the ore with probing upward. The geology here does not indicate the ore being cut off and the presence of the Donato (Triple Star) occurrence about 4000 feet southwest of the Eldorado in the same half-section mountain mass encourages the thought that much of this large area has about the same fiber zones. As mentioned, it is reported that the Eldorado workings extend about 3600 feet into the mountain; the direction is not known, however, one can assume they are at least half way to the Donato.

Geologic assumptions together with some factual data are extrapolated and somewhat modified by the mining record. The Victory probably had a total production of about 6,000 tons; a resource inference of 1000 tons at 50% probability and 2000 tons more at 25% probability seems justified. The Eldorado probably had 20,000 tons or more total production; a resource inference of 10,000 tons at 50% probability and 10,000 tons more at 25% probability is believed justified. The Eldorado resource area is extended throughout the entire mountain mass to include the Donato.

Conclusions:

The Chrysotile mines appear to be well managed and it is felt that they will continue to produce and expand the known asbestos resources. Their success depends on clearing up some marketing problems and only knowledgeble interference by various governmental agencies. Agencies administering "clean air" and health regulations must take the responsibility of clearly understanding all facets

of the problem. This a large responsibility but is necessary to the continued existance of this industry.

Victor E. Kral
May 1976

Attach: Map 1- 8½ x 11 Eldorado
1- 8½ x 11 Victory
Jaquays Mng. Corp. 2 pp

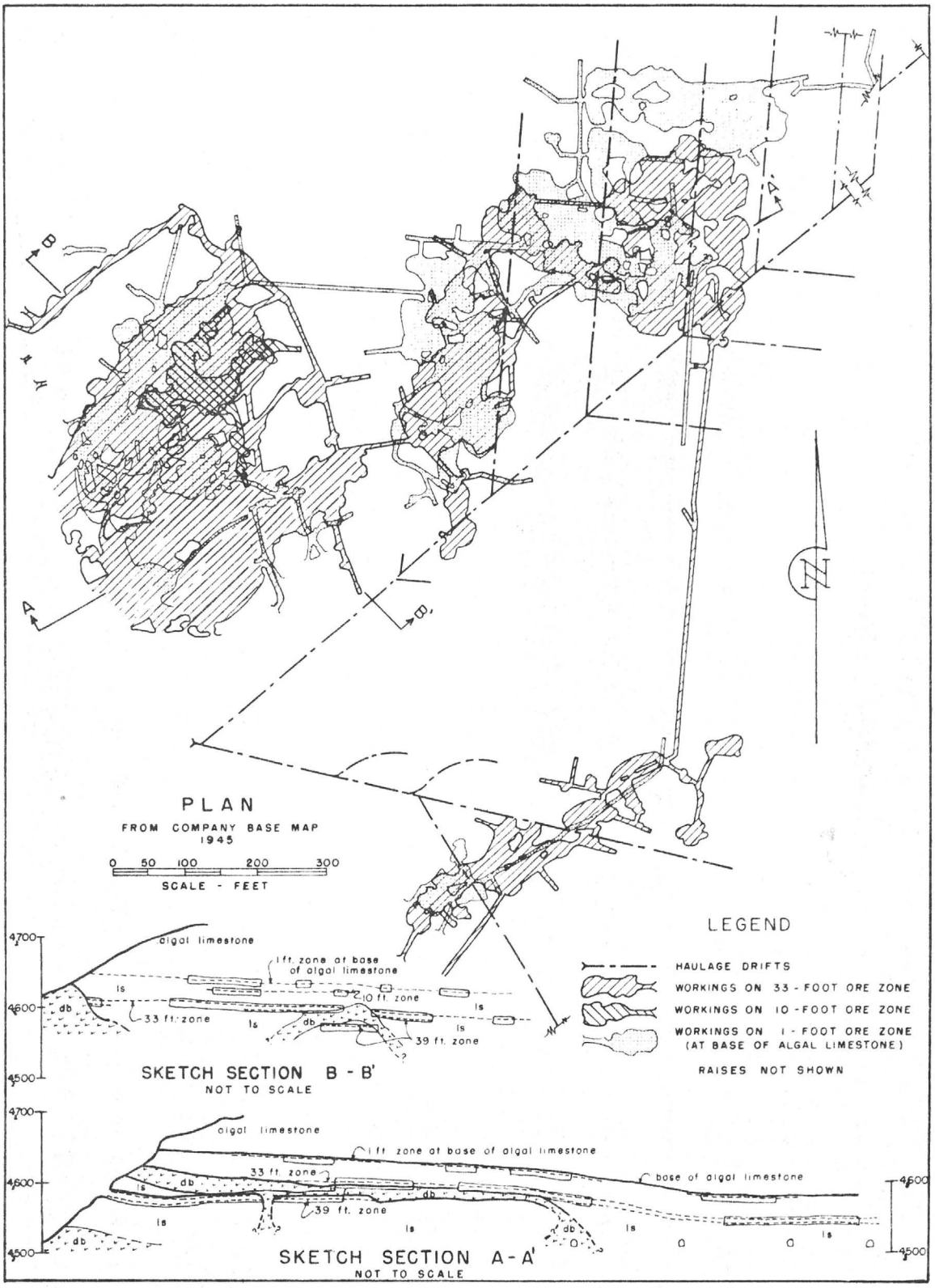


Figure 12. - Plan and sections, Victory mine. Western Chemical Co. (Asbestos Division).

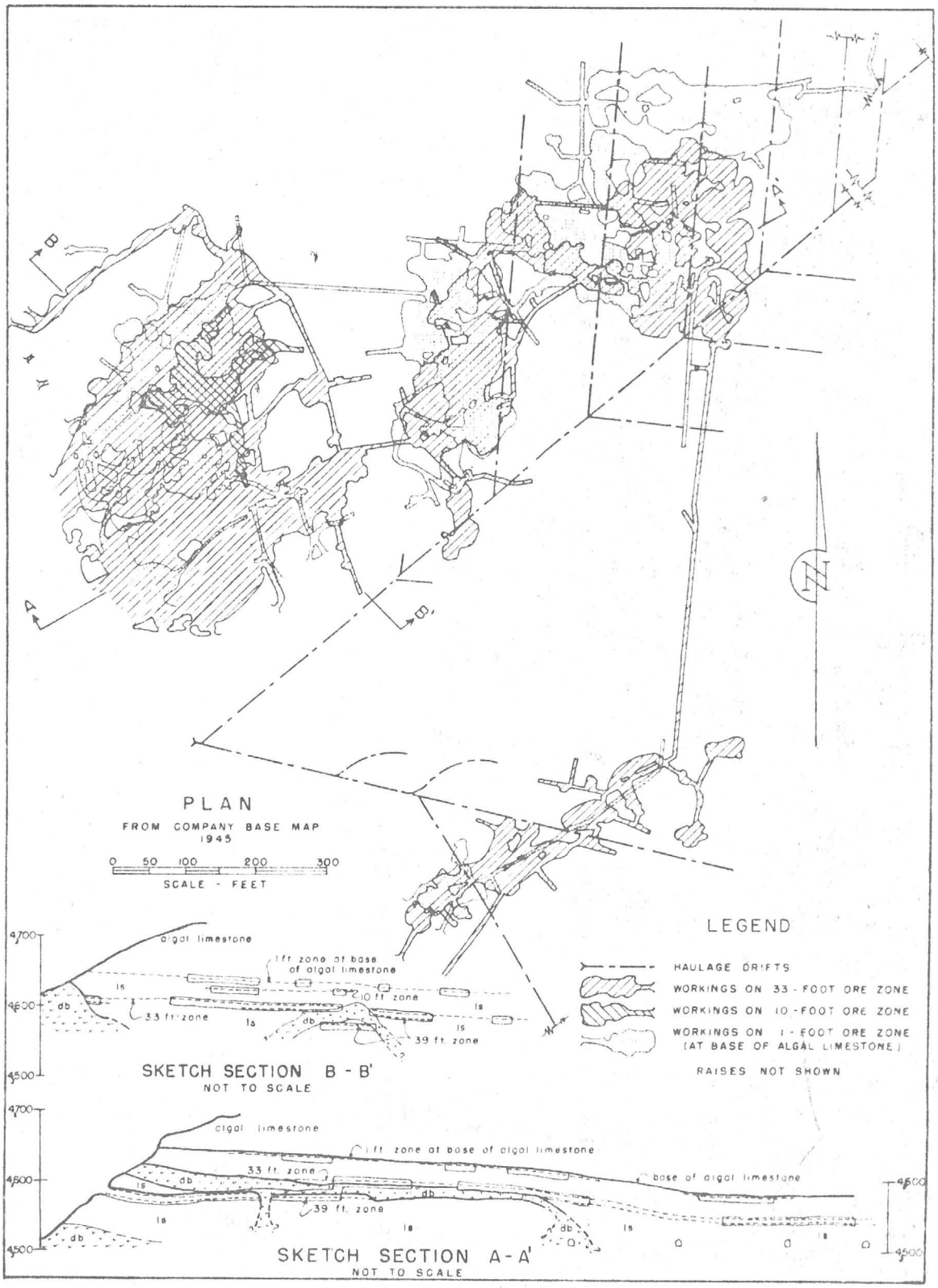


Figure 12. - Plan and sections, Victory mine. Western Chemical Co. (Asbestos Division).

JAQUAYS MINING CORPORATION

Jaquays is the only Arizona asbestos producer. The company is owned by D. W. Jaquays, president and managed by Nelson Muncy, vice president; both are registered professional engineers, and Mr. Jaquays is a former safety engineer with the U.S. Bureau of Mines. The mill superintendent is Paul Wright and mining superintendent is Frank Stephenson. Professional management is reflected at both the mine and mill, and marketing problems are given full attention.

The company's mining properties are in the Salt River canyon area, all south of the river. They consist of the Chrysotile mines (formerly Johns-Manville) the Eldorado and Victory, Regal, Canadian (Asbestos King), and Donato (Triple Star). Present production comes from the Eldorado.

The mill, situated just east of Globe near the junction of US70 and Arizona 77, currently meets all local, state and federal regulation. An article in E & MJ, March 1975, indicates its capacity at about 3.5 tph of cobbed ore. This mill was built about 1958, replacing an older mill in Globe. About 10 years later major changes were made and updating changes are made as necessary.

Of three mills situated just east of Globe processing Arizona asbestos, two have been shut down by environmental regulations; only the Jaquays mill has complied with all regulations and, therefore, survived. Being the only Arizona asbestos producer, and the principal producer for many years, it feels that the effort to survive is a difficult and individual problem. Further, production and

sales indicate that the market for Arizona asbestos is small. Arizona production from 1914 thru 1972 totals 42,400 tons of all fiber and crude, an average of about 720 tpy. Highest production was during the war years of 1940-44 which averaged 1743 tpy. Since 1968 production has been about 1200 tpy. Jaquays is, therefore, a small mining venture operating at marginal profit under constant threat of illogical competition. In short, another mill built without full understanding of the market would result in two bancrupt ventures.

In the light of these business hazards the company prefers not to divulge any details regarding its operation..

Management recognizes an oddity of the non metallics industry: the technical specifications of a commodity do not necessarily determine its adaptability. In searching for new markets it has been found that this asbestos seems to have the correct specifications but simply does not work properly for some uses, friction material and construction products (asbestos cement) being examples.

A study of the asbestos industry indicates that the various mines usually produce fiber adaptable to particular Uses. US produced fiber is used more or less as follows:

Atlas, Coalinga, Cal. for floor tile

Calaveras, Copperopolis, Cal. cement-asbestos pipe

Jaquays, Globe, Az. filter media

Union Carbide, King City, Cal. largely as paint filler

Vermont, Lowell, Vt. Hooker cell filtration

Donato (Triple Star)

Summary:

This property is about 33 miles from Globe; the 1.4 miles off the Chrysotile road would require rebuilding of mining is contemplated. The property has had some production and may afford access to part of the assumed fiber in the hill between it and the Eldorado 4000 feet northeast.

Resources that may be attributable to this property are included with the Eldorado as they would be part of the same general mineralized zone.

Introduction:

The Donato deposit is about 33 miles north of the U.S. 60-70 junction at the east edge of Globe. From US 60 at the Chrysotile mine turnoff the road log is:

0.0	US 60-Chrysotile mine road
1.8	turn left (SW) on Forest Road #304
2.7	cross Ash Creek
3.2	Donato mine

The latter mile or so is best negotiated with 4-wheel drive.

The mine is situated in the NW/NE of Section 4, T 4 N, R 17 E, unsurveyed (sectionalizing data from Tonto National Forest map). It is at about 5100 feet elevation on the Chrysotile 7½' USGS topog. quad., in the Tonto National Forest.

The workings are on the south side of the same large hill as the Eldorado Mine about 4000 feet to the northeast.

Ownership:

The seven unpatented claims are owned by Jaquays Mining Company; they have been surveyed and patent applications made.

History and Production:

Stewart states that work was started here in early 1954 by the Donato brothers and others operating as the Triple Star Mining Company. In recent years the property was aquired by the Jaquays Company which shipped some fiber.

Geology and Workings:

Stewart states that the fiber zone is about 32 feet stratigraphically below the algal member and 75 to 80 feet above a thick diabase sill with an upward discordancy on the west. He also mentions a small diabase outcrop on the east and postulates that the diabase is much nearer the fiber zone inside the hill.

The work here consists of three adits from a dozed bench cut about 100 feet wide and 500 feet long. The two eastern adits have considerable stoping and near the portals expose about 3 inches of semi soft fiber in 14 inches. It is assumed that the fiber mined was better than that remaining.

In the light of the extensive work done at the Eldorado about 4000 feet to the northeast, and the assumption that the workings are more than half way to the Donato, it may be that the two fiber occurrences are in the same beds. Altho it is believed that at least part of the Donato fiber is cut off by a discordancy, it appears reasonable that much of the hill explored by the Donato and Eldorado contains fiber due to the underlying sill. The Donato

may be logical access to at least part of this fiber.

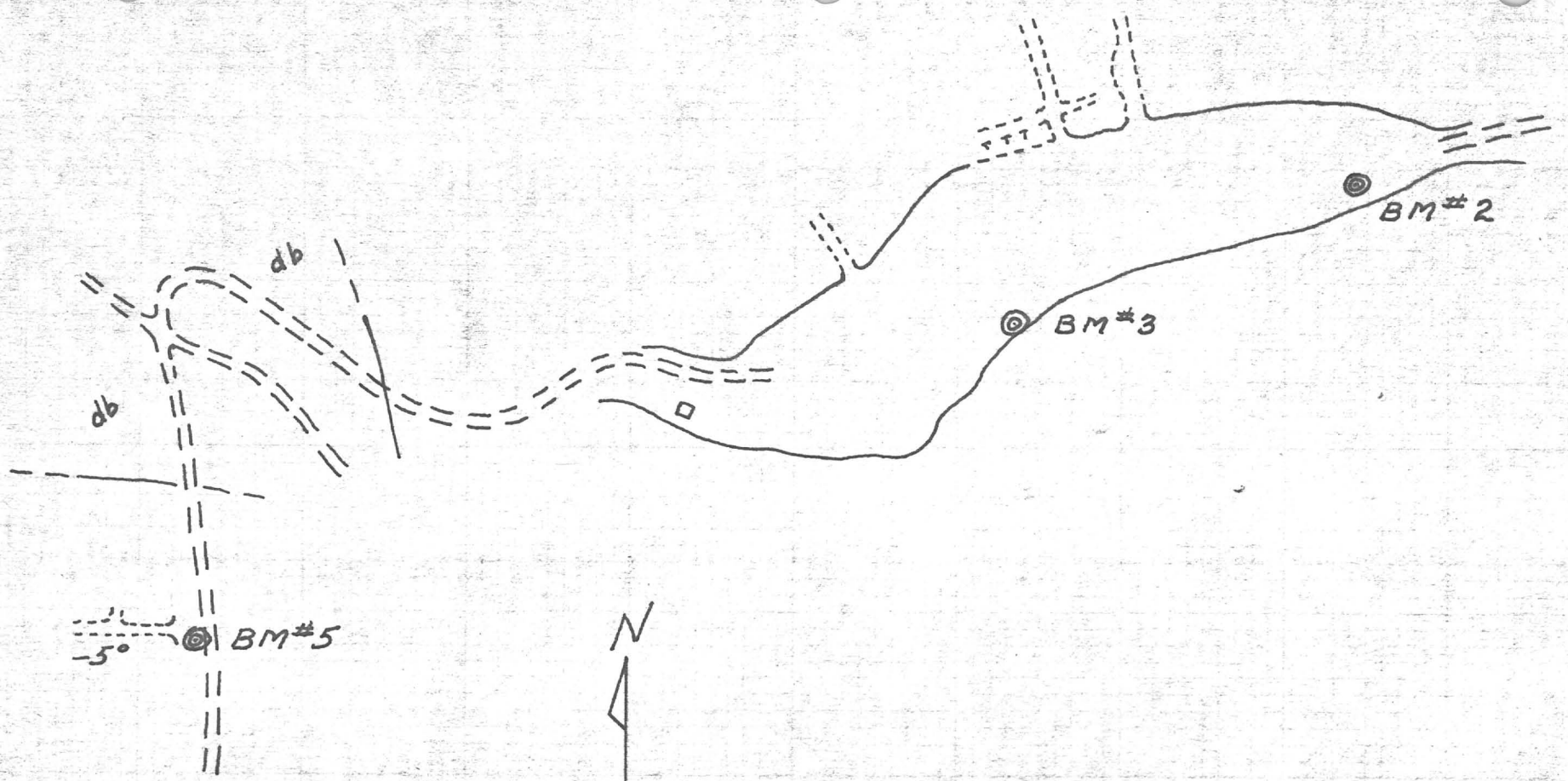
Potential Resources:

The potential here is tied directly to the Eldorado and no additional resource estimate seems justified beyond that shown for the Eldorado.

Examined
4/7 and 6/4/76

Victor E. Kral
June 1976

Attch: 8½ x 11 sketch
1 photo



DONATO (TRIPLE STAR)

NE/4 Sec. 4, T4N, R17E (unsurveyed)

Sketched April 6, 1976 V.E.K.

0 100' 200'

Emsco

Summary:

The property apparently had a significant production, however, its potential for appreciable additional resource looks poor.

Introduction:

Road Log from U.S. 60 near Seneca

0.0 U.S. 60

0.9 Cross Seneca Creek take Regal mine road.

1.4 Forest - Indian Res. Bdy.

1.6 Turn north off Regal road

2.5 End of road at old mill site on topographic rim overlooking Salt River Canyon to north, and upper end of ½ mile steep foot trail to workings (could be easily improved to a jeep trail).

The property and its road is shown on the Blue House Mtn 15' USGS topographic quadrangle at an elevation of 4200 feet. It is in the NW/SE of section 34, T 5N, R17E, unsurveyed (sectionalized data from Tonto National Forest map).

Ownership:

On San Carlos Indian Reservation; doubtful that anyone has a lease as no recent activity is noted.

Production and History:

The asbestos here was reportedly found by a 14 year old boy; Stewart reports that the claims were originally located in 1921. Small production was made until 1930 and again

from 1938 to 1940. During the latter period a small mill was installed and the ore raised by aerial tramway. These operations ceased in 1942 and the equipment was dismantled. The mill foundations are on the ground but no evidence of a tramway remains. Stewart adds that minor selective mining was conducted in 1951 to mid 1952. The workings indicate no activity in many years.

Geology and Workings:

Stewart states that a 75-foot segment of Mescal limestone here has diabase both above and below and is cut off to both north and south by crosscutting diabase. The northern diabase was noted. No fiber was noted near the portals of the adits.

It appears that the workings are on three levels; upper to mid level is about 15 feet, with about 7 feet to the lower level. The last work was apparently done in the mid level which has noteworthy banded blocky serpentine in the back. As the rock is very blocky it is extremely dangerous, particularily for amateurs who may be interested in the serpentine. Luckily, not many would care to pack the rock up the trail.

Potential Resources:

As per Stewart's sketch of the workings it appears that the fiber has been worked out. His sketch indicates that exploration to the SE on the upper level might be continued through the diabase, however, it is doubtful that the diabase will be found to be as narrow as shown in the sketch.

Stewart mentions no such exploration potential and after seeing the thickness of the diabase intrusives, this exploration target looks poor.

The property may have some potential for decorative stone.

Victor E. Kral
May, 1976

Examined 5/8/76

Attach: Map 1- 8½ x 11

Figure 23. - Plan and section, Emsco mine.

Fiber King Area

Summary:

The fiber occurrence in the main adit is adjacent to a discordancy in the diabase. It appears that the economic mining limit was about 100 feet from this discordancy and the fiber was extremely meager at this distance. The adit was driven 220 feet approximately parallel to the diabase, and it may be assumed that if asbestos economics were good enough it would be logical to continue the adit farther. In the light of only 100-foot stoping width, at best, this appears rather unlikely.

The area has several minor occurrences but none seem to have much potential. Should the asbestos demand increase the area may warrant prospecting for small amounts of better grade fiber.

Introduction:

Road log from center Salt River bridge on US60

0.0	Center bridge
0.2	Turn off on river road, head westerly (downstream)
6.4	Ford, Cibecue Creek
8.0	Corrals, road up canyon, grown in.
8.05	Ford small stream
9.4	Road left "Salt Banks"
10.1	Fiber King adit 200 yds. N of road.

The principal Fiber King adit and the road to it are shown on the Blue House Mtn. 15' USGS topog. quad. at an elevation of 3400 feet about ½ mile north of the Salt River. The property is directly north of the Regal mine and is in the NW/SE of Section 12, T 5 N, R 16 E, unsurveyed (sectionalizing data from Tonto National Forest map). The area is in the Fort Apache Indian Reservation.

Ownership:

It appears that nothing has been done here for many years and it is most doubtful that a lease from the Fort Apache Indian Reservation exists.

History and Production:

Stewart states that claims in this area were first located in 1921 and some production was made in the early years. Considerable production was made in the mid forties and the last activity was probably in 1949.

Geology and Workings:

Stewart states that about 200 feet of the algal and lower member of the Mescal limestone is both underlain and overlain by diabase. Fiber zones are found just above the lower sill and 100 feet higher just under the algal member. The major deposit, the adit examined, is in the lower fiber zone adjacent to a discordancy in the diabase. The adit bears N 10° W and Stewart's notes indicate it to be 220 feet in length. Stoping off this adit indicate the fiber zone to be 100 feet wide at the most and parallel to the discordancy. The fiber near the face was not encouraging, however, an improvement in the economics of asbestos might suggest driving the adit farther. Pillars indicate that the fiber occurs in veinlets totalling 1½ to 2 inches near the diabase discordancy to a total of 3/4" away from the diabase.

Other occurrences mentioned by Stewart are minor but some of good grade. None appear to have much potential, however, an increased demand for asbestos may warrant prospecting for small amounts of good fiber.

Conclusions:

At best, the potential for additional asbestos here, even in case of increased demand, is remote.

Victor E. Kral
May 1976

Examined 5/14/76

Attach: Map 1- 8½ x 11

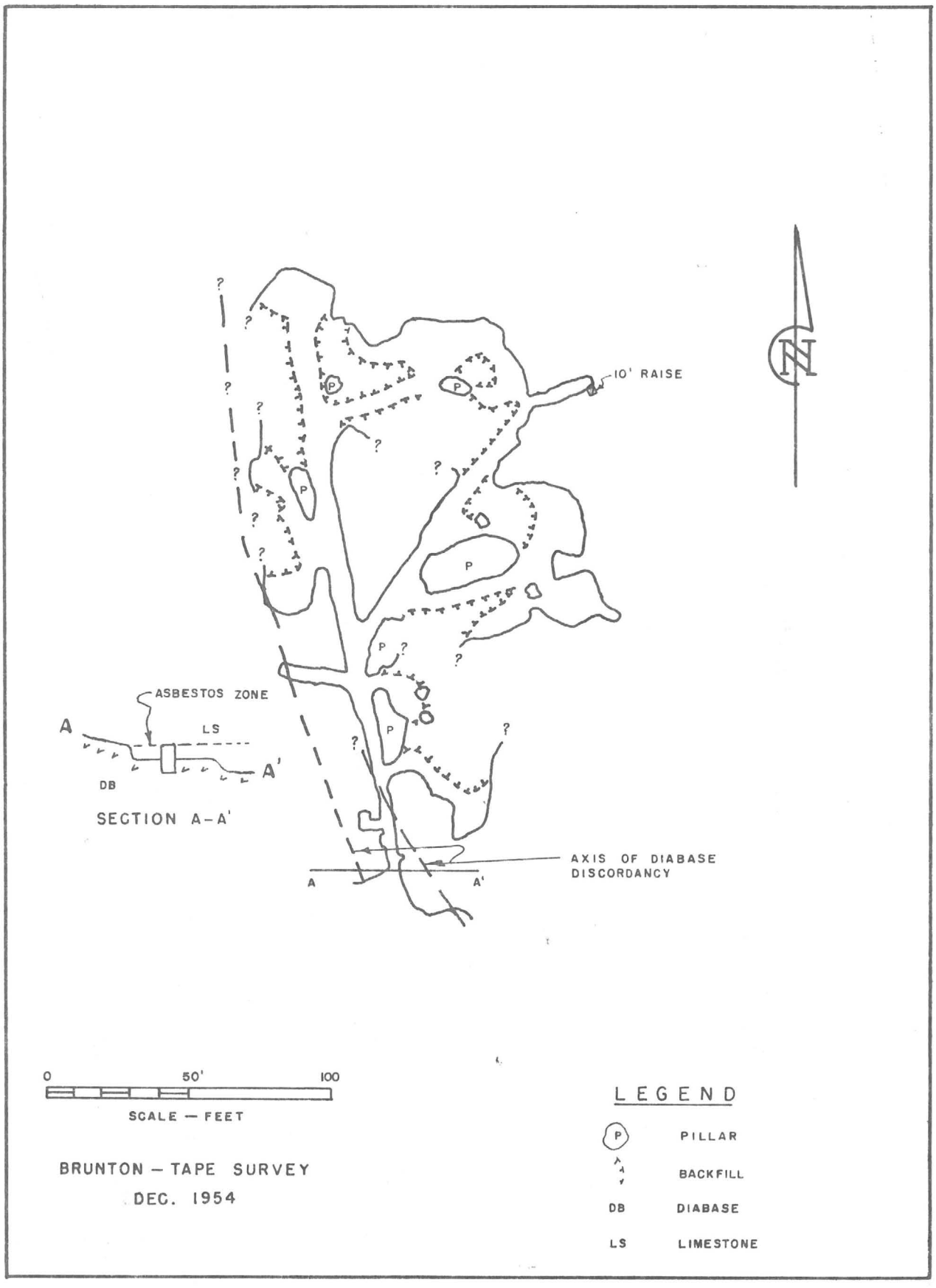


FIGURE 10 — PLAN & SECTION — FIBER KING MINE

Arizona
Asbestos

Fourth of July

Summary:

The property is about 44 miles north of Globe, the latter 10 miles of which is a fair bladed dirt road. Production has been minor, however, it may be a fair prospect if the demand for asbestos increases. No potential resources can be claimed for it. It appears that the claims have been abandoned.

Introduction:

Road log from U.S. 60

0.0 U.S. 60 at Seneca Lake road, 34 miles N of U.S.60-70 juction Globe

0.9 Cross Seneca Creek, take Regal mine road west

3.9 Phillips mine road, buildings on right

6.6 Turn south off Regal road on Forest road 473 A

7.9 Road SW, keep right

9.4 Remains of old camp, cans, etc.

About 300 feet westerly are two old adits about 100 feet apart, the northerly one is caved.

This prospect and the road to it are shown on the Blue House Mtn. 15' USGS topog. quad. at an elevation of about 4500 feet in the SW/NE of section 26, T5N, R17E, unsurveyed (sectionalizing data from Tonto National Forest map). The property is in the Tonto National Forest.

Ownership:

The lack of recent work indicates that the claims are probably abandoned.

History and Production:

The work noted is somewhat different than that described by Stewart; it appears that more work was done since his visit and considerable caving has occurred. Stewart states that claims were located here prior to 1928 and have been relocated several times. He adds that the operator in 1949 claimed to have recovered 1300 pounds of #1 and 2 tons of #2 soft crudes from 10 tons of cobbed material.

Geology and Workings:

One adit driven at N75E for about 50 feet and another caved adit 100 feet north were the only evidence of the old work. It may well be that other caved adits are obliterated. The adits are off a side hill road cut that is badily sloughed.

As stated by Stewart the fiber zone is in undulating beds about 10 feet above the diabase. The fiber noted in the one open adit is in seams totalling about 2 inches of harsh fiber.

About 800 feet north of the old work considerable dozing has been done exposing an L shaped face about 350 feet long containing 2 to 3 feet of serpentine. Scraps of long harsh fiber were found scattered in the area. This work was probably done five to ten years ago.

It was noted that the fiber in the old exploration is about 20 feet below the algal limestone member which in this area contains exceptional algal colony structures.

Potential Resources:

If the demand for asbestos increases this may be a fair area for exploration as a good sized area could be drilled with 100 to 150-foot holes. Little is known about the diabase sills except where exposed below the fiber zone here, however, it appears that concordancy is prevelant. This consistancy may be an advantage.

Although the property may be a fair prospect, no potential resources can be claimed for it.

Examined 4/8/76

Victor E. Kral
May, 1976

June 1976: Information obtained from the last operator indicates the property has no potential. The drilling mentioned above was done and results were negative. However, he did intersect 6,8 and 10-inch seams of high grade hematite. A study of the surface float indicates that such lenses are sometimes almost 2 feet thick. The harsh long fiber was sold to the GSA stockpile. Operator states no one else would take it.

Victor E. Kral

Attach; 1 photo

Grand View (Phillips Mines)

Summary:

Access to the Phillips properties was refused and no information was made available other than that in Bureau files on the Grand View asbestos project #2302 performed in 1943. The properties are about 38 miles north of Globe off a good dirt road. They have produced from 1940 until recent years, however, the amounts are not known. Bureau work disolosed marginal fiber in an area not previously explored and it is felt that further exploration in the same general area would be advisable.

Introduction:

The Grand View is but one of several mines making up the Phillips properties which extend about a mile northwesterly from the Grand View. As permission to go on the property was refused, and no information is available from the reputed owner, very little can be said about the Phillips properties.

The western part of the Grand View (USBM adits driven in 1943) is in the SW/NW of Section 34, T5N, R17E, unsurveyed (sectionalizing from Tonto National Forest map). The work is on a north facing cliff overlooking the Salt River Canyon at an elevation of 4200 feet on the Blue House Mtn. 15' USGS topog. quad., in the Tonto National Forest.

The properties are reached by taking the Regal mine road which turns off US 60 34 miles north of the US 60-70 junction at the east edge of Globe. The road log to the properties is:

0.0 US 60-Seneca Lake road junction.
1.4 Indian Reservation-Tonto National Forest bdy.
1.8 trail north to head of old tramway, probably to Grand View.
3.4 road back on right (NE) to Grand View (about one mile).
3.9 buildings on right and road to other Phillips properties and old mill.

The main Regal mine road is graded and drained dirt in good condition.

Ownership:

Both Phillips and his widow are dead and Rex Towne of Globe claims to be the owner. Just how Towne aquired the property is not known.

History and Production:

The USBM drove two adits totaling 560 feet with some cross-cutting in 1943; this work was about 900 feet west of the older workings. The Bureau exploration found marginal to good fiber and it is assumed this was mined out years ago. From 1940 Phillips had a more or less continuace small production from these properties; later Rex Towne is reported to have had a small production every year until his mill was shut down for noncompliance with environmental regulations. Production records are not available.

Geology and Workings:

Bureau reports of the work done in 1943 state that the Grandview fiber zones are in a 100-foot section of limestone with diabase sills both below and above: the fiber is found near the lower sill. At the western part of the deposit (site of Bureau work) the lower sill is abobe the fiber zone on the cliff face, however, the diabase becomes stratagraphically lower to the south and is below the

fiber zone about 40 feet inside the hill. The Bureau found marginal one beyond this in both adits. The limestone-diabase contact is covered with slide rock west of these adits.

Potential Resources:

Altho no resources can be given, it appears that dozing off the slide rock west of the Bureau adits and driving other exploration adits here would be logical.

Victor E. Kral
June 1976

Attach: Map 1- 8½ x 11
1 photo

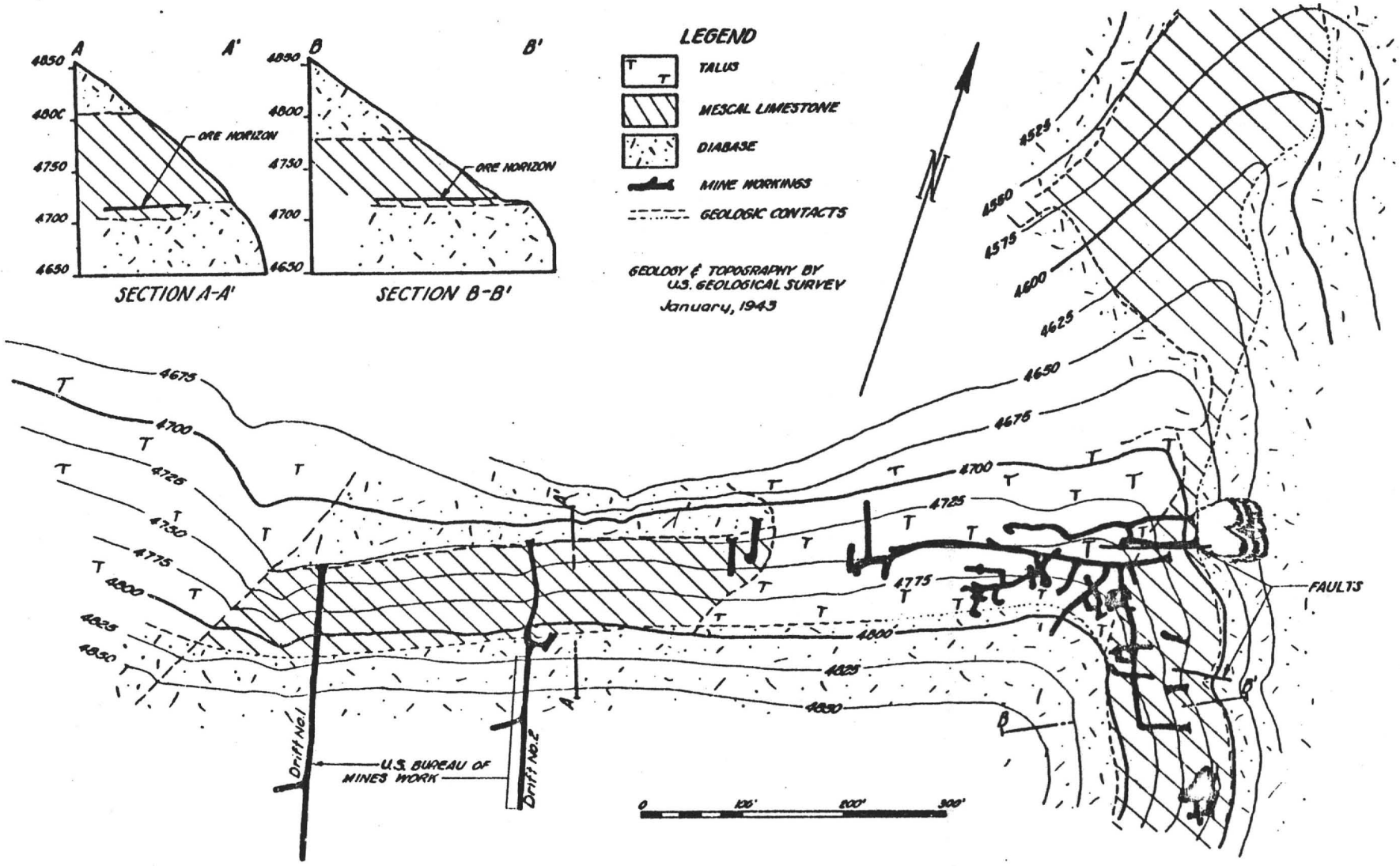


Figure 16. - Plan and sections - Grandview claims No. 4 and 5.

Arizona
Asbestos

Great View

Summary:

This prospect is very accessible, however, no potential resource is noted.

Introduction:

The Great View prospect is on the west side of a small knoll of 4480-foot elevation on the west side of U.S. Route 60 at the first major curve as the highway begins its north bound switchback decent into the Salt River canyon. The prospect is shown on the Blue House Mtn. 15'USGS topographic quadrangle at an elevation of about 4300 feet. It is in the SE/SE of Section 26, T5N, R17E unsurveyed (sectionalizing data from Tonto National Forest map)

Ownership:

On San Carlos Indian Reservation; doubtfull that anyone has a lease as no recent activity is noted.

Production and History:

L.A. Stewart reports that the original claims were located in 1921 and the adit was driven in 1923. The property was probably idle until 1953 when some production was made.

Geology and Workings:

An easterly adit of about 80-foot length has stoping of about 50-foot width near the portal, partly backfilled. A narrow diabase sill is just below about 2.5 feet of serpentine which contains as much as 1 inch of short soft and semi-soft fiber. The attitude of

beds here is about N 70° W with 16° dip NE.

Stewart states that the mineralized bed is cut off by diabase at the adit face. It appears that no work has been done in the past several years.

Potential Resources:

No appreciable potential resource is noted.

Examined 5/8/76

Victor E. Kral
May 1976

LOCKE MINE

Summary:

The Locke mine, originally producing in about 1920, is situated about 36 miles north of Globe. It had a minor production as evidenced by the stopes but shows no evidence of production since its early activity other than some reworking of the waste dumps. The mine has no potential resource unless other similar diabase intrusives can be found; in short, it is worked out.

Introduction:

The old Locke mine is about 36 miles north of the US 60-70 junction at the east edge of Globe. Its road log from US 60 at the Chrysotile mine road junction is:

0.0	US 60-Chrysotile mine road junction
1.8	turn southwest on Forest Road #304
2.7	cross Ash Creek
3.2	Donato (Triple Star mine)
5.0	Toney Tank, cribbing of small asbestos mill, take southwesterly trail
5.6	top of ridge, evidence of old camp, workings N 20° W about 200 feet (hard to find).

The mine is in the SE/NW of Section 32, T 4½ N, R 17 E. unsurveyed (sectionalizing from Tonto National Forest map), at an elevation of 5350 feet on the Chrysotile 7½' USGS topog. quad; it is in the Tonto National Forest. The mine can be reached only with a 4 wheel drive vehicle.

Ownership:

As there is considerable evidence of dump rock screening during recent years the property may not be abandoned, however, no evidence of claim ownership was noted.

History and Production:

Stewart mentions production from here in 1920. Considering the stoping, the mine had an appreciable small production. As noted in the workings and Stewart's map, the stoping was only about 50 to 75 feet wide and about 200 feet down the 5° to 10° dip of the beds. It is doubtful that any production has been made from the mine since Stewart's examination in about 1954, however, much work has been done reworking the dumps. It may be that some stope gob has been removed.

Geology and Workings:

The ore is apparently controlled by a near vertical discordancy striking about N 30° E. As would be expected, the ore width is narrow, about 60 feet, and as the workings follow down the 5° to 10° dip, mining becomes increasingly difficult. It is difficult to find much fiber left in the workings but Stewart states that two fiber zones are 5 feet apart and each carried as much as 2 inches of fiber of soft to semi soft character. The best noted in the pillars was 1½ inches, however, waste rock on the dump indicates 2 inches of fiber.

Potential Resources:

Unless other similar discordancies, or areas of diabase near favorable limestone, can be found here, the area has no potential

resource. As the topography to the west is relatively flat the immediate area could be easily prospected with a magnetometer to pick up other diabase intrusives.

Several small workings and occurrences are found near Toney Tank, however, only the Locke mine is worthy of comment.

Examined
4/7/76

Victor E. Kral
June 1976

Attach: Maps 2- 8½ x 11
Photos 1 sheet

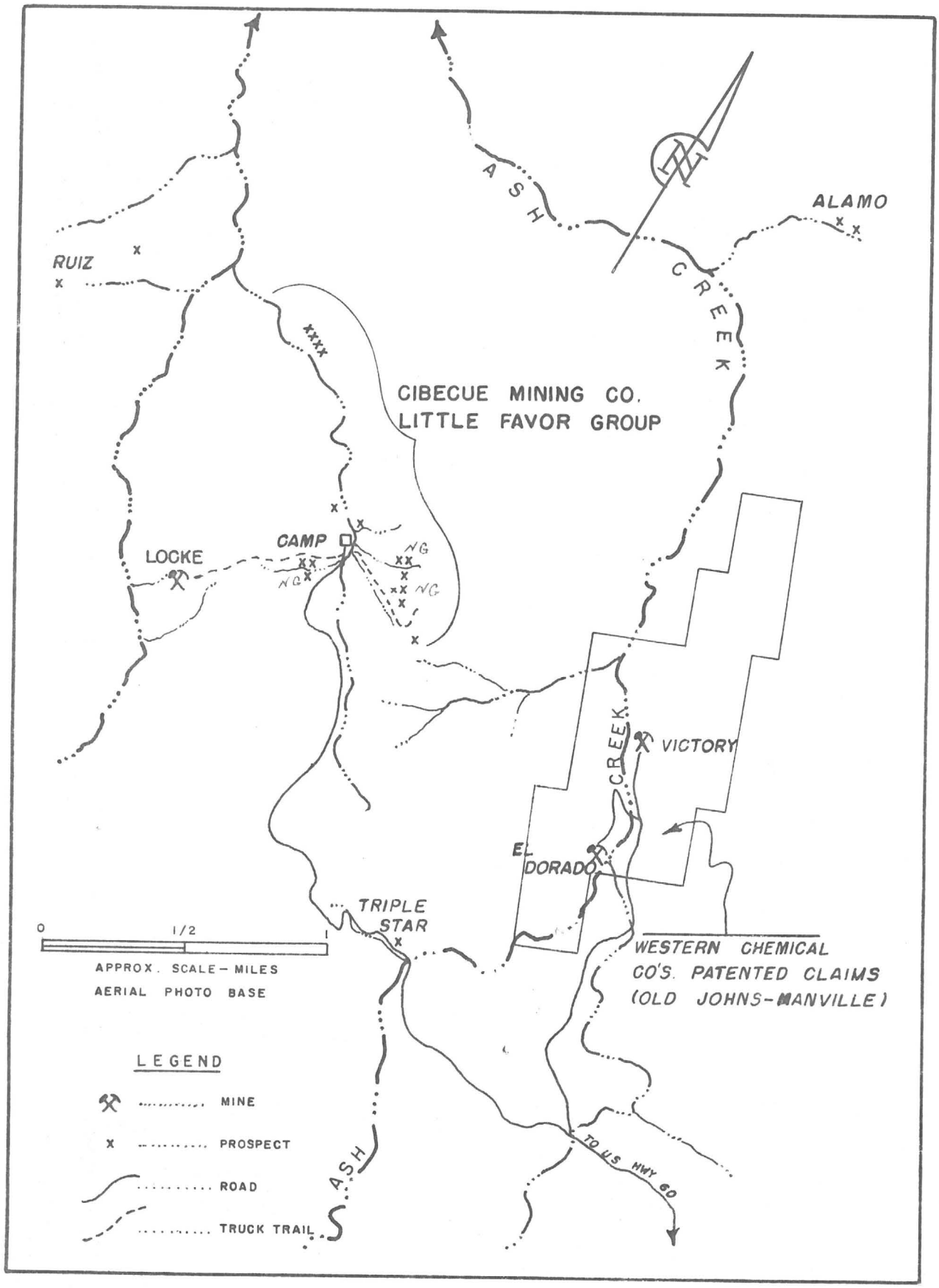


FIGURE 8 – SKETCH LOCATION MAP-CIBECUE MINING CO'S. LITTLE FAVOR GROUP AND VICINITY

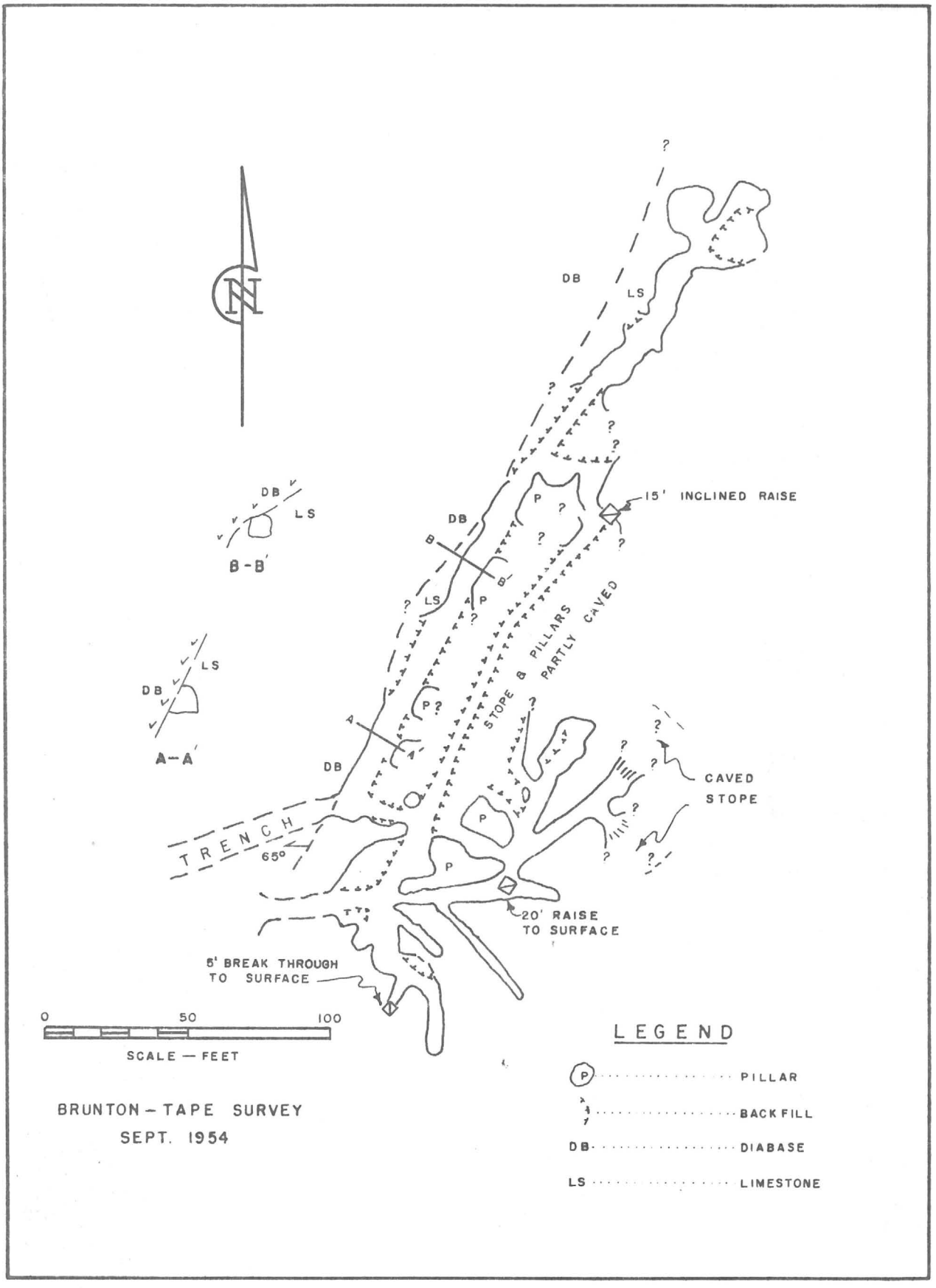


FIGURE 9- PLAN & SECTIONS, LOCKE MINE
CIBECUE MINING CO. INC.

Arizona

Asbestos

Pine Top (Lucky Seven)

Summary:

Relatively long fiber seems to be abundant here but it is all harsh. Should a need arise for harsh fiber it can be assumed that 3000 tons of harsh fiber half of which will be #2 and #3 grade has a 50% probability. The soft fiber has no potential.

The property's location near the highway is an asset. Its presence on the Indian Reservation is a drawback.

Introduction:

Road log going north and west

0.0 on US 60 at Seneca (Seneca Creek crosses highway)
0.7 road west to Seneca Lake and Regal mine (on US 60)
1.1 on US 60 turn west thru gate marked "No Trespass" (at times this is locked)
1.9 Trash dump, keep right (NE) down small wash
2.1 Leave vehicle and walk about ½mile around hill to couple of old metal ore bins and east workings
-also-
1.9 Trash dump keep left following ridge
2.0 Leave vehicle and follow old road N and NE about ¼ mile to west workings.

This deposit and roads going to both ends is shown on the Blue House Mtn. 15' USGS topog. quad. The deposit is in the mid part of the S/2 - N/2 of section 35, T5N, R17E, unsurveyed, at an elevation of 4200 to 4600 feet (sectionalizing data from Tonto National Forest map).

Ownership, History and Production:

The property is on the San Carlos Indian Reservation at present no lease is known to exist. Stewart mentions the earliest work and production was in 1942 and again in 1952.

Jack Neal of Globe (phone 602-425-5831), operating as the Metate Asbestos Co., produced small amounts of fiber from here during 1958-1969 part of which was used for sugar refining. He states that 15 to 20 tons per day of mill feed was produced that gave about 40% recovery. This would be intermittent operation.

Geology and Workings:

The fiber zone here is in the upper part of the algal member of the Mescal limestone and is overlain by the upper cherty member of the Mescal. The diabase is about 5 feet and 12 feet below the fiber zones. At the eastern end of the deposit are four or more adits, two of which are caved and the other two are dangerous due to the blocky ground. Stewart states that the upper fiber zone is the principal producer here. The exposure here is about 1000 feet with much dozing to open the upper (west) 300 to 400 feet.

The western deposit is on the same stratagraphic horizon about 1000 feet west of the eastern work. Here most of the activity has been in the lower fiber horizon about 5 feet above the diabase and 15 to 50 feet below another sill. About 480 feet has been exposed by many small adits. The upper part of the algal member here

is characterized by heavy concentrations of the algal colonies; no algal structure was noted in the eastern deposit.

The fiber in these deposits is all harsh although much of it is long, one inch fiber is not uncommon.

Stewart mentions a soft fiber occurrence about 200 feet stratagraphically below these deposits. Minor work has been done here and small production made. This was not examined although its presence was later noted from the nearby highway. Stewart's comments indicate it has little potential.

Potential Resources:

The harsh fiber exposures, about 1000 feet at the east end, and 500 feet at the west end dip at about 10° SE and, therefore, pose some mining problem; however, should a need arise for harsh fiber, it may be assumed that a moderate reserve could be developed here. It is inferred that about 250,000 square feet of about 2 inches of harsh fiber containing about 60% of grades #1 #2 and #3 may be mined here.

The soft fiber is not expected to have any resource.

Conclusions:

These deposits have potential if a need arises for harsh fiber, otherwise they have none. Its proximity to highway transportation is an asset. Its presence on Indian Reservation is a definite drawback.

Victor E. Kral
May 1976

Examined 4/9/76

Attach: Map 1- 8½ x 11
Photos 1 sheet

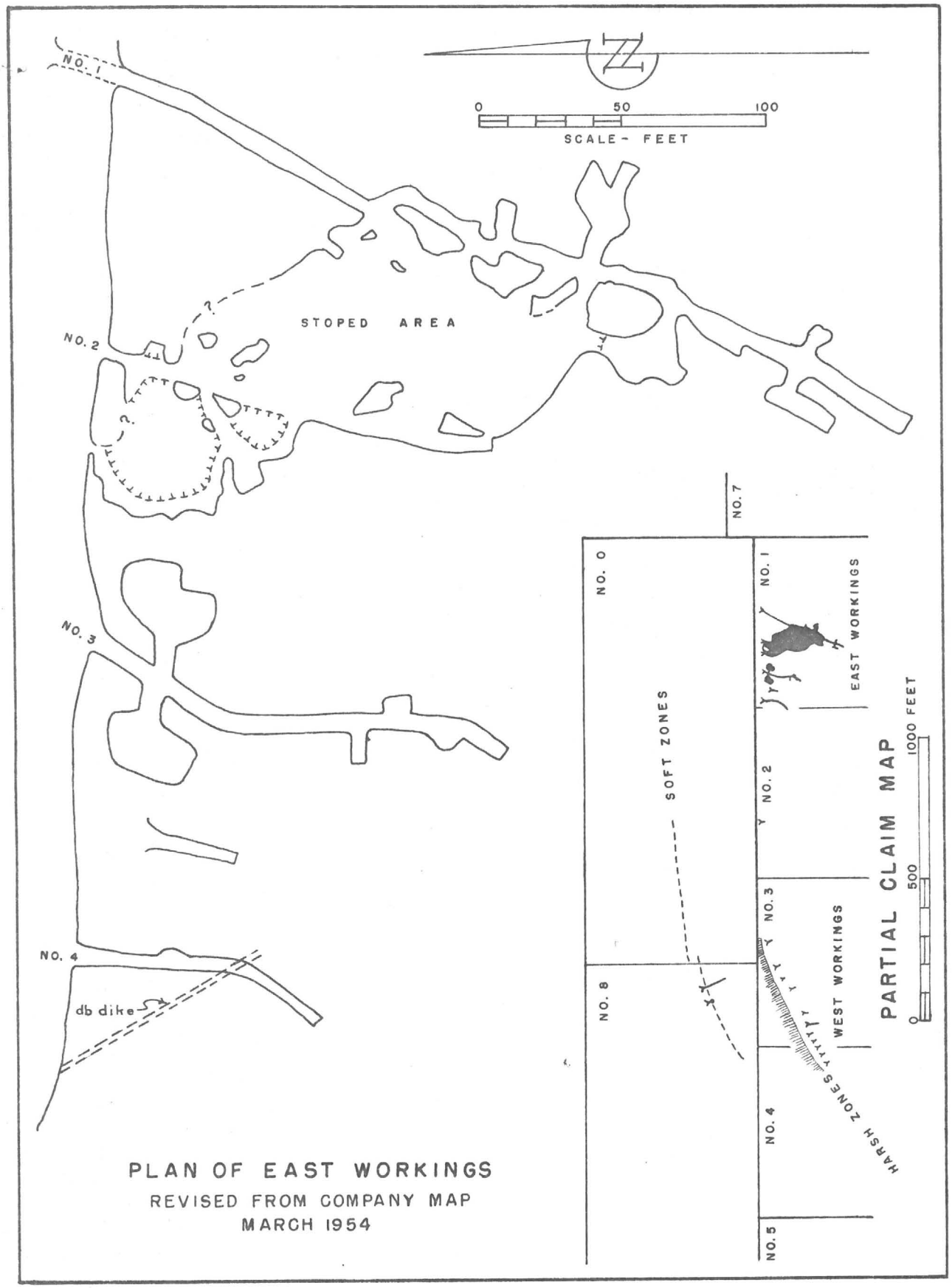


FIGURE 18. - PLAN - PINE TOP MINE

Punto Negro

Summary:

As so little was done here in the fifties, when asbestos had an artificial stimulous in the government stock pile, one must assume the potential is minor. Exploration drilling here would be simple.

The assessment work done here may be to hold the claims for their uranium potential in the Dripping Springs quartzite below the Mescal limestone.

Introduction:

Road log from U.S. 60 near Seneca

0.0 U.S. 60

0.9 Cross Seneca Creek take Regal mine road.

3.9 Old Phillips buildings and road to Phillips mine

4.3 Turn north off Regal road

5.6 Canadian mine (use 4-wheel drive beyond this)

6.4 Road north to Salt River group

6.6 Earth tank on left

7.3 Cross major wash and road heads NW along west side of canyon

7.7 Old adit on right, dozer work

7.8 Much dozer work, approximate center of dozer assessment work, near principal old adit, now caved.

8.1 End of dozed road

The property is at an elevation of about 4050 feet on

a mesa one mile south of the Cibecue Creek - Salt River junction shown on the Blue House Mtn. 15' USGS topographic quadrangle. It is in the NW/SE of section 17, T5N, R17E, unsurveyed (sectionalizing data from Tonto National Forest map). The claims are in the Tonto National Forest.

Ownership:

Although it is quite evident that assessment work is being done no monuments were noted and the unpatented claim ownership is unknown.

Production and History:

Stewart states that claims were originally located in 1921. The very minor workings indicate little or no production.

Geology and Workings:

A relatively flat lying limestone underlies up to 5 feet of diabase overburden, all that remains of a concordant sill. The old minor adits mentioned by Stewart were noted, however, the principal one is now caved. An 18-inch hole to these old workings was noted in the limestone, the adit being about 10 feet below the top of the limestone. Recent assessment work consists entirely of dozer scraping and is more or less worthless to evaluate the property. Minor bits of short fiber were noted in and around the dozer work.

Potential Resources:

The lack of earlier work indicates little encouragement

and one can only assume that the potential is meager. Obviously, exploration by drilling would be simple here.

Victor E. Kral
May, 1976

Examined 5/9/76

REGAL MINE

Summary:

This property is one of several in the district owned by the Jaquays Mining Corp. It is 46 miles north of Globe and served by a good graded and drained dirt road to US60.

Altho not visited, much information is available from Stewart's writing. The Regal is the second largest producer in Arizona, its total production being about 10,000 tons produced between 1916 and 1964. In the light of its production the resource potential should be carefully considered; available geologic data indicate an exploration target east of the old workings at a lower level. In fact, it has been reported some ore remains in the mine at a lower level.

Introduction:

The Regal mine was not visited as the Jaquays Mining Corp. does not wish to give more than a minimum of information of its asbestos operation.

The property consists of both patented and unpatented mining claims on the south rim of the Salt River canyon about 46 miles by road north of the US60-Az. 70 highway junction on the east edge of Globe. Of this distance the mine is 9.6 miles by graded and drained dirt road northwesterly of the Seneca Lake road junction on US60. The old northerly adits at an elevation of 4350 on the Blue House Mtn. U.S.G.S. 15' topographic quadrangle are in the center of the N/2-N/2 of section 24, T5N, R16E, unsurveyed (sectionalized from

the Tonto National Forest map.)

Ownership:

The property is owned by the Jaquays Mining Corp. which also owns the Canadian mine about 3 miles easterly in this area.

History and Production: (largely from Stewart)

The claims were originally located in 1916 and had minor production by various owners. It appears that substantial production began about 1928 when the Regal Asbestos Mines installed a mill reportedly able to produce fiberized asbestos. About 10 years later ownership transferred to the Arizona Chrysotile Asbestos Co. who made substantial production through 1948 when the mill was destroyed by fire. In 1949 an idle mill was purchased and in 1950 the mine was reopened under the management of D. W. Jaquays who purchased the property two years later. After that it appears that the property produced about 600 tons of fiber per year. In 1959 Jaquays built a new mill and started producing from the Chrysotile mine as well; the two produced together until 1964 when the Regal was shut down.

Stewart estimates the total production of the Regal mine through 1958 as 7700 tons. A rough estimate of total production at 10,000 tons seems logical. The Regal is the second largest producer in Arizona, the largest producer being the Chrysotile.

Geology and Workings: (largely from Stewart)

The principal asbestos bearing serpentine zones are 6 feet apart, the lower one being 19 feet above a diabase sill of at least 300 feet thickness and 35 feet below the algal limestone of the

Mescal formation. Two feet above the lower zone is a persistant 1 to 3 inch bluish-green serpentine band referred to as the "oscar". The persistance of the oscar marker bed makes it of extreme importance in mining the Regal.

The limestone is relatively flat lying, however, a network of thrust faults has developed dome like structures which are condusive to better mineralization. This doming is responsible for at least two of the better fiber areas mined from the Regal. Roughly an area about one half mile long by 1000 feet wide has been mined out. The diabase rolls downward on the east side of the workings lessening the quantity of fiber; It appears that this area may be a logical target for exploration at lower levels. Experience indicates that altho the most favorable ore horizon is just below the algal, favorable beds are often found at great distances below this member. Here most production has been from beds 29 and 35 feet below the algal limestone. If the discordant diabase becomes concordant again there may well be ore horizons below those mined.

Potential Resources:

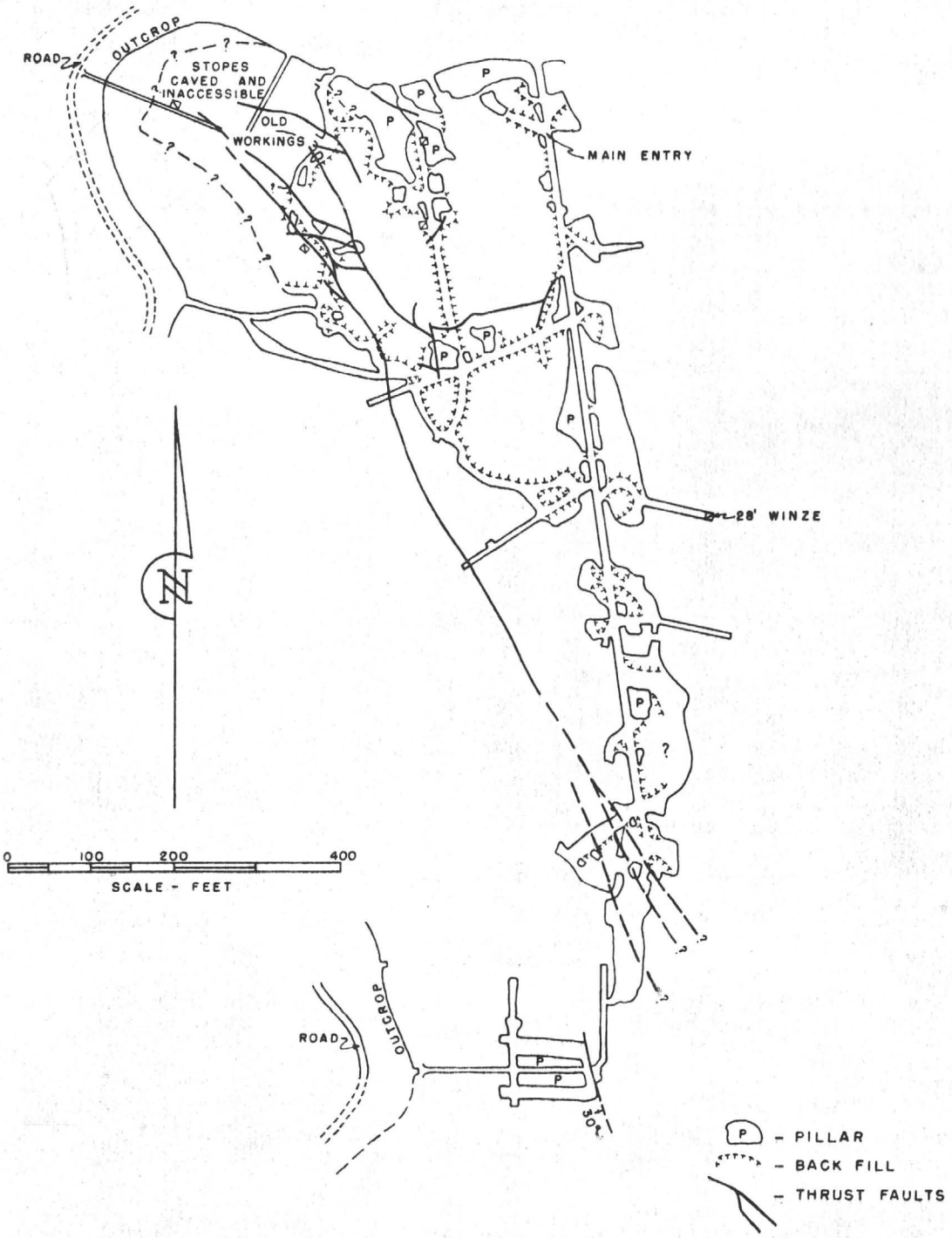
It is reported that the Regal has some ore left at a lower level, this is reasonable as the maps indicate that the property warrants further exploration at lower levels east of the old workings.

Conclusions:

The Regal mine is a good example of an efficient small mine. Stewart's description of the mining in IC 7986 (1961) is a most interesting recapitulation of what makes small mines productive. Most interesting to read at a time when such operations are almost extinct.

Victor E. Kral
May 1976

Attach: Map 1- 8½ x 11
Photo 1



PLAN

FROM MAP BY OWNER (AS OF MAY 1, 1954)

FAULT PATTERN BY U. S. G. S.

Figure 8. - Plan of Regal mine, Jaquays Mining Corp.

WONDER PROSPECT

Summary:

This prospect is about 42 miles north of Globe; of the 7.5 miles off US 60, 6.3 miles is the Regal mine road (good condition) and the balance is fair road traversible by any vehicle.

The asbestos claims were abandoned and have been overstaked in the present search for uranium in the underlying Dripping Springs quartzite.

Little has been done here since Stewart's examination in about 1954 and no potential asbestos resource is visualized.

Introduction:

This property is about 41.5 miles north of the US 60-70 junction at the east edge of Globe. The road log to the property from US 60 at the Seneca Lake road is:

0.0 US 60-Seneca Lake Road junction
6.3 leave Regal mine road turn south of Forest Road #473 A
7.5 evidence of old camp on left and trail to workings

The workings are in the NW/SW of Section 30, T 5 N, R 17 E, unsurveyed (sectionalizing from Tonto National Forest map), at an elevation of about 4700 feet on the Blue House Mtn. 7½' USGS topog. quad., in the Tonto National Forest.

Ownership:

The asbestos claims were apparently abandoned and recent relocations have been made for uranium, undoubtedly due to the Dripping Springs quartzite underlying the Mescal limestone. The names of the new claimants are not known.

History and Production:

Stewart states that the claims were originally located in 1930. No stoping has been done and production is unlikely. It is assumed that the claims were probably abandoned in the fifties.

Geology and Workings:

Stewart states that a 50-foot diabase sill is found 30 to 50 feet below the mineralized zone and that 100 to 150 feet of Mescal limestone underlies the diabase. The limestone in turn rests upon the Dripping Springs quartzite, of considerable uranium interest at the present time.

The workings were found about as described by Stewart; the principal work is an 85-foot adit driven northerly at about-12° following the dipping beds. As much as 1½ inches of harsh fiber was noted. Since Stewart's examination about 1000 feet of sidehill dozer cut has been made following the fiber zone stratagraphic horizon, but no appreciable fiber was noted.

Potential Resources:

In the light of what was seen this property has no potential asbestos resource.

Examined
6/4/76

Victor E. Kral
June 1976

Arizona

Asbestos

Asbestos Peak (American Ore Mine)

Summary:

The Asbestos Peak mine is about 42 miles north of Globe, about 3000 feet southeast of Asbestos Point. It produced heavily prior to 1921 and had only minor production since then, however, it is reported that $70,000 of fiber was removed by open cut excavation in 1959. As the early work removed only long fiber, the dumps have been reworked to some extent. Probably the longest cross fiber chrysotile found in the world came from this property; 14 inches being the longest. Exploration drifting has been more extensive than usual here; in spite of this the open cut results indicate the need for more exploration. Drilling is suggested. No projection of potential resources is justified.

Introduction:

The Asbestos Peak mine is about 42 miles north of Globe, of which 3 miles up Pocket Creek off AZ 288 (Globe-Young road) is rough 4-wheel drive road. The property is in the NW/SW of section 20, T5N,R14E, at an elevation of about 6300 feet on the McFadden Peak USGS 15' topog. quad. The property is on the south side of a southeasterly spur off Asbestos Point; the slope here is extremely steep. The claims are in the Sierra Ancha Eperimental Forest of the Tonto National Forest.

The present road comes up a steep north slope, wet in the spring. Topography suggests a better route to the west to intersect the Globe road about a mile south of Pocket Creek at about 4700 feet elevation.

Ownership:

The unpatented claims are owned by Chas. Nichols, Box 752, Globe, AZ 85501; phone (602) 467-2276 (Roosevelt).

History and Production: (Largely from Stewart)

The original claims were located in 1915. Several hundred tons of #1 fiber was shipped by the American Ores and Asbestos Co. in 1917. This company and the Raybestos Co. operated extensively in 1919 and 1920. Peak employment was 275 men producing hand cobbed crude Nos. 1 and 2. By 1921 the equipment was removed and claims were abandoned. Some production was later made in 1926 and 1927 and again from 1947 to the fifties. As Stewart's map is a reproduction of one dated 1920 and the present workings are about as shown, production after 1920 was minor. However, in recent years considerable open cut work was done by Ed Towne of Globe who is reported to have removed about $70,000of fiber in 1959. The open cut work is roughly sketched on Stewart's map.

Much of the later work consisted of reworking mine dumps to recover the shorter fiber.

Geology and Workings:

The fiber is found in 20 to 30 feet of algal limestone just below a 10-foot diabase sill intruded between the algal

member and the upper Mescal member, which is silt stone. The mineralized limestone is underlain by a thick diabase sill. The two sills are connected by several dikes and a wide discordancy at the west end. The algal member in this area does not contain the algal colony structure so common elsewhere.

The workings are extensive and more than the usual amount of exploration by drifting has been done. As the productive open cut work was largely in virgin areas it appears that underground exploration did not get all the answers.

Potential Resources:

The central and eastern parts of the deposit have less than 100 feet of rock over the fiber zones, therefore, these areas are amenable to surface drilling. It appears logical to attempt this exploration, however, only heavy equipment should be used with care; fiber zones are difficult to drill.

As open cut work found new fiber and so much area to the north is unexplored there appears to be a potential for more ore. Further, early production, which must have been near 2000 tons (estimated from stope area) was all long fiber; today much more of the fiber would be sold. It is, therefore, inferred that about 1000 tons of 10% No. 1, 20% No.2, 30% No. 3 fiber and the balance shorter grades may be found. This estimate is based only on past production.

Conclusions:

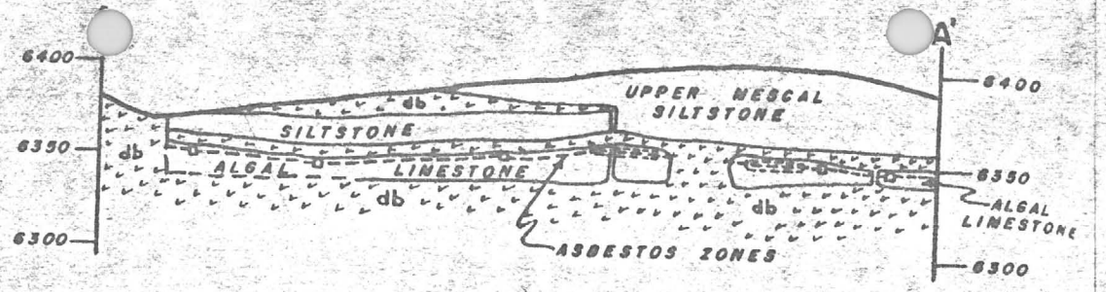
Most work done here was about 50 years ago. The open cuts were made over 15 years ago. No one has taken advantage

of more modern equipment particularily adaptable to a shallow deposit. Much information regarding the attitude of the diabase as well presence of the ore could be had by shallow drilling at relatively low cost.

Victor E. Kral
June, 1976

Examined
1/21/76

Attach: Map 1- 8½ x 13



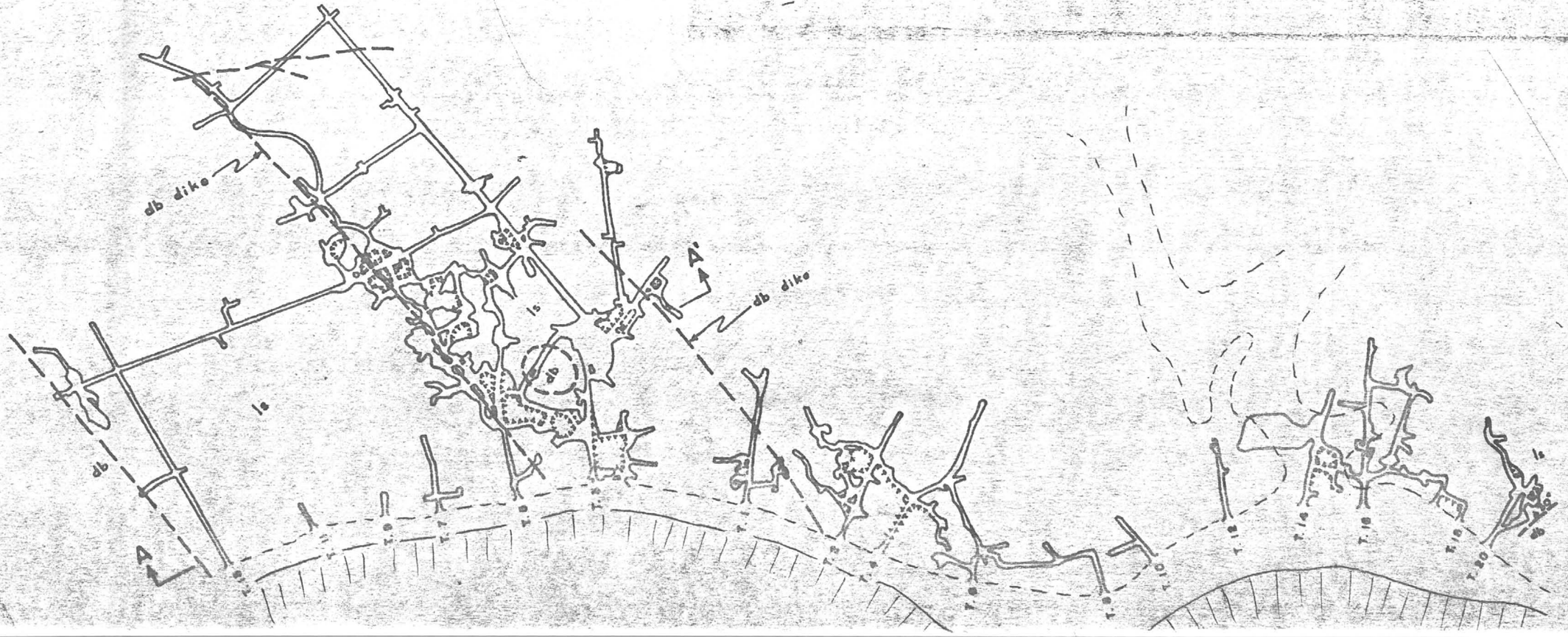
SECTION A-A'

OPEN CUTS

PLAN OF MINE WORKINGS

COURTESY OF WM. G. SHANLEY

Figure 24. - Plan and section, American Ores mine.



Bowe Tree Saddle

Summary:

The workings are about 60 miles north of Globe and 3.6 miles northeast of Board Tree Saddle on the Globe - Young road. Exploration under a DMEA project intercepted a diabase roll that cut off the fiber zone. This sill may not stay in the same stratagraphic position; the possibility of it dipping back down could be determined easily by shallow drilling from the dip slope surface. The property has had no production and shows little indication of having reserve potential.

Introduction:

The Bowe Tree Saddle property is about 60 miles north of Globe of which the last 3.6 miles from Board Tree Saddle on AZ 288 (Globe - young road) northeast to the property is rough 4-wheel drive road. The turn off on AZ 288 is marked Forest Road 203 to Cherry Creek; turn left (north) off this road 2 miles from AZ 288. The property is about 200 yards northwest of an excellent spring shown on the McFadden Peak 15' USGS topog. quad. The principal workings are in the NE/SE of section 4, T7N, R14E, unsurveyed, at an elevation of about 5200 feet. The claims are in the Tonto National Forest.

Ownership:

The unpatented claims are owned by Charles Nichols, Box 752, Globe, AZ 85501; phone (602) 467-2276 (Roosevelt).

History and Production:

Stewart gives no early history. This property was explored by DMEA Project 2975 in 1953. The results were discouraging and the project was

terminated somewhat prior to the total planned expenditure. The remains of a mill but no appreciable tailings indicate that it may have had very minor production.

Geology and Workings:

A diabase sill is about 2 feet below a zone containing up to 2 inches total of semi-harsh to soft fiber. The beds strike westerly and dip 12° to 20° southerly. The hillside containing the workings is virtually a dip slope and the present owner very logically continued a side hill cut northerly on the east side of the hill to the top and curved it westerly to expose about 1000 feet of the limestone just above the diabase. Unfortunately, little or no fiber was exposed.

The DMEA exploration consisted of about 125 feet of drifting northerly but as the fiber zone rose at about 12° two raises were driven with 60 feet of drifting off the longest raise. The diabase was found to roll, cutting off the fiber zone. As the side hill cut finds the diabase to be undulating it may dip to a lower stratagraphic position. In the light of the dip slope it appears feasible to drill the hillside. Such exploration should give much information at relatively low cost.

Other work noted is a 100-foot adit driven N20°E about 600 feet northwest of the main work. It seems to have no stopes and no fiber was found either in the adit or on the dump. The relationship of this work to any diabase intrusive is not known. Also about 600 feet farther northwest, just across a low saddle, are old minor underhand stopes in limestone resting on diabase and dipping about 25° southwest. The fiber is harsh to semi-soft, short, totalling about 3 inches over 6-inch space in some spots.

Potential Resources:

Although the property warrants drilling on the dip slope, no potential resources can be projected.

Victor E. Kral
June 1976

Examined 2/1 and 6/4/76

Attach: Maps 2- 8½ x 11
1- 11 x 15

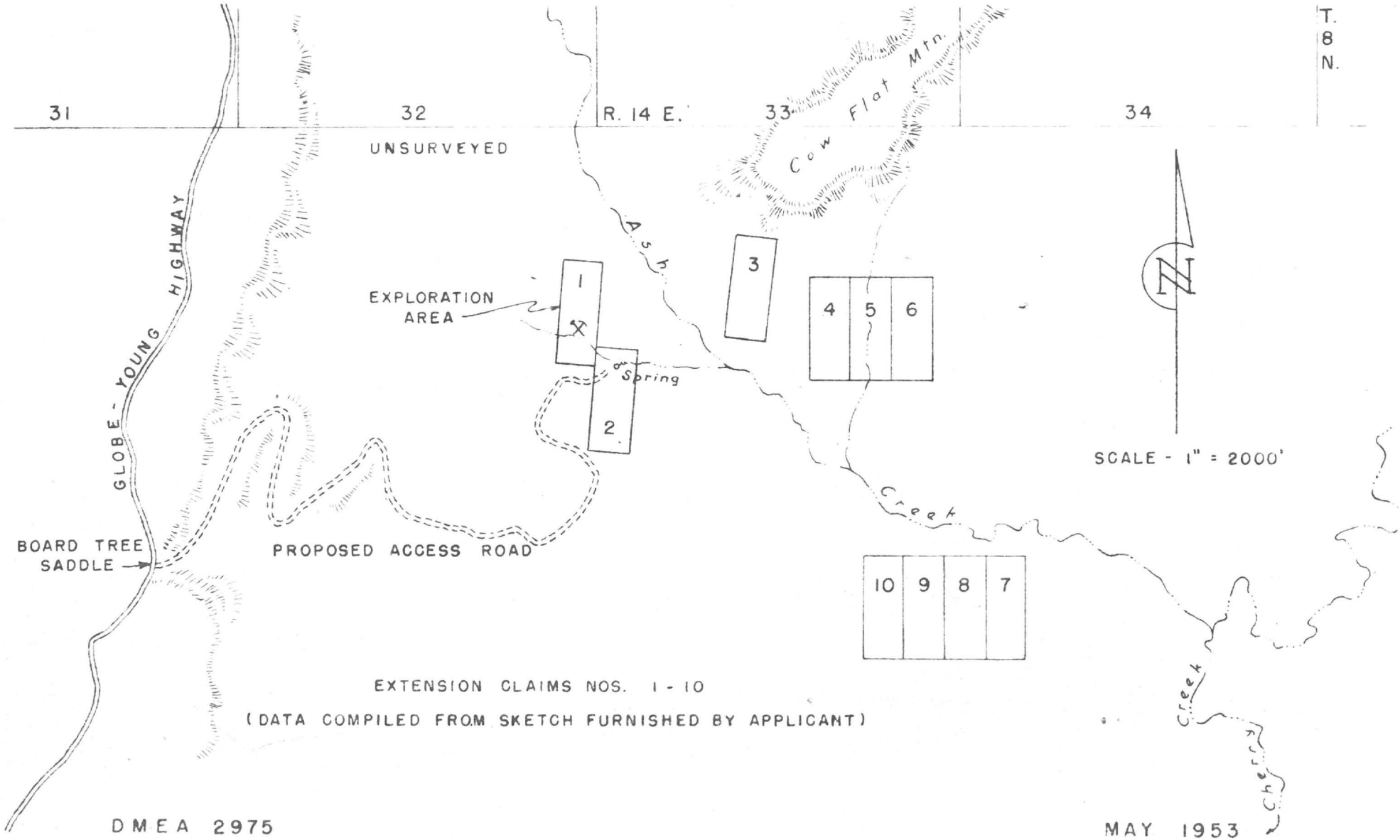


FIGURE 2. - SKETCH MAP OF BORE TREE SADDLE ASBESTOS CO. CLAIMS

GILA COUNTY, ARIZONA

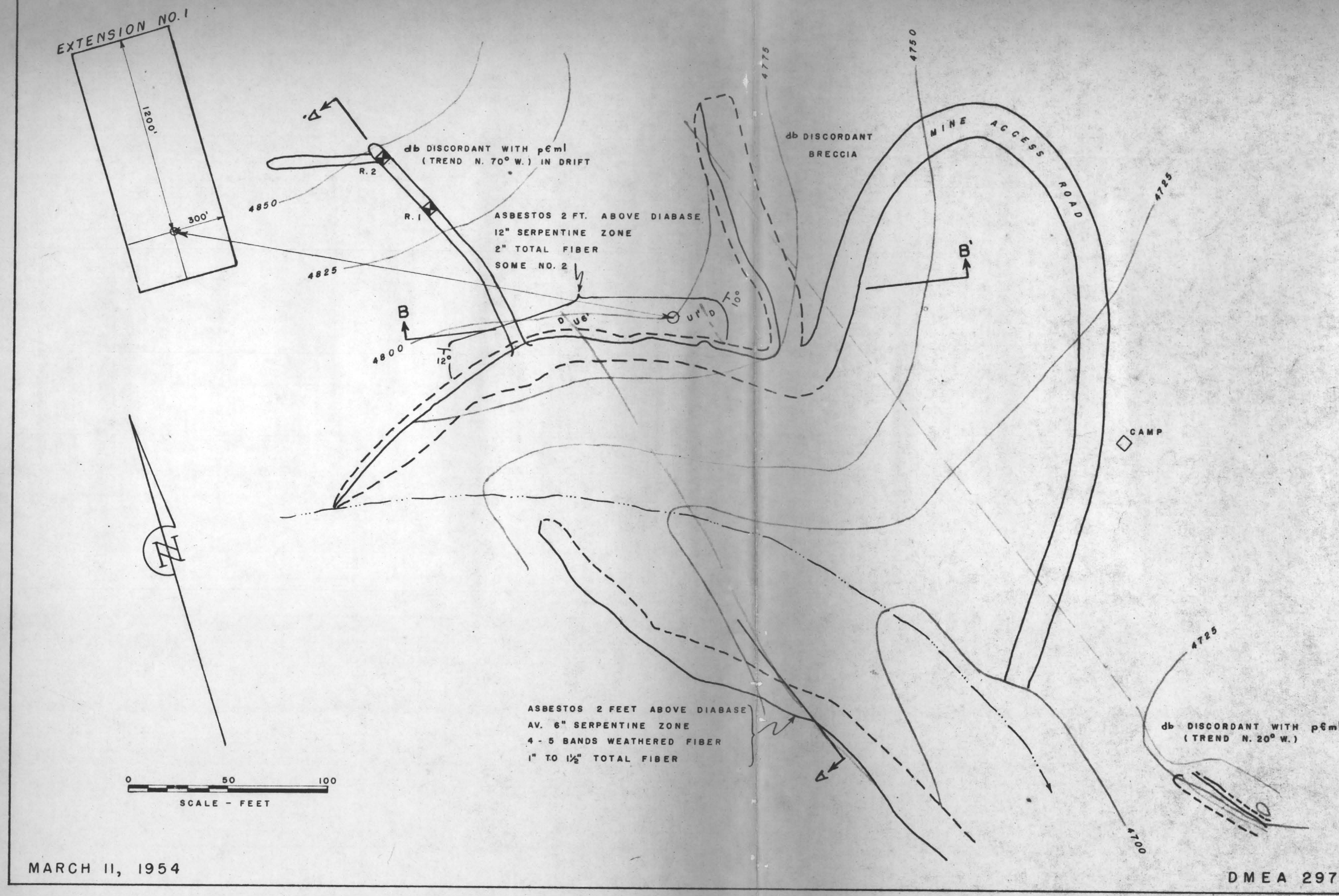


FIGURE 3. - PLAN OF MINE WORKINGS
BORE TREE SADDLE ASBESTOS COMPANY - GILA COUNTY, ARIZONA

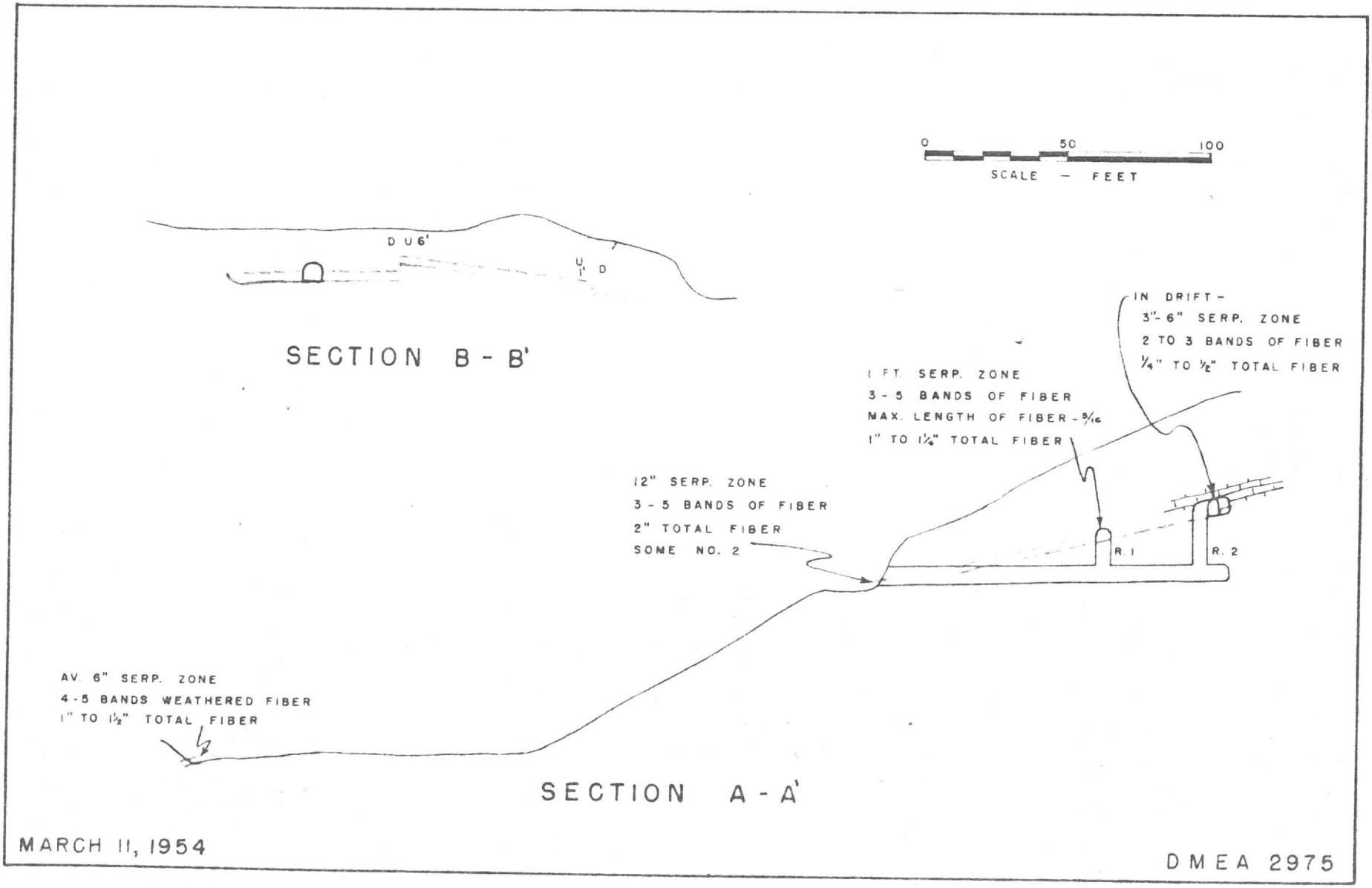


FIGURE 4. - SECTIONS OF MINE WORKINGS
BORE TREE SADDLE ASBESTOS COMPANY — GILA COUNTY, ARIZONA

Arizona
Asbestos

Buckhorn Mine

Summary:

This property is about 12 miles south of Young of which the last 3.2 miles is best negotiated with a 4-wheel drive vehicle. Production is estimated to have been 500 to 1000 tons of long fiber; most of this was probably produced during 1927-'30. Drilling in 1952 under a DMEA project gave average submarginal results although some holes were good enough to warrant 303 feet of diabase adit and a 17-foot raise to better handle the slightly dipping ore horizons. This work resulted in $7,000 fiber production in 1955 but the operation ceased that year. Should asbestos economics improve this property is well set up to begin mining although more drilling should be done for better mine planning. It is inferred that 2,000 metric tons of fiber may be available.

Introduction:

The Buckhorn is reached from Young by traveling 8.5 miles south on the Cherry Creek road (Forest Route 54), then turn left (east), continuing on Route 54 for 2.9 miles to the top of a narrow ridge, the south end of Buckhorn Mesa, where a 0.3 mile spur turns right (east) down a grade to the diabase adit of the Buckhorn. The mine is shown on the Young 15' USGS topog. quad. in the SW/SW of section 30 T8N, R15E. It is about 2 miles by road southwest of the Home and No. 1 mines. The numerous old workings are at an elevation of about 5100 feet. The property is in the Tonto National Forest.

Ownership:

The Buckhorn was one of several properties in the Sierra Ancha district under option to Vance Thornberg and associates doing business as the American Asbestos Cement Corp; they terminated their operations in late 1955 or early '56 and present ownership is not known. Lack of activity indicates the claims are abandoned.

History and Production: (from Stewart and USBM files)

Most of the work was probably done by the Triangle Asbestos Corp. active during 1927-30. More recently, in 1952, under DMEA Project 1093X, 12 diamond drill holes were drilled from the top of Buckhorn Mesa to the diabase about 2 feet below the ore zones. The holes encountered the diabase at 68 to 92 feet. The results were encouraging enough to warrant a 303-foot adit in the diabase. The portal is about 40 feet below the old workings. The bedding dips slightly northwest into the mesa from the workings below the southeast rim of the mesa. This adit was driven in 1954 and a 17-foot raise near DDH#8 encountered the two zones having a total 2½ inches of good quality fiber including some No. 1 grade. It is reported that $7,000 of fiber was mined from here before operations were moved elsewhere. In late 1955 or early '56 Thornberg stopped all work and gave up his options on claims in the Sierra Ancha district.

Geology and Workings:

Two fiber zones about 3 feet apart are about 75 feet below the surface of Bucksin Mesa; the lower zone is 1 to 2 feet above a more or less concordant sill. The bedding dips slightly NW into the mesa from old workings that extend almost continuously for 800 feet along the SE side of the mesa. The fiber zones have been traced for about 1300 feet. Most of the workings extend less than 100 feet into hillside although some

go back about 200 feet. Although some minor fiber is left in the pillars, great effort has been taken to extract fiber by channelling 3 or 4 inches into the serpentine (typical "chloride" mining).

The 303-foot northwesterly adit in diabase, and 17-foot raise to the fiber zones, make the mine more workable as it is doubtful that a new operator would want to work thru the old workings that incline slightly into the hillside.

Potential Resources:

The results of the 12 diamond drill holes indicate that the property is submarginal in that the total fiber is 1 to 2 inches in the better holes. Should asbestos economics improve, and a mill be available, this property would be a nice set up to start mining as the development work (diabase adit and raise) has been done.

It is estimated that a block about 400 feet by 800 feet, about 75% mineable, of 1½ inch fiber of 10% No. 1, 20% No. 2 , 30% No. 3 and the balance shorter grades may be available as an inferred resource (50% probability). Using Stewart's formula of 6.5 short tons per inch per 1000 square feet gives 2340 short tons. Round this to 2000 metric tons.

Conclusions:

If asbestos economics improve, this property should have additional drilling for better mine planning. It appears to be one of the best potential mines in the Sierra Ancha District.

Victor E. Kral
June, 1976

Examined 1/22/76

Attach: Maps 1- 8½ x 11
1- 19½ x 15

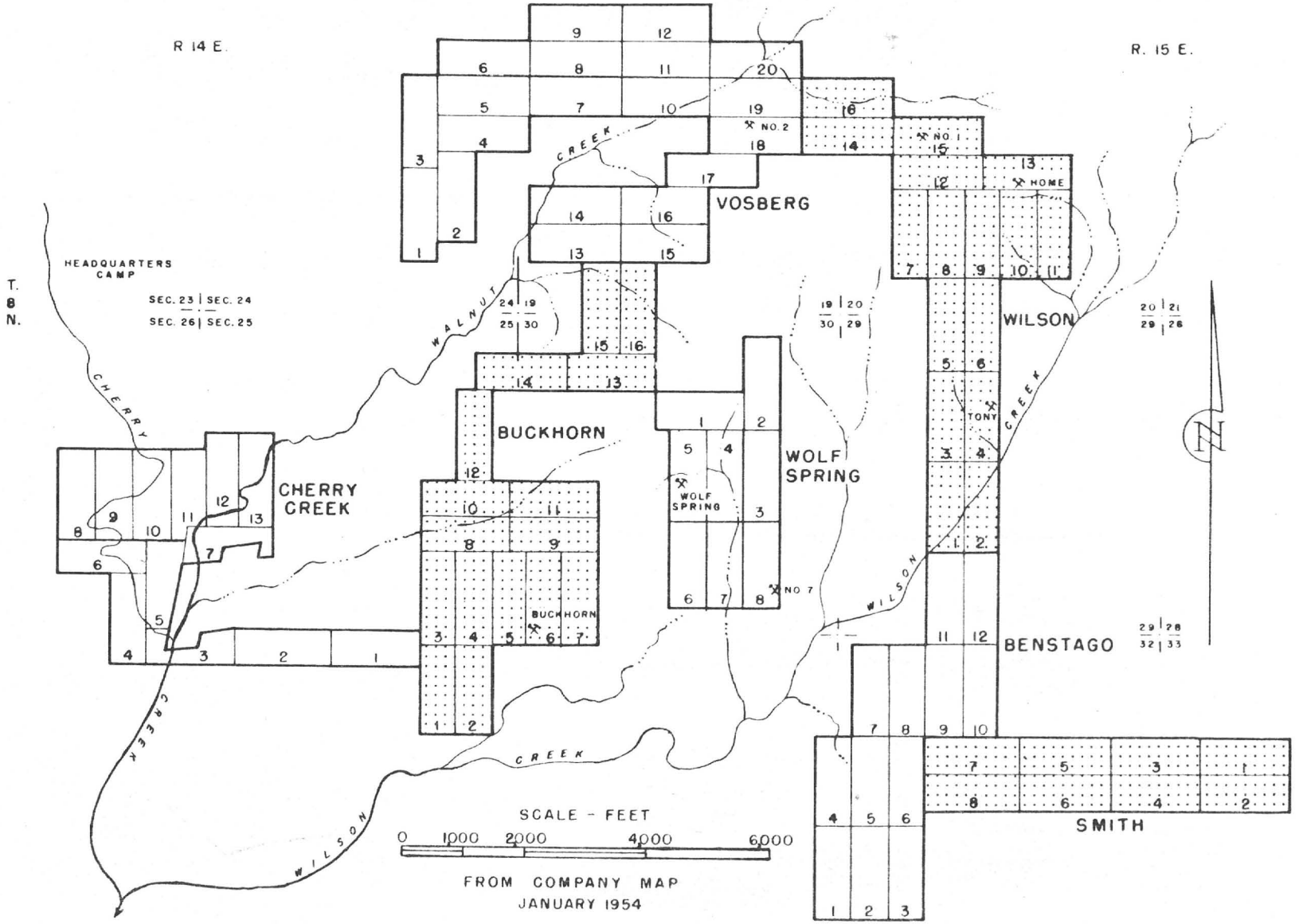


Figure 25. - Claim map, American Asbestos Cement Corp.

Home Mine

Summary:

The Home Mine is situated about 22 miles by road SE of Young; it appears to have been last worked in 1952 and only a few hundred tons of marketable fiber was produced. As the deposits has only about 40 feet of limestone cover over the serpentine- asbestos bed, exploratory drilling would be relatively simple and not expensive.

Introduction:

The Home Mine workings are shown on the Young 15 minute, USGS topographic quadrangle, in the NW/SE of Section 20, T8N, R15E, in the Tonto National Forest. The road log from Young is:

0.0 Young on AZ 288, go toward Heber;

9.0 Bottle Springs, turn south on Forest Route 202;

17.0 Q Ranch on left;

19.5 turn right (west) on Forest Route 54 (jeep trail);

21.5 on mesa, 1/4 east of cabin ruins, faint trail to Home Mine east and #1 mine west;

Home Mine 1/4 mile east, trail now grown in with brush.

The mine can also be reached from Young by taking the Cherry Creek road south 8.5 miles, then turn east on Forest Route 54 and go 5.5 miles to old cabin ruins and trail to Home Mine. The workings are at an elevation of about 5300 feet on the west side of a small mesa cut out by stream drainage. It is doubtful that any work has been done here since 1952, the last described by Stewart. It is assumed that the claims have long since lapsed.

Geology and Workings:

Only the northern adit shown on Stewart's map (attached) is now open, although the southern adit may be entered by crawling over caved limestone debris. The central stope openings are hardly recognizable as such. The limestone bedding is essentially flat and most of the workings are probably accessible by way of the northern adit.

Pillars near the portal contain asbestos as described by Stewart: 12 to 16 inches of serpentine containing 2 to 3 inches of relatively short fiber. Apparently the grade was hardly economical in 1952, otherwise it would not have been left. Stewart states that very little #2 fiber was recovered here, therefore, one must assume that most of it was #3 and lower grade. The workings indicate that production was relatively small.

Stewart mentions a diabase sill about 50 feet below the ore horizon (this was not seen) and two diabase dikes. As the limestone thickness over the ore horizon is only about 40 feet this property lends itself to easy exploratory drilling and possible open cut mining.

Reserves and Conclusions:

With proper milling facilities available, more of the fiber found here would be marketable and the eonomics of this deposit should be better than in 1952. In spite of this assumption, rough calculations of the value of about 20,000 square feet of 2 1/2 inches of fiber assumed to give 1 inch of #3 and 1 1/2 inches of #4 grade results in a value of about $100,000. It is doubtful that the required stoping and processing can be done for this return. It would appear, therefore, that exploration here must find considerable better ore than is now noted and Stewart mentions in his report.

As the diabase sill responsible for the ore is about 50 feet below the ore horizon (Stewart), this appears to be an excellent target for shallow drilling to pick up a lower, better horizon as was the case in the No. 1 Mine 1/2 mile west, possibly associated with the same diabase sill.

Examined
1/9/76

Victor E. Kral
March 1976

Attach: Map 1- 8½ x 11

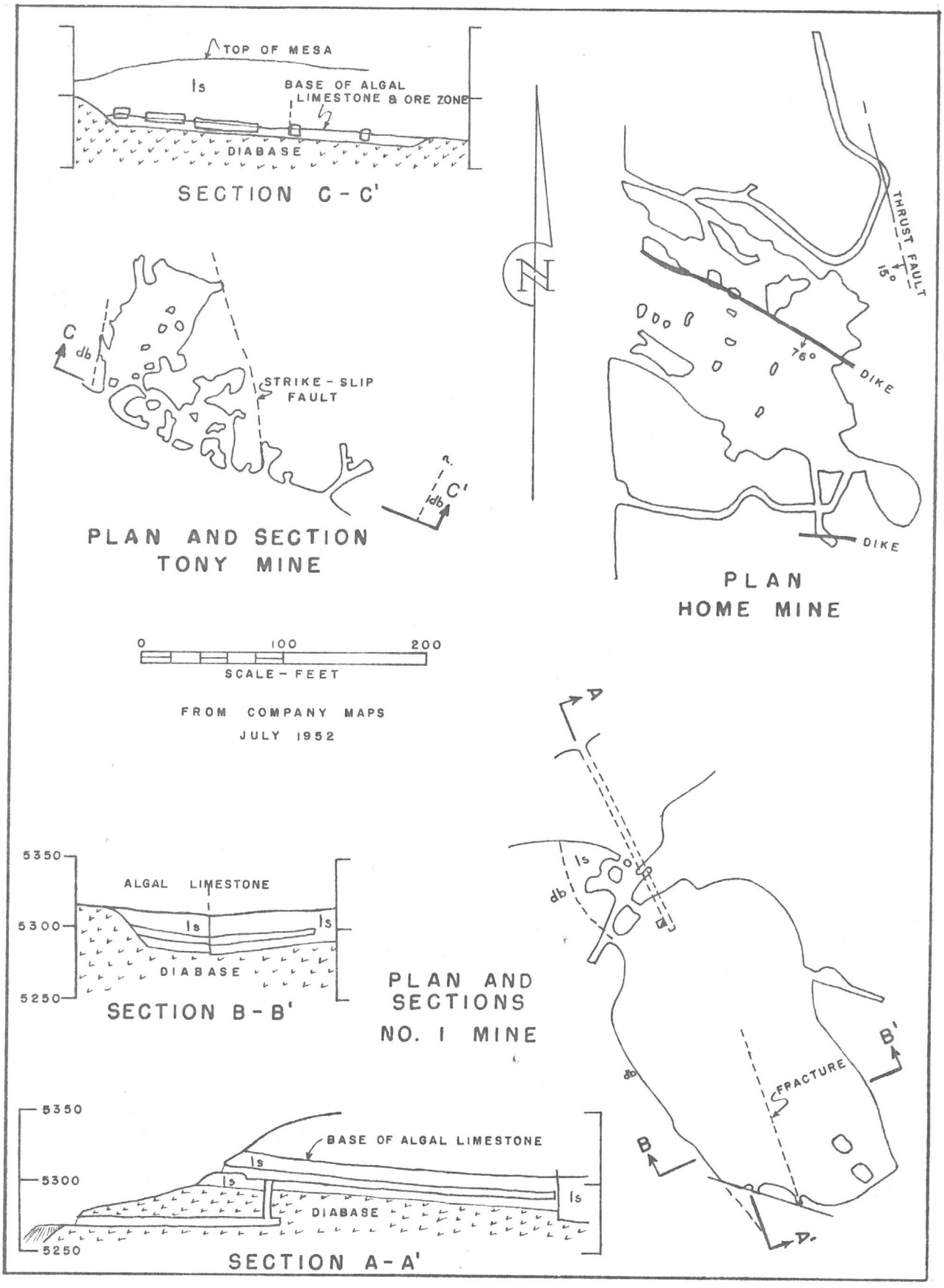


FIGURE 22. - PLANS & SECTIONS - NO. 1, HOME & TONY MINES
AMERICAN ASBESTOS CEMENT CORP.

Kyle's Sloan Creek

Summary:

The Sloan Creek deposits about 25 miles southeast of Young have had a small but consistant production. Bureau of Mines exploration in 1943 was dissapointing; in spite of this, minor production will probably be possible when asbestos economics are favorable. The mineralization is erratic and does not lend itself to projection of potential resources.

Introduction:

This report covers all the Sloan Creek deposits, American Beauty, Blue Jay, Turkey Track, Last Chance, Aileen and Cowboy. The workings of the Last Chance, Aileen and Cowboy were not examined.

The road log from Young to these properties is:

0.0 Young travel toward Heber

9.0 Bottle Springs, turn south on Forest Rte #202

17.6 Q Ranch on left

19.8 Forest Rte #54 right to Cherry Creek

23.5 Rurn left on Forest Rte #127

24.5 Road left 1/2 mile to Kyles camp

24.8 End of present road between Blue Jay and Turkey Track deposits.

The American Beauty, Turkey Track and Blue Jay deposits

are in the NW/SE of section 27, T8N, R15E and are shown on the Young 15' USGS topog. quad. at an average elevation of 5200 feet.

The Last Chance deposit is in the SE/SE of section 27, T8N, R15E at an elevation of about 5200 feet; it is also on the Young 15' quadrangle. The workings are reached by walking down Sloan Creek from the Blue Jay but can probably also be reached by a road southeasterly from the Kyle camp.

The Aileen and Cowboy deposits are in the N/2 of NW/4 of section 35, T8N, R17E, on the McFadden Peak 15' topog. quad. at elevations of 5000 to 5100 feet. These properties are probably reached by the road southeasterly of Kyles camp.

Ownership:

All these Sloan Creek deposits are claimed by William Kyle, 704 E. Sycamore, Globe, AZ, 85501, phone (602) 425-2974.

History and Production:

Stewart states that Roger Kyle and Earl Pierce located claims here in 1916. He adds that a small but consistent production has been made since 1916.

In March 1943 the U. S. Bureau of Mines did 416 feet of drifting in three adits, two on the Cowboy totalling 127 feet, and 289 feet in one drift on the Last Chance.

Stewart states that some production was coming from the Aileen in 1954, however, total production from the Sloan Creek deposits is not known.

Geology and Workings: (from Stewart and Bureau reports)

The Aileen and Cowboy are on the edges of a mesa underlain

with a thick diabase sill; at the Aileen this sill is 15 feet below a productive fiber zone several feet below the algal formation. Another serpentine band nearer the algal has no fiber. At the Cowboy two zones are 2 and 7 feet below the algal, the upper zone is not productive. A pocket of 1 to 3-inch asbestos near the surface was mined in 1928. A 10-foot adit explored this "bonanza" area and the Bureau extended this drift 27 feet with no success. On the strength of favorable geology, an adit was driven 100 feet; the serpentine zones were found to be barren.

The Last Chance had several stopes on fiber totalling as much as 1½ inches. The Bureau tried to find a southern extension with a 289 - foot drift, however, the exploration found only minor asbestos veinlets that finally pinched out. The Last Chance diabase appears as a sheet over part of the hill and connects with a major cross cutting dike parallel to the canyon. Fiber did not increase near this intrusive.

The Turkey Track fiber zone with only minor asbestos noted strikes about SW and dips 15° NW into the hill. It appears that a diabase discordancy leaves only a wedge of limestone.

The American Beauty workings are directly below the algal formation and extend as much as 250 feet to the NE into a mesa like area having only about 40 to 50 feet of limestone over the workings. It appears that a wide diabase discordancy would cut off the limestone about 300 feet northwest of the portal.

This area needs careful structural mapping, looks like several hundred feet vertical displacement here.

The Blue Jay workings are across the canyon east of the American Beauty and Turkey Track. A diabase discordancy was noted just east of the workings but what other diabase is responsible for the fiber is not known. The area was extensively worked but little fiber remains to indicate what was available. Much of the western work is in very blocky limestone which caved. The eastern work consists of at least six adits in about 200 feet, with extensive stoping, some 2 inches of fiber was noted in some pillars.

Potential Resources:

It may be expected that small amounts of fiber could be found in the future, however, the area is too broken up, particularily at the west and, to expect any appreciable production. As is the case with much of the Sierra Ancha District, if the economics are good, and regulations will allow small operations, minor production may be expected.

No potential resources can be projected.

Victor E. Kral
June, 1976

Western Part Examined
5/11/76

Attach: Map 1- 8½ x 11
Photos 1 sheet

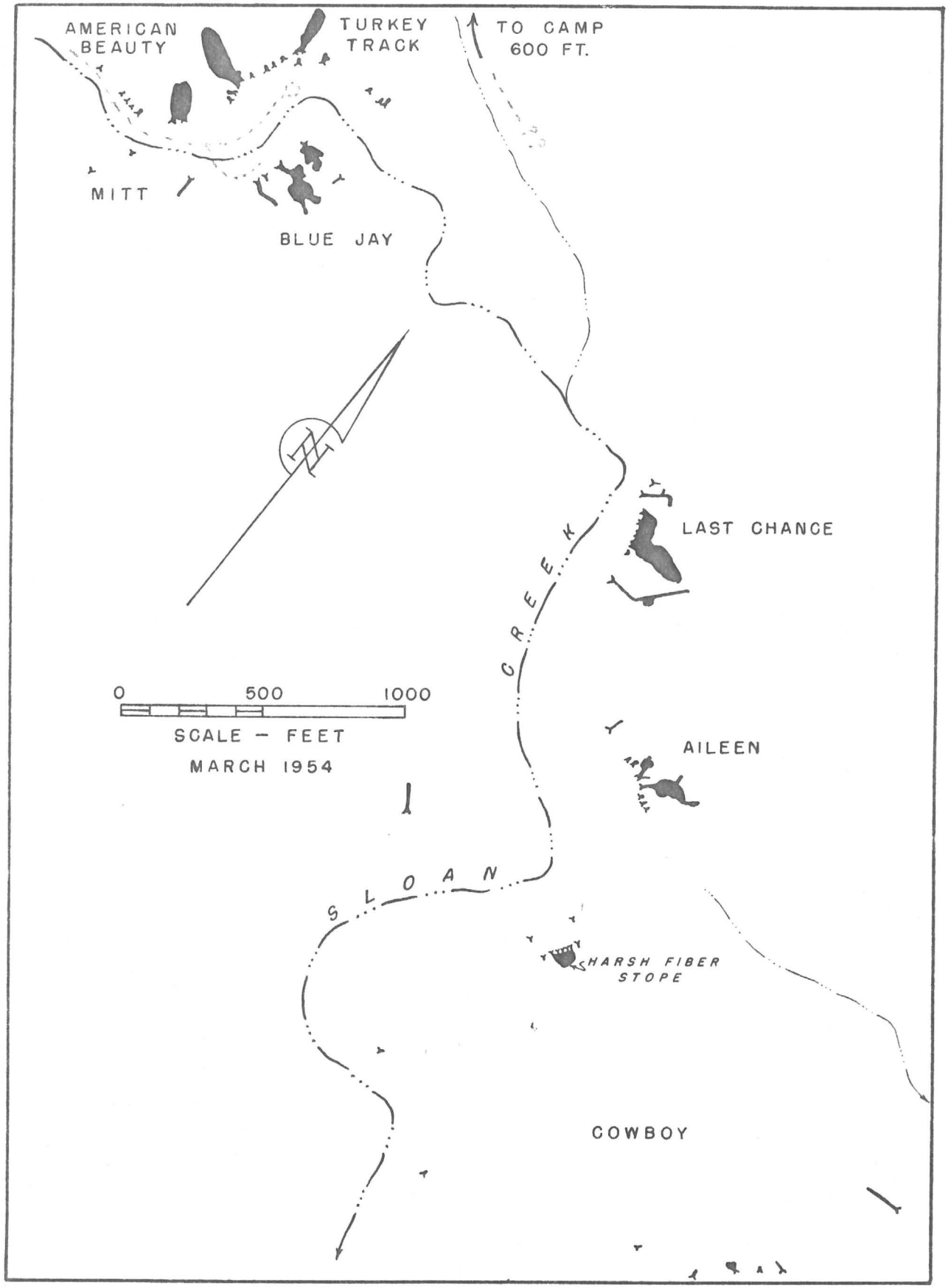


FIGURE 27. - SKETCH LOCATION MAP
WORKINGS OF SLOAN CREEK GROUP

May Mine

Summary:

Proper data to find the mine were not available at the time and it could not be found; the May mine has not been visited. The mine is about 29 miles southeast of Young, 20 miles south of Bottle Springs on the Young - Heber road and 2 miles south of the American Fiber Co. mill where the ore was processed. The property was opened in 1952 and probably operated more or less continuously until the mill burned in about 1961.

The ore zones are underlain by a diabase sill with a discordancy across the fiber zones at the portals of the adits; this appears to control the ore and mineralization may be less intense as mining progresses into the hill; the mine may be essentially worked out. Study of additional data and possibly a visit to the mine will be necessary to resolve this.

Introduction:

The May mine is near the old Rock House Ranch shown on the McFadden Peak 15' USGS topog. quad. at an elevation of about 5200 feet in the SW/NE of section 22, T7N, R15E. The May mine is about 29 miles southeast of Young and is on Forest Route #202 about 20 miles south of Bottle Springs on the Young - Heber road. It is about 2 miles south of the site of the American Fiber Co. mill where its fiber rock was treated.

An unsuccessful attempt to find the May mine was made. Proper data on the property was not found until later and the

mine was not visited. Data now available give a very accurate location. If the deposit is visited later this report will be updated.

Ownership:

The claims in the May mine area are reported to be owned by Kenneth Hammes of Sedona, AZ, doing business as the Pan American Fiber Corp.

History and Production:

Stewart states that the May mine was opened in 1952 and apparently it produced more or less continuously until about the time the mill burned in 1961. No estimate of production can be made.

Geology and Workings: (largely from Stewart)

Four fiber zones are found; the upper two are about 1-foot apart and have been too unimportant to mine. The third and fourth zones are 6 and 9 feet below the upper band. The workings carry the third zone at the top of the stope. The total fiber in each of the lower zones is 1½ to 3 inches or more and averages about 2 inches for each zone. Much of the fiber is of #1 length.

The concordant sill underlying the asbestos zones rolls upward on the south side of the hill at the portals of the adits. The mineralization near the diabase contact at the portals is greatest and decreases in intensity away from the discordancy.

The Montezuma is another mine adjacent to the May and believed to be on the same fiber zones except that the mineralization appears to be in the upper two zones.

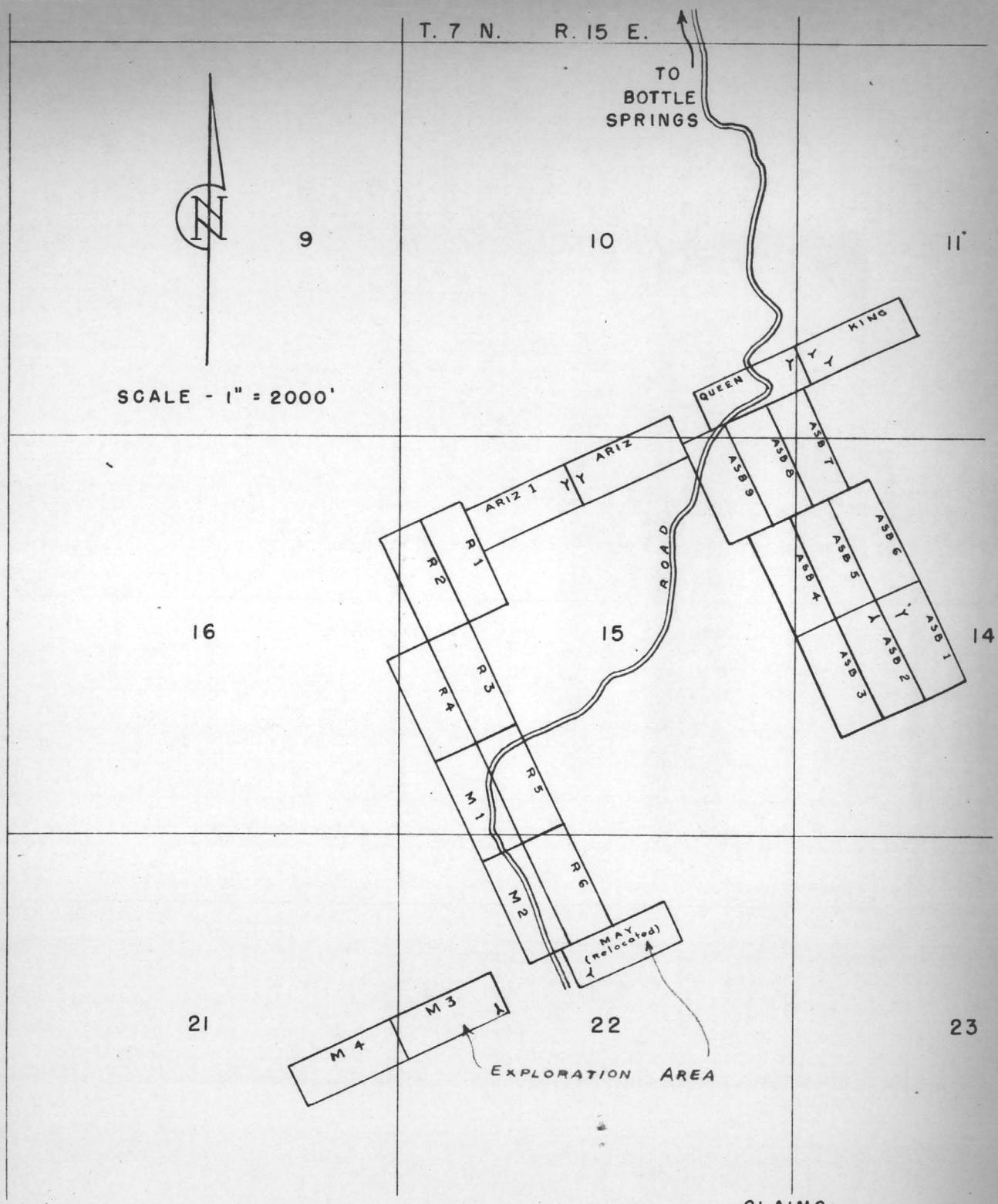
Potential Resources:

From the data now available it appears the discordancy may have a major bearing on the mineralization. If this is so, and mineralization becomes lessor as stoping progresses into the hill, away from the discordancy, the mines may be essentially worked out.

Many more data are available on these properties, until they are analyzed and the property is probably visited, one must assume that no potential resources can be projected.

Victor E. Kral
June 1976

Attach: Maps 2- 8½ x 11



CLAIMS:

ARIZ	-	ARIZONA
ASB	-	ASBESTOS
M	-	MONTEZUMA
R	-	ROSE

COPIED FROM DOCKET MAP

DMEA 2789

FIGURE 2. - CLAIM MAP - AMERICAN FIBER CORP.
GILA COUNTY, ARIZONA

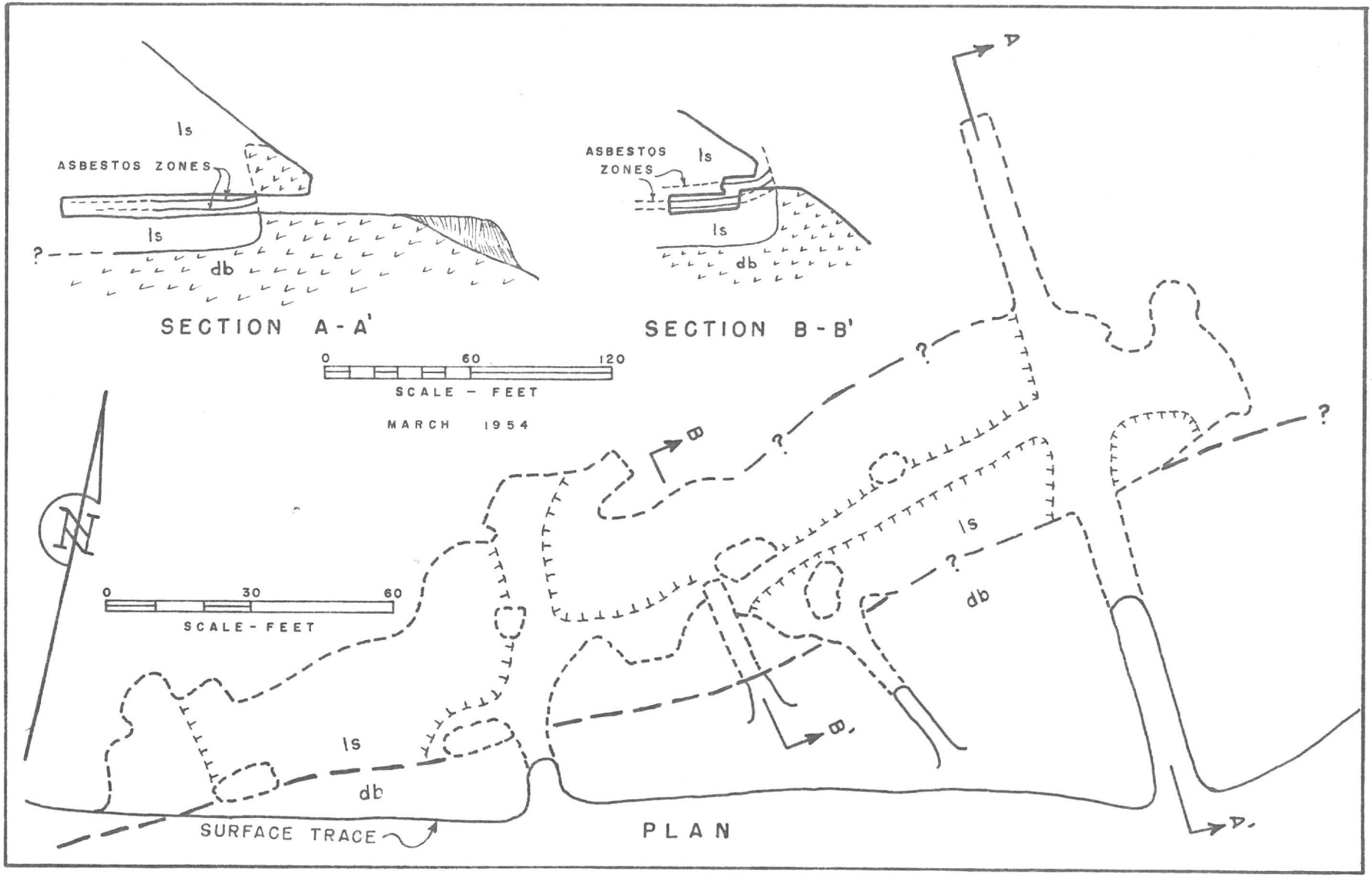


FIGURE 30. - PLAN AND SECTIONS - MAY MINE - AMERICAN FIBER COMPANY

Arizona
Asbestos

No. 1 Mine

Summary:

The No. 1 mine situated about 22 miles SE of Young by way of Bottle Springs and the Q ranch or 14 miles by way of Cherry Creek and Forest Route 54 is about 1/2 mile west of the Home mine. It apparently was last worked in 1951 and most production came from the lower of two serpentine - asbestos zones above a diabase sill. The sill cuts off the ore to the SW, it pinches to the NE and is cut off by a fault to the SE. Between these bounds the mine was worked out and the pillars pulled. Drilling 80 to 150 feet from the surface could explore the area SE of the fault.

Introduction:

The mine is just north of an old cabin and ruins shown on the Young 15 minute USGS topographic quadrangle, in the SE/NW of section 20, T8N, R15E. It is about 1/2 mile NW of the Home mine and is in the Tonto National Forest. To reach the property from Young travel about 9 miles on the Heber road (State Route 288) to Bottle Spring, turn south on Forest Road 202 about 10.5 miles (2.5 miles past the Q Ranch), turn right (westerly) on Forest Road 54 (a Jeep trail) and 90 about 2 miles to a faint trail crossing about 1/4 mile east of an old cabin and ruins. From the trail crossing walk west about 1/2 mile down a washed out trail to the lower adit in diabase. The upper workings are only a few hundred feet

NW of the cabin but the trail is indistinct. The upper work, containing the serpentine - asbestos zone, is at an elevation of about 5300 feet on the north slope of a mesa separated by a small ravine from the Home mine mesa to the east. It is assumed that the claims have long since lapsed.

Geology and Workings: (from Stewart)

(Pillars have been robbed, the mine is caved and dangerous) The limestone dips SE into the mesa at 5°; this necessitated the lower adit and raise in diabase to properly mine the asbestos. Ore was mined from two horizons a few feet apart, the lower and most productive found during later work. Both zones are cut off by the diabase sill on the SW and pinch out to the NE. The serpentine - asbestos terminated at a fault to the SE and the mine was worked out.

Apparently no work was done SE of the fault, probably because mining near the fault was already too far from the raise, as indicated by Stewart's plan and sections.

Reserves and Conclusions:

As stated, the mine is worked out, however, drilling from the surface to explore the area SE of the easterly fault may be feasible. It is estimated that such drilling would be to depths of 80 to 150 feet. Should ore horizons be found the mining may be better handled from the east or SE sides of the mesa.

Victor E. Kral
March 13, 1976

Examined 1/22/76

Attach: Map 1- 8½ x 11

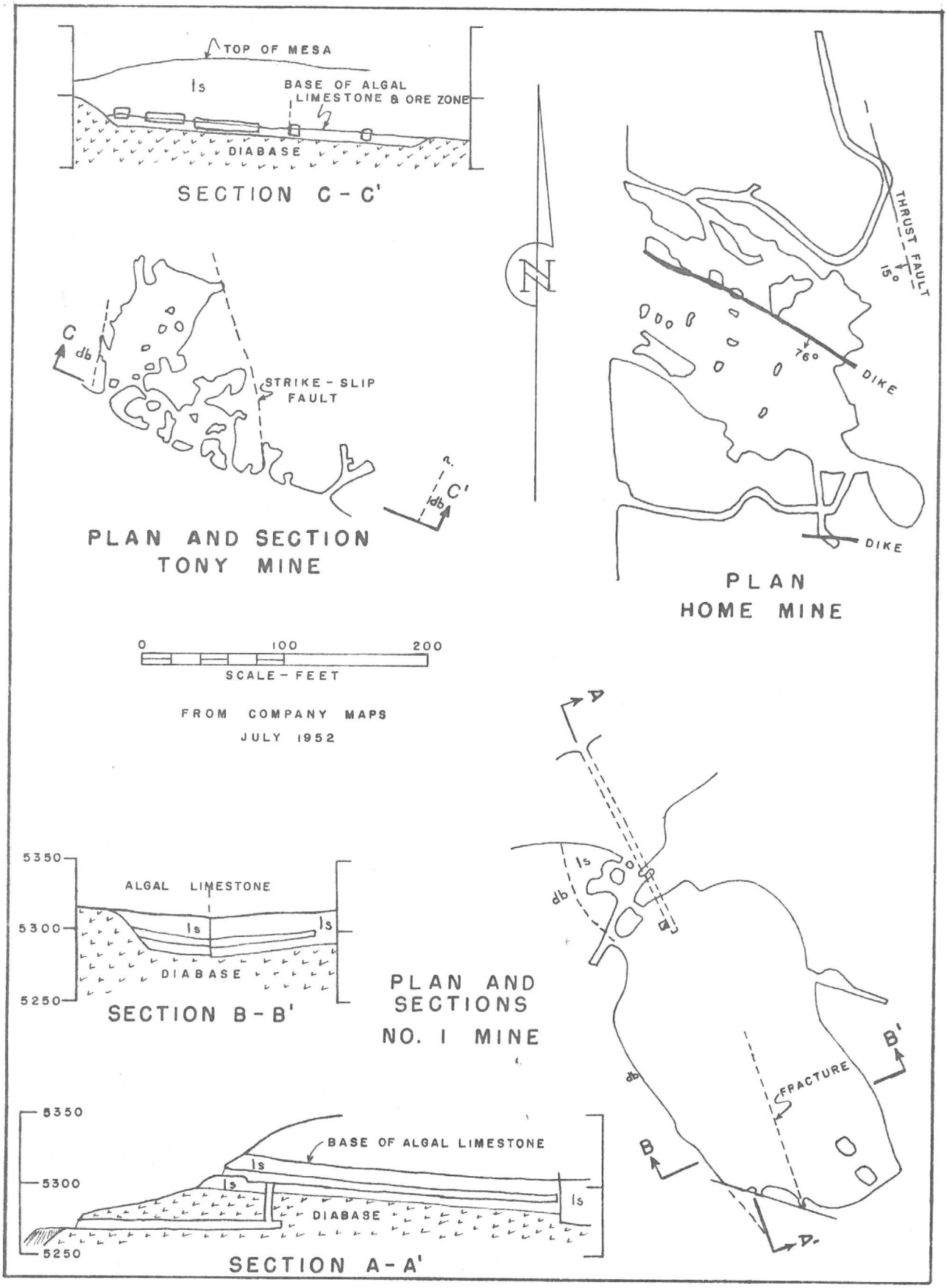


FIGURE 22. - PLANS & SECTIONS - NO. 1, HOME & TONY MINES
AMERICAN ASBESTOS CEMENT CORP.

No. 2 Mine

Summary:

The No. 2 Mine is 14.5 miles southeast of Young and about 6.5 miles east of the old American Asbestos Cement Corp. mill. The property has about 300 feet of workings that probably resulted in a fair return in fiber. Last production from here was probably in late 1955 when about $7000 to $8000 of fiber was mined in a very short time. No projection of potential resources is justified.

Introduction:

The No. 2 mine of the American Asbestos Cement Corp. is about 14.5 miles southeast of Young. It is reached by taking the Cherry Creek road (Forest Rte #54) 8.5 miles south from Young, then turn west about 4.9 miles to an old cabin on the right and a faint trail left, turn left about 1 mile to the property, the last half mile may be too rough for even a 4 wheel drive vehicle. The workings are in the SW/NE of section 19, T8N, R15E; they are shown on the Young 15' USGS topog. quad. at an elevation of 5850 feet.

Ownership:

The ownership is unknown; the claims may be abandoned as no evidence of activity was noted.

History and Production: (from Stewart and Bureau reports)

A small but important production was probably made from here. In addition to Stewart's notes on stopes and fiber in pillars, about $7,000 to $8,000 was mined from here in a short period at the end of 1955 (after Stewart's examination).

Reynolds Falls

Summary:

This property is 52 miles north of Globe, the last 4 miles up Reynolds Creek is usually negotiable with 2-wheel drive vehicles.The elevation being 6300 feet and terrain rough, winter poses problems.

Total production has been 200-300 tons as estimated from stoped area. The total fiber is about 2 to 6 inches largely in the middle zone of three zones found. Bureau exploration, 90 feet of stope cross-cutting, found good fiber largely mined since the 1943 work.

It is estimated that about 1000 tons of inferred ore of grade similar to Bureau sampling may be available. Although future mining may consider a lower working adit consideration should be given to modifying the present workings to allow hoisting up the 4° incline and mining horizontally off this haulage way.

A potential resource of about 1000 tons may be inferred here.

Introduction:

The property is 52 miles north of Globe and 4 miles up Reynolds Creek from the Globe - Young road. It is near the junction of Reynolds Creek with the South Fork tributary. The principal adit is in the NW/SW section 21, T6N, R14E, at an elevation of about 6300 feet on the M^{c}Fadden Peak 15' USGS topog. quad., in the Tonto National Forest. The road directly to the principal adit and mill remains is barely negotiable by a 2 wheel drive vehicle. One cabin remains at the old camp.

Ownership:

The property is owned by Carley "Rusty" Moore of Globe, phone

(602) 425-9400; however, in early '76 it was optioned to Wyoming Minerals (Westinghouse Corp) for its uranium potential in the Dripping Springs quartzite.

History and Production: (largely from Stewart)

The first activity here was in 1917 and some shipments were made in 1924 and 1928; a small mill was then installed and minor production made. Considerable production was made in the thirties. In 1943 the USBM conducted an exploration program and minor production was made into the fifties. Later, arrangements were made for a DMEA loan to drive a lower adit, however, the asbestos market dropped and plans were cancelled. Only minor production has been made in recent years from fiber zones above the water. Considering the size of the stoped area, the total production has been only a few hundred tons.

Geology and Workings:

This is a pine forest area of heavy overburden and out crops are few, however, Stewart notes a thick concordant sill about 65 feet below the fiber zones. He finds some evidence that the mineral is just below the algal member which does not have the characteristic algal structure.

Stewart states that the fiber occurs in three general zones over a distance of 9 to 11 feet; most production has come from the middle zone with three bands, the upper band being the principal producer contains 1 to 4 inches of total fiber.

The only mine adit is on the west side of the South Fork about 1000 feet southwest of its confluence with Reynolds Creek. The portal is only a few feet above the creek bed and during the spring of the year drains a small amount of water. Due to the 4° westerly dip of the beds

the workings are flooded except near the portal. A rough estimate of the workings on Stewart's map indicates about 6000 square feet of almost solid stoping. The inclined adit is about 300 feet into the hill and maximum stope width is about the same distance. Obviously the problems of water and raising the ore have made mining more difficult. The general layout of the topography allows a lower adit.

The remains of a small mill using a crusher, two sets of rolls and shaking screens is still on the property.

Potential Resources:

At most, this property produced about 300 tons of fiber under somewhat adverse conditions. Nothing in Stewart's comments or the Bureau's reports on its work in "43" indicates that the fiber deminishes with depth into the hillside. It is felt, therefore, that considerable more fiber may be available than has been mined. The workings show no exploration other than that conducted by the Bureau, and much of the ore opened by that work has been mined. It must be assumed that previous mining was in those areas containing the best fiber, and a more efficient mining system would allow mining in the few fringe areas that have been by-passed. It is felt therefore that about 1000 tons of reserves can be inferred (50% probability) at the same grade as the Bureau samples. This is not based on any calculations, it is merely an inferrence that about four or five times the area that has been stoped can yet be stoped.

Conclusions:

This is one of the deposits in the entire Arizona asbestos area that seem to have real potential. It has not been mined out because it poses a

minor mining problem as well as a weather and access problem. This terrain at 6300 feet elevation is not readily worked in the winter; it is doubtful that any such attempt has been made. Although a lower adit to simplify the removal of ore and waste was considered, and should be considered for future mining, the inevitable environmental impact problem arises. A lower working adit system requires space for more waste rock than the present system, space for such waste may be a problem, although it is believed to be there. Mining will not allow dumping into a stream bed whereby each spring runoff removes last year's waste, as has been done.

An alternate may be to continue using the present workings, modified to allow a method of hoisting cars up the 4^{o} slope. Mining could then be done on the strike of the beds with ore and waste moved horizontally to the main haulage incline. Even in such case, arrangements must be made to either get the waste across the south fork or tram laterally along the hillside to better dump space.

Examined 5/10/76

Victor E. Kral
June 1976

Attach: Map 1- $8\frac{1}{2}$ x 11
Photos 1 sheet

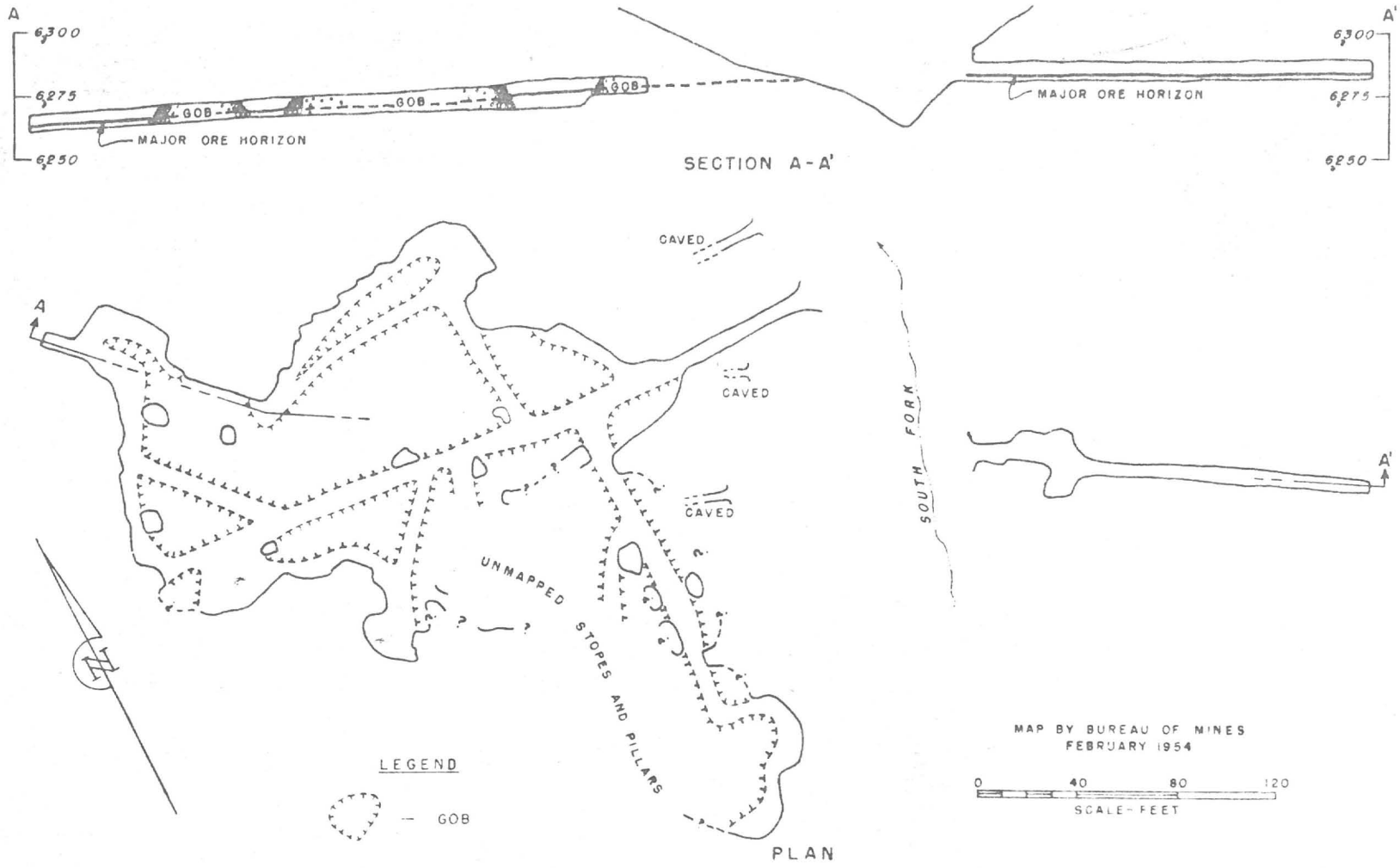


Figure 29. - Plan and section of Reynolds Falls mine.

Rock House Group, North End

Summary:

The North End of the Rock House group has several minor occurrences near the millsite and old camp. The first mill was erected in 1928 and removed in the thirties. The second mill (American Fiber Co.) was erected in 1952 and operated on fiber from mines about two miles south until it burned in about 1961.

Of the four occurrences here none have potential resources, although one had some production.

Introduction:

The so called North End occurrences of the Rock House Group are near the American Fiber Co. millsite which is 26.6 miles southeast of Young, in the SW/SW of section 11, T7N, R15E, and is shown on the 15' McFadden Peak USGS topog. quad. as two adits. The prospects are at an elevation of about 5100 feet and are in the Tonto National Forest.

The road log from Young would be: (0.0)Young on AZ288, go toward Heber - (9.0) Bottle Springs, turn south on Forest Route #202 - (17.0) Q Ranch on left - (26.6) Old Camp, 3 bldgs. and millsite.

Ownership:

These asbestos claims were apparently abandoned as they have been overstaked recently by claims for uranium. New claimants are unknown.

History and Production:

Stewart states that the earliest claims were located here in 1915 by Earl V. Pierce; the properties were still in the family after Pierce's

death in 1953. The first mill was erected in 1928; the foundations are still in evidence. Activity ceased during the depression and the mill was later moved to the Emsco in the Salt River area. A small fiberation mill was erected in Young about 1950 by the Bottle Springs Asbestos Co. who later became the American Fiber Co. In 1952 the May deposit, about 2 miles south of the old millsite, was opened and the rock was milled at the American Asbestos Cement Corp. mill 9 miles south of Young. In 1952 the American Fiber Co. mill was erected alongside the old millsite by Ed Towne of Globe and production was apparently maintained from the May mine area until about the time the mill burned in about 1961. It is estimated that about 1500 tons of asbestos mill tails remain here and may be of use in place of lower grade fiber.

The production from the four or five occurrences near the mill would be small and nearly negligible.

Geology and Workings:

Across Lacey Forks canyon to the north is a hill or mesa with a 900-foot dozer cut along the south and southwest side exposing traces of fiber. The best noted was about ½ inch in three short adits at the east end of the cut. The fiber zone is underlain by a diabase sill that becomes discordant at the west end (Stewart notes a similar discordancy at the east end).

About 200 feet east of the mill site and on the same side of the canyon are twin adits about 30 feet apart with connecting workings. The stoping is solidly backfilled but the portals show about 3 inches of harsh fiber. It may be assumed that much of the fiber removed was of good grade (surface exposed fiber is usually harsh). Stewart states that an area

about 80 by 80 feet has been explored, part of which has been mined.

Stewart mentions a prospect about 1100 feet southeast of the twin adits that shows about ½ inch of fiber at best. This occurrence was not visited.

He also mentions an occurrence of no importance 200 feet west of the mill that was not noted.

About 600 feet southwest of the mill is a 300-foot dozer cut and short caved adits exposing fiber zones dipping SE into the hill. About 1 inch of semi-harsh fiber was the best noted.

About 1500 feet southwest of the mill and 150 feet west of the road is a small dozer bench with two short adits, caved and dangerously blocky. About 1 inch of semi-soft fiber in 6 inches was noted. Stewart mentions that the fiber he noted pinched out inside the workings.

Potential Resources:

These occurrences have no potential resource.

Victor E. Kral
June 1976

Examined 6/5/76

Attach: Map 1- 8½ x 11
Photos 2 sheets

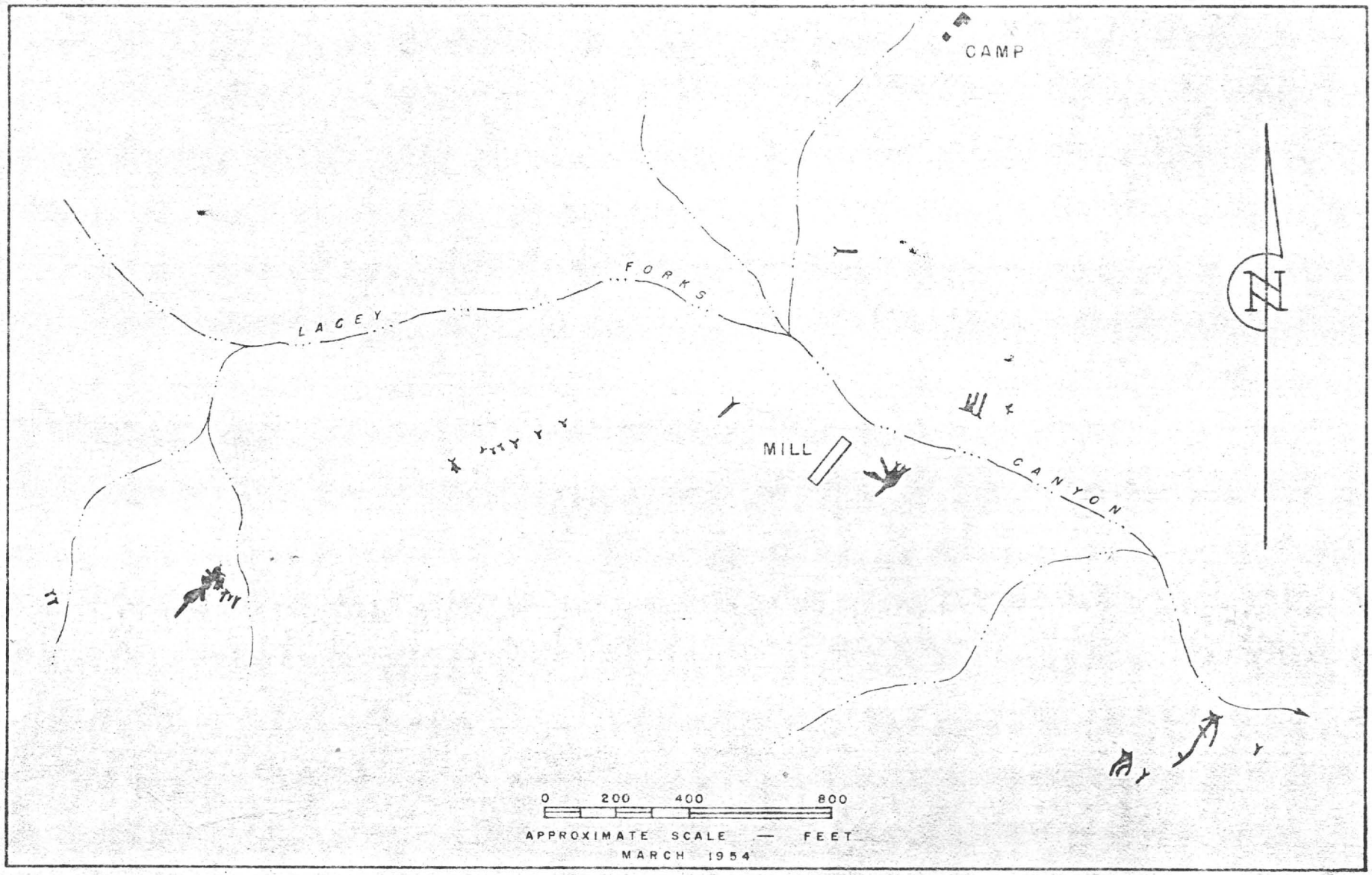


FIGURE 29. - SKETCH LOCATION MAP - NORTH END ROCK HOUSE GROUP
AMERICAN FIBER COMPANY

Arizona
Asbestos

CHROME BUTTE PROSPECT

The Chrome Butte Prospect is situated in the NW-NW-NW of Section 8, T. 1 N., R. 16 E., G. & S.R.M. Access is from the north or south. To the south, a jeep trail leads from the property to US 60 near the Wheeler Landing Field. At the time of this examination (1-9-76) the gate near the west ¼ corner of Section 18 was locked. Access may be had from the north via a jeep trail which branches east from US 60 1.0 miles (1.6 km) north of the Cammerman Wash bridge. About 0.6 miles (1 km) after leaving the highway the road forks. The right (south) fork continues in a southerly direction down the crest of a ridge for about 0.5 miles (0.8 km), then turns SE for about 0.7 miles (1.1 km), ending at an asbestos prospect in the SE-SE of Section 6. From this point the Chrome Butte Prospect is 1500 feet (457 m) southeast. The property is shown on the Cammerman Wash 7½' quadrangle.

The deposit is on the west edge of the San Carlos Apache Reservation, about 100 feet (30 m) from the boundary fence. Across the fence to the west is the G & H Number 2 Prospect. Elevation of the property is about 4220 feet (1286 m).

In the prospect area the Mescal Limestone strikes N 45-70 W and dips 25-35 SW. Two fiber zones were noted above a diabase sill. The lowest, occurring 5 feet (1.5 m) above the contact, is about 8 inches (20 cm) thick and contains up to 2 1/2 inches (6 cm) of semiharsh fiber up to 3/8 inches (1 cm) long. A second zone 16 inches (41 cm) above the lower zone is 2 to 3 inches (5 to 8 cm) thick and has 1/4 to 1/2 inch (0.6-1.3 cm) of fiber up to 1/4 inch (0.6 cm) long.

An inclined adit was driven S 70 W a distance of about 80 feet (24 m). The adit was mined to an average width of 20 feet (6 m). The back was slabby and unstable and the workings were not mapped. Fifty feet (15 m) southeast of the workings the diabase cuts discordantly upward through the

limestone, terminating the favorable beds.

Mineralization on the prospect is terminated by topography on the north and south, by structure on the east, and by the reservation boundary on the west. It is doubtful if the property could be developed except as a part of the adjacent G & H Number 2 property, which is itself not particularly promising.

REFERENCES:

Bromfield, C.S., and Shride, A.F., 1956, Mineral resources of the San Carlos Indian Reservation, Arizona: USGS Bull. 1027-N, p. 672-673.

Stewart, L. A., 1955, Chrysotile-asbestos deposits of Arizona: USBM Information Circular IC 7706, p. 106-107.

This property is 9.1 miles by road NE of Globe

R. C. Goodmundson
Jan. 1976

Arizona
Asbestos

G & H NO. 2 PROSPECT

The G & H No. 2 Prospect is situated in the NE-NE-NE of Section 7, T. 1 N., R. 16 E., G. & S.R.M. Access is from the north or south. To the south, a jeep trail leads from the property to US 60 near the Wheeler Landing Field. At the time of this examination (1-9-76) the gate near the west ¼ corner of Section 18 was locked. Access may be had from the north via a jeep trail which branches east from US 60 1.0 miles (1.6 km) north of the Cammerman Wash bridge. About 0.6 miles (1 km) after leaving the highway the road forks. The right (south) fork continues in a southerly direction down the crest of a ridge for about 0.5 miles (0.8 km), then turns SE for about 0.7 miles (1.1 km), ending at an asbestos prospect on the north end of the property. From this point the main workings are about 1200 feet south. The property is shown on the Cammerman Wash 7½' topographic quadrangle.

The deposit is situated on a north-facing ridge which is underlain by a diabase sill. About 1600 feet of bulldozer cuts have exposed units of the Precambrian Mescal Limestone which strike N 64 W and dip 24 SW. Two short adits, shown on the topo map, were driven into the ridge. The eastern adit was driven S 15 W a distance of about 20 feet. It followed a 1-inch (2.5 cm) thick fiber zone which pinched out about 5 feet (1.5 m) from the portal. The west adit was driven S 5 W a distance of 25 feet. No fiber was observed in this adit, although about 10 feet (3 m) to the west thin, discontinuous veinlets of harsh fiber extend a few feet from a one foot (0.3 m) diabase dike.

About 1200 feet (366 m) north of the adits, across an arroyo, a low hill capped with Mescal Limestone is underlain by diabase. It has been prospected by two bulldozer cuts. No serpentine was observed in the lower cut. In the upper cut, two fiber zones were observed. Each zone contains about 1½ inches (4 cm) of harsh fiber. Maximum fiber length is 1/4 inch (0.6 cm).

Mineralization on the G & H No. 2 Prospect is sparse. It is unlikely that a mineable ore body could be developed. No ore has been produced from the property.

REFERENCES:

Stewart, L.A., 1955, Chrysotile-asbestos deposits of Arizona: USBM Information Circular IC 7706, p. 108-109.

This property is 9.1 miles by road NE of Globe.

R. C. Goodmundson
Jan. 1976

INDIAN SPRING MINE

The Indian Spring Mine is situated in the SE-NW and NE-SW of Section 5, T. 2 S., R. 16 E. G. & S.R.M. The property is reached by a jeep trail which branches east from Arizona Highway 77 at Arrastra Gulch, about 5½ miles (8.8 km) south of the intersection of US 70. The mine is 1.6 miles (2.6 km) from the highway, on the crest of a NW-trending ridge. The boundry of the San Carlos Indian Reservation is about 350 feet (107 m.) east of the workings. Milling facilities at Globe are approximately 7.5 miles (12 km) away.

Asbestos mineralization in the Precambrian Mescal limestone is genetically related to a diabase sill which underlies the workings. Three fiber zones occur in competent limestone beds between the algal member of the Mescal Limestone and the underlying diabase. These zones are 5, 6.5 and 9 feet above the diabase near the portal of the main workings. Limestone beds at the portal strike N 80° W and dip 35° SW.

Workings on the property from south to north, consist of a surface pit, a 200-foot incline with strike drifts, and a 25-foot incline. The locations of the workings are shown on the attached map.

The surface pit was excavated on the southwest end of the property. Here the Mescal limestone strikes N 60° W and dips 30° SW. Beneath the algal member, which forms the surface of the dip slope, three serpentine zones were observed, but no fiber was exposed.

The main workings consist of a 200-foot incline and two sets

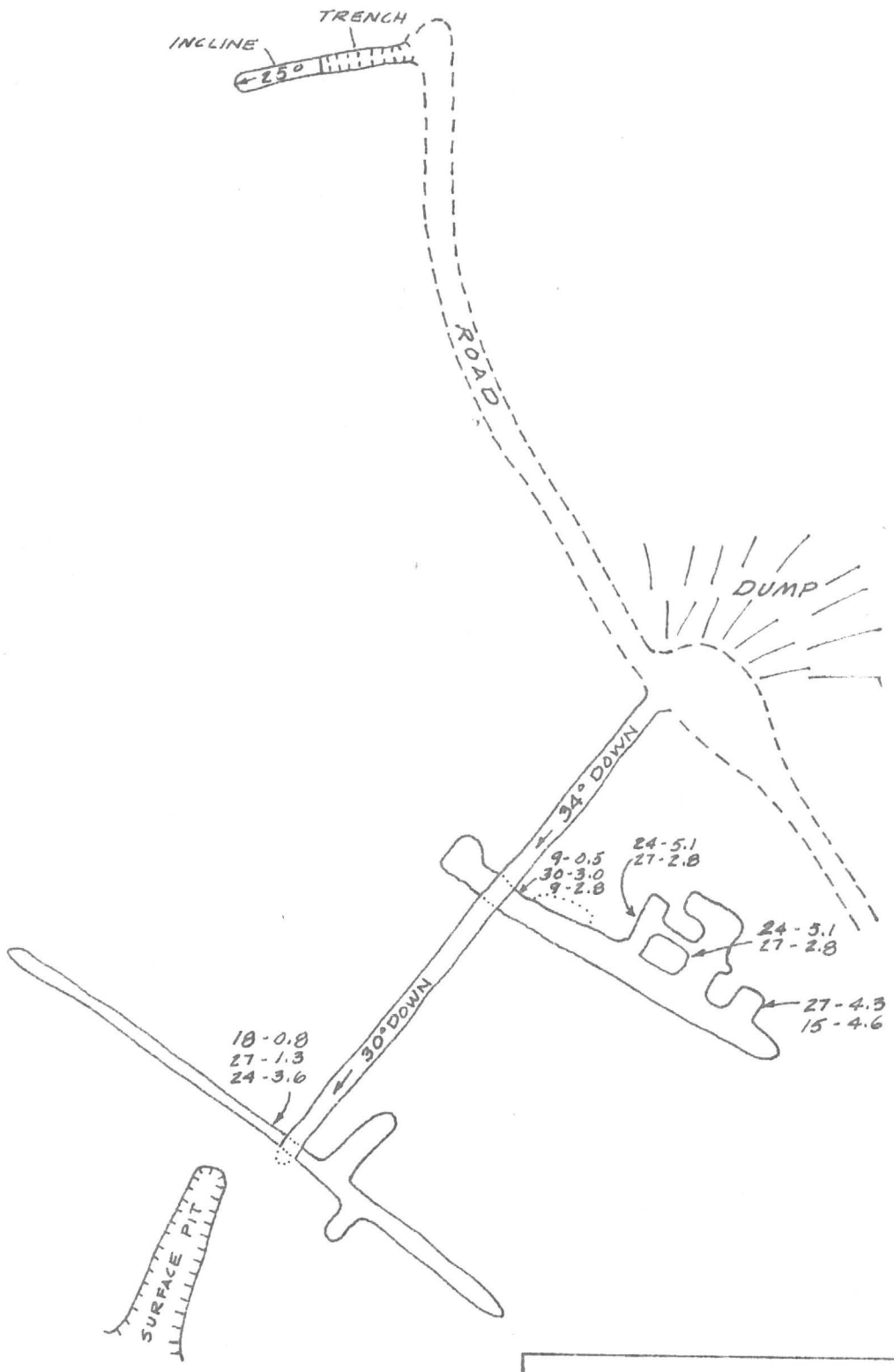
of strike drifts. The plan of the workings, and the thicknesses of serpentine and fiber zones are shown on the enclosed map. The lower strike drifts were not examined in detail due to bad air.

About 200 feet off the main workings a short trench and incline was driven. At the portal four thin serpertine zones are present, each contain less than 1 inch (2.5 cm) of harsh fiber. At the bottom of the incline only two fiber zones are present, each contain less than $\frac{1}{2}$ inch (1.2 cm) of fiber.

The economic potential of the deposit is doubtful principally because the beds dip 30 to 34°. The two to three zones contain a total of $2\frac{1}{4}$ to $3\frac{1}{2}$ inches (5.7 to 8.9 cm) of largely harsh asbestos; the middle zone is usually soft. The asbestos thickness pinches near the drift faces.

Robert C. Goodmundson January '76
with comments by V. E. Kral

Attch. 1-8$\frac{1}{2}$x11 map



EXPLANATION:

24 - 0.3

WIDTH OF SERPENTINE BAND IN CM

TOTAL WIDTH OF FIBER IN CM.

T.N.

50 FT.

MAP SHOWING LOCATION OF
SURFACE & UNDERGROUND WORKINGS
INDIAN SPRING MINE
SECTION 5, T. 2S. R. 16 E.
GILA COUNTY, ARIZONA
1 INCH = 50 FEET
INCLINED WORKINGS PROJECTED TO HORIZONTAL PLANE
1-20-76 R.C.G.