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FILE COPY
SURNAME:

Schmidt
Ellis
Hedges
Kinkel
Johnson

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

NOV 17 1952

Messrs. Kurt F. Koenigbeck
235 Pioneer Drive
Box 212
Superior, Arizona

J. F. Jackson

Re: Docket No. [illegible]-2569
(Copper, Lead, Molybdenum,
Prudential Mine
Final County, Arizona

Gentlemen:

Reference is made to your application for Government aid in the amount of $[illegible],000 to explore the captioned project.

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

A careful study of your application and data available to this Agency, and an examination of the property concerned reveal that the possibility of disclosing missile reserves by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise that your application for exploration aid is denied.

If additional work on your property reveals information which makes the project feasible, an application may be submitted for consideration.

Incerely yours,

C. C. Mittendorf (for)
Administrator

11-17-52

FSchmidt/jem
11/13/52
cc to: Adm. Reading File
Docket
Messrs. CJohnson-3621
RKinkel-5214 GSA
Ellis Schmidt
Opr. Com. Field Team Reg. IV (2)

11/13/52 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 12 1952

November 12, 1952

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA-2569 (Copper) K. F. Koenzback and J. F. Jackson, Prudential Mines, Pinal County, Arizona

I have reviewed the reports of examination by Faick and Farnham on the above-named application and concur in their (and the Field Team's) recommendation that the application be denied, on the ground that no justification is found for Government support of exploration.

C. H. Johnson

C. H. Johnson

Copy to - Mr. Nelson
Minerals Division
Base Metals Branch
C. H. Johnson
Files

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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C. H. Johnson

C. H. Johnson

CHJohnson:ks

Copy to - Mr. Nelson
Minerals Division
Base Metals Branch
C. H. Johnson
Files

10/30/52 rgla

IN REPLY REFER TO:

G-MD-CF

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

October 27, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 28 1952

Memorandum

To: E. W. Ellis

From: A. R. Kinkel, Jr.

Subject: Docket DMEA 2569 (Copper, lead, molybdenum)
Prudential Mines
Pinal County, Arizona

I agree with the field team that no exploration should be approved at the Prudential Mines, Pinal County, Arizona. There is no indication that minerals in sufficient amounts to be of interest would be uncovered by exploration.

A R Kinkel Jr.

A. R. Kinkel

IN REPLY REFER TO:

G-MD-CF

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

October 27, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 28 1952

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A. R. Kinkel

ARKinkel:gt

10/20/52 gfa

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

224 New Customhouse
Denver 2, Colorado

October 15, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2569 (Copper-Lead-Molybdenum) Kurt F. Koenzbock and J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are the original and three copies of the report pertaining to the above application. The brochure is also enclosed.

We recommend that the application be denied because of the improbability of making a significant discovery.

John F. Shaw for
W. H. King

A. H. Koschmann

Enclosures

DEPARTMENT OF THE INTERIOR
Defense Minerals
OCT 2 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

October 15, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject; Final Report, DMEA Docket 2569, (Copper-Lead-Molybdenum) Kurt F. Moenzbeck & J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-2569 by L. L. Farnham of the Bureau of Mines.

The applicant requested aid in the amount of $104,362 for sinking, drifting and diamond drilling.

A large amount of exploratory work already done on this property has revealed only a small amount of mineralization.

The examiners concur that further work is not warranted and they recommend that the application be denied.

We concur in this recommendation.

John F. Shaw

John F. Shaw for
W. H. King

Enclosures

Arizona-New Mexico Branch
xxxxxxxxxxxxxxxxxxxx

MINING DIVISION
REGION IV

October 8, 1952

Memorandum

To : H. H. King, Denver, Colorado

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

Subject : Final Report, Docket DMEA-2569, Kurt F. Koenzbock's & J. P. Jackson's Prudential Copper-Lead-Molybdenum Mines, Pinal County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by J. E. Palck of the Geological Survey and L. L. Farnham of the Bureau of Mines, and the section on Engineering by Farnham for the above report. A separate section on Geology will be submitted by the Geological Survey.

Because of the small amount of mineralization and the large amount of exploratory work already done on these deposits, the examiners believe that no further work is warrented. Therefore they recommend that the application be denied. I concur with their recommendations, as does Mr. A. F. Shride of the Geological Survey.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC: W. H. King (8)
A. F. Shride
DMEA-2569
DF

WRStormsals

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

200 New Customhouse
Denver 2, Colorado

October 14, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2569, Prudential Mines, Pinal County, Arizona. Koenzbock and Jackson. Copper-Lead-Molybdenum.

Enclosed are the original and 8 copies of the geologic report by J. N. Falck of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

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

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

October 9, 1952

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, DMRA 2569, Prudential Mines (Koenzbock and Jackson), Pinal County, Arizona (Copper, Lead, Molybdenum)

Enclosed are the original and 8 copies of the above report by J. N. Faick of the Geological Survey.

It is concluded that there is little geologic possibility of ore occurring on the applicants' property. Therefore, denial is recommended. The report and this recommendation have my approval.

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

Enclosures 9

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2569, Kurt F. Koenzbock's and J. P. Jackson's Prudential Copper-Lead-Molybdenum Mines Pinal County, Ariz.

J. N. Faick, Geologist
U. S. Geological Survey

L. L. Farnham, Mining Engineer
U. S. Bureau of Mines

October 1952

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By J. N. Faick[1] and L. L. Farnham[2]

The property of the Prudential Copper-Lead-Molybdenum Mines, Pinal County, Ariz., was examined late in September 1952, following a request to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for exploration aid by Kurt F. Koenzbock and J. P. Jackson of Superior, Ariz. The application, docketed as DMEA-2569, requested $104,362 to be used for the further exploration of 3 separate and unrelated copper, lead and molybdenum prospects, known as the Belle Fissure, Prudential, and Potts Canyon.

The property was acquired by Kurt F. Koenzbock about the time of World War I. Although rather well explored, the deposits have not been productive.

The Belle Fissure is a large diabase dike that cuts Dripping Springs quartzite and Pioneer shale. The dike has been explored by 2 adits, one of which disclosed a very small quartz-carbonate vein containing minor amounts of copper. There is no geological evidence to indicate that appreciable amounts of ore would be found associated with the dike.

The Prudential prospect has been developed by a 120-foot shaft, 90 feet of drifts, and 5 short adits. These workings explore a prominent fault along which trace amounts of sphalerite and chalcopyrite occur in metamorphosed beds of the lower part of the Mescal limestone. No ore was found and it appears very unlikely that any would be disclosed by further exploration.

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

The best prospect in the area is the Potts Canyon deposit. Here a 100-foot shaft has partly explored a quartz-carbonate vein containing appreciable amounts of lead and zinc. The principal lead minerals are galena, wulfenite and vanadinite. However, the vein is too small and too sparsely mineralized to be significant.

All the subject prospects have been adequately explored and the failure to find minable ore is convincing evidence that probably none exists. There is little likelihood that further exploration of the applicants' claims would result in a significant discovery.

Therefore, it is recommended that the loan application be denied.

John M. Zaick

N. R. Fahrbach

Walter K. Storms

PRUDENTIAL MINES
(KOENZBOCK AND JACKSON)
PINAL COUNTY, ARIZONA
DMEA 2569

COPPER - LEAD - MOLYBDENUM

Geology

By
John N. Faick
Geologist, U. S. Geological Survey

PRUDENTIAL MINES
(KOENZBOCK AND JACKSON)
PINAL COUNTY, ARIZONA
DMEA 2569

COPPER - LEAD - MOLYBDENUM

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Fig. 1 - Location Map	See Engineering Report
Fig. 2 - Claim Map Showing Portions of Areal Geology	" " "
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INTRODUCTION

The Defense Minerals Exploration Administration has received an application (DMEA 2569) for the exploration of three copper, lead, and molybdenum prospects located about three airline miles northwest of Superior (Fig. 1), Pinal County, Arizona. The application was submitted by Mr. Kurt F. Koenzbock and Mr. J. P. Jackson, under the name of Prudential Mines. Messrs. Koenzbock and Jackson control 31 unpatented mining claims situated in Sections 20, 21, 28 and 29; T. 1 S., R. 12 E.

The Prudential Mines property is situated in an area drained by Potts (Whitford) Canyon, an intermittent tributary to Queen Creek. The topography is moderate and consists of low hills with altitudes ranging from about 2600 to 3300 feet.

The applicants' proposed exploration consists of the following:

1. Diamond drill (one 600-foot) hole to explore the Belle Fissure.

2. Explore the Prudential deposit by means of an unspecified footage of drifting, crosscutting and diamond drilling on the 70-foot and 120-foot levels.

3. Rehabilitate the Potts Canyon shaft on the Greyhound claim and deepen it from the 100-foot level to the 150-foot level, then crosscut to the vein and drift along it for about 400 feet.

The proposed exploration is not justified on the basis of the available geological data.

GENERAL GEOLOGY

The geology of the area is described in an unpublished report[1/]

1/ Wardwell, H. R., Geology of the Potts Canyon Mining Area Near Superior, Arizona: University of Arizona Masters Thesis, pp. 1-88, 1952.

which is the source of some of the data given below.

A generalized stratigraphic column, arranged from basic data included in the Wardwell[2] report is as follows:

System	Formation or Group	Member	Thickness in Feet	Character
Tertiary		Dacite	Several hundred	Pink dacite & tuffaceous beds.
Cambrian		Troy quartzite	100-150	Purple & light red quartzite.
Pre-Cambrian	Apache	Basalt	100-200	Black, usually vesicular.
		Mescal limestone	350-400	White to brown siliceous limestone containing abundant chert bands.
		Dripping Spring quartzite	750-810	Brown or cream colored arkosic quartzite.
		Barnes conglomerate	3-30	Red or buff quartzite & conglomerate.
		Pioneer shale	350-400	Maroon fissile shales.
		Scanlan conglomerate	2-5	Quartz pebbles in schist or shale matrix.
Pre-Cambrian		Pinal schist		Sericite or chlorite schist.

Paleozoic formations younger than the Troy quartzite are not represented in the area, nor are Mesozoic rocks known in the district. All of the formations ranging in age from the Pinal schist to the Troy

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2/ Idem, pp. 9-30.

quartzite inclusive have been intruded by diabase, which usually occurs as sills but is often present as crosscutting bodies. The diabase is of wide distribution in central Arizona and locally has a great thickness, as for example in the Magma mine[3/] at Superior, Arizona where two sills totaling 3100 feet in thickness have been cut by mine workings. Several faults have been recognized in the area.

The geology of the Potts Canyon area is, in a few respects, analogous to that of the Superior district and may be interpreted by comparison with this district. At Superior, the pre-ore faults, which are believed to be related[4/] to the emplacement of a Central Arizona batholith during late Cretaceous or early Tertiary time, exert an important influence on mineralization. Ore deposition closely followed the pre-mineral faulting and may have begun before faulting entirely ceased. Mineralization was widespread in the Superior region and extended along the western part of the Pinal Mountain area for a few miles north and south of Superior, and extended into the Potts Canyon area. Although mineralization was of wide distribution, it was intense at only two places, the Magma mine at Superior and the Silver King mine about 2 miles north of Superior. The success of the Silver King and Magma mines has encouraged prospectors to intensively search for other mineral deposits in nearby areas, such as the Potts Canyon area, but to a notable extent the search has been unrewarded.

3/ Short, M. N., Galbraith, F. W., Harshman, E. N., Kuhn, T. H., and Wilson, E. D., Geology and Ore Deposits of the Superior Mining Area, Arizona: Arizona Bur. Mines Bull. 151, p. 35, 1943.

4/ Idem, P. 55.

THE PRUDENTIAL MINES PROSPECTS

There are many small prospects in the Potts Canyon area and many of these were already very old when one of the applicants, Mr. Koenzbock, acquired his properties about the time of World War I. Of the 31 unpatented claims controlled by the applicants, the Belle Fissure, the Prudential (Rochelle) and Potts Canyon (Greyhound) properties have received the bulk of the exploration done to date.

Belle Fissure

The Belle Fissure (Fig. 2) is a prominent diabase dike that cuts across tilted beds of Dripping Spring quartzite and Pioneer shale. The dike strikes about N. 40° W. and is nearly vertical. It is about 60 feet wide and exposed at the surface for about 3000 feet. The dike has been slightly broken in a few places by post-diabase faults that are present within the dike and are approximately parallel to its sides. These faults have localized feeble mineralization, which is now represented by a few films, veinlets, and pockets of copper oxide minerals. The largest exposure of mineral seen on the Belle Fissure by the examiners consisted of a single vein which was exposed in the back of a 125-foot adit driven in the dike from the southern slope of Potts Canyon. The vein is from 1 to 4 inches wide and is exposed for about 40 feet along the adit. A few percent of the vein filling consists of chrysocolla and malachite, the remainder being gangue quartz and calcite. Minerals containing molybdenum were not observed. A white efflorescent coating, obviously a product of oxidation, formed a band about one inch wide on each side of the vein. The vein is too small to encourage prospecting and the examiners could find no geological evidence to indicate that ore was likely to exist along the dike, therefore exploration of it cannot be recommended.

Potts Canyon Shaft

The Potts Canyon shaft (Fig. 2) and several prospect pits are situated on the northeast end of the Greyhound claim. The shaft, which is inaccessible, is inclined about 55° in a northeasterly direction and is about 100 feet deep. Near the bottom the applicant reports a short crosscut and a 25-foot drift on the vein. These workings partly explore a mineralized shear zone in diabase. The shear strikes N. 8°-15° E. and dips about 45° southeast, and is reported by the applicant to be 3 feet wide where penetrated by the crosscut. The mineralized zone is so poorly exposed that it can be traced for only about 150 feet on the surface; however, the applicant claims it can be traced for many hundreds of feet. This writer believes that there are several very small, widely separated, overlapping mineralized zones rather than a single large one. These are spaced many feet or several tens of feet apart so that they must be considered as separate veins.

The writer believes the shaft and a small cut about 35 feet south of it has prospected the largest and best mineralized of these zones. This zone is probably only about 150 feet long and not more than 3 feet wide. Mineralized material lying on the dumps contain galena, anglesite, wulfenite, and vanadinite associated with a gangue of quartz and silicified diabase. Two grab samples of the ore on the dumps yielded the following results:

Location	OUnces Gold/ton	Ounces Silver/ton	Percent Lead	Percent Copper	Percent Zinc
Potts Canyon Shaft	Tr.	1.8	1.6	Nil	1.8
Potts Canyon Cut	Tr.	3.6	6.9	Nil	2.3

There has been no production from the Potts Canyon prospect, therefore any ore removed during prospecting operations probably remains on the dumps. This amounts to only about two or three tons of low grade

oxidized material having no economic value. The ore was not assayed for molybdenum because there is obviously very little of it.

As the vein structures are very small, weakly mineralized, and widely separated, they do not justify additional exploration.

Prudential Prospect

The Prudential prospect, which is situated on the Rochelle claim (Fig. 2) is by far the most extensively developed of all the applicant's prospects. At the time of this examination the Prudential shaft was inaccessible, therefore part of the data included in this report is taken from Wardwell[5/] who apparently had access to the shaft workings.

The Prudential prospect is developed by a 120-foot shaft which is inclined westward at 75° for the first 20 feet; the remainder is vertical. At the 70-foot level are two short drifts (Fig. 3), totaling about 90 feet of workings that extend both north and south of the shaft, and about 50 feet of crosscuts. The property is also explored by five short adits totaling about 365 feet. These workings explore the Prudential fault zone (Figs. 3 and 4) which has a throw in excesss of 600 feet. Along the fault a remnant of Mescal limestone, having a stratigraphic thickness of about 70 feet, rests upon the Dripping Spring quartzite and both of these formations abut against the fault on the west side. Relatively weak mineralization has been localized along and near the fault zone.

The Prudential shaft was sunk on the fault along which a gossan is exposed at the surface for a distance of 40 feet north of the shaft and about 100 feet south of it. The gossan is about 10 feet wide at the shaft collar. The gossan consists of iron oxides in an altered limestone in which tremolite is abundant. Approximately 20 feet below the shaft

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5/ Op. cit., pp. 76-77; 84-86.

collar the gossan narrows to 2 or 3 feet, and it apparently pinches out a few feet below this depth. On the 70-foot level the fissure contains greenish-black chlorite and grayish-green tremolite. It is reported[6] that minute bands of sphalerite with which is associated trace amounts of chalcopyrite are present in the tremolite gangue.

Diabase, quartzite, and altered limestone are present on the mine dumps and prove that these three rock types were penetrated by the mine workings. The shaft apparently penetrated quartzite (Fig. 4) below the limestone, and crosscuts on the 70-level apparently also crossed from limestone into the quartzite.

Tremolite has replaced some of the beds of Mescal limestone, and the replacement was most intense near the fault although the effects can be observed as far as 60 feet from the fault. Near the end of the lower or - 9 - foot adit (Fig. 3) intensely silicated beds were encountered, but none were observed in the upper or +24 adits.

At the Prudential prospect, the tremolite deposits, with which is associated minor amounts of sphalerite and chalcopyrite, have formed by metamorphism of beds of the Apache limestone. Metamorphism probably was not caused by the intrusion of the diabase, but owes its origin to a mineralizing medium that circulated along the Prudential fault and to a limited extent along the beds of the Mescal limestone.

Sphalerite and chalcopyrite are present only in insignificant or trace amounts. No shipments of zinc, lead, or copper have been made from the property and only trace amounts of these can be seen on the dumps. No molybdenum minerals were seen.

6/ Wardwell, H. R., op. cit., pp. 84-85.

Two samples of the gossan yielded the following results:

Location	Ounces Au/ton	Ounces Ag/ton	Percent Lead	Percent Copper	Percent Zinc
South side of Prudential shaft	Tr.	0.15	0.1	0.20	0.1
40 ft. north of Prudential shaft	Tr.	0.3	0.1	0.04	0.15

Failure to find commercial ore is convincing evidence that none exists, and there is no geological reason to think that future exploration will be more generously rewarded than in the past.

ORE RESERVES

There is no ore of any class at the Prudential Mines prospects. The most intensive mineralization occurred along shear and fracture zones at the Potts Canyon shaft. In this locality occur a few small quartz-carbonate veins containing small amounts of lead, zinc, and silver. These veins are too small and too low grade to be of commercial value, therefore no attempt is made to estimate reserves.

CONCLUSIONS

The Belle Fissure is not the faulted extension of the Magma vein, as claimed by the applicants, but is a very large diabase dike occupying a fault in Dripping Spring quartzite. It is weakly mineralized but there is no geological evidence to indicate that ore of economic importance occurs associated with it. At the Potts Canyon shaft small quartz-carbonate veins, containing relatively small amounts of lead, zinc, and silver occupy shear and fracture zones in diabase. These veins are too small and too widely scattered to have commercial possibilities. Along the Prudential fault deposits of tremolite containing insignificant amounts of sphalerite and chalcopyrite have developed by metamorphism of beds of Mescal limestone. The deposits are very small, apparently shallow, and have been adequately explored by present mine workings.

RECOMMENDATIONS

It is recommended that the applicants' proposals for exploration of the Belle Fissure, Potts Canyon, and Prudential prospects be denied because of the absence of ore and the improbability of making a significant discovery.

DMEA-2569, KURT F. KOENZBOCK'S AND J. P. JACKSON'S PRUDENTIAL COPPER-LEAD-MOLYBDENUM MINES PINAL COUNTY, ARIZ.

Engineering Report

By L. L. Farnham,
Mining Engineer
U. S. Bureau of Mines

October 1952

DMEA-2569, KURT F. KOENZBOCK'S AND J. P. JACKSON'S
PRUDENTIAL COPPER-LEAD-MOLYBDENUM MINES
PINAL COUNTY, ARIZ.

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INTRODUCTION

In May 1952, Kurt F. Koenzbock and J. P. Jackson of Superior, Ariz. applied to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for an exploration loan amounting to $104,362. The application was docketed as DMEA-2569. The funds requested were to be used in the further exploration of 3 separate and unrelated copper-lead-molybdenum prospects.

These prospects were visited by DMEA examiners on September 17 and 18, 1952.

ACKNOWLEDGMENTS

Thanks are extended to the applicants, Kurt F. Koenzbock and J. P. Jackson, for their help during the examination of their property.

LOCATION AND PHYSICAL FEATURES

The subject property is situated in the Potts Canyon area about 3 airline miles northwest of the town of Superior, Pinal County, Ariz. The claims cover portions of Secs. 20, 21, 28 and 29, T. 1 S., R. 12 E. (figure 1). The property can be reached over 5.5 miles of dirt road that turns northward from U. S. Highway 60-70 at a point 1.6 miles west of Superior. The Prudential is the only one of the 3 prospects that is directly accessible from this road. The other subject claims are reached by trails.

The area is semi-arid and of moderate relief with altitudes ranging from 2,600 to 3,300 feet above sea level.

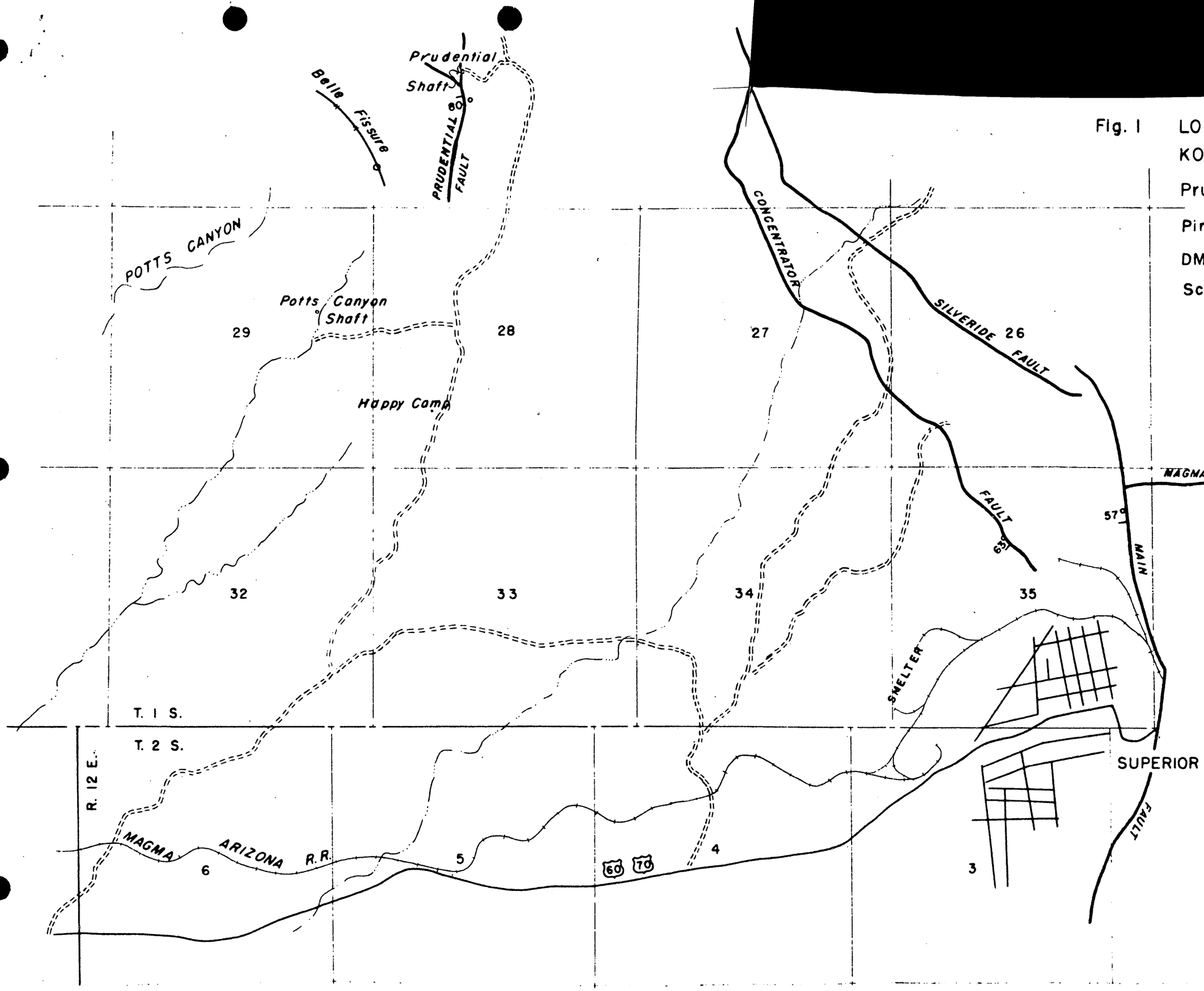

Fig. 1 LOCATION MAP
KOENZBOCK and JACKSON
Prudential Mines
Pinal County, Ariz.
DMEA 2569
Scale: 1" = 2000'

HISTORY AND PRODUCTION

Much of the subject property has been held by Kurt F. Koenzbock for the past 35 years. Very little, if any ore has been produced from any of the various claims.

OWNERSHIP AND EXTENT

The property consists of a contiguous group of 31 unpatented mining claims (figure 2) recorded in the name of Kurt F. Koenzbock. It includes the Greyhound group, the Belle Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Hornell group, and the Gertrude, Nettie, Florence, and Emma claims.

DESCRIPTION OF THE DEPOSITS

Belle Fissure

The so-called Belle Fissure is a diabase dike occupying a fault that cuts the Apache group of pre-Cambrian sedimentary rocks. The dike, thought by some to be the western faulted segment of the Magma Vein, attains a width of 60 feet and is traceable on the surface for over 2,000 feet (figure 2). It strikes N. 40° W. and dips steeply to the south. As mapped by Wardwell[1/], the southern wall of the fault, now occupied by the dike, moved about 700 feet westward relative to the northern side (figure 2). Where it is cut by Potts Canyon the dike is exposed through a vertical range of over 400 feet.

On the east side of the canyon floor an adit explored a narrow fracture zone near the footwall of the dike for 125 feet. Near the portal of this adit the fracture contained spots of oxide iron and

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1/ Wardwell, H. R., Geology of the Potts Canyon Area, Univ. of Ariz. Masters Thesis, 1941.

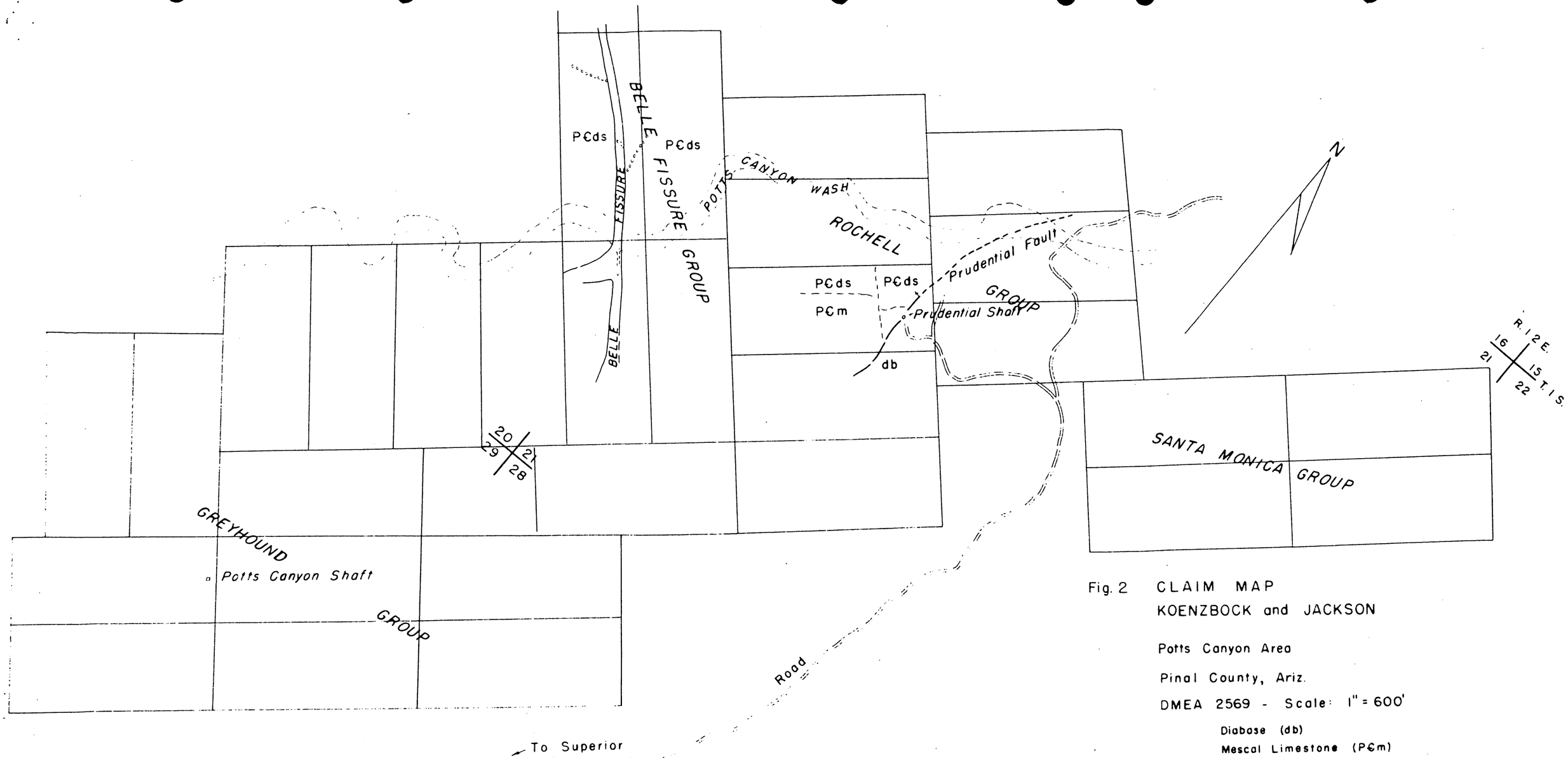

Fig. 2 CLAIM MAP
KOENZBOCK and JACKSON

Potts Canyon Area

Pinal County, Ariz.

DMEA 2569 - Scale: 1" = 600'

Diabase (db)
Mescal Limestone (P€m)
Dripping Springs Quartzite (P€ds)

copper minerals. The copper mineralization, associated with quartz anc calcite, was confined to a lense that attained a maximum width of 4 to 6 inches and a length of about 20 feet. Although the fracture zone persisted the full length of the adit, no copper mineralization was evident in the last 100 feet of the opening. A few pounds of 3 to 5 percent copper ore that had obviously been sorted from the material broken when the adit was driven still remained on the dump at the time of this examination. About 800 feet northwest of this adit and at an elevation about 200 feet higher, a shallow crosscut had exposed the full width of the diabase dike. A few small spots, showing some malachite and chryscolla, were found by this work.

Wherever observed, the bulk of the diabase constituting the dike, was unaltered and showed no signs of mineralization except in the narrow and unpromising fracture zones previously described. Consequently there were no indications that deeper exploration of the dike, as proposed by the applicant, would be likely to disclose any more or better mineralization than that exposed by the present work.

Prudential Deposit

The Prudential workings, situated near the northeastward end of the Rochelle claim, explored a rather conspicuous outcrop of gossan. This mineralization, consisting essentially of oxides of iron with occasional spots of copper stain, occurred in the lower portion of the Mescal limestone where it abutted a large mass of diabase along the Prudential fault (figures 3 and 4). This fault

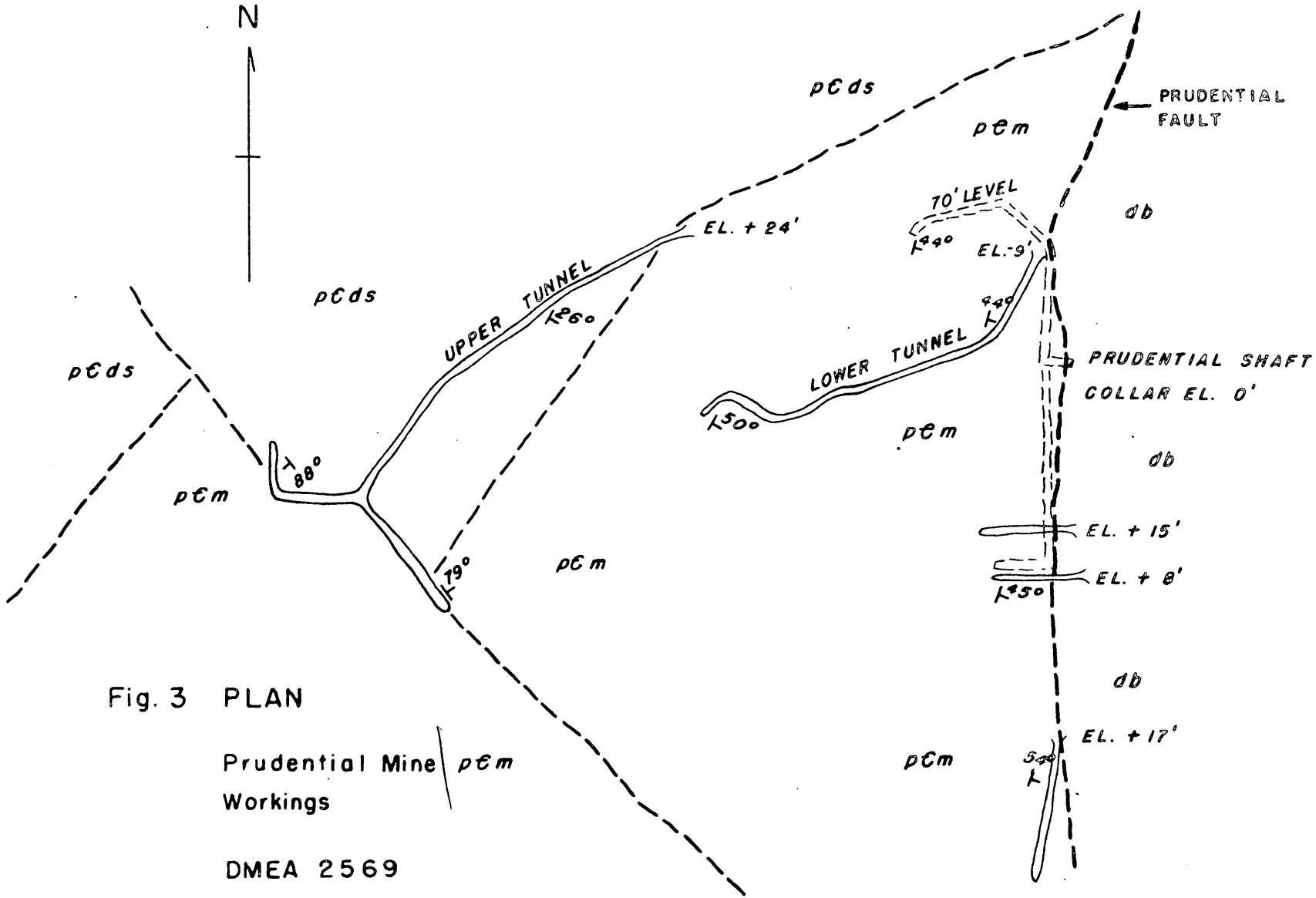

Fig. 3 PLAN

Prudential Mine Workings

DMEA 2569

Scale: 1" = 40'

Revised from map by H. R. Wardwell

Diabase (db)
Mescal Limestone (pCm)
Dripping Springs Quartzite (pCds)

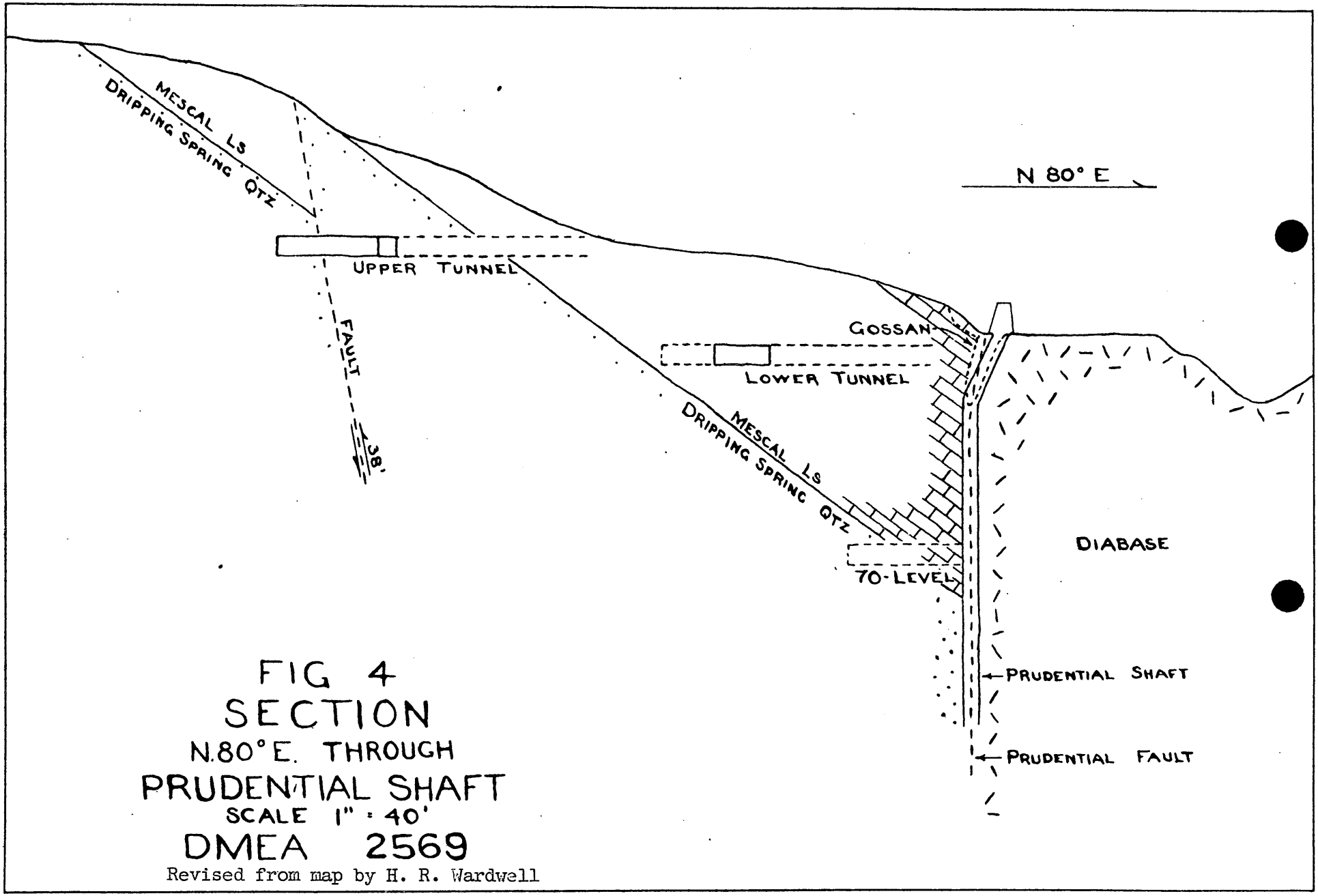

FIG 4
SECTION
N.80°E. THROUGH
PRUDENTIAL SHAFT
SCALE 1" = 40'
DMEA 2569
Revised from map by H. R. Wardwell

contact between the limestone and the diabase had a northerly strike and dipped steeply westward, whereas the limestone, striking northeasterly, dipped about 50° eastward into the fault contact (figure 4). The bulk of the mineralization had replaced a lenticular band of the metamorphosed limestone adjacent and parallel to the diabase contact.

In the vicinity of the shaft the gossan attained a maximum width of about 10 feet from which it gradually narrowed both to the north and south, and pinched out entirely at distances of 40 and 80 feet, respectively, from the shaft (figure 3).

The small inclined shaft was inaccessible but was said to have followed the fault contact to a depth of 120 feet. There it apparently bottomed in the underlying Dripping Springs quartzite. From the shaft at a depth of 70 feet, drifts both to the north and south had followed the contact for a total distance of about 90 feet. Two short crosscuts from the end of each drift were driven to explore the full width of the limestone. Nothing of the nature of ore, other than a few specimens of chalcopyrite and sphalerite in a gangue of silicified limestone, was found by this work.

West of the Prudential fault several isolated spots of copper stain were found in the limestone. Two shallow adits, totaling about 365 feet of work, had been driven to explore these surface showings, but nothing of promise was disclosed in either adit (figure 3). At the westerly end of the upper adit a northwestward-trending fault was encountered and was followed by about 70 feet of drifting. This fault zone proved to be unmineralized.

Two samples of the better mineralized portions of the gossan were taken by the examiners in the vicinity of the shaft. The assay results of these samples were as follows:

		Ounces per ton		Percent		
Number	Width	Gold	Silver	Lead	Copper	Zinc
12634	6 ft.	Tr.	0.15	0.1	0.20	0.1
12637	3 ft.	Tr.	0.3	0.1	0.04	0.15

Potts Canyon Prospect

The Potts Canyon deposit is situated on the Greyhound claim near the southwestern portion of the applicants' property (figure 2). Here an old inclined shaft (55°), entirely inaccessible, was sunk on one of a number of narrow parallel fractures that cut a large irregular mass of diabase. The principal fracture, filled with quartz and carbonate minerals, ranged in width from a few inches to seldom as much as 3 feet. It was traceable on the surface at infrequent intervals for several hundred feet. Much of the vein material appeared barren, but occasional pieces were found that showed small crystals of wulfenite and vanadinite. The shaft was said to have reached an inclined depth of 100 feet where a drift had followed the vein southward for 25 feet.

According to the applicant the vein in the face of this drift was 3 feet wide and contained commercial amounts of molybdenum, lead and silver. A few hundred pounds of ore, said to have come from this drift, was neatly piled near the collar of the shaft. A grab sample taken by the examiners from this pile of material contained 1.8 ounces of silver per ton, 1.6 percent lead, and 1.8 percent zinc.

About 25 feet south of the shaft there were several hundred pounds of selected ore which was said to have come from a near-by open cut. A grab sample of this material contained a trace of gold, 3.6 ounces of silver per ton, 6.9 percent lead, and 2.3 percent zinc. The principal lead minerals were galena, wulfenite, and vanadinite. Apparently this ore occurred as a small lense or pod, for very little mineralization was evident in the vein remaining in the face of the open cut.

The main dump, representing the material broken during the shaft sinking and drifting, was mineralized very poorly. According to the applicant no ore was ever removed from the property, hence had the vein contained appreciable quantities of ore minerals there should have been much more broken ore on the dumps than the few hundred pounds that was evident.

ORE RESERVES

There was no minable ore on the subject property.

PROPOSED EXPLORATION

The exploration proposed by the applicant consisted of the following:

(1) One inclined diamond drill hole, 600 feet deep, to explore the Belle Fissure;

(2) An indefinite amount of drifting, crosscutting, and diamond drilling from the 70- and 120-foot levels of the Prudential shaft;

(3) The rehabilitation and sinking of the Potts Canyon shaft an additional 50 feet, crosscutting and drifting 400 feet from the bottom of the shaft.

COST OF THE PROJECT

As estimated by the applicants, the total cost of the proposed work would amount to $104,362. The applicants proposed to finance their share of this cost by selling stock in a company to be incorporated under the name of the Prudential Mines, Inc.

CONCLUSIONS AND RECOMMENDATIONS

In the opinion of the examiners, none of the 3 prospects owned by the applicants are worthy of further exploration.

Even if the far-fetched theory be granted that the Belle Fissure is a faulted segment of the Magma vein, there would be no justification for its further exploration unless there was some geologic evidence available that would indicate the possibility of discovering an ore body. Such indications are lacking.

The Prudential limestone-diabase contact deposit has been explored sufficiently to show the limits of the mineralization. No ore was found and only a remnant of the favorable limestone host rock remains in the vicinity of the mineralized area.

The lead mineralization, consisting of wulfenite and vanadinite, which was found in the Potts Canyon deposit, occurs as small sporadic bunches in narrow lenticular veins. Judged by the limited amount of ore encountered during the previous exploration it is presumed that the deposits are too small to be of commercial importance.

Therefore, it is recommended that the requested loan be denied.

10/27/52 glu

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

224 New Customhouse
Denver 2, Colorado

October 15, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2569 (Copper-Lead-Molybdenum) Kurt F. Koenzbock and J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are the original and three copies of the report pertaining to the above application. The brochure is also enclosed.

We recommend that the application be denied because of the improbability of making a significant discovery.

John F. Shaw
John F. Shaw for
W. M. King

A. M. Koschmann
A. M. Koschmann

Enclosures

OCT 2 . 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

October 15, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2569, (Copper-Lead-Molybdenum) Hurt F. Eisenbeck & J. P. Jackson, Prudential Mines, Pima County, Arizona.

Enclosed are nine copies of the final engineering report on DMEA-2569 by L. L. Parsons of the Bureau of Mines.

The applicant requested aid in the amount of $[illegible] for sinking, drifting and diamond drilling.

A large amount of exploratory work already done on this property has revealed only a small amount of mineralization.

The examiners report that further work is not warranted and they recommend that the application be denied.

We concur in this recommendation.

John F. Shea for
W. H. King

Enclosures

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

Arizona-New Mexico Branch
xxxxxxxxxxxxxxxxxxxx

MINING DIVISION
REGION IV

October 3, 1952

Memorandum

To : W. H. King, Denver, Colorado

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

Subject : Final Report, Docket DMEA-2569, Kurt F. Koenzbock's & J. P. Jackson's Prudential Copper-Lead-Molybdenum Mines, Pinal County, Ariz.

Enclosed are original and 3 copies of the section on Summary, Conclusions and Recommendations by J. E. Faick of the Geological Survey and L. L. Farnham of the Bureau of Mines, and the section on Engineering by Farnham for the above report. A separate section on Geology will be submitted by the Geological Survey.

Because of the small amount of mineralization and the large amount of exploratory work already done on these deposits, the examiners believe that no further work is warranted. Therefore they recommend that the application be denied. I concur with their recommendations, as does Mr. A. F. Shride of the Geological Survey.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC: W. H. King (3)
A. F. Shride
DMEA-2569
JF

WRStormsals

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

200 New Customhouse
Denver 2, Colorado

October 14, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2569, Prudential Mines, Pinal County, Arizona. Koenzbock and Jackson. Copper-Lead-Molybdenum.

Enclosed are the original and 8 copies of the geologic report by J. N. Falck of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

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

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

October 9, 1952

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, MMSA 2569, Prudential Mines (Koenzbock and Jackson), Pinal County, Arizona (Copper, Lead, Molybdenum)

Enclosed are the original and 3 copies of the above report by J. H. Faick of the Geological Survey.

It is concluded that there is little geologic possibility of ore occurring on the applicants' property. Therefore, denial is recommended. The report and this recommendation have my approval.

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

Enclosures 3

UNITED STATES
DEPARTMENT OF THE INTERIOR
CARL L. ALBERT, SECRETARY

BUREAU OF MINES LEONARD ROSS, DIRECTOR

BUREAU OF MINES REPORT OF INVESTIGATIONS
RI 6.0 [illegible]
[illegible] IV

RI 6.0[illegible]. Part 1. Accidents and U. S. Accidents

Underground Commercial Mines Mines

Coal Series, 1940.

J. J. Polach, Geologist
U. S. Bureau Coal Survey

J. J. Forbes, Mining Engineer
U. S. Bureau of Mines

October 1942

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

by J. [illegible] Dolan and L. [illegible] Parsons[1] [2]

The property of the Prudential Copper-Lead-Uranium Mines, Pima County, Ariz., was examined late in September 1951, following a request to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for exploration aid by Mrs T. Beaudreau and J. P. Jackson of Superior, Ariz. The application, dated [illegible], requested $[illegible] to be used for the further exploration of 3 copper and uranium copper, lead and molybdenum prospects, known as the Lolo Mesaro, Prudential, and Lolo claims.

The property was acquired by Mrs T. Beaudreau about the time of World War I. Although rather well explored, the deposits have not been productive.

The Lolo Mesaro is a large diorite dike that cuts brighly sericitized quartzite and Pioneer shale. The dike has been explored by 3 adits, one of which disclosed a very small quartz-carbonate vein containing minor amounts of copper. There is no geologic evidence to indicate that appreciable amounts of ore would be found associated with the dike.

The Prudential prospect has been developed by a 120-foot shaft, 90 feet of drifts, and 3 short adits. Some vertical crystals of pyrite occur in mineralized beds of the lower part of the Pioneer formation. No ore has been found and it appears very unlikely that any would be discovered by further exploration.

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[1] Geologist, U. S. Geological Survey.

[2] Mining Engineer, U. S. Bureau of Mines

The best prospect is the area in the Peter Cooper deposit. Here a 10-foot shaft has partly exposed a quartz-carbonate vein containing appreciable amounts of lead and zinc. The principal lead minerals are galena, anglesite and vanadinite. Moreover, the vein is too small and too sparsely mineralized to be significant.

All the subject prospects have been reclaimed, explored and the failure to find minerals are in sufficient evidence that probably none exists. There is little likelihood that further exploration of the applicants' claims would result in a significant discovery.

Therefore, it is recommended that the lease application be denied.

PRUDENTIAL MINES
(KOHNSBOCK AND JACKSON)
PINAL COUNTY, ARIZONA
DMEA 2569

COPPER - LEAD - MOLYBDENUM

Geology

By
John H. Faick
Geologist, U. S. Geological Survey

PRUDENTIAL MINES
(KOENIGOCK AND JACKSON)
PINAL COUNTY, ARIZONA
DMCA 2569

COPPER - LEAD - MOLYBDENUM

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ILLUSTRATIONS

Fig. 1 - Location Map — See Engineering Report

Fig. 2 - Claim Map Showing Portions of Areal Geology

Fig. 3 - Plan of Prudential Mine Working

Fig. 4 - Section Through Prudential Shaft

INTRODUCTION

The Defense Minerals Exploration Administration has received an application (DMEA 2569) for the exploration of three copper, lead, and molybdenum prospects located about three airline miles northwest of Superior (Fig. 1), Pinal County, Arizona. The application was submitted by Mr. Kurt F. Koenzbock and Mr. J. F. Jackson, under the name of Prudential Mines. Messrs. Koenzbock and Jackson control 31 unpatented mining claims situated in Sections 20, 21, 28 and 29; T. 1 S., R. 12 E.

The Prudential Mines property is situated in an area drained by Potts (Whitford) Canyon, an intermittent tributary to Queen Creek. The topography is moderate and consists of low hills with altitudes ranging from about 2600 to 3300 feet.

The applicants' proposed exploration consists of the following:

1. Diamond drill (one 600-foot) hole to explore the Belle Fissure.

2. Explore the Prudential deposit by means of an unspecified footage of drifting, crosscutting and diamond drilling on the 70-foot and 120-foot levels.

3. Rehabilitate the Potts Canyon shaft on the Greyhound claim and deepen it from the 100-feet level to the 150-foot level, then crosscut to the vein and drift along it for about 400 feet.

The proposed exploration is not justified on the basis of the available geological data.

GENERAL GEOLOGY

The geology of the area is described in an unpublished report[1/]

1/ Wardwell, H. R., Geology of the Potts Canyon Mining Area Near Superior, Arizona: University of Arizona Masters Thesis, pp. 1-38, 1952.

which is the source of some of the data given below.

A generalized stratigraphic column, arranged from basic data included in the Wardwell[2] report is as follows:

System	Formation or Group	Member	Thickness in Feet	Character
Tertiary		Dacite	Several hundred	Pink dacite & tuffaceous beds.
Cambrian		Troy quartzite	100-150	Purple & light red quartzite.
Pre-Cambrian	Apache	Basalt	100-200	Black, usually vesicular.
		Mescal limestone	350-400	White to brown siliceous limestone containing abundant chert bands.
		Dripping Spring quartzite	750-810	Brown or cream colored arkosic quartzite.
		Barnes conglomerate	3-30	Red or buff quartzite & conglomerate.
		Pioneer shale	350-400	Maroon fissile shales.
		Scanlan conglomerate	2-5	Quartz pebbles in schist or shale matrix.
Pre-Cambrian		Final schist		Sericite or chlorite schist.

Paleozoic formations younger than the Troy quartzite are not represented in the area, nor are Mesozoic rocks known in the district. All of the formations ranging in age from the Final schist to the Troy

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2/ Idem, pp. 9-30.

quartzite inclusive have been intruded by diabase, which usually occurs as sills but is often present as crosscutting bodies. The diabase is of wide distribution in central Arizona and locally has a great thickness, as for example in the Magma mine[3] at Superior, Arizona where two sills totaling 3100 feet in thickness have been cut by mine workings. Several faults have been recognized in the area.

The geology of the Potts Canyon area is, in a few respects, analogous to that of the Superior district and may be interpreted by comparison with this district. At Superior, the pre-ore faults, which are believed to be related[4] to the emplacement of a Central Arizona batholith during late Cretaceous or early Tertiary time, exert an important influence on mineralization. Ore deposition closely followed the pre-mineral faulting and may have begun before faulting entirely ceased. Mineralization was widespread in the Superior region and extended along the western part of the Pinal Mountain area for a few miles north and south of Superior, and extended into the Potts Canyon area. Although mineralization was of wide distribution, it was intense at only two places, the Magma mine at Superior and the Silver King mine about 2 miles north of Superior. The success of the Silver King and Magma mines has encouraged prospectors to intensively search for other mineral deposits in nearby areas, such as the Potts Canyon area, but to a notable extent the search has been unrewarded.

3/ Short, M. N., Galbraith, F. W., Harshman, E. N., Kuhn, T. H., and Wilson, E. D., Geology and Ore Deposits of the Superior Mining Area, Arizona: Arizona Bur. Mines Bull. 151, p. 35, 1943.

4/ Idem, P. 55.

THE PRUDENTIAL MINES PROSPECT:

There are many small prospects in the Potts Canyon area and many of these were already very old when one of the applicants, Mr. Koenshock, acquired his properties about the time of World War I. Of the 31 unpatented claims controlled by the applicants, the Belle Fissure, the Prudential (Rochelle) and Potts Canyon (Greyhound) properties have received the bulk of the exploration done to date.

Belle Fissure

The Belle Fissure (Fig. 2) is a prominent diabase dike that cuts across tilted beds of Dripping Spring quartzite and Pioneer shale. The dike strikes about N. 40° W. and is nearly vertical. It is about 60 feet wide and exposed at the surface for about 3000 feet. The dike has been slightly broken in a few places by post-diabase faults that are present within the dike and are approximately parallel to its sides. These faults have localized feeble mineralization, which is now represented by a few films, veinlets, and pockets of copper oxide minerals. The largest exposure of mineral seen on the Belle Fissure by the examiners consisted of a single vein which was exposed in the back of a 125-foot adit driven in the dike from the southern slope of Potts Canyon. The vein is from 1 to 4 inches wide and is exposed for about 40 feet along the adit. A few percent of the vein filling consists of chrysocolla and malachite, the remainder being gangue quartz and calcite. Minerals containing molybdenum were not observed. A white efflorescent coating, obviously a product of oxidation, formed a band about one inch wide on each side of the vein. The vein is too small to encourage prospecting and the examiners could find no geological evidence to indicate that ore was likely to exist along the dike, therefore exploration of it cannot be recommended.

Potts Canyon Shaft

The Potts Canyon shaft (Fig. 2) and several prospect pits are situated on the northeast end of the Greyhound claim. The shaft, which is inaccessible, is inclined about 55° in a northeasterly direction and is about 100 feet deep. Near the bottom the applicant reports a short crosscut and a 25-foot drift on the vein. These workings partly explore a mineralized shear zone in diabase. The shear strikes N. 8°-15° E. and dips about 45° southeast, and is reported by the applicant to be 3 feet wide where penetrated by the crosscut. The mineralized zone is so poorly exposed that it can be traced for only about 150 feet on the surface; however, the applicant claims it can be traced for many hundreds of feet. This writer believes that there are several very small, widely separated, overlapping mineralized zones rather than a single large one. These are spaced many feet or several tens of feet apart so that they must be considered as separate veins.

The writer believes the shaft and a small cut about 35 feet south of it has prospected the largest and best mineralized of these zones. This zone is probably only about 150 feet long and not more than 3 feet wide. Mineralized material lying on the dumps contain galena, anglesite, wulfenite, and vanadinite associated with a gangue of quartz and silicified diabase. Two grab samples of the ore on the dumps yielded the following results:

Location	Ounces Gold/ton	Ounces Silver/ton	Percent Lead	Percent Copper	Percent Zinc
Potts Canyon Shaft	Tr.	1.8	1.6	Nil	1.8
Potts Canyon Cut	Tr.	3.6	6.9	Nil	2.3

There has been no production from the Potts Canyon prospect, therefore any ore removed during prospecting operations probably remains on the dumps. This amounts to only about two or three tons of low grade

oxidized material having no economic value. The ore was not assayed for molybdenum because there is obviously very little of it.

As the vein structures are very small, weakly mineralized, and widely separated, they do not justify additional exploration.

Prudential Prospect

The Prudential prospect, which is situated on the Rochelle claim (Fig. 2) is by far the most extensively developed of all the applicant's prospects. At the time of this examination the Prudential shaft was inaccessible, therefore part of the data included in this report is taken from Wardwell[5] who apparently had access to the shaft workings.

The Prudential prospect is developed by a 120-foot shaft which is inclined westward at 75° for the first 20 feet; the remainder is vertical. At the 70-foot level are two short drifts (Fig. 3), totaling about 90 feet of workings that extend both north and south of the shaft, and about 50 feet of crosscuts. The property is also explored by five short adits totaling about 365 feet. These workings explore the Prudential fault zone (Figs. 3 and 4) which has a throw in excess of 600 feet. Along the fault a remnant of Mescal limestone, having a stratigraphic thickness of about 70 feet, rests upon the Dripping Spring quartzite and both of these formations abut against the fault on the west side. Relatively weak mineralization has been localized along and near the fault zone.

The Prudential shaft was sunk on the fault along which a gossan is exposed at the surface for a distance of 40 feet north of the shaft and about 100 feet south of it. The gossan is about 10 feet wide at the shaft collar. The gossan consists of iron oxides in an altered limestone in which tremolite is abundant. Approximately 20 feet below the shaft

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5/ Op. cit., pp. 76-77; 84-86.

collar the gossan narrows to 2 or 3 feet, and it apparently pinches out a few feet below this depth. On the 70-foot level the fissure contains greenish-black chlorite and grayish-green tremolite. It is reported[6] that minute bands of sphalerite with which is associated trace amounts of chalcopyrite are present in the tremolite gangue.

Diabase, quartzite, and altered limestone are present on the mine dumps and prove that these three rock types were penetrated by the mine workings. The shaft apparently penetrated quartzite (Fig. 4) below the limestone, and crosscuts on the 70-level apparently also crossed from limestone into the quartzite.

Tremolite has replaced some of the beds of Mescal limestone, and the replacement was most intense near the fault although the effects can be observed as far as 60 feet from the fault. Near the end of the lower or - 9 - foot adit (Fig. 3) intensely silicated beds were encountered, but none were observed in the upper or +24 adits.

At the Prudential prospect, the tremolite deposits, with which is associated minor amounts of sphalerite and chalcopyrite, have formed by metamorphism of beds of the Apache limestone. Metamorphism probably was not caused by the intrusion of the diabase, but owes its origin to a mineralizing medium that circulated along the Prudential fault and to a limited extent along the beds of the Mescal limestone.

Sphalerite and chalcopyrite are present only in insignificant or trace amounts. No shipments of zinc, lead, or copper have been made from the property and only trace amounts of these can be seen on the dumps. No molybdenum minerals were seen.

6/ Wardwell, M. R., op. cit., pp. 84-85.

Two samples of the gossan yielded the following results:

Location	Ounces Au/ton	Ounces Ag/ton	Percent Lead	Percent Copper	Percent Zinc
South side of Prudential shaft	Tr.	0.15	0.1	0.20	0.1
40 ft. north of Prudential shaft	Tr.	0.3	0.1	0.04	0.15

Failure to find commercial ore is convincing evidence that none exists, and there is no geological reason to think that future exploration will be more generously rewarded than in the past.

ORE RESERVES

There is no ore of any class at the Prudential Mines prospects. The most intensive min ralization occurred along shear and fracture zones at the Potts Canyon shaft. In this locality occur a few small quartz-carbonate veins containing small amounts of lead, zinc, and silver. These veins are too small and too low grade to be of commercial value, therefore no attempt is made to estimate reserves.

CONCLUSIONS

The Belle Fissure is not the faulted extension of the Magan vein, as claimed by the applicants, but is a very large diabase dike occupying a fault in Dripping Spring quartzite. It is weakly mineralized but there is no geological evidence to indicate that ore of economic importance occurs associated with it. At the Potts Canyon shaft small quartz-carbonate veins, containing relatively small amounts of lead, zinc, and silver occupy shear and fracture zones in diabase. These veins are too small and too widely scattered to have commercial possibilities. Along the Prudential fault deposits of tremolite containing insignificant amounts of sphalerite and chalcopyrite have developed by metamorphism of beds of Mescal limestone. The deposits are very small, apparently shallow, and have been adequately explored by present mine workings.

RECOMMENDATIONS

It is recommended that the applicants' proposals for exploration of the Belle Fissure, Potts Canyon, and Prudential prospects be denied because of the absence of ore and the improbability of making a significant discovery.

[illegible], [illegible] B. [illegible] [illegible] C. S. [illegible]
[illegible]
[illegible], [illegible]

Engineering Report

By L. P. Fenlon,
Major, Engineer
U. S. Bureau of Mines

October 2952

[illegible]-1969, [illegible]
[illegible]
[illegible]
PRAIL COUNTY, [illegible]

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Location and physical features	[illegible]
History and production	[illegible]
Ownership and assets	[illegible]
Description of the deposits	[illegible]
Ore reserves	[illegible]
Proposed exploration	[illegible]
Cost of the project	7
Conclusions and recommendations	7

ILLUSTRATIONS

No.	Title	Following page
1	Location map	1
2	Claim map	2
3	Plan of industrial workings	3
4	Section of industrial workings	3

INTRODUCTION

In May 1952, Kurt F. Koenzbock and J. P. Jackson of Superior, Ariz. applied to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for an exploration loan amounting to $104,362. The application was docketed as DMEA-2569. The funds requested were to be used in the further exploration of 3 separate and unrelated copper-lead-molybdenum prospects.

These prospects were visited by DMEA examiners on September 17 and 18, 1952.

ACKNOWLEDGMENTS

Thanks are extended to the applicants, Kurt F. Koenzbock and J. P. Jackson, for their help during the examination of their property.

LOCATION AND PHYSICAL FEATURES

The subject property is situated in the Potts Canyon area about 3 airline miles northwest of the town of Superior, Pinal County, Ariz. The claims cover portions of Secs. 20, 21, 28 and 29, T. 1 S., R. 12 E. (figure 1). The property can be reached over 5.6 miles of dirt road that turns northward from U. S. Highway 60-70 at a point 1.6 miles west of Superior. The Prudential is the only one of the 3 prospects that is directly accessible from this road. The other subject claims are reached by trails.

The area is semi-arid and of moderate relief with altitudes ranging from 2,100 to 3,300 feet above sea level.

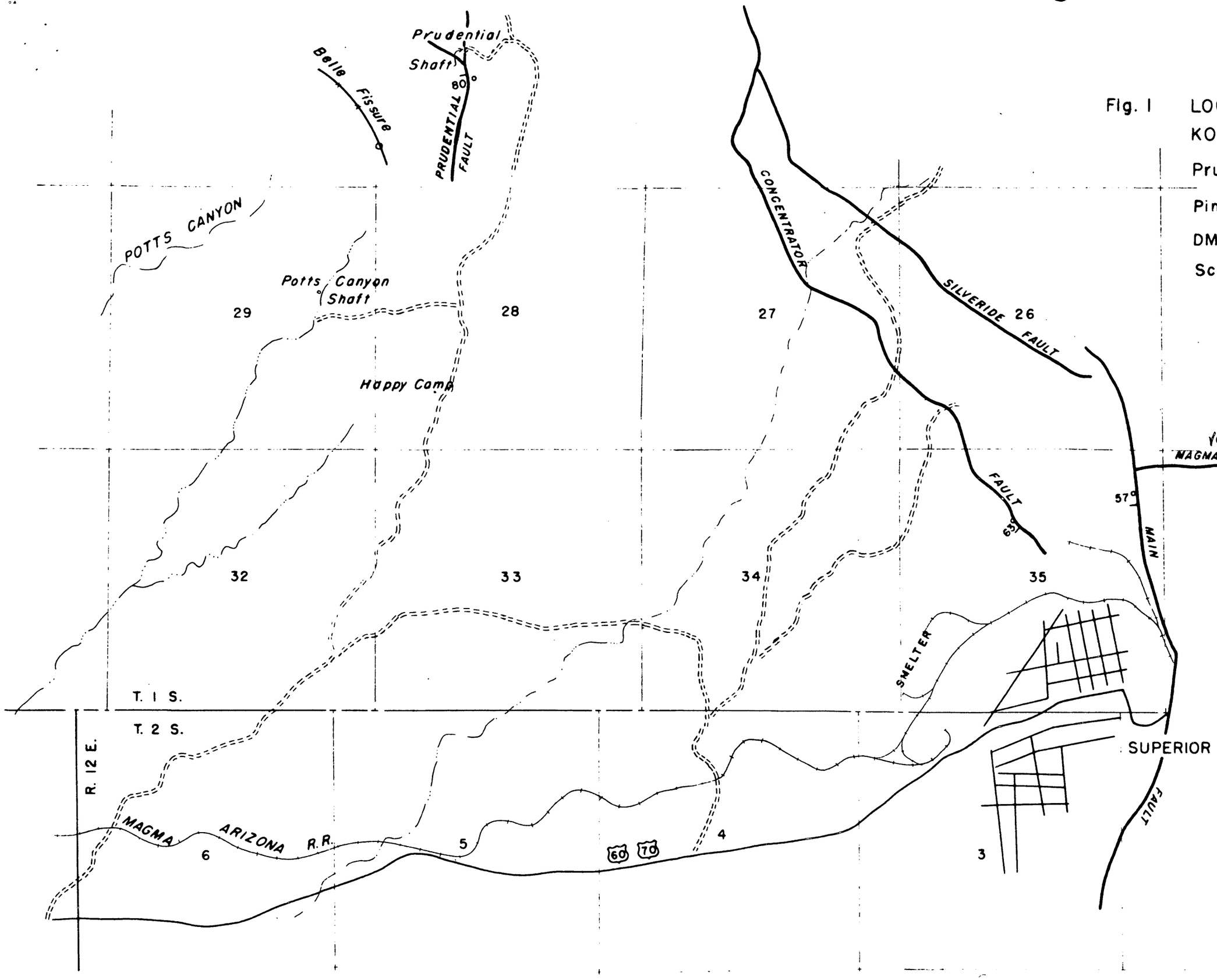

Fig. 1 LOCATION MAP
KOENZBOCK and JACKSON
Prudential Mines
Pinal County, Ariz.
DMEA 2569
Scale: 1" = 2000'

HISTORY AND PRODUCTION

Much of the subject property has been held by Kurt F. Koenzbock for the past 35 years. Very little, if any ore has been produced if from any of the various claims.

OWNERSHIP AND EXTENT

The property consists of a contiguous group of 31 unpatented mining claims (figure 2) recorded in the name of Kurt F. Koenzbock. It includes the Greyhound group, the Belle Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Kornell group, and the Gertrude, Hettie, Florence, and Nuna claims.

DESCRIPTION OF THE DEPOSITS

Belle Fissure

The so-called Belle Fissure is a diabase dike occupying a fault that cuts the Apache group of pre-Cambrian sedimentary rocks. The dike, thought by some to be the western faulted segment of the Magna Vein, attains a width of 60 feet and is traceable on the surface for over 2,000 feet (figure 2). It strikes N. 40° W. and dips steeply to the south. As mapped by Wardwell,[1] the southern wall of the fault, now occupied by the dike, moved about 700 feet westward relative to the northern side (figure 2). Where it is cut by Potts Canyon the dike is exposed through a vertical range of over 400 feet.

On the east side of the canyon floor an adit explored a narrow fracture zone near the footwall of the dike for 125 feet. Near the portal of this adit the fracture contained spots of oxide iron and

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1/ Wardwell, R. R., Geology of the Potts Canyon Area, Univ. of Ariz. Masters Thesis, 1941.

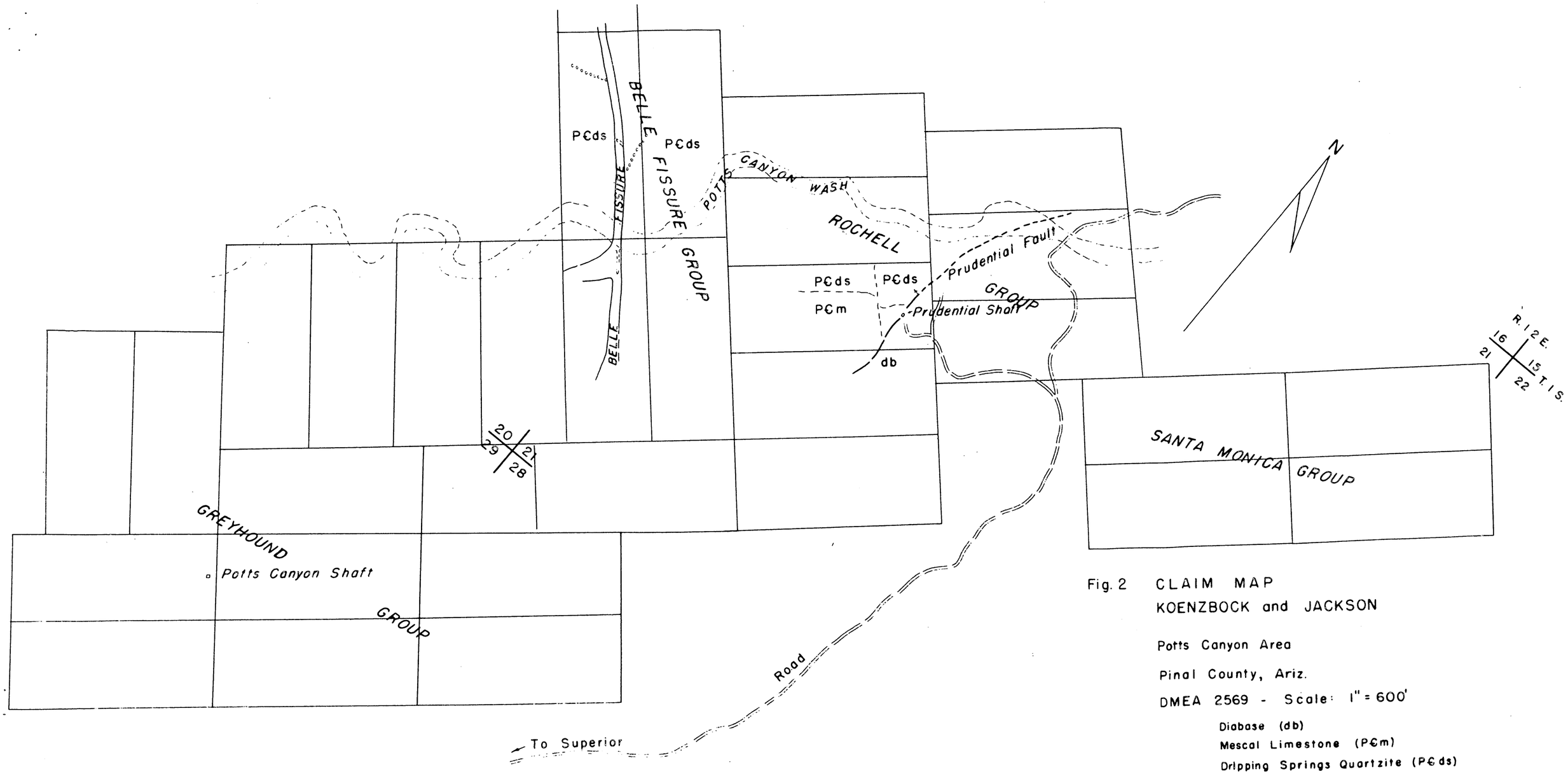

Fig. 2 CLAIM MAP
KOENZBOCK and JACKSON

Potts Canyon Area

Pinal County, Ariz.

DMEA 2569 - Scale: 1" = 600'

Diabase (db)
Mescal Limestone (P€m)
Dripping Springs Quartzite (P€ds)

copper minerals. The copper mineralization, associated with quartz and calcite, was confined to a lenses that attained a maximum width of 4 to 6 inches and a length of about 14 feet. Although the fracture zone paralleled the full length of the adit, the copper mineralization was evident in the last 14 feet of the opening. A few pounds of 3 to 5 percent copper ore that had obviously been carried from the material broken when the adit was driven could be recalled on the dump at the time of this examination. About 100 feet northwest of this adit and at an elevation about 140 feet higher, a shaft crossed and exposed the full width of the diabase dike. A few small spots, showing some malachite and chrysocolla, were found by this work.

Wherever observed, the bulk of the diabase constituting the dike, was unaltered and showed no signs of mineralization except in the narrow and unpromising fracture zones previously described. Consequently there were no indications that deeper exploration of the dike, as proposed by the applicant, would be likely to discover any more or better mineralization than that exposed by the present work.

Sunnyside Speck

The Sunnyside working, situated near the northwestern end of the Cedarville field, exposed a rather conspicuous outcrop of ocean. Auto mineralization, consisting essentially of oxides of iron with occasional spots of copper stain, occurred in the lower portion of the fissure zone where it cut a large mass of diabase along the Prudential fault (Figures 3 and 4). This fault

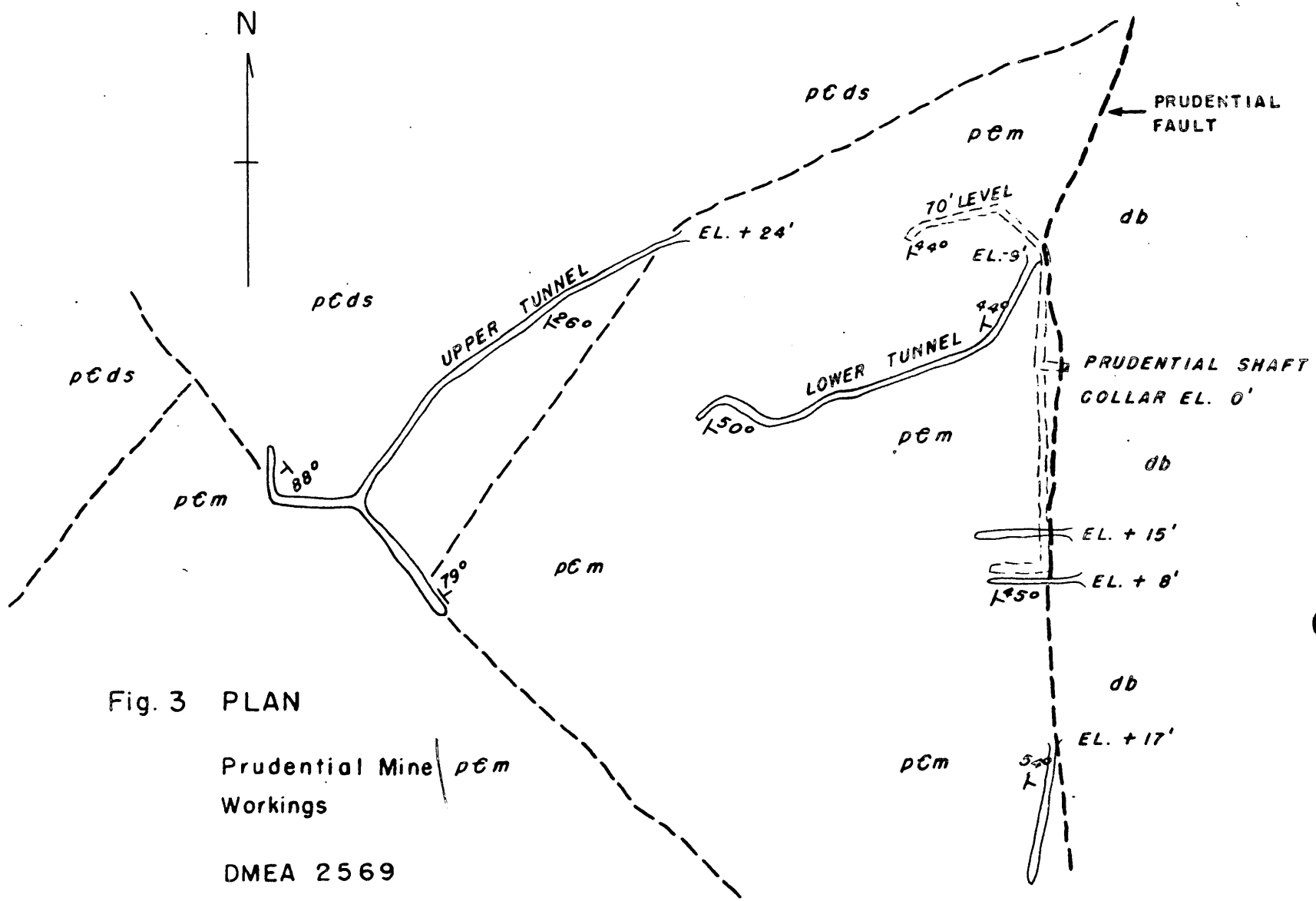

Fig. 3 PLAN

Prudential Mine Workings

DMEA 2569

Scale: 1" = 40'

Revised from map by H. R. Wardwell

Diabase (db)
Mescal Limestone (pЄm)
Dripping Springs Quartzite (pЄds)

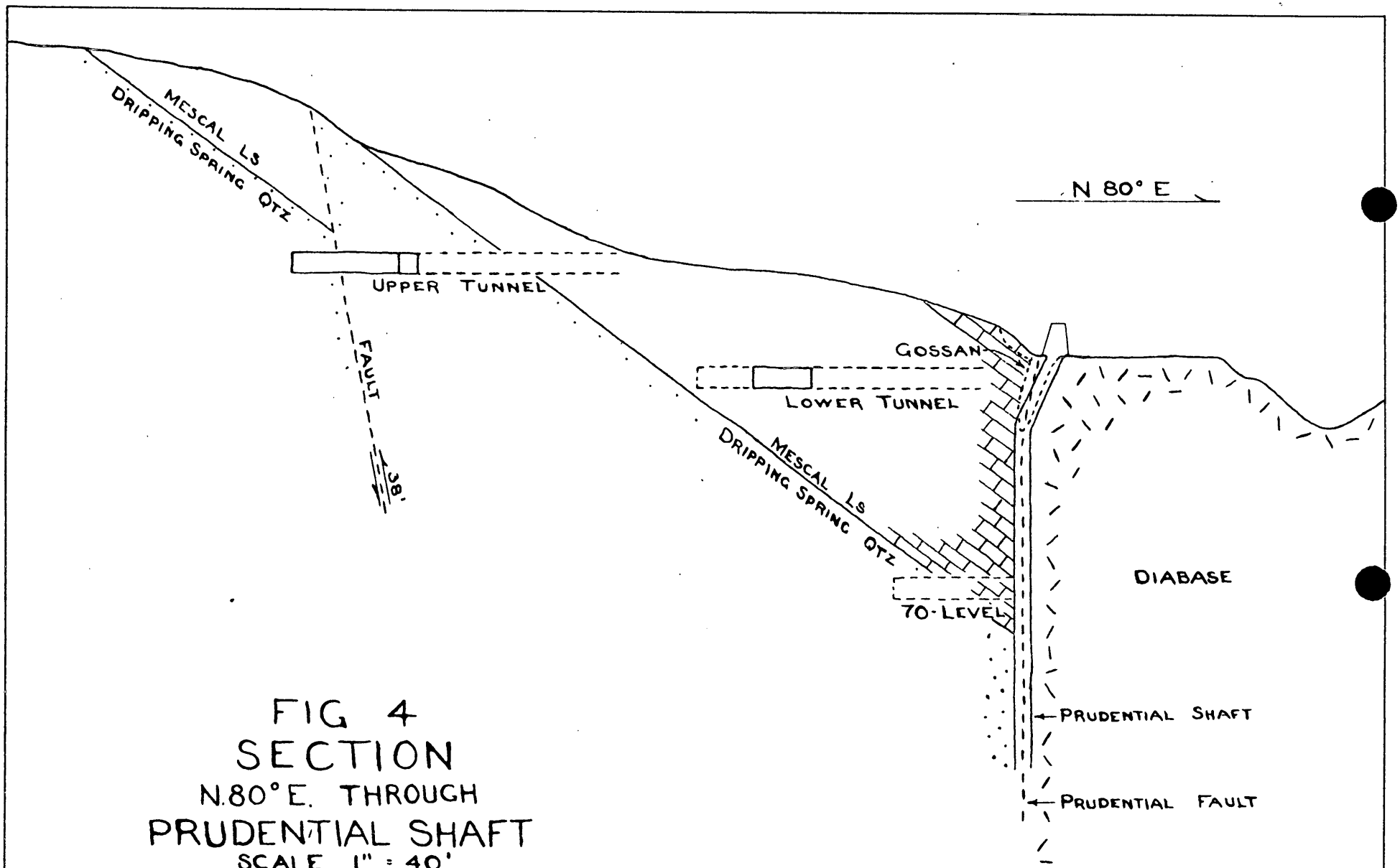

FIG 4
SECTION
N.80° E. THROUGH
PRUDENTIAL SHAFT
SCALE 1" = 40'
DMEA 2569

Revised from map by H. R. Wardwell.

contact between the limestone and the diabase had a northerly strike and dipped steeply westward, whereas the limestone, striking north-easterly, dipped about 50° eastward from the fault contact (Figure 4). The bulk of the mineralization replaced a lenticular bed of the sedimentary limestone adjacent and parallel to the diabase contact.

In the vicinity of the shaft the vein varied a maximum width of about 10 feet from which it gradually narrowed both to the north and south, and pinched out entirely at distances of 40 and 50 feet, respectively, from the shaft (Figure 3).

The small inclined shaft was inaccessible but was said to have followed the fault contact to a depth of 100 feet. There it apparently entered the underlying, crumpled, granite gneiss. From the shaft at a depth of 70 feet, drifts both to the north and south had followed the contact for a total distance of about 90 feet. Two short crosscuts from the end of each drift were driven to explore the full width of the limestone. Outside of the nature of ore, other than a few specimens of malachite and azurite in a gangue of silicified limestone, was found by this work.

Most of the Prudential Scale covered isolated spots of copper stain were found in the limestone. The earlier adits, totalling about 165 feet of work, had been driven to explore these surface showings, but nothing of profit was disclosed in either adit (Figure 3). In the westerly end of the lower adit a northwestward-trending fault was encountered and was followed by about 70 feet of drifting. This fault zone proved to be mineralized.

Two samples of the better mineralized portions of the vein were taken by the engineers in the vicinity of the shaft. The assay results of these samples were as follows:

Sample	Width	Ounces per ton Gold	Silver	Percent Lead	Zinc	Iron
22-24	6 ft.	Tr.	0.19	0.1	0.26	0.1
22-27	3 ft.	Tr.	0.3	0.1	0.64	0.25

Mineralogical Report

The vein material occurs in stringers on the inclined plane near the southeastern portion of the applicant's property (Figure 4). The 6-ft inclined shaft (1-4), entirely inaccessible, was sunk on one of a number of narrow parallel fractures that cut a large irregular mass of diorite. The principal fracture, filled with quartz and carbonate minerals, ranged in width from 8 inches to called as much as 3 feet. It was traceable on the surface at infrequent intervals for several hundred feet. Much of the vein material appeared barren, but occasional pieces were found that showed small crystals of galena and sphalerite. The shaft was said to have reached an inclined depth of 100 feet where a drift had followed the vein westward for 25 feet.

According to the applicant the vein in the face of this drift was 3 feet wide and contained commercial values of molybdenum, lead and silver. A few hundred pounds of ore, said to have come from this drift, was nearby piled near the collar of the shaft. A grab sample taken by the engineers from this pile of material contained 1.5 ounces of silver per ton, 1.0 percent lead, and 1.5 percent zinc.

Most of the [illegible] of the drill hole were composed chiefly of chloride ore which was sold as ore over from a recovery open cut. A [illegible] sample of this chloride contained a trace of gold, 3.6 ounces of silver per ton, 4.9 percent lead, and 4.3 percent zinc. The principal lead minerals were [illegible], [illegible], and cerussite. Apparently this ore consists of a drill hole or pod, for very little mineralization was evident in the rock adjacent to the edge of the open cut.

The rock dump, representing the material broken during the shaft sinking and drifting, was mineralized very poorly. According to the applicant, it was transported from the property, hence the [illegible] chloride ore appearing in the dump was in fact brought onto the property.

Conclusions

There are no minable ore on the subject property.

Recommendations

The exploration proposed by the applicant consisted of the following:

(1) One inclined diamond drill hole, 100 feet deep, to explore the drill fissure;

(2) An indefinite amount of drifting, crosscutting, and diamond drilling from the 7- and 14-foot levels of the Prehistorical shaft;

(3) The rehabilitation and sinking of the [illegible] Canyon shaft an additional 50 feet, crosscutting and drifting 100 feet from the bottom of the shaft.

COST OF THE PROJECT

As estimated by the applicants, the total cost of the proposed work would amount to $[illegible]. The applicants proposed to finance their share of this cost by selling stock in a company to be incorporated under the name of the Prudential Mines, Inc.

EVALUATION AND RECOMMENDATIONS

In the opinion of the examiners, none of the 3 prospects mentioned by the applicants are worthy of further exploration.

Even if the far-fetched theory be granted that the Lolle Fissure is a faulted segment of the Lepan vein, there would be no justification for its further exploration unless there was some positive evidence available that would indicate the possibility of discovering an ore body. Such indications are lacking.

The Prudential Minerals-Chelsea contact deposit has been explored sufficiently to show the limits of the mineralization. No ore was found and only a remnant of the favorable limestone rock such remains in the vicinity of the mineralized area.

The lead mineralization, consisting of galenite and sphalerite, which was found in the Porto Lepan deposit, occurs as small sporadic bunches in narrow lenticular veins. Judged by the limited amount of ore encountered during the previous exploration it is presumed that the deposits are too small to be of commercial importance.

Therefore, it is recommended that the requested loan be denied.

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

224 New Customhouse
Denver 2, Colorado

October 15, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2569 (Copper-Lead-Molybdenum) Kurt F. Koensbeck and J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are the original and three copies of the report pertaining to the above application. The brochure is also enclosed.

We recommend that the application be denied because of the improbability of making a significant discovery.

John F. Shaw
John F. Shaw for
W. E. King

A. H. Koechmann
A. H. Koechmann

Enclosures

DEPARTMENT OF THE INTERIOR
Defense ...
OCT 3 - 1952

U. S. Geological Survey

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mining Division
Region IV

October 15, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2369, (Copper-Lead-Molybdenum) Kurt F. Koenebeck & J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-2369 by L. L. Farnham of the Bureau of Mines.

The applicant requested aid in the amount of $104,362 for sinking, drifting and diamond drilling.

A large amount of exploratory work already done on this property has revealed only a small amount of mineralization.

The examiners concur that further work is not warranted and they recommend that the application be denied.

We concur in this recommendation.

John F. Shaw for
W. H. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE

(date)

Arizona-New Mexico Branch
xxxxxxxxxxxxxxxxxxxx

MINING DIVISION
REGION IV

October 3, 1952

Memorandum

To : W. H. King, Denver, Colorado

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

Subject : Final Report, Docket DMA-2569, Kurt V. Koenzbock's & J. P. Jackson's Prudential Copper-Lead-Molybdenum Mines, Pinal County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by S. L. Veick of the Geological Survey and L. L. Farnham of the Bureau of Mines, and the section on Engineering by Farnham for the above report. A separate section on Geology will be submitted by the Geological Survey.

Because of the small amount of mineralization and the large amount of exploratory work already done on these deposits, the examiners believe that no further work is warranted. Therefore they recommend that the application be denied. I concur with their recommendations, as does Mr. A. F. Shride of the Geological Survey.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms

CC: W. H. King (8)
A. F. Shride
DMA-2569
WF

WRStormsals

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

October 14, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2569, Prudential Mines, Pinal County, Arizona. Koenzbock and Jackson. Copper-Lead-Molybdenum.

Enclosed are the original and 8 copies of the geologic report by J. N. Faick of the U. S. Geological Survey, covering the above docket.

It has been recommended that the loan be denied.

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

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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

October 9, 1952

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, DMEA 2569, Prudential Mines (Koenzbock and Jackson), Pinal County, Arizona (Copper, Lead, Molybdenum)

Enclosed are the original and 8 copies of the above report by J. N. Faick of the Geological Survey.

It is concluded that there is little geologic possibility of ore occurring on the applicants' property. Therefore, denial is recommended. The report and this recommendation have my approval.

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

Enclosures 9

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

STRATEGIC MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

SMEA-2569, Kurt F. Koenzbock's and J. P. Jackson's

Prudential Copper-Lead-Molybdenum Mines

Pinal County, Ariz.

J. L. Faick, Geologist
U. S. Geological Survey

L. L. Farnham, Mining Engineer
U. S. Bureau of Mines

October 1952

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By J. M. Palek[1] and L. L. Farnham[2]

The property of the Prudential Copper-Lead-Molybdenum Mines, Pinal County, Ariz., was examined late in September 1952, following a request to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for exploration aid by Kurt F. Koenzbeck and J. F. Jackson of Superior, Ariz. The application, docketed as DMA-2589, requested $104,302 to be used for the further exploration of 3 separate and unrelated copper, lead and molybdenum prospects, known as the Belle Fissure, Prudential, and Potts Canyon.

The property was acquired by Kurt F. Koenzbeck about the time of World War I. Although rather well explored, the deposits have not been productive.

The Belle Fissure is a large diabase dike that cuts Dripping Springs quartzite and Pioneer shale. The dike has been explored by 2 adits, one of which disclosed a very small quartz-carbonate vein containing minor amounts of copper. There is no geological evidence to indicate that appreciable amounts of ore would be found associated with the dike.

The Prudential prospect has been developed by a 120-foot shaft, 90 feet of drifts, and 5 short adits. These workings explore a prominent fault along which trace amounts of sphalerite and chalcopyrite occur in metamorphosed beds of the lower part of the Mescal limestone. No ore was found and it appears very unlikely that any would be disclosed by further exploration.

1/ Geologist, U. S. Geological Survey.

2/ Mining Engineer, U. S. Bureau of Mines

The best prospect in the area is the Potts Canyon deposit. Here a 100-foot shaft has partly explored a quartz-carbonate vein containing appreciable amounts of lead and zinc. The principal lead minerals are galena, wulfenite and vanadinite. However, the vein is too small and too sparsely mineralized to be significant.

All the subject prospects have been adequately explored and the failure to find minable ore is convincing evidence that probably none exists. There is little likelihood that further exploration of the applicants' claims would result in a significant discovery.

Therefore, it is recommended that the loan application be denied.

PRUDENTIAL MINES
(KOENZBOCK AND JACKSON)
PINAL COUNTY, ARIZONA
DMRA 2569

COPPER - LEAD - MOLYBDENUM

Geology

By
John N. Faick
Geologist, U. S. Geological Survey

PRUDENTIAL MINES
(KOENZBOCK AND JACKSON)
PINAL COUNTY, ARIZONA
IMKA 2569

COPPER - LEAD - MOLYBDENUM

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General Geology	1
Prudential Mines Company's Prospects	4
Belle Fissure	4
Potts Canyon Shaft	5
Prudential Prospect	6
Ore Reserves	8
Conclusions	8
Recommendations	9

ILLUSTRATIONS

Fig. 1 - Location Map	See Engineering Report
Fig. 2 - Claim Map Showing Portions of Areal Geology	" " "
Fig. 3 - Plan of Prudential Mine Working	" " "
Fig. 4 - Section Through Prudential Shaft	" " "

INTRODUCTION

The Defense Minerals Exploration Administration has received an application (DMEA 2569) for the exploration of three copper, lead, and molybdenum prospects located about three airline miles northwest of Superior (Fig. 1), Pinal County, Arizona. The application was submitted by Mr. Kurt F. Koenzbock and Mr. J. F. Jackson, under the name of Prudential Mines. Messrs. Koenzbock and Jackson control 31 unpatented mining claims situated in Sections 20, 21, 28 and 29; T. 1 S., R. 12 E.

The Prudential Mines property is situated in an area drained by Potts (Whitford) Canyon, an intermittent tributary to Queen Creek. The topography is moderate and consists of low hills with altitudes ranging from about 2600 to 3300 feet.

The applicants' proposed exploration consists of the following:

1. Diamond drill (one 600-foot) hole to explore the Belle Fissure.

2. Explore the Prudential deposit by means of an unspecified footage of drifting, crosscutting and diamond drilling on the 70-foot and 120-foot levels.

3. Rehabilitate the Potts Canyon shaft on the Greyhound claim and deepen it from the 100-foot level to the 150-foot level, then crosscut to the vein and drift along it for about 400 feet.

The proposed exploration is not justified on the basis of the available geological data.

GENERAL GEOLOGY

The geology of the area is described in an unpublished report[1/]

1/ Wardwell, H. R., Geology of the Potts Canyon Mining Area Near Superior, Arizona: University of Arizona Masters Thesis, pp. 1-88, 1952.

which is the source of some of the data given below.

A generalized stratigraphic column, arranged from basic data included in the Wardwell[2/] report is as follows:

System	Formation or Group	Member	Thickness in Feet	Character
Tertiary		Dacite	Several hundred	Pink dacite & tuffaceous beds.
Cambrian		Troy quartzite	100-150	Purple & light red quartzite.
Pre-Cambrian	Apache	Basalt	100-200	Black, usually vesicular.
		Mescal limestone	350-400	White to brown siliceous limestone containing abundant chert bands.
		Dripping Spring quartzite	750-810	Brown or cream colored arkosic quartzite.
		Barnes conglomerate	3-30	Red or buff quartzite & conglomerate.
		Pioneer shale	350-400	Maroon fissile shales.
		Scanlan conglomerate	2-5	Quartz pebbles in schist or shale matrix.
Pre-Cambrian		Pinal schist		Sericite or chlorite schist.

Paleozoic formations younger than the Troy quartzite are not represented in the area, nor are Mesozoic rocks known in the district. All of the formations ranging in age from the Pinal schist to the Troy

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2/ Idem, pp. 9-30.

quartzite inclusive have been intruded by diabase, which usually occurs as sills but is often present as crosscutting bodies. The diabase is of wide distribution in central Arizona and locally has a great thickness, as for example in the Magma mine[3] at Superior, Arizona where two sills totaling 3100 feet in thickness have been cut by mine workings. Several faults have been recognized in the area.

The geology of the Potts Canyon area is, in a few respects, analogous to that of the Superior district and may be interpreted by comparison with this district. At Superior, the pre-ore faults, which are believed to be related[4] to the emplacement of a Central Arizona batholith during late Cretaceous or early Tertiary time, exert an important influence on mineralization. Ore deposition closely followed the pre-mineral faulting and may have begun before faulting entirely ceased. Mineralization was widespread in the Superior region and extended along the western part of the Pinal Mountain area for a few miles north and south of Superior, and extended into the Potts Canyon area. Although mineralization was of wide distribution, it was intense at only two places, the Magma mine at Superior and the Silver King mine about 2 miles north of Superior. The success of the Silver King and Magma mines has encouraged prospectors to intensively search for other mineral deposits in nearby areas, such as the Potts Canyon area, but to a notable extent the search has been unrewarded.

3/ Short, M. N., Galbraith, F. W., Harshman, E. N., Kuhn, T. H., and Wilson, E. D., Geology and Ore Deposits of the Superior Mining Area, Arizona: Arizona Bur. Mines Bull. 151, p. 35, 1943.

4/ Idem, P. 55.

THE PRUDENTIAL MINES PROSPECTS

There are many small prospects in the Potts Canyon area and many of these were already very old when one of the applicants, Mr. Koenzbock, acquired his properties about the time of World War I. Of the 31 unpatented claims controlled by the applicants, the Belle Fissure, the Prudential (Rochelle) and Potts Canyon (Greyhound) properties have received the bulk of the exploration done to date.

Belle Fissure

The Belle Fissure (Fig. 2) is a prominent diabase dike that cuts across tilted beds of Dripping Spring quartzite and Pioneer shale. The dike strikes about N. 40° W. and is nearly vertical. It is about 60 feet wide and exposed at the surface for about 3000 feet. The dike has been slightly broken in a few places by post-diabase faults that are present within the dike and are approximately parallel to its sides. These faults have localized feeble mineralization, which is now represented by a few films, veinlets, and pockets of copper oxide minerals. The largest exposure of mineral seen on the Belle Fissure by the examiners consisted of a single vein which was exposed in the back of a 125-foot adit driven in the dike from the southern slope of Potts Canyon. The vein is from 1 to 4 inches wide and is exposed for about 40 feet along the adit. A few percent of the vein filling consists of chrysocolla and malachite, the remainder being gangue quartz and calcite. Minerals containing molybdenum were not observed. A white efflorescent coating, obviously a product of oxidation, formed a band about one inch wide on each side of the vein. The vein is too small to encourage prospecting and the examiners could find no geological evidence to indicate that ore was likely to exist along the dike, therefore exploration of it cannot be recommended.

Potts Canyon Shaft

The Potts Canyon shaft (Fig. 2) and several prospect pits are situated on the northeast end of the Greyhound claim. The shaft, which is inaccessible, is inclined about 55° in a northeasterly direction and is about 100 feet deep. Near the bottom the applicant reports a short crosscut and a 25-foot drift on the vein. These workings partly explore a mineralized shear zone in diabase. The shear strikes N. 8°-15° E. and dips about 45° southeast, and is reported by the applicant to be 3 feet wide where penetrated by the crosscut. The mineralized zone is so poorly exposed that it can be traced for only about 150 feet on the surface; however, the applicant claims it can be traced for many hundreds of feet. This writer believes that there are several very small, widely separated, overlapping mineralized zones rather than a single large one. These are spaced many feet or several tens of feet apart so that they must be considered as separate veins.

The writer believes the shaft and a small cut about 35 feet south of it has prospected the largest and best mineralized of these zones. This zone is probably only about 150 feet long and not more than 3 feet wide. Mineralized material lying on the dumps contain galena, anglesite, wulfenite, and vanadinite associated with a gangue of quartz and silicified diabase. Two grab samples of the ore on the dumps yielded the following results:

Location	Ounces Gold/ton	Ounces Silver/ton	Percent Lead	Percent Copper	Percent Zinc
Potts Canyon Shaft	Tr.	1.8	1.6	Nil	1.8
Potts Canyon Cut	Tr.	3.6	6.9	Nil	2.3

There has been no production from the Potts Canyon prospect, therefore any ore removed during prospecting operations probably remains on the dumps. This amounts to only about two or three tons of low grade

oxidized material having no economic value. The ore was not assayed for molybdenum because there is obviously very little of it.

As the vein structures are very small, weakly mineralized, and widely separated, they do not justify additional exploration.

Prudential Prospect

The Prudential prospect, which is situated on the Rochelle claim (Fig. 2) is by far the most extensively developed of all the applicant's prospects. At the time of this examination the Prudential shaft was inaccessible, therefore part of the data included in this report is taken from Wardwell[5/] who apparently had access to the shaft workings.

The Prudential prospect is developed by a 120-foot shaft which is inclined westward at 75° for the first 20 feet; the remainder is vertical. At the 70-foot level are two short drifts (Fig. 3), totaling about 90 feet of workings that extend both north and south of the shaft, and about 50 feet of crosscuts. The property is also explored by five short adits totaling about 365 feet. These workings explore the Prudential fault zone (Figs. 3 and 4) which has a throw in excess of 600 feet. Along the fault a remnant of Mescal limestone, having a stratigraphic thickness of about 70 feet, rests upon the Dripping Spring quartzite and both of these formations abut against the fault on the west side. Relatively weak mineralization has been localized along and near the fault zone.

The Prudential shaft was sunk on the fault along which a gossan is exposed at the surface for a distance of 40 feet north of the shaft and about 100 feet south of it. The gossan is about 10 feet wide at the shaft collar. The gossan consists of iron oxides in an altered limestone in which tremolite is abundant. Approximately 20 feet below the shaft

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5/ Op. cit., pp. 76-77; 84-86.

collar the gossan narrows to 2 or 3 feet, and it apparently pinches out a few feet below this depth. On the 70-foot level the fissure contains greenish-black chlorite and grayish-green tremolite. It is reported[6] that minute bands of sphalerite with which is associated trace amounts of chalcopyrite are present in the tremolite gangue.

Diabase, quartzite, and altered limestone are present on the mine dumps and prove that these three rock types were penetrated by the mine workings. The shaft apparently penetrated quartzite (Fig. 4) below the limestone, and crosscuts on the 70-level apparently also crossed from limestone into the quartzite.

Tremolite has replaced some of the beds of Mescal limestone, and the replacement was most intense near the fault although the effects can be observed as far as 60 feet from the fault. Near the end of the lower or - 9 - foot adit (Fig. 3) intensely silicated beds were encountered, but none were observed in the upper or +24 adits.

At the Prudential prospect, the tremolite deposits, with which is associated minor amounts of sphalerite and chalcopyrite, have formed by metamorphism of beds of the Apache limestone. Metamorphism probably was not caused by the intrusion of the diabase, but owes its origin to a mineralizing medium that circulated along the Prudential fault and to a limited extent along the beds of the Mescal limestone.

Sphalerite and chalcopyrite are present only in insignificant or trace amounts. No shipments of zinc, lead, or copper have been made from the property and only trace amounts of these can be seen on the dumps. No molybdenum minerals were seen.

6/ Wardwell, H. R., op. cit., pp. 84-85.

Two samples of the gossan yielded the following results:

Location	Ounces Au/ton	Ounces Ag/ton	Percent Lead	Percent Copper	Percent Zinc
South side of Prudential shaft	Tr.	0.15	0.1	0.20	0.1
40 ft. north of Prudential shaft	Tr.	0.3	0.1	0.04	0.15

Failure to find commercial ore is convincing evidence that none exists, and there is no geological reason to think that future exploration will be more generously rewarded than in the past.

ORE RESERVES

There is no ore of any class at the Prudential Mines prospects. The most intensive mineralization occurred along shear and fracture zones at the Potts Canyon shaft. In this locality occur a few small quartz-carbonate veins containing small amounts of lead, zinc, and silver. These veins are too small and too low grade to be of commercial value, therefore no attempt is made to estimate reserves.

CONCLUSIONS

The Belle Fissure is not the faulted extension of the Magma vein, as claimed by the applicants, but is a very large diabase dike occupying a fault in Dripping Spring quartzite. It is weakly mineralized but there is no geological evidence to indicate that ore of economic importance occurs associated with it. At the Potts Canyon shaft small quartz-carbonate veins, containing relatively small amounts of lead, zinc, and silver occupy shear and fracture zones in diabase. These veins are too small and too widely scattered to have commercial possibilities. Along the Prudential fault deposits of tremolite containing insignificant amounts of sphalerite and chalcopyrite have developed by metamorphism of beds of Mescal limestone. The deposits are very small, apparently shallow, and have been adequately explored by present mine workings.

RECOMMENDATIONS

It is recommended that the applicants' proposals for exploration of the Belle Fissure, Potts Canyon, and Prudential prospects be denied because of the absence of ore and the improbability of making a significant discovery.

DMEA-2569, KURT F. KOENZBOCK'S AND J. P. JACKSON'S
PRUDENTIAL COPPER-LEAD-MOLYBDENUM MINES
PINAL COUNTY, ARIZ.

Engineering Report

By L. L. Farnham,
Mining Engineer
U. S. Bureau of Mines

October 1952

DMRA-2569, KURT F. HOENSCCK'S AND J. P. JACKSON'S
PRUDENTIAL COPPER-LEAD-MOLYBDENUM MINES
PINAL COUNTY, ARIZ.

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INTRODUCTION

In May 1952, Kurt F. Koensbock and J. P. Jackson of Superior, Ariz. applied to the Defense Minerals Exploration Administration under the Defense Production Act of 1950, as amended, for an exploration loan amounting to $104,362. The application was docketed as DMEA-2569. The funds requested were to be used in the further exploration of 3 separate and unrelated copper-lead-molybdenum prospects.

These prospects were visited by DMEA examiners on September 17 and 18, 1952.

ACKNOWLEDGMENTS

Thanks are extended to the applicants, Kurt F. Koensbock and J. P. Jackson, for their help during the examination of their property.

LOCATION AND PHYSICAL FEATURES

The subject property is situated in the Potts Canyon area about 3 airline miles northwest of the town of Superior, Pinal County, Ariz. The claims cover portions of Secs. 20, 21, 28 and 29, T. 1 S., R. 12 E. (figure 1). The property can be reached over 5.6 miles of dirt road that turns northward from U. S. Highway 60-70 at a point 1.6 miles west of Superior. The Prudential is the only one of the 3 prospects that is directly accessible from this road. The other subject claims are reached by trails.

The area is semi-arid and of moderate relief with altitudes ranging from 2,600 to 3,300 feet above sea level.

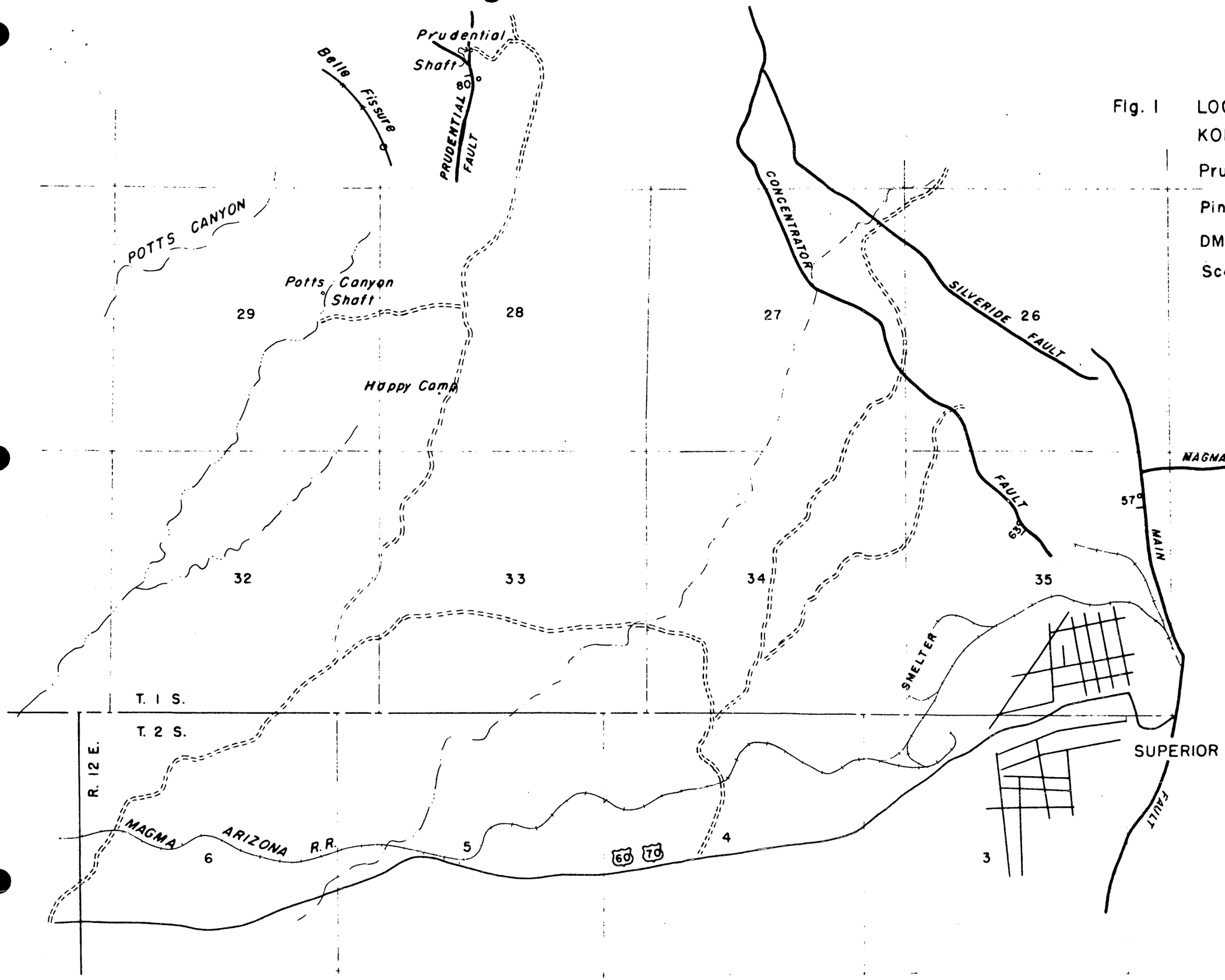

Fig. 1 LOCATION MAP
KOENZBOCK and JACKSON
Prudential Mines
Pinal County, Ariz.
DMEA 2569
Scale: 1" = 2000'

HISTORY AND PRODUCTION

Much of the subject property has been held by Kurt F. Koenzbock for the past 35 years. Very little, if any ore has been produced if from any of the various claims.

OWNERSHIP AND EXTENT

The property consists of a contiguous group of 31 unpatented mining claims (figure 2) recorded in the name of Kurt F. Koenzbock. It includes the Greyhound group, the Bello Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Hornell group, and the Gertrude, Nettie, Florence, and Emma claims.

DESCRIPTION OF THE DEPOSITS

Bello Fissure

The so-called Bello Fissure is a diabase dike occupying a fault that cuts the Apache group of pre-Cambrian sedimentary rocks. The dike, thought by some to be the western faulted segment of the Magma Vein, attains a width of 60 feet and is traceable on the surface for over 2,000 feet (figure 2). It strikes N. 40° W. and dips steeply to the south. As mapped by Hardwell,[1/] the southern wall of the fault, now occupied by the dike, moved about 700 feet westward relative to the northern side (figure 2). Where it is cut by Potts Canyon the dike is exposed through a vertical range of over 400 feet.

On the east side of the canyon floor an adit explored a narrow fracture zone near the footwall of the dike for 125 feet. Near the portal of this adit the fracture contained spots of oxide iron and

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1/ Hardwell, M. R., Geology of the Potts Canyon Area, Univ. of Ariz. Masters Thesis, 1941.

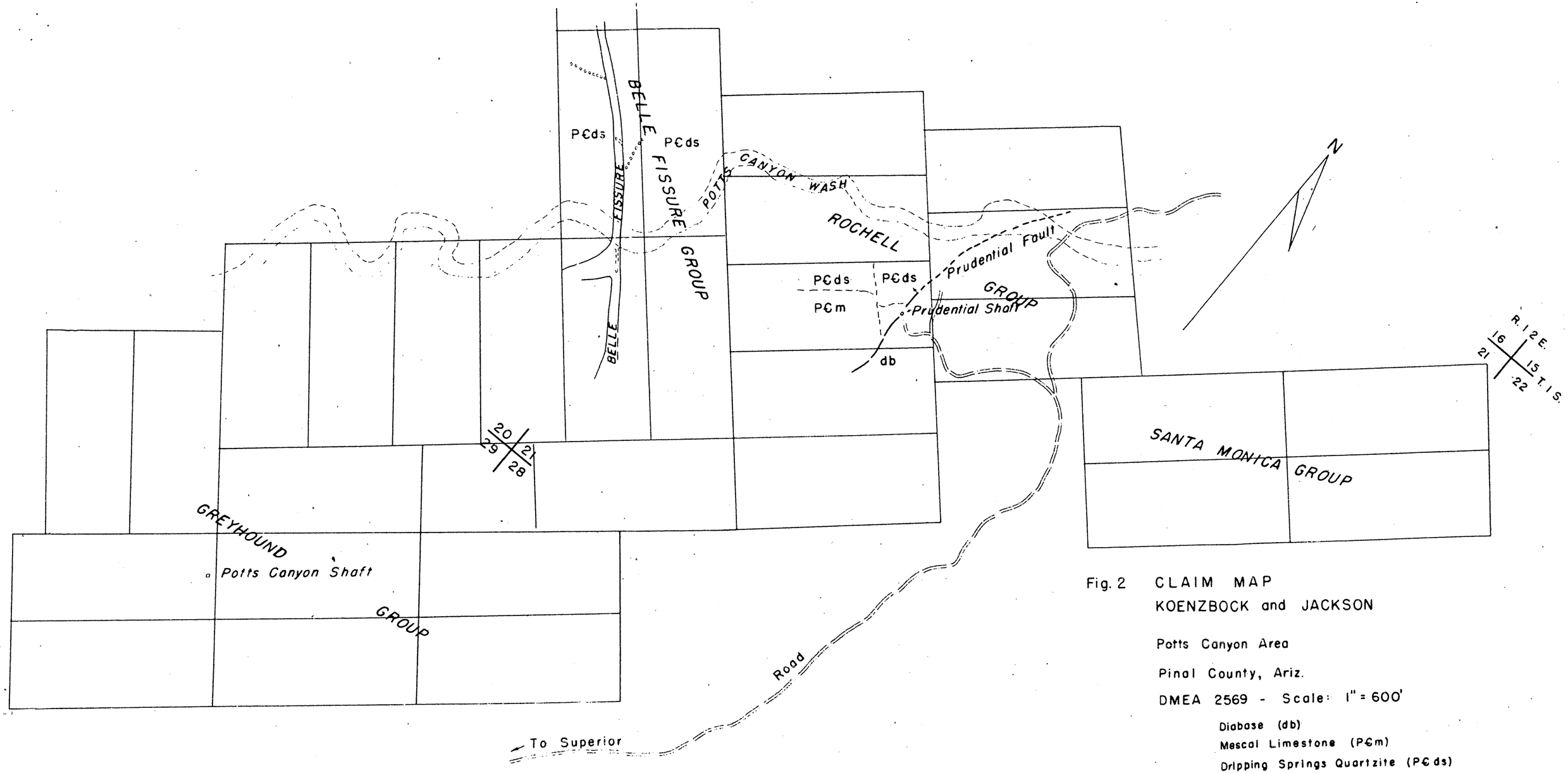

Fig. 2 CLAIM MAP
KOENZBOCK and JACKSON

Potts Canyon Area

Pinal County, Ariz.

DMEA 2569 - Scale: 1" = 600'

Diabase (db)
Mescal Limestone (P€m)
Dripping Springs Quartzite (P€ds)

minerals. The copper mineralization, associated with quartz lcite, was confined to a lense that attained a maximum width to 6 inches and a length of about 20 feet. Although the fracture persisted the full length of the adit, no copper mineralization evident in the last 100 feet of the opening. A few pounds of to 5 percent copper ore that had obviously been sorted from the aterial broken when the adit was driven still remained on the dump at the time of this examination. About 300 feet northwest of this adit and at an elevation about 200 feet higher, a shallow crosscut had exposed the full width of the diabase dike. A few small spots, showing some malachite and chrysocolla, were found by this work.

Wherever observed, the bulk of the diabase constituting the dike, was unaltered and showed no signs of mineralization except in the narrow and unpromising fracture zones previously described. Consequently there were no indications that deeper exploration of the dike, as proposed by the applicant, would be likely to disclose any more or better mineralization than that exposed by the present work.

Prudential Deposit

The Prudential workings, situated near the northeastward end of the Rochelle claim, explored a rather conspicuous outcrop of gossan. This mineralization, consisting essentially of oxides of iron with occasional spots of copper stain, occurred in the lower portion of the Mescal limestone where it abutted a large mass of diabase along the Prudential fault (figures 3 and 4). This fault

copper minerals. The copper mineralization, associated with quartz and calcite, was confined to a lense that attained a maximum width of 4 to 6 inches and a length of about 20 feet. Although the fracture zone persisted the full length of the adit, no copper mineralization was evident in the last 100 feet of the opening. A few pounds of 3 to 5 percent copper ore that had obviously been sorted from the material broken when the adit was driven still remained on the dump at the time of this examination. About 300 feet northwest of this adit and at an elevation about 200 feet higher, a shallow crosscut had exposed the full width of the diabase dike. A few small spots, showing some malachite and chrysocolla, were found by this work.

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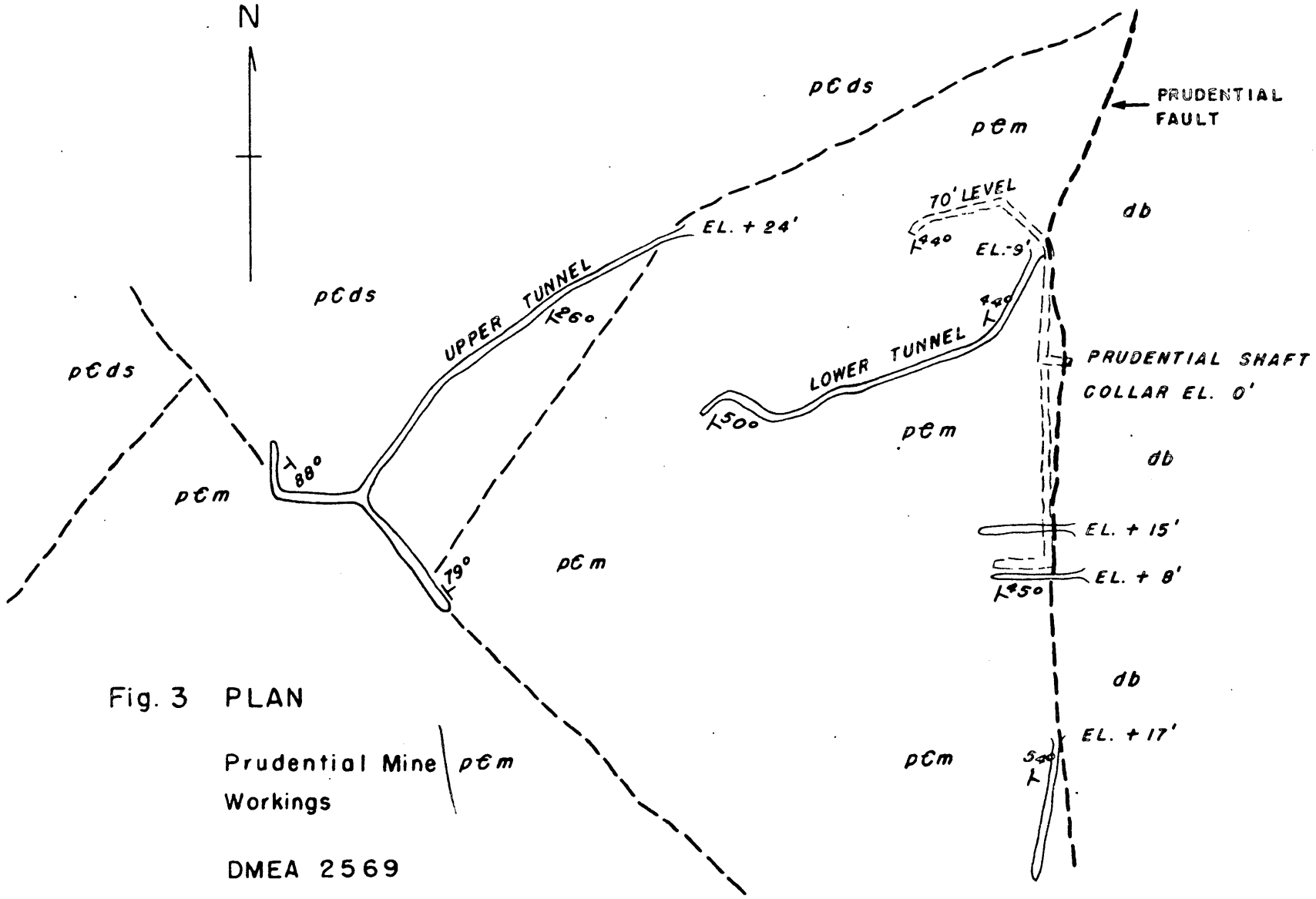

Fig. 3 PLAN

Prudential Mine Workings

DMEA 2569

Scale: 1" = 40'

Revised from map by H. R. Wardwell

Diabase (db)
Mescal Limestone (pCm)
Dripping Springs Quartzite (pCds)

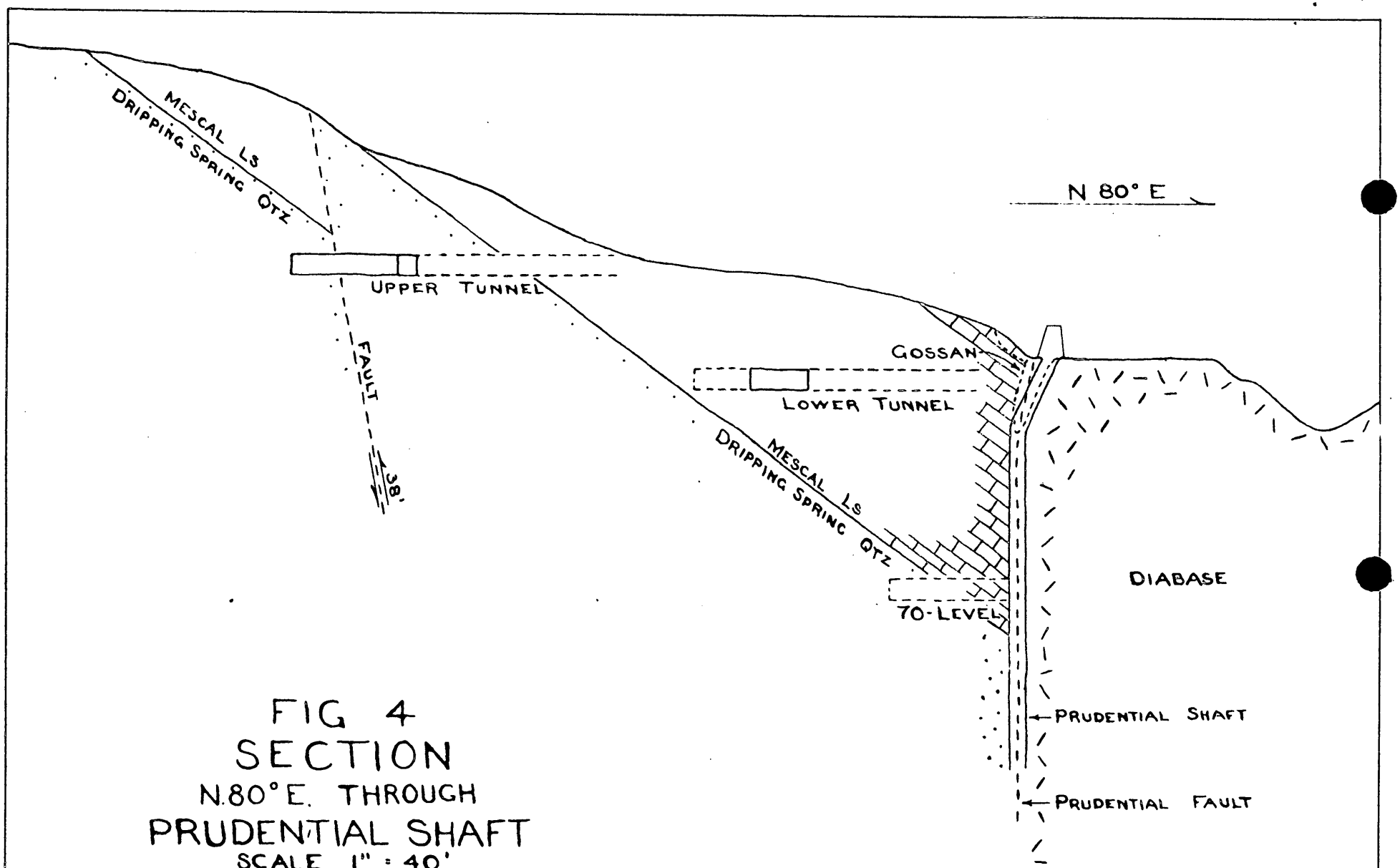

FIG 4
SECTION
N.80° E. THROUGH
PRUDENTIAL SHAFT
SCALE 1" = 40'
DMEA 2569
Revised from map by H. R. Wardwell

contact between the limestone and the diabase had a northerly strike and dipped steeply westward, whereas the limestone, striking northeasterly, dipped about 50° eastward into the fault contact (figure 4). The bulk of the mineralization had replaced a lenticular band of the metamorphosed limestone adjacent and parallel to the diabase contact.

In the vicinity of the shaft the gossan attained a maximum width of about 10 feet from which it gradually narrowed both to the north and south, and pinched out entirely at distances of 40 and 80 feet, respectively, from the shaft (figure 3).

The small inclined shaft was inaccessible but was said to have followed the fault contact to a depth of 120 feet. There it apparently bottomed in the underlying Dripping Springs quartzite. From the shaft at a depth of 70 feet, drifts both to the north and south had followed the contact for a total distance of about 90 feet. Two short crosscuts from the end of each drift were driven to explore the full width of the limestone. Nothing of the nature of ore, other than a few specimens of chalcopyrite and sphalerite in a gangue of silicified limestone, was found by this work.

West of the Prudential fault several isolated spots of copper stain were found in the limestone. Two shallow adits, totaling about 365 feet of work, had been driven to explore those surface showings, but nothing of premise was disclosed in either adit (figure 3). At the westerly end of the upper adit a northwestward-trending fault was encountered and was followed by about 70 feet of drifting. This fault zone proved to be unmineralized.

Two samples of the better mineralized portions of the gossan were taken by the examiners in the vicinity of the shaft. The assay results of these samples were as follows:

		Ounces per ton		Percent		
Number	Width	Gold	Silver	Lead	Copper	Zinc
12634	6 ft.	Tr.	0.15	0.1	0.20	0.1
12637	3 ft.	Tr.	0.3	0.1	0.04	0.15

Potts Canyon Prospect

The Potts Canyon deposit is situated on the Greyhound claim near the southwestern portion of the applicants' property (figure 2). Here an old inclined shaft (55°), entirely inaccessible, was sunk on one of a number of narrow parallel fractures that cut a large irregular mass of diabase. The principal fracture, filled with quartz and carbonate minerals, ranged in width from a few inches to seldom as much as 3 feet. It was traceable on the surface at infrequent intervals for several hundred feet. Much of the vein material appeared barren, but occasional pieces were found that showed small crystals of wulfenite and vanadinite. The shaft was said to have reached an inclined depth of 100 feet where a drift had followed the vein southward for 25 feet.

According to the applicant the vein in the face of this drift was 3 feet wide and contained commercial amounts of molybdenum, lead and silver. A few hundred pounds of ore, said to have come from this drift, was neatly piled near the collar of the shaft. A grab sample taken by the examiners from this pile of material contained 1.3 ounces of silver per ton, 1.6 percent lead, and 1.3 percent zinc.

About 25 feet south of the shaft there were several hundred pounds of selected ore which was said to have come from a near-by open cut. A grab sample of this material contained a trace of gold, 3.6 ounces of silver per ton, 6.9 percent lead, and 2.3 percent zinc. The principal lead minerals were galena, wulfenite, and vanadinite. Apparently this ore occurred as a small lense or pod, for very little mineralization was evident in the vein remaining in the face of the open cut.

The main dump, representing the material broken during the shaft sinking and drifting, was mineralized very poorly. According to the applicant no ore was ever removed from the property, hence had the vein contained appreciable quantities of ore minerals there should have been much more broken ore on the dumps than the few hundred pounds that was evident.

ORE RESERVES

There was no minable ore on the subject property.

PROPOSED EXPLORATION

The exploration proposed by the applicant consisted of the following:

(1) One inclined diamond drill hole, 600 feet deep, to explore the Belle Fissure;

(2) An indefinite amount of drifting, crosscutting, and diamond drilling from the 70- and 120-foot levels of the Prudential shaft;

(3) The rehabilitation and sinking of the Potts Canyon shaft an additional 50 feet, crosscutting and drifting 400 feet from the bottom of the shaft.

COST OF THE PROJECT

As estimated by the applicants, the total cost of the proposed work would amount to $104,362. The applicants proposed to finance their share of this cost by selling stock in a company to be incorporated under the name of the Prudential Mines, Inc.

CONCLUSIONS AND RECOMMENDATIONS

In the opinion of the examiners, none of the 3 prospects owned by the applicants are worthy of further exploration.

Even if the far-fetched theory be granted that the Belle Fissure is a faulted segment of the Magma vein, there would be no justification for its further exploration unless there was some geologic evidence available that would indicate the possibility of discovering an ore body. Such indications are lacking.

The Prudential limestone-diabase contact deposit has been explored sufficiently to show the limits of the mineralization. No ore was found and only a remnant of the favorable limestone host rock remains in the vicinity of the mineralized area.

The lead mineralization, consisting of wulfenite and vanadinite, which was found in the Potts Canyon deposit, occurs as small sporadic bunches in narrow lenticular veins. Judged by the limited amount of ore encountered during the previous exploration it is presumed that the deposits are too small to be of commercial importance.

Therefore, it is recommended that the requested loan be denied.

DMEA 2569

Memo by Schmidt Koenzbock and Jackson Superior Ariz

Reasons for my Field Referral. Commodity men Nelson agrees, Chas Johnson disagrees Hence necessity for my presenting reasons

Henry Wardwell geologist in his report of Aug 15, 1952 gives interesting information concerning the long range possibilities of the Belle Fissure being an extension of the Magma vein. If there is any possibility of this being the case as indicated, the property is worthy of a field examination. It is conceded from the Wardwell report that this is a long shot. While the Magma had more mineralization in the cropping of the porphyry dike, than would seem to be the case in the Belle Fissure, there never was enough showing on the surface, nor on the 650 level to indicate to the writer who was Superintendent of the Magma when it was first opened, that such a splendid producer would be developed.

The applicant offers an extensive plan of exploration costing $104,362.00 I do not take this proposed work very seriously. I want to know what our field team recommends. Not what the owners recommend.

The application shows no assays nor does the Wardwell report. But Wardwell does show " only several lenses of oxidized copper mineralization " in the Belle Fissure outcrop. Also near the Prudential shaft there are evidences in several places of low grade mineralization on the surface. North and South from the shaft, alluvium covers the cappings so that there may be something promising hidden by the wash.

This is a district where abundant copper mineralization has been found without any commensurate surface indications, and since we are interested in exploration I think that an examination to give us reliable information is justified. The first thing to determine is whether the geology looks sufficiently promising, and whether a few drill holes or some bulldozer surface work may not reveal something of importance that will call for further work.

I am not opposed to the applicant selling stock to raise money any more than I was when W. B. Thompson sold stock to finance the Magma. ~~However there is necessity~~

However there is necessity for the applicant having money to put up his half, share, but since the amount involved will be dependent upon the exploration program, and if only a few drill holes are recommended and the amount may be nominal, the applicant may be able to stand the cost. It is not necessary to consider a $104,000.00 program at this time.

The information we want about this project is not to be obtained from the applicant. I dont know the value of his opinion or idea s. the Field Team should geologize the property. They would probably receive all courtesies at the Magma.

Manifestly the Magma does not want this property. It is the purpose of the DMEA to explore where established companies may not wish to do so. Our policy is more liberal. Furthermore these big companies make many mistakes.

It is because I lay stress on trying to avoid overlooking a possible copper mine and because I think our Field Team can come up with some inexpensive method of exploration such as a few drill holes or bulldozer stripping that might give us the pulse of things that I recommend that they check the conclu ions of Wardwell and either recommend a plan of exploration or deny the application.

Schmidt

expert to Koenzbock
J. V. Jackson 230 Pecan Drive
Box 312
Superior, Ariz

GEOLOGIC REPORT
Concerning Portions of the
POTTS CANYON MINING AREA
near Superior, Arizona

August 15, 1951

Henry R. Wardwell, Geologist

Location and Accessibility

This area lying three miles northwest of the town of Superior, Arizona in Pinal County may be reached by road turning north from U.S. Highway 60-70 at the Superior Airport. A rough graded country road leads directly to Potts Canyon in the vicinity of the Prudential Mine.

Ownership

A series of thirty-one contiguous claims are held by right of location with assessment performed for the year 1951 by Mr. Kurt Koenzbock. These claims include the Greyhound group, the Belle Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Hornell group, the Gertrude, Nettie, Florence and Emma claims.

Most of these claims lie within Section 21, Tier 1 South, Range 12 East, Gila and Salt River Meridian and Base Line.

Topography and Stratigraphy

Potts Canyon, draining southwestward into Queen Creek, has been formed by erosion of a tilted fault block striking roughly north-south and dipping about 30° east. North of the Prudential mine the floor of the canyon is wide and flat where a thick sill of diabase was intruded into the preCambrian sediments chiefly in the Dripping Spring Quartzite. South of the mine the sediments, containing only a thin sill of diabase, were steeply eroded into a box canyon.

The formations exposed in the localities here described are late pre-Cambrian Pioneer shale, Dripping Spring quartzite and Mescal limestone capped by a basalt flow and variously intruded by post-Cambrian diabase.

Structure

Both pre-mineral and post-mineral faults are found in this area.

The Belle Fissure is a pre-mineral fault which served as a channelway for the intrusion of diabase into the sedimentary layers. The Prudential shaft was sunk on the post-diabase pre-mineral Prudential fault. The Concentrator fault, which crosses Potts Canyon one mile north of the Prudential Mine, is a post-mineral fault.

The Concentrator fault striking north-south near Superior is the major feature of the formations in the district. The west end of the Magma mine is bounded by this fault and its accessory the Main fault. The throw (nearly vertical displacement) of this fault is greater than 3500 feet. The horizontal movement along the fault is not known because of the fact that no markers such as earlier veins or dikes have been correlated on opposite walls of this break. As a result the west extension of the east-west striking Magma fault, in which is emplaced the Magma vein, has never been found on the west or down-dropped side of the Concentrator fault. If the Magma fault was mineralized beyond the known limits at the west end of the Magma mine then there is somewhere on the west side of the Concentrator fault an extension of the Magma vein.

The area immediately west of the Concentrator fault two miles northwest of the Magma mine and more than three miles south of the Magma mine is covered by post-mineral lava flows and conglomerates which cover and conceal any possible vein extension on the west side of the fault in its vicinity. The Potts Canyon area is the nearest exposure of pre-mineral formations not covered by post-mineral rocks on the west wall of the Concentrator fault.

The Belle Fissure in Potts Canyon is one structure that has been believed to be the west extension of the Magma vein. The displacement of the formations north and south of the Belle Fissure coincides with the movements of the formations on opposite walls of the Magma vein. The Belle Fissure strikes northwest-southeast which is not an excessive variation from the east-west strike of the Magma vein. One notable difference between the structures is the occurrence of the diabase. In the Magma mine diabase is one of the more favorable wall rocks of the vein i.e. pre-mineral whereas in the Belle Fissure diabase has filled the fracture itself. There is, however, evidence of post-diabse faulting along the walls of the Belle Fissure indicating that subsequent to intrusion of diabase in the fissure further faulting occurred.

The Prudential fault crosses Potts Canyon with a generally north-south strike. This fracture is a normal tensional fault which down-drops the sediments on the west wall about 1200 feet. It is likely that this fault contributed to the post-mineral regional tilting to the east of the sedimentary blocks whereby the same formation is now encountered four times between Potts Canyon and Apache Leap at Superior. The Prudential is not entirely post-mineral in movement. In the vicinity of the Prudential mine the hanging wall of the fault is mineralized and abundant gosson occurs along the fissure.

The Lead and Silver workings which are up the steep ridge in the diabase east of the Potts Canyon road are not characterized by vigorous structural origin. The diabase sill contains sheeting planes similar to bedding planes in sedimentary formations. These sheeting planes dip eastward in general parallel with the sedimentary beds into which the diabase was intruded as a thick sill. Mineralization occurs along a series of these sheeting planes in the diabase under the top of the ridge capped by Dripping Spring quartzite.

Mineralization

A drift on the west bank of Potts Canyon in the 60-foot wide diabase-filled Belle Fissure exposed a lens of oxidized copper minerals chiefly malochite and chrysocolla with some tenorite. The diabase host rock in the fissure contains numerous slickensides and abundant gouge confirming the observation that, subsequent to initial faulting and intrusion of the diabase, later faulting and eventually mineralization occurred within the diabase filling the fissure.

The outcrop of the Magma vein in Superior was occupied by a dike of porphry which immediately preceded mineralization in age whereas the diabase dike occupying the Belle Fissure is considerably older in age than the mineralization. Nevertheless the north and south walls of both faults, the Magma and the Belle Fissure, are displaced in the same relative direction approximately the same distance horizontally. Furthermore the presence of post-diabase faulting and mineralization in the Belle Fissure makes possible chronological correlation between the Magma and Belle Fissure in spite of the diabase filling in the Belle Fissure which has never been observed in the Magma mine.

The Prudential shaft was sunk on the Prudential fault with diabase foot wall and Mescal limestone for a hanging wall. In the vicinity of the shaft on the surface the limestone beds have been crosscut in several places revealing intense alteration of the limestone beds and low grade mineralization chiefly copper with abundant iron in the form of hematite, limonite and magnetite. Surrounding the shaft is an area of considerable alteration approximately 10 feet in width from diabase footwall into the limestone. Here a light brown and maroon iron gosson was developed. North and south from the shaft evidence of mineralization along the Prudential fault is lacking primarily because of the alluvial cover which has not been stripped outside the immediate vicinity of the Prudential shaft. To the north this fault becomes obscured in the wash of Potts Canyon and to the south it loses identity where the hanging wall limestone gives way to pre-Cambrian basalt. Crosscut development along the length of this fault is one of the post-mineral north-south faults of the Superior district or is an exception to the general rule at east-west pre-mineral faults.

The mineralized sheeting planes of the Lead and Silver Group are not characterized by steep angle vein walls. Rather the mineralized stringers containing galena, quartz and calcite with varying amounts of hematite in vugs follow the prevalent east dip of the diabase sill. Three inclined shafts sunk down the dip of the diabase from the mineralized outcrops on the ridge are partially filled with slough such that the galena-bearing stringers evidently exposed down the foot wall of the inclines some thirty to forty feet are now obscured by fill.

Exploration

The Belle Fissure as a possible west extension of the Magma vein offers a highly speculative chance to develop a strongly mineralized fissure. The encouraging evidence is primarily structural. The character of the outcrop of the Belle Fissure is not necessarily convincing with regard to economic concentrations of metals since the strike length of more than one-half mile reveals only several lenses of oxidized copper mineralization. A 500-foot diamond drill hole reaching a depth of 400 feet below Potts Canyon in the Belle Fissure could be drilled at a steep angle to the north from the west bank of Potts Canyon Wash about 150 feet south of the Belle Fissure. At this depth primary mineralization could

be reached and a fair test of the ore-bearing possibilities of the Belle Fissure below oxidation would be achieved.

The Prudential mine requires more surface exploration work along the Prudential fault before diamond drilling could be recommended. The hanging wall limestone alteration zone should be crosscut the entire width. Several crosscuts farther south from the shaft should be driven across the Prudential fault. If the intense alteration and well-developed iron oxide gosson are exposed over a greater strike length along the Prudential fault the possibilities of commercial ore in this north-south contrary-striking fissure are greatly increased.

The Lead and Silver Group mineralized stringers are in their attitude well positioned for diamond drilling. Several 100-foot holes drilled steeply down to the west from the ridge above the outcrops would intersect the series of sheeting planes where mineralization occurs well down the dip from the outcrop. Such drilling is again highly speculative, but for a different reason, in this instance the lack of strong vein structure. Nevertheless it is possible that the thin scattered seams of galena exposed on the surface improve with depth but it is indicated that such was not the case in the thirty to forty-foot inclines now obscured by fill. Any diamond drilling of these galena-bearing sheeting planes in the diabase should be preceded by a general repair and cleaning of the partially filled inclines in order to evaluate the persistence of the stringers with that much depth.

Henry R. Wardwell

FILE COPY 700
SURNAME:

Schmidt
J. Keone
F. E. Johnson

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

JUL 14 1952

Messrs. Kurt F. Koenzbock & J. F. Jackson
235 Hiener Drive
Box 312
Superior, Arizona

Re: Docket No. DMEA-2569
(Copper, Lead, Molybdenum)
Prudential Mine
Pinal County, Arizona

Gentlemen:

The application for assistance in exploring your property in Arizona, under the above captioned docket number, has been reviewed by the Rare and Miscellaneous Metals Division of the Defense Minerals Exploration Administration. Your application has been referred for a field examination to the Executive Officer of Region IV at the following address:

Mr. W. H. King
Executive Officer, Region IV
DMEA Field Team
224 New Customhouse Bldg.
Denver 2, Colorado

The Regional Office will contact you at the earliest opportunity in regard to your project.

Sincerely yours,

cc 7-14-52

(signed) FRANK E. JOHNSON (fw)

Acting Administrator

FSSchmidt/gla
7-9-52

cc to: Adm. Reading File
✓Docket
Mr. Ellis
Mr. Schmidt
DMEA Field Team, Region IV (2)

700 FILE COPY
SURNAME:

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

Schwardt
Selfridge
Jackson

Mr. W. L. King
Executive Officer
DMEA Field Team, Region IV
224 New Customhouse Building

JUL 14 1952

Re: Docket No. DMEA-2569
(Copper, Lead, Molybdenum)
Kurt F. Koenzbock & J. P. Jackson
Superior, Arizona

Dear Mr. King:

The captioned application is being referred to you for a field examination.

The application itself is looking in necessary information to justify the request for a Field Team examination. However, the report of Henry Wardwell of August 15, 1951, gives interesting information concerning the long range possibilities of the Belle Fissure being an extension of the Magma vein. If there is any possibility of this being the case as indicated, the examination should be made with the checking of this point as one of the main objectives.

Wardwell recommends a certain drill hole that might indicate the merits of this Belle Fissure. The possibilities of doing this with one or a few drill holes is of great interest.

The report also mentions possibilities of copper mineralization at the Prudential shaft where some bulldozer stripping might reveal a more extensive mineralized cropping.

Whether the applicants would be able to supply their half of the exploratory costs would depend on the amount of these costs as determined by the program developed by the Field Team and approval by the Applicants. In the event that one or only a few drill holes were involved the Applicants' share might be a nominal amount. In any case, the Field Team should ascertain whether the Applicants could supply their share of the cost of such a project as the Field Team might recommend and approved by the Applicants, without it being contingent on their selling of stock.

If the conclusions of the Field Team justify some exploratory program, it is recommended that the stimated cost details required for a contract be provided, together with all necessary maps and drawings.

It is assumed from your letter of transmittal of June 3, 1952, that you have retained one copy of the application. Enclosed please find maps as follows:

Vertical section through Prudential Shaft
Plan showing topography and geology in vicinity of Belle Fissure.
Areal Geology of Potts Canyon Mining area.

It would be appreciated if these maps were returned after they have served their purpose.

Sincerely yours,

George C. Selfridge
ce 7/14/52
ACTING Chairman, Operating Committee
(JHB)

Enclosures - 3 maps

APPROVED:

J. H. Hedges (JHB)
Member, Bureau of Mines

T. P. Thayer (JHB)
Member, Geological Survey

FSSchmidt/gla 7-9-52

cc to: Adm. Reading File
Operating Committee
Docket
Messrs. Ned Nelson, Rm. 4216 GSA
C. H. Johnson, Rm. 3621
Ellis
Schmidt

7/3/52 gla

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

July 1, 1952

Memorandum

To: E. W. Ellis, DMEA

From: E. H. Johnson, Bureau of Mines

Subject: DMEA - 2569 J. P. Jackson and K. F. Koenzback, Prudential mine and Belle Fissure, Pinal County, Arizona

I have reviewed this application and recommend that Applicant be asked for further information before any referral be made to the Field.

Applicant proposes: (1) 600 feet of diamond drilling on the Belle Fissure claim; (2) an unspecified footage of drifting, crosscutting, and diamond drilling on the 70-foot and 120-foot levels of the Prudential mine; (3) deepening the Potts Canyon shaft (on the Greyhound claim) 100 feet, crosscutting at that depth (150 level) to the vein and drifting 400 feet (for molybdenum). In support of the first two items Applicant refers to a report and map by H. R. Wardwell. In support of the third he states only "expect to find molybdenum in commercial quantity."

1) Wardwell explains clearly the thinking behind the Belle Fissure project, which is that this may be a northwestward extension of the Magma vein, distant some two or three miles and offset by the Concentrator post-mineral fault which terminates the Magma orebodies on the West. Wardwell calls it "a highly speculative chance." In my opinion it is too speculative to merit consideration in view of the one-shot nature of the proposal (only one drill hole) and the fact that Applicant intends to incorporate and sell stock to raise his share of the funds. If a responsible firm wanted to give a good test to such a prospect I would certainly recommend field investigation.

2) Regarding the Prudential shaft prospect, Wardwell in 1949 sketched some proposed diamond drilling there, but in his August 15, ~~1952~~ 1951 report states "The Prudential mine requires more

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 2 - 1952

surface exploration work along the Prudential fault before diamond drilling could be recommended," and apparently means stripping or trenching, because he refers to the alluvial cover obscuring any evidence of mineralization north and south of the shaft.

I think this discrepancy between Wardwell's recommendation and Applicant's proposal should be called to Applicant's attention. If he wants to persist in his proposal he should explain why and furnish maps of the existing workings and the full layout of crosscutting and drilling at this prospect. It is impossible to appraise anything so vague.

3) Applicant should give reasons for expecting to find molybdenum at the Potts Canyon shaft, and perhaps it would be well to tell him that a few properly taken samples and some better sketches would be helpful. The sketch he furnished with reference to this prospect is still meaningless to me after some study.

You will notice that the estimated costs seem excessive, and that they are not well itemized. Applicant really has three unrelated prospects, but has lumped them together in his cost figures.

Application and sketches are returned herewith.

C. H. Johnson

C. H. Johnson

Attachment

Copy to - Mr. Nelson
Minerals Division
Base Metals Branch
C. H. Johnson
Files

COPY

July 1, 1952

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA - 2569 J. P. Jackson and K. F. Koenzback, Prudential mine and Belle Fissure, Pinal County, Arizona

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Application and sketches are returned herewith.

(Signed) C. H. Johnson

Attachment

6/26/52 gla

IN REPLY REFER TO:

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

June 25, 1952

Memorandum

To: Mr. E. Wm. Ellis

From: N. E. Nelson

Subject: DMEA-2569 - Prudential Mine, Superior, Arizona.

The geologic map of the Bureau of Mines of Arizona Bull. 151, Superior Mining Area, Arizona, does not show, as such, the Belle Fissure, Prudential fault and other features mentioned in Wardell's report, and it is not possible to judge the validity of his correlations.

Perhaps the conclusions which are the basis of this application are warranted despite the apparent lack of similiarity of conditions at the Prudential and the Magma Mines.

The field team should pass on the prospects of what Mr. Wardell calls a highly speculative chance.

N. E. Nelson

N. E. Nelson
Geologist

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

June 25, 1952

Memorandum

To: Mr. E. Wm. Ellis

From: N. E. Nelson

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The field team should pass on the prospects of what Mr. Wardell calls a highly speculative chance.

N. E. Nelson

N. E. Nelson
Geologist

EXPLORATION

Subject: DMEA-2569
Re: Exploration Loan
Prudential Mine
June 6, 1952

Mr. Kurt F. Koenzbock
235 Hiener Drive
Box 312
Superior, Arizona

My dear Mr. Koenzbock:

This will acknowledge receipt of your application dated May 29, 1952 for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMEA-2569 and referred to the Rare and Miscellaneous Metals Division.

Kindly refer to DMEA-2569 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Administrative Officer

7862

DMEA-2569

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

224 New Customhouse
Denver 2, Colorado

June 3, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Molybdenum-Lead) Kurt F. Koenzbock and J. P. Jackson, Prudential Mines, Pinal County, Arizona

Enclosed are three copies of the application of Koenzbock and Jackson in the amount of $100,000 for exploration assistance on the Prudential mine.

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

Enclosed

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 6 1952

DMEA-0569

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

224 New Customhouse
Denver 2, Colorado

June 3, 1952

Memorandum

To: Secretary to the Operating Committee, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: (Molybdenum-Lead) Kurt F. Koenzbock and J. P. Jackson, Prudential Mines, Pinal County, Arizona

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W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Enclosed

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 6 1952

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2569
Metal or Mineral
Date Received 6-6-52
Amount $
Participation (Government %)

Name and address of applicant

Kurt F. Koenigbock
J P Jackson
Superior Ariz

235 Pleasant Drive
Box 312
Superior Ariz

235 Pleasant Drive
Box 312

Date May 29th 1952

If you have already filed MF-100, give date filed _____, type of assistance requested _____,

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 6 1952

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

(Name of company)	By Kurt F. Koenigbauer (Signature of authorized official)
May 29th 1952 (Date)	J P Jackson Owner (Title)

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

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

Kurt J. Koenzbach
J P Jackson
235 Pioneer Drive
Box 312
Superior - Ariz

1 (a) Prudential Mine, consisting of 32 mining claims in the Pioneer Mining District, Pinal County, State of Arizona, Situated about 2 1/2 miles in a Westerly and North Westerly direction from the Magma Mine at Superior, Arizona.

(b) Owners of the property.

(c) Greyhound Claim

(d) Rochelle Claim

(e) Bell Fissure Claim.

Hurt & Hoenzbach
J P Jackson 230 Hanover Drive
Box 312
Superior
Ariz

2 (a) Copper, molybdenum and lead.

(b) Prudential shaft on the Rochelle claim, heavy copper showing on the surface. See Mr. Wardwell's report.

(b) Pott's Canyon shaft on Greyhound claim.
Fissure vein in diabase, length of vein-- 4000 feet, contents molybdenum, lead and silver.
Shaft 100 feet, should be sunk additional 50 feet before cross-cutting and drifting.

(b) Bell Fissure claim has a fissure showing copper on the surface. A ~~$~~/ 600 foot diamond-drill hole to cut this vein should confirm the surface indications.
Enclosed find Mr. Wardwell's report on same.

Sure to Koenigbock
J P Jackson
235 Jefferson Drive
Box 312
Superior
Ariz

5 (a) Prudential Mine shaft.

Exploration work on the 70-feet and 120-feet levels will consist of drifting and cross-cutting to both foot- and hanging-walls, with diamond-drilling to determine the extent of the ore-body. We expect to hit a large body of sulfide ore.

(a) Bell Fissure.

Exploration work will consist of a 600-feet diamond-drill hole to cut the fissure at 500 feet. See map by Mr. Wardwell.

not received

(a) Pott's Canyon Shaft.

100-foot shaft has to be re-timbered and sunk to the 150-foot level, cross-cut 40 feet to vein and drift 300 feet north-east and 100 feet south-west on the vein, expect to find molybdenum in commercial quantity. Total cost of the project as out-lined will be $100,000.00

(b) Will start work as soon as the exploration loan is granted, and complete the project within 18 months.

Court of Hornsbach
J P Jackson 235 Phenix Drive
Box 312
Superior
Ariz

5. Repair three-room house, new roof, doors and windows to be used as Mine Office --- $500.00

Kurt F. Koenigbock
J P Jackson 236 Jefferson Avenue
Box 312
Superior Ariz

6. One 12 ft. by 14 ft. Warehouse - - - $500.00

One Hoist house - - - - - - - - - - $400.00

Total $900.00

Kurt F. Kerzbach
J P Jackson
235 Superior Drive
Box 363
Superior Ariz

7 (b) Two 210 cu.ft. Chicago Pneumatic two stage, air-cooled portable compressors with electric starter and battery, $12,400.00

Two single drum mine type hoist, 12-15 H.P. with bank levers, clutch and brake, direct drive geared to 4-cylinder Gasoline power unit $3,150.00

Two Chicago Pneumatic #50 Drifters $1,450.00

Two 3 1/2 inch by 6 ft. screw column arm and saddle $360.00

Two No.7 Chicago pneumatic air sinking pumps, capacity up to 200 feet $570.00

Four 16 ft. mine cars, roller bearing, 18 inch gauge $960.00

One lot 12-pound mine rails, 2000 lineal feet $648.00

Two 500-gal. water tanks $1,000

Four 50-ft. length 1/2 inch air-hose with couplings $102.00

Four 50-ft. lengths 3/4 inch air-hose with couplings $128.00

Twenty-four pieces 1-inch hexagon Timkens drill rods (8 2ft. lengths, 8 4ft. lengths, 8 6ft. lengths) $144.40

Four hundred Timken type side-hole bits $222.80

Two 11-cu.ft. mine buckets $230.00

350 feet 1/2 inch Union Rope Hoisting Cable $57.40

Two 18-inch mine sheaves $115.00

Two rubber tired wheel barrows $63.00

One Chevrolet pick-up truck $1,810.38

400 feet 3-inch air pipe $472.16

300 feet 2-inch air pipe $346.50

1,500 feet 1-inch water pipe $406.95

400 feet ventilation pipe $130.00

Total $24,050.89

Sent to Haeny bank
J P Jackson 235 Green Drive
Box 312
Superior
Ariz

8. Mine Superintendent	$500.00 per month
Manager	$500.00 per month
Two miners	$15.00 per day
Two operating engineers	$15.00 per day
Two muckers	$14.00 per day

Cost of 18 months of operation:

Mine superintendent	$9,000.00
Manager	$9,000.00
Two miners	$14,865.00
Two operating engineers	$14,865.00
Two muckers	$13,896.00
Total	$61,626.00

Sent to Foxy Cook
J P Jacobs
235 Spence Drive
Box 312
Superior Ariz

9. 20,000 ft. timber (275 ft. of shaft and two head frames)	$1,600.00
Twelve 100-pound cans of carbide, $8.61 per hundred	103.32
1,500 pounds of powder, $21.95 per hundred	3,292.50
12,000 feet of fuse, $11.55 per 1,000 feet	136.20
30 boxes caps	65.25
3,000 gal. of fuel	600.00
50 gal. motor oil at $1.00 per gal.	50.00
25 gal. compressor oil at $1.00 per gal.	25.00
15 gal. rope oil at $2.00 per gal.	30.00
50 bags cement, $1.80 per sack	90.00
One 50-pound anvil	32.65
Six picks	24.90
Four axes	15.40
Six shovels	22.50
One pipe vise	12.00
One die set	28.00
One hack saw	3.30
Two hand saws	10.60
Two hammers	6.30
Two cross-cut saws	12.50
Two squares	7.50
Two levels	3.65
One set of brace and bits	12.85
Two sets of pipe wrenches	37.70
One forge	30.00
Assaying	2,000.00
Diamond drilling	4,500.00
Miscellaneous	171.49
State industrial insurance for 18 months	4,362.00
Total	$17,285.41

Kurt F. Haenzbock
J P Jackson 235 Pierce Drive
Box 32
Superior
Ariz

10. We propose to incorporate the 58 claims under the name of The Prudential Mines, Incorporated, and sell stock to finance this project.

Kurt A Koenigbach
J P Jackson 233 Sherman Ave
Bd 312
Superior

11. Summary of proposed expenses :

Salary and wages - - - - - - - -	$61,626.00
Equipment - - - - - - - - - - -	24,050.59
Supplies - - - - - - - - - - - -	17,285.41
Repairs on house - - - - - - - -	500.00
New building - - - - - - - - -	900.00
Total	$104,352.00

Form MF-103
(Revised June 1951)

2569

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2569
Metal or Mineral
Date Received 6-6-52
Amount $
Participation (Government %)

Name and address of applicant

Kurt F. Koenigbeck
Superior Ariz
J P Jackson
235 Steiner Drive
Box 312
Superior Ariz

235 Steiner Drive
Box 312
Superior Ariz

Date May 29 1952

If you have already filed MF-100, give date filed ....., type of assistance requested .....,

DMA Docket Number (if available) .....

$104,367

INSTRUCTIONS

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

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DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 6 1952

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

J P Jackson

By Kurt F. Koenigbach

(Name of company) (Signature of authorized official)

May 29 - 1952 Owners

(Date) (Title)

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

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

Kurt F. Koenigbock 236 Greene Drive
J P Jackson Box 312
Superior Ariz

1 (a) Prudential Mine, consisting of 32 mining claims in the Pioneer Mining District, Pinal County, State of Arizona, Situated about 2 1/2 miles in a Westerly and North Westerly direction from the Magma Mine at Superior, Arizona.

(b) Owners of the property.

(c) Greyhound Claim

(c) Rochelle Claim

(c) Bell Fissure Claim.

Robert F. Koenigbach
J P Jackson
235 Hearst Drive
Box 312
Cupertino Cal

2 (a) Copper, molybdenum and lead.

(b) Prudential shaft on the Rochelle claim, heavy copper showing on the surface. See Mr. Wardwell's report.

(b) Pott's Canyon shaft on Greyhound claim.
Fissure vein in diabase, length of vein-- 4000 feet, contents molybdenum, lead and silver.
Shaft 100 feet, should be sunk additional 50 feet before cross-cutting and drifting.

(b) Bell Fissure claim has a fissure showing copper on the surface. A ~~f/~~ 500 foot diamond-drill hole to cut this vein should confirm the surface indications.
Enclosed find Mr. Wardwell's report on same.

Ernst F. Koenzbock
J P Jackson
235 Phone Drive
Box 312
Clifton
Ariz

3 (a) Prudential Mine shaft.

Exploration work on the 70-foot and 120-foot levels will consist of drifting and cross-cutting to both foot- and hanging-walls, with diamond-drilling to determine the extent of the ore-body. We expect to hit a large body of sulfide ore.

(a) Bell Fissure.

Exploration work will consist of a 600-foot diamond-drill hole to cut the fissure at 500 feet. See map by Mr. Wardwell.

(a) Pott's Canyon Shaft.

6 wks 100-feet shaft has to be re-timbered and sunk to the 150-feet level, cross-cut 40 feet to vein and drift

6 wks 500 feet north-east and 100 feet south-west on the vein, expect to find molybdenum in commercial quantity. Total cost of the project as out-lined will be $100,000.00

(b) Will start work as soon as the exploration loan is granted, and complete the project within 18 months.

$5000
5000
9000
3000
22000
Why?

Kurt F. Koenzbock
J P Jackson 2 35 Gen Dir
Bx 312
Supervisors

6. Repair three-room house, new roof, doors and windows to be used as Mine Office --- $500.00

Kept for Koenigbach
J. Jackson 231 Penn Ave
Box 312
Superior Ariz

6.	One 12 ft. by 16 ft. Warehouse - - -	$500.00
	One Hoist house - - - - - - - - - -	$400.00
	Total	$900.00

Kurt & Harry Buck
J. R. Jackson 235 Fremont Ave
Box 312
Hayward, Calif.

7 (b) Two 210 cu.ft. Chicago Pneumatic two stage, air-cooled portable compressors with electric starter and battery, $12,400.00

Two single drum mine type hoist, 12-15 H.P. with bank levers, clutch and brake, direct drive geared to 4-cylinder Gasoline power unit $3,150.00

Two Chicago Pneumatic #50 Drifters $1,470.00

Two 3 1/2 inch by 6 ft. screw column arm and saddle $360.00

Two No.7 Chicago pneumatic air sinking pumps, capacity up to 200 feet $570.00

Four 16 ft. mine cars, roller bearing, 18 inch gauge $960.00

One lot 12-pound mine rails, 2000 lineal feet $640.00

Two 500-gal. water tanks $310.00

Four 50-ft. length 1/2 inch air-hose with couplings $102.00

Four 50-ft. lengths 3/4 inch air-hose with couplings $122.00

Twenty-four pieces 1-inch hexagon Timkens drill rods (8 2ft. lengths, 8 4ft. lengths, 8 6ft. lengths) $144.40

Four hundred Timken type side-hole bits $222.80

Two 11-cu.ft. mine buckets $230.00

250 feet 1/2 inch Union Rope Hoisting Cable $57.40

Two 18-inch mine sheaves $115.00

Two rubber tired wheel barrows $63.00

One Chevrolet pick-up truck $1,810.30

400 feet 3-inch air pipe $472.16

500 feet 2-inch air pipe $346.50

1,500 feet 1-inch water pipe $406.95

400 feet ventilation pipe $150.00

Total $24,050.59

Kurt & Koenigbach 235 Fremont Line
J P Jackson Box 312
Superin
X any
X

8. Mine Superintendent $500.00 per month

Manager $500.00 per month

Two miners $15.00 per day

Two operating engineers $15.00 per day

Two muckers $14.00 per day

Cost of 18 months of operation:

Mine superintendent	$9,000.00
Manager	$9,000.00
Two miners	$14,865.00
Two operating engineers	$14,865.00
Two muckers	$13,896.00
Total	$61,626.00

Kurt F. Koenigbach 235 Pierce Drive
J. P. Jackson Box 312 Superior Ariz

9. 20,000 ft. timber (275 ft. of shaft and two head frames)	$1,600.00
Twelve 100-pound cans of carbide, $8.61 per hundred	103.32
1,500 pounds of powder, $21.95 per hundred	3,292.50
12,000 feet of fuse, $11.35 per 1,000 feet	136.20
30 boxes caps	65.25
3,000 gal. of fuel	600.00
50 gal. motor oil at $1.00 per gal.	50.00
25 gal. compressor oil at $1.00 per gal.	25.00
15 gal. rope oil at $2.00 per gal.	30.00
50 bags cement, $1.80 per sack	90.00
One 50-pound anvil	32.65
Six picks	24.90
Four axes	15.40
Six shovels	22.50
One pipe vise	12.00
One die set	28.00
One hack saw	3.30
Two hand saws	10.60
Two hammers	6.30
Two cross-cut saws	12.50
Two squares	7.30
Two levels	3.65
One set of brace and bits	12.85
Two sets of pipe wrenches	37.70
One forge	30.00
Assaying	2,000.00
Diamond drilling	4,500.00
Miscellaneous	171.49
State industrial insurance for 18 months	4,362.00
Total	$17,285.41

Kurt F. Koenigbach
J P Jackson
235 Pine Drive
Box 312
Superior Ariz

10. We propose to incorporate the 48 claims under the name of The Prudential Mines, Incorporated, and sell stock to finance this project.

Kurt F Koenigbach
J P Jackson
238 Green Drive
Box 312
Superior Ariz

11. Summary of proposed expenses :

Salary and wages - - - - - - - -	$81,626.00
Equipment - - - - - - - - - - -	24,050.59
Supplies - - - - - - - - - - - -	17,285.41
Repairs on house - - - - - - - -	500.00
New building - - - - - - - - -	900.00
Total	$124,362.00

4

J P Jackson
Kurt F. Koenzbock
235 Pleasant Drive
Box 812
Superior Ariz

GEOLOGIC REPORT
Concerning Portions of the
POTTS CANYON MINING AREA
near Superior, Arizona

August 15, 1951

Henry R. Wardwell, Geologist

Location and Accessibility

This area lying three miles northwest of the town of Superior, Arizona in Pinal County may be reached by road turning north from U.S. Highway 60-70 at the Superior Airport. A rough graded country road leads directly to Potts Canyon in the vicinity of the Prudential Mine.

Ownership

A series of thirty-one contiguous claims are held by right of location with assessment performed for the year 1951 by Mr. Kurt Koenzbock. These claims include the Greyhound group, the Belle Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Hornell group, the Gertrude, Nettie, Florence and Emma claims.

Most of these claims lie within Section 21, Tier 1 South, Range 12 East, Gila and Salt River Meridian and Base Line.

Topography and Stratigraphy

Potts Canyon, draining southwestward into Queen Creek, has been formed by erosion of a tilted fault block striking roughly north-south and dipping about 30° east. North of the Prudential mine the floor of the canyon is wide and flat where a thick sill of diabase was intruded into the preCambrian sediments chiefly in the Dripping Spring Quartzite. South of the mine the sediments, containing only a thin sill of diabase, were steeply eroded into a box canyon.

The formations exposed in the localities here described are late pre-Cambrian Pioneer shale, Dripping Spring quartzite and Mescal limestone capped by a basalt flow and variously intruded by post-Cambrian diabase.

Structure

Both pre-mineral and post-mineral faults are found in this area.

The Belle Fissure is a pre-mineral fault which served as a channelway for the intrusion of diabase into the sedimentary layers. The Prudential shaft was sunk on the post-diabase pre-mineral Prudential fault. The Concentrator fault, which crosses Potts Canyon one mile north of the Prudential Mine, is a post-mineral fault.

The Concentrator fault striking north-south near Superior is the major feature of the formations in the district. The west end of the Magma mine is bounded by this fault and its accessory the Main fault. The throw (nearly vertical displacement) of this fault is greater than 3500 feet. The horizontal movement along the fault is not known because of the fact that no markers such as earlier veins or dikes have been correlated on opposite walls of this break. As a result the west extension of the east-west striking Magma fault, in which is emplaced the Magma vein, has never been found on the west or down-dropped side of the Concentrator fault. If the Magma fault was mineralized beyond the known limits at the west end of the Magma mine then there is somewhere on the west side of the Concentrator fault an extension of the Magma vein.

The area immediately west of the Concentrator fault two miles northwest of the Magma mine and more than three miles south of the Magma mine is covered by post-mineral lava flows and conglomerates which cover and conceal any possible vein extension on the west side of the fault in its vicinity. The Potts Canyon area is the nearest exposure of pre-mineral formations not covered by post-mineral rocks on the west wall of the Concentrator fault.

The Belle Fissure in Potts Canyon is one structure that has been believed to be the west extension of the Magma vein. The displacement of the formations north and south of the Belle Fissure coincides with the movements of the formations on opposite walls of the Magma vein. The Belle Fissure strikes northwest-southeast which is not an excessive variation from the east-west strike of the Magma vein. One notable difference between the structures is the occurrence of the diabase. In the Magma mine diabase is one of the more favorable wall rocks of the vein i.e. pre-mineral whereas in the Belle Fissure diabase has filled the fracture itself. There is, however, evidence of post-diabse faulting along the walls of the Belle Fissure indicating that subsequent to intrusion of diabase in the fissure further faulting occurred.

The Prudential fault crosses Potts Canyon with a generally north-south strike. This fracture is a normal tensional fault which down-drops the sediments on the west wall about 1200 feet. It is likely that this fault contributed to the post-mineral regional tilting to the east of the sedimentary blocks whereby the same formation is now encountered four times between Potts Canyon and Apache Leap at Superior. The Prudential is not entirely post-mineral in movement. In the vicinity of the Prudential mine the hanging wall of the fault is mineralized and abundant gosson occurs along the fissure.

The Lead and Silver workings which are up the steep ridge in the diabase east of the Potts Canyon road are not characterized by vigorous structural origin. The diabase sill contains sheeting planes similar to bedding planes in sedimentary formations. These sheeting planes dip eastward in general parallel with the sedimentary beds into which the diabase was intruded as a thick sill. Mineralization occurs along a series of these sheeting planes in the diabase under the top of the ridge capped by Dripping Spring quartzite.

Mineralization

A drift on the west bank of Potts Canyon in the 60-foot wide diabase-filled Belle Fissure exposed a lens of oxidized copper minerals chiefly malochite and chrysocolla with some tenorite. The diabase host rock in the fissure contains numerous slickensides and abundant gouge confirming the observation that, subsequent to initial faulting and intrusion of the diabase, later faulting and eventually mineralization occurred within the diabase filling the fissure.

The outcrop of the Magma vein in Superior was occupied by a dike of porphry which immediately preceded mineralization in age whereas the diabase dike occupying the Belle Fissure is considerably older in age than the mineralization. Nevertheless the north and south walls of both faults, the Magma and the Belle Fissure, are displaced in the same relative direction approximately the same distance horizontally. Furthermore the presence of post-diabase faulting and mineralization in the Belle Fissure makes possible chronological correlation between the Magma and Belle Fissure in spite of the diabase filling in the Belle Fissure which has never been observed in the Magma mine.

The Prudential shaft was sunk on the Prudential fault with diabase foot wall and Mescal limestone for a hanging wall. In the vicinity of the shaft on the surface the limestone beds have been crosscut in several places revealing intense alteration of the limestone beds and low grade mineralization chiefly copper with abundant iron in the form of hematite, limonite and magnetite. Surrounding the shaft is an area of considerable alteration approximately 10 feet in width from diabase footwall into the limestone. Here a light brown and maroon iron gosson was developed. North and south from the shift evidence of mineralization along the Prudential fault is lacking primarily because of the alluvial cover which has not been stripped outside the immediate vicinity of the Prudential shaft. To the north this fault becomes obscured in the wash of Potts Canyon and to the south it loses identity where the hanging wall limestone gives way to pre-Cambrian basalt. Crosscut development along the length of this fault is one of the post-mineral north-south faults of the Superior district or is an exception to the general rule at east-west pre-mineral faults.

The mineralized sheeting planes of the Lead and Silver Group are not characterized by steep angle vein walls. Rather the mineralized stringers containing galena, quartz and calcite with varying amounts of hematite in vugs follow the prevalent east dip of the diabase sill. Three inclined shafts sunk down the dip of the diabase from the mineralized outcrops on the ridge are partially filled with slough such that the galena-bearing stringers evidently exposed down the foot wall of the inclines some thirty to forty feet are now obscured by fill.

Exploration

The Belle Fissure as a possible west extension of the Magma vein offers a highly speculative chance to develop a strongly mineralized fissure. The encouraging evidence is primarily structural. The character of the outcrop of the Belle Fissure is not necessarily convincing with regard to economic concentrations of metals since the strike length of more than one-half mile reveals only several lenses of oxidized copper mineralization. A 500-foot diamond drill hole reaching a depth of 400 feet below Potts Canyon in the Belle Fissure could be drilled at a steep angle to the north from the west bank of Potts Canyon wash about 150 feet south of the Belle Fissure. At this depth primary mineralization could

be reached and a fair test of the ore-bearing possibilities of the Belle Fissure below oxidation would be achieved.

The Prudential mine requires more surface exploration work along the Prudential fault before diamond drilling could be recommended. The hanging wall limestone alteration zone should be crosscut the entire width. Several cross-cuts farther south from the shaft should be driven across the Prudential fault. If the intense alteration and well-developed iron oxide gosson are exposed over a greater strike length along the Prudential fault the possibilities of commercial ore in this north-south contrary-striking fissure are greatly increased.

The Lead and Silver Group mineralized stringers are in their attitude well positioned for diamond drilling. Several 100-foot holes drilled steeply down to the west from the ridge above the outcrops would intersect the series of sheetin planes where mineralization occurs well down the dip from the outcrop. Such drilling is again highly speculative but for a different reason in this instance the lack of strong vein structure. Nevertheless it is possible that the thin scattered seams of galena exposed on the surface improve with depth but it is indicated that such was not the case in the thirty to forty-foot inclines now obscured by fill. Any diamond drilling of these galena-bearing sheeting planes in the diabase should be preceded by a general repair and cleaning of the partially filled inclines in order to evaluate the persistence of the stringers with that much depth.

Henry R. Wardwell

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMA-251
Metal or Mineral
Date Received 10-20-52
Amount $
Participation (Government %)

Name and address of applicant

Kurt F. Koengbeck
J P Jackson
Superior, Ariz

235 Pioneer Drive
Box 312
Superior, Ariz

235 Pioneer Drive
Box 312

Date May 29th 1952

If you have already filed MF-100, give date filed _____, type of assistance requested _____,

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

(Name of company)	By Kurt F. Koenigbock (Signature of authorized official)
May 29th 1952 (Date)	Owners (Title)

J P Jackson

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

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

Albert F. Hoenigbach
J. P. Jackson 235 Pioneer Drive
Box 312
Superior Ariz

1 (a) Prudential Mine, consisting of 32 mining claims in the Pioneer Mining District, Pinal County, State of Arizona, Situated about 2 1/2 miles in a Westerly and North Westerly direction from the Magma Mine at Superior, Arizona.

(b) Owners of the property.

(c) Greyhound Claim

(c) Rochelle Claim

(c) Bell Fissure Claim.

Kurt F. Hoerz book
J P Jackson 235 Pierce Drive
Box 312
Superior
Ariz

2 (a) Copper, molybdenum and lead.

(b) Prudential shaft on the Rochelle claim, heavy copper showing on the surface. See Mr. Wardwell's report.

(b) Pett's Canyon shaft on Greyhound claim.
Fissure vein in diabase, length of vein-- 4000 feet, contents molybdenum, lead and silver.
Shaft 100 feet, should be sunk additional 50 feet before cross-cutting and drifting.

(b) Bell Fissure claim has a fissure showing copper on the surface. A ~~$~~/ 600 foot diamond-drill hole to cut this vein should confirm the surface indications.
Enclosed find Mr. Wardwell's report on same.

Scott F. Koenigbock
J. P. Jackson
230 Phoenix Bldg
Box 812
Superior Ariz

3 (a) Prudential Mine shaft.

Exploration work on the 70-foot and 120-foot levels will consist of drifting and cross-cutting to both foot- and hanging-walls, with diamond-drilling to determine the extent of the ore-body. We expect to hit a large body of sulfide ore.

(a) Bell Fissure.

Exploration work will consist of a 600-feet diamond-drill hole to cut the fissure at 300 feet. See map by Mr. Tardwell.

(a) Pett's Canyon Shaft.

100-feet shaft has to be re-timbered and sunk to the 150-feet level, cross-cut 40 feet to vein and drift 300 feet north-east and 100 feet south-west on the vein, expect to find molybdenum in commercial quantity. Total cost of the project as out-lined will be $100,000.00

(b) Will start work as soon as the exploration loan is granted, and complete the project within 18 months.

Kurt J. Hoenigbach
J P Jackson 235 Pioneer Bldg
Box 312
Stephenville
Tex

5. Repair three-room house, new roof, doors and windows to be used as Mine Office --- $300.00

Kurt F Woerzbach
J P Jackson 235 Spencer Dr
Box 312
Springville Ariz

6. One 12 ft. by 14 ft. Warehouse - - - - $500.00

One Hoist house - - - - - - - - - - $400.00

Total $900.00

Heirs of Weingbach
J P Jackson 235 Pecan Drive
Box 312
Superior
Ariz

7 (b) Two 210 cu.ft. Chicago Pnuematic two stage, air-cooled portable compressors with electric starter and battery, $12,400.00

Two single drum mine type hoist, 12-15 H.P. with bank levers, clutch and brake, direct drive geared to 4-cylinder Gasoline power unit $3,150.00

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500 feet 2-inch air pipe $346.50

1,500 feet 1-inch water pipe $406.95

400 feet ventilation pipe $130.00

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Kurt F. Voerhoek
J P Jackson 235 Jefferson Ave
Box 312
Superior

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Two muckers $14.00 per day

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Heirs of Hoenzbach
J P Jackson
235 Phoenix Orion Bldg
312 Luhrs Arcy

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Miscellaneous	171.49
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Hurst of Yoerg book
J P Jackson 235 Pierce Ave
Box 912
Elyria
Ohio

10. We propose to incorporate the 32 claims under the name of The Prudential Mines, Incorporated, and sell stock to finance this project.

Kent J. Haenzlbeck
J P Jackson 235 Hesser Drive
Box 312
Sylvania Ary

11. Summary of proposed expenses :

Salary and wages - - - - - - - -	$61,626.00
Equipment - - - - - - - - - - - -	24,050.59
Supplies - - - - - - - - - - - - -	17,285.41
Repairs on house - - - - - - - -	500.00
New building - - - - - - - - - -	900.00
Total	$104,362.00

4

Kurt F. Koenzbock
J P Jackson
285 Pioneer Drive
Box 312
Superior Ariz

GEOLOGIC REPORT
Concerning Portions of the
POTTS CANYON MINING AREA
near Superior, Arizona

August 15, 1951

Henry R. Wardwell, Geologist

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Most of these claims lie within Section 21, Tier 1 South, Range 12 East, Gila and Salt River Meridian and Base Line.

Topography and Stratigraphy

Potts Canyon, draining southwestward into Queen Creek, has been formed by erosion of a tilted fault block striking roughly north-south and dipping about 30° east. North of the Prudential mine the floor of the canyon is wide and flat where a thick sill of diabase was intruded into the preCambrian sediments chiefly in the Dripping Spring Quartzite. South of the mine the sediments, containing only a thin sill of diabase, were steeply eroded into a box canyon.

The formations exposed in the localities here described are late pre-Cambrian Pioneer shale, Dripping Spring quartzite and Mescal limestone capped by a basalt flow and variously intruded by post-Cambrian diabase.

Structure

Both pre-mineral and post-mineral faults are found in this area.

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The Prudential fault crosses Potts Canyon with a generally north-south strike. This fracture is a normal tensional fault which down-drops the sediments on the west wall about 1200 feet. It is likely that this fault contributed to the post-mineral regional tilting to the east of the sedimentary blocks whereby the same formation is now encountered four times between Potts Canyon and Apache Leap at Superior. The Prudential is not entirely post-mineral in movement. In the vicinity of the Prudential mine the hanging wall of the fault is mineralized and abundant gosson occurs along the fissure.

The Lead and Silver workings which are up the steep ridge in the diabase east of the Potts Canyon road are not characterized by vigorous structural origin. The diabase sill contains sheeting planes similar to bedding planes in sedimentary formations. These sheeting planes dip eastward in general parallel with the sedimentary beds into which the diabase was intruded as a thick sill. Mineralization occurs along a series of these sheeting planes in the diabase under the top of the ridge capped by Dripping Spring quartzite.

Mineralization

A drift on the ~~west~~ east bank of Potts Canyon in the 60-foot wide diabase-filled Belle Fissure exposed a lens of oxidized copper minerals chiefly malochite and chrysocolla with some tenorite. The diabase host rock in the fissure contains numerous slickensides and abundant gouge confirming the observation that, subsequent to initial faulting and intrusion of the diabase, later faulting and eventually mineralization occurred within the diabase filling the fissure.

The outcrop of the Magma vein in Superior was occupied by a dike of porphry which immediately preceded mineralization in age whereas the diabase dike occupying the Belle Fissure is considerably older in age than the mineralization. Nevertheless the north and south walls of both faults, the Magma and the Belle Fissure, are displaced in the same relative direction approximately the same distance horizontally. Furthermore the presence of post-diabase faulting and mineralization in the Belle Fissure makes possible chronological correlation between the Magma and Belle Fissure in spite of the diabase filling in the Belle Fissure which has never been observed in the Magma mine.

The Prudential shaft was sunk on the Prudential fault with diabase foot wall and Mescal limestone for a hanging wall. In the vicinity of the shaft on the surface the limestone beds have been crosscut in several places revealing intense alteration of the limestone beds and low grade mineralization chiefly copper with abundant iron in the form of hematite, limonite and magnetite. Surrounding the shaft is an area of considerable alteration approximately 10 feet in width from diabase footwall into the limestone. Here a light brown and maroon iron gosson was developed. North and south from the shaft evidence of mineralization along the Prudential fault is lacking primarily because of the alluvial cover which has not been stripped outside the immediate vicinity of the Prudential shaft. To the north this fault becomes obscured in the wash of Potts Canyon and to the south it loses identity where the hanging wall limestone gives way to pre-Cambrian basalt. Crosscut development along the length of this fault is one of the post-mineral north-south faults of the Superior district or is an exception to the general rule at east-west pre-mineral faults.

The mineralized sheeting planes of the Lead and Silver Group are not characterized by steep angle vein walls. Rather the mineralized stringers containing galena, quartz and calcite with varying amounts of hematite in vugs follow the prevalent east dip of the diabase sill. Three inclined shafts sunk down the dip of the diabase from the mineralized outcrops on the ridge are partially filled with slough such that the galena-bearing stringers evidently exposed down the foot wall of the inclines some thirty to forty feet are now obscured by fill.

Exploration

The Belle Fissure as a possible west extension of the Magma vein offers a highly speculative chance to develop a strongly mineralized fissure. The encouraging evidence is primarily structural. The character of the outcrop of the Belle Fissure is not necessarily convincing with regard to economic concentrations of metals since the strike length of more than one-half mile reveals only several lenses of oxidized copper mineralization. A 500-foot diamond drill hole reaching a depth of 400 feet below Potts Canyon in the Belle Fissure could be drilled at a steep angle to the north from the west bank of Potts Canyon wash about 150 feet south of the Belle Fissure. At this depth primary mineralization could

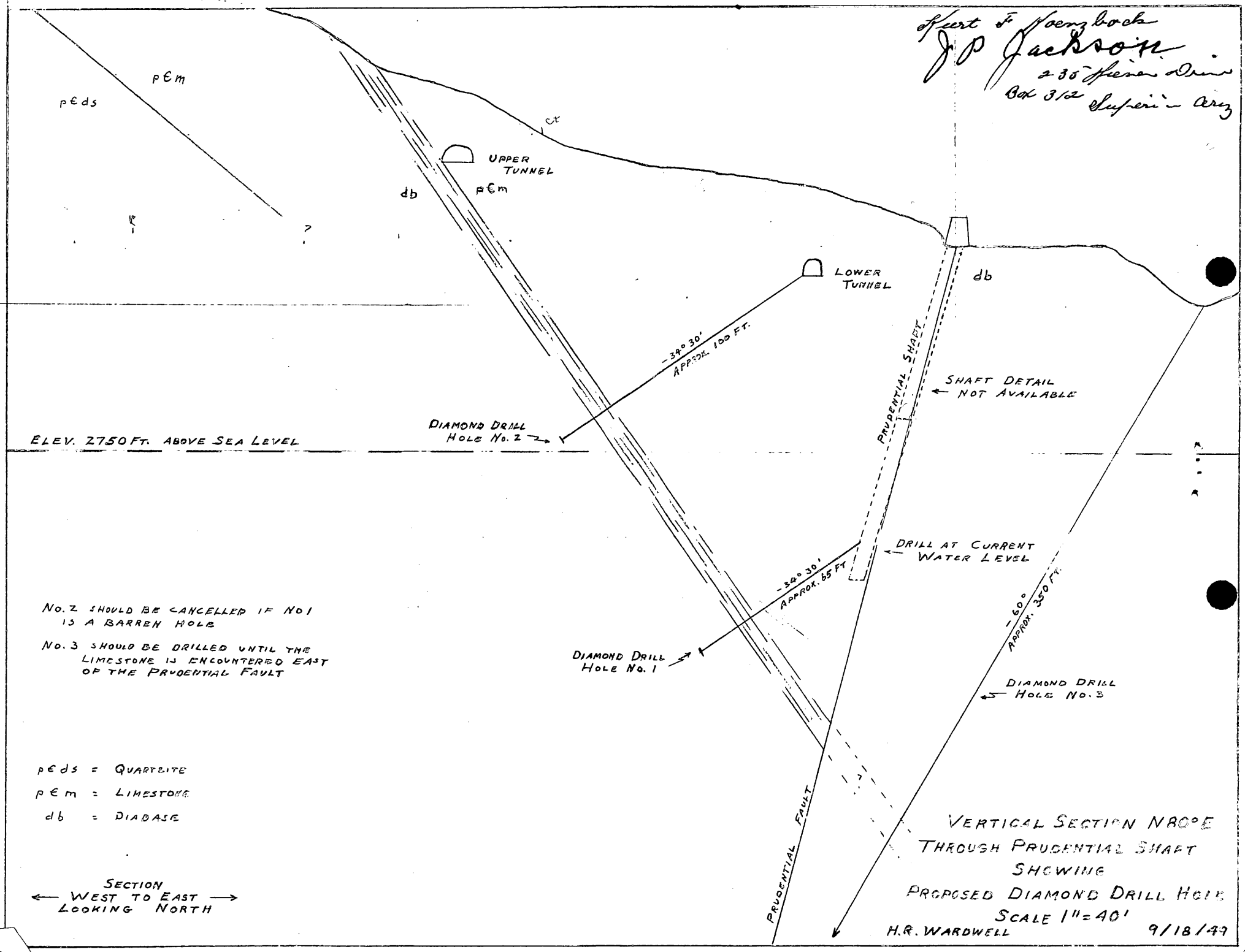
be reached and a fair test of the ore-bearing possibilities of the Belle Fissure below oxidation would be achieved.

The Prudential mine requires more surface exploration work along the Prudential fault before diamond drilling could be recommended. The hanging wall limestone alteration zone should be crosscut the entire width. Several cross-cuts farther south from the shaft should be driven across the Prudential fault. If the intense alteration and well-developed iron oxide gosson are exposed over a greater strike length along the Prudential fault the possibilities of commercial ore in this north-south contrary-striking fissure are greatly increased.

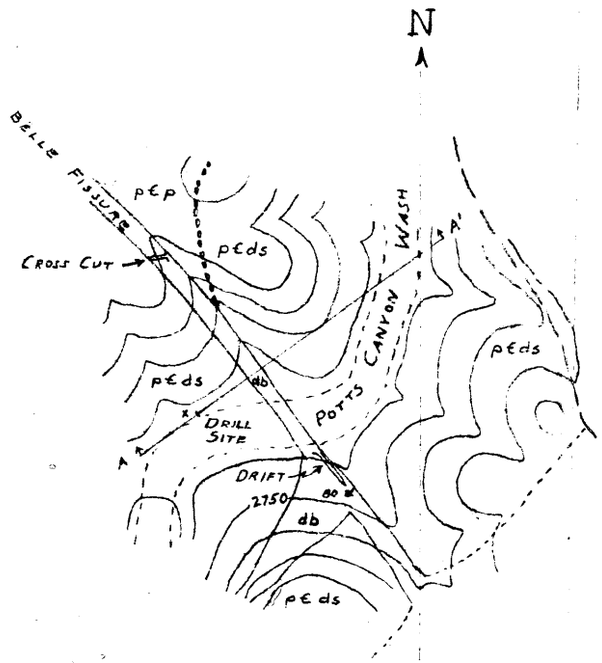
The Lead and Silver Group mineralized stringers are in their attitude well positioned for diamond drilling. Several 100-foot holes drilled steeply down to the west from the ridge above the outcrops would intersect the series of sheetin planes where mineralization occurs well down the dip from the outcrop. Such drilling is again highly speculative but for a different reason in this instance the lack of strong vein structure. Nevertheless it is possible that the thin scattered seams of galena exposed on the surface improve with depth but it is indicated that such was not the case in the thirty to forty-foot inclines now obscured by fill. Any diamond drilling of these galena-bearing sheeting planes in the diabase should be preceded by a general repair and cleaning of the partially filled inclines in order to evaluate the persistence of the stringers with that much depth.

Henry R. Wardwell

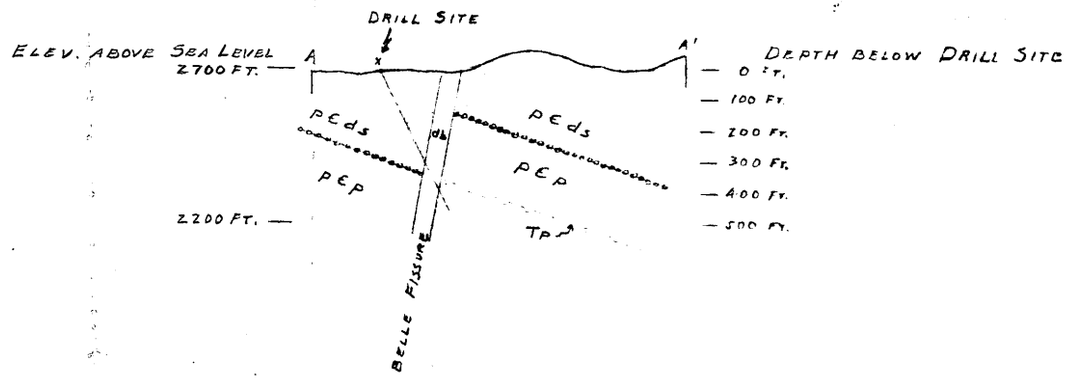
Sheet to Koenigbock
J P Jackson
235 Hieber Drive
Box 312 Superior Ariz



Hurt & Hurt Box
J P Jackson
235 Heaney Drive
Box 312
Superior Ariz



PLAN SHOWING TOPOGRAPHY & GEOLOGY
IN VICINITY OF BELLE FISSURE & POTTS WASH
SCALE 1" = 600'



VERTICAL SECTION A - A' SHOWING
PROPOSED DIAMOND DRILL HOLE THROUGH
BELLE FISSURE.
SCALE 1" = 600'

PROBABLE LENGTH OF HOLE 500 FT.
INCLINATION OF HOLE -65°

Tp - PORPHYRY
db - DIABASE
pЄds - DRIPPING SPRING QUARTZITE
oooooo - BARNES CONGLOMERATE
pЄp - PIONEER SHALE

ZA 21
29, 28

MAGMA COPPER CO. SUPERIOR, ARIZONA	
DEPT.	
DATE 2/26/49	DWG. NO.
DRAWN H.R. Wardwell	
SCALE 1" = 600'	

195-L "ALBANENE"—K. & E. CO., N. Y.—REG. U.S. PAT. OFF.

6/11/52

Mr. Nelson:

Please attach this map by Mr. Wardwell to form MF-103 which is in your office. Docket DMEA-2569.

EWE

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 25 1952

DATE
DRAWN
SCALE
DWG NO

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2569
Metal or Mineral
Date Received 6-6-52
Amount $
Participation (Government %)

Name and address of applicant

Kurt F. Koenigbeck
J P Jackroy
Superior Ariz

235 Hiener Drive
Box 312
Hiener
235 Hiener Drive
Box 312
Superior Ariz

Date May 29th 1952

If you have already filed MF-100, give date filed _____, type of assistance requested _____,

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 6 1952

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

(Name of company)	By Kurt F. Koenzbach. (Signature of authorized official)
May 29th 1952 (Date)	J P Jackson Owners (Title)

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

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

Kurt F. Koenigbeck 235 Pioneer Drive
J P Jackson Box 2
Superior Arizona

1 (a) Prudential Mine, consisting of 32 mining claims in the Pioneer Mining District, Pinal County, State of Arizona, Situated about 2 1/2 miles in a Westerly and North Westerly direction from the Magma Mine at Superior, Arizona.

(b) Owners of the property.

(c) Greyhound Claim

(c) Rochelle Claim

(c) Bell Fissure Claim.

Kurt F. Koenigbacher 235 Heiner Drive
J P Jackson Box 31[illegible] Superior Arizona

2 (a) Copper, molybdenum and lead.

(b) Prudential shaft on the Rochelle claim, heavy copper showing on the surface. See Mr. Wardwell's report.

(b) Pott's Canyon shaft on Greyhound claim.
Fissure vein in diabase, length of vein-- 4000 feet, contents molybdenum, lead and silver.
Shaft 100 feet, should be sunk additional 50 feet before cross-cutting and drifting.

(b) Bell Fissure claim has a fissure showing copper on the surface. A ~~$~~/ 600 foot diamond-drill hole to cut this vein should confirm the surface indications.
Enclosed find Mr. Wardwell's report on same.

Kurt F. Koenigbach
J. P. Jackson

235 Steiner Drive
Box 31
Superior Arizona

3 (a) Prudential Mine shaft.

Exploration work on the 70-foot and 120-foot levels will consist of drifting and cross-cutting to both foot- and hanging-walls, with diamond-drilling to determine the extent of the ore-body. We expect to hit a large body of sulfide ore.

(a) Bell Fissure.

Exploration work will consist of a 600-foot diamond-drill hole to cut the fissure at 500 feet. See map by Mr. Wardwell.

(a) Pott's Canyon Shaft.

100-foot shaft has to be re-timbered and sunk to the 150-foot level, cross-cut 40 feet to vein and drift 300 feet north-east and 100 feet south-west on the vein, expect to find molybdenum in commercial quantity. Total cost of the project as out-lined will be $100,000.00

(b) Will start work as soon as the exploration loan is granted, and complete the project within 18 months.

Kurt F. Koenigbeck
J P Jackson

235 Hiener Drive
Box 312
Superior Arizona

5. Repair three-room house, new roof, doors and windows to be used as Mine Office --- $500.00

Kurt F. Koenzbock 235 Pioneer Drive
J P Jackson Box 312 Superior Arizona

6. One 12 ft. by 14 ft. Warehouse - - - $500.00

One Hoist house - - - - - - - - - - $400.00

Total $900.00

Kurt F. Koenigbeck
J. P. Jackson

235 Hiener Drive
Box 312
Superior Arizona

7 (b) Two 210 cu.ft. Chicago Pnuematic two stage, air-cooled portable compressors with electric starter and battery, $12,400.00

Two single drum mine type hoist, 12-15 H.P. with bank levers, clutch and brake, direct drive geared to 4-cylinder Gasoline power unit $3,150.00

Two Chicago Pnuematic #50 Drifters $1,430.00

Two 3 1/2 inch by 6 ft. screw column arm and saddle $360.00

Two No.7 Chicago pneumatic air sinking pumps, capacity up to 200 feet $570.00

Four 16 ft. mine cars, roller bearing, 18 inch gauge $960.00

One lot 12-pound mine rails, 2000 lineal feet $648.00

Two 500-gal. water tanks $310.00

Four 50-ft. length 1/2 inch air-hose with couplings $102.00

Four 50-ft. lengths 3/4 inch air-hose with couplings $122.00

Twenty-four pieces 1-inch hexagon Timkens drill rods (8 2ft. lengths, 8 4ft. lengths, 8 6ft. lengths)$144.40

Four hundred Timken type side-hole bits $222.80

Two 11-cu.ft. mine buckets $230.00

350 feet 1/2 inch Union Rope Hoisting Cable $57.40

Two 18-inch mine sheaves $115.00

Two rubber tired wheel barrows $63.00

One Chevrolet pick-up truck $1,810.38

400 feet 3-inch air pipe $472.16

600 feet 2-inch air pipe $346.50

1,500 feet 1-inch water pipe $406.95

400 feet ventilation pipe $130.00

Total $24,050.59

Scott & Hoenzbock
J P Jackson

235 Hiener Drive
Box 31
Superior Arizona

8. Mine Superintendent	$500.00 per month
Manager	$500.00 per month
Two miners	$15.00 per day
Two operating engineers	$15.00 per day
Two muckers	$14.00 per day

Cost of 18 months of operation:

Mine superintendent	$9,000.00
Manager	$9,000.00
Two miners	$14,865.00
Two operating engineers	$14,865.00
Two muckers	$13,896.00
Total	$61,626.00

Kurt F. Poenzbach
J. P. Jackson

285 Spencer Drive
Box 312 Superior Arizona

9. 20,000 ft. timber (275 ft.of shaft and two head frames)	$1,600.00
Twelve 100-pound cans of carbide, $8.61 per hundred	103.32
1,500 pounds of powder, $21.95 per hundred	3,292.50
12,000 feet of fuse, $11.35 per 1,000 feet	136.20
30 boxes caps	65.25
3,000 gal.of fuel	600.00
50 gal. motor oil at $1.00 per gal.	50.00
25 gal. compressor oil at $1.00 per gal.	25.00
15 gal. rope oil at $2.00 per gal.	30.00
50 bags cement, $1.80 per sack	90.00
One 50-pound anvil	32.65
Six picks	24.90
Four axes	15.40
Six shovels	22.50
One pipe vise	12.00
One die set	28.00
One hack saw	3.30
Two hand saws	10.60
Two hammers	6.30
Two cross-cut saws	12.50
Two squares	7.30
Two levels	3.65
One set of brace and bits	12.85
Two sets of pipe wrenches	37.70
One forge	30.00
Assaying	2,000.00
Diamond drilling	4,500.00
Miscellaneous	171.49
State industrial insurance for 18 months	4,362.00
Toyal	$17,285.41

Kurt F. Koenigbock
J P Jackson

236 Pioneer Drive
Box 312
Superior Arizona

10. We propose to incorporate the 32 claims under the name of The Prudential Mines, Incorporated, and sell stock to finance this project.

Kurt F. Koenigbeck
J P Jackson

135 Greener Drive
Box 312
Superior Arizona

11. Summary of proposed expenses :

Salary and wages - - - - - - - - -	$61,626.00
Equipment - - - - - - - - - - - - -	24,050.59
Supplies - - - - - - - - - - - - - -	17,285.41
Repairs on house - - - - - - - - - -	500.00
New building - - - - - - - - - - - - -	900.00
Total	$104,362.00

Sent to Koenzbock
J P Jackson
235 Pioneer Drive
Box 312
Superior Ariz

GEOLOGIC REPORT
Concerning Portions of the
POTTS CANYON MINING AREA
near Superior, Arizona

August 15, 1951

Henry R. Wardwell, Geologist

Location and Accessibility

This area lying three miles northwest of the town of Superior, Arizona in Pinal County may be reached by road turning north from U.S. Highway 60-70 at the Superior Airport. A rough graded country road leads directly to Potts Canyon in the vicinity of the Prudential Mine.

Ownership

A series of thirty-one contiguous claims are held by right of location with assessment performed for the year 1951 by Mr. Kurt Koenzbock. These claims include the Greyhound group, the Belle Fissure group, the Rochelle and New Rochelle groups, the Santa Monica group, the Hornell group, the Gertrude, Nettie, Florence and Emma claims.

Most of these claims lie within Section 21, Tier 1 South, Range 12 East, Gila and Salt River Meridian and Base Line.

Topography and Stratigraphy

Potts Canyon, draining southwestward into Queen Creek, has been formed by erosion of a tilted fault block striking roughly north-south and dipping about 30° east. North of the Prudential mine the floor of the canyon is wide and flat where a thick sill of diabase was intruded into the preCambrian sediments chiefly in the Dripping Spring Quartzite. South of the mine the sediments, containing only a thin sill of diabase, were steeply eroded into a box canyon.

The formations exposed in the localities here described are late pre-Cambrian Pioneer shale, Dripping Spring quartzite and Mescal limestone capped by a basalt flow and variously intruded by post-Cambrian diabase.

Structure

Both pre-mineral and post-mineral faults are found in this area.

The Belle Fissure is a pre-mineral fault which served as a channelway for the intrusion of diabase into the sedimentary layers. The Prudential shaft was sunk on the post-diabase pre-mineral Prudential fault. The Concentrator fault, which crosses Potts Canyon one mile north of the Prudential Mine, is a post-mineral fault.

The Concentrator fault striking north-south near Superior is the major feature of the formations in the district. The west end of the Magma mine is bounded by this fault and its accessory the Main fault. The throw (nearly vertical displacement) of this fault is greater than 3500 feet. The horizontal movement along the fault is not known because of the fact that no markers such as earlier veins or dikes have been correlated on opposite walls of this break. As a result the west extension of the east-west striking Magma fault, in which is emplaced the Magma vein, has never been found on the west or down-dropped side of the Concentrator fault. If the Magma fault was mineralized beyond the known limits at the west end of the Magma mine then there is somewhere on the west side of the Concentrator fault an extension of the Magma vein.

The area immediately west of the Concentrator fault two miles northwest of the Magma mine and more than three miles south of the Magma mine is covered by post-mineral lava flows and conglomerates which cover and conceal any possible vein extension on the west side of the fault in its vicinity. The Potts Canyon area is the nearest exposure of pre-mineral formations not covered by post-mineral rocks on the west wall of the Concentrator fault.

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The Prudential fault crosses Potts Canyon with a generally north-south strike. This fracture is a normal tensional fault which down-drops the sediments on the west wall about 1200 feet. It is likely that this fault contributed to the post-mineral regional tilting to the east of the sedimentary blocks whereby the same formation is now encountered four times between Potts Canyon and Apache Leap at Superior. The Prudential is not entirely post-mineral in movement. In the vicinity of the Prudential mine the hanging wall of the fault is mineralized and abundant gosson occurs along the fissure.

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Mineralization

A drift on the west bank of Potts Canyon in the 60-foot wide diabase-filled Belle Fissure exposed a lens of oxidized copper minerals chiefly malochite and chrysocolla with some tenorite. The diabase host rock in the fissure contains numerous slickensides and abundant gouge confirming the observation that, subsequent to initial faulting and intrusion of the diabase, later faulting and eventually mineralization occurred within the diabase filling the fissure.

The outcrop of the Magma vein in Superior was occupied by a dike of porphry which immediately preceded mineralization in age whereas the diabase dike occupying the Belle Fissure is considerably older in age than the mineralization. Nevertheless the north and south walls of both faults, the Magma and the Belle Fissure, are displaced in the same relative direction approximately the same distance horizontally. Furthermore the presence of post-diabase faulting and mineralization in the Belle Fissure makes possible chronological correlation between the Magma and Belle Fissure in spite of the diabase filling in the Belle Fissure which has never been observed in the Magma mine.

The Prudential shaft was sunk on the Prudential fault with diabase foot wall and Mescal limestone for a hanging wall. In the vicinity of the shaft on the surface the limestone beds have been crosscut in several places revealing intense alteration of the limestone beds and low grade mineralization chiefly copper with abundant iron in the form of hematite, limonite and magnetite. Surrounding the shaft is an area of considerable alteration approximately 10 feet in width from diabase footwall into the limestone. Here a light brown and maroon iron gosson was developed. North and south from the shift evidence of mineralization along the Prudential fault is lacking primarily because of the alluvial cover which has not been stripped outside the immediate vicinity of the Prudential shaft. To the north this fault becomes obscured in the wash of Potts Canyon and to the south it loses identity where the hanging wall limestone gives way to pre-Cambrian basalt. Crosscut development along the length of this fault is one of the post-mineral north-south faults of the Superior district or is an exception to the general rule at east-west pre-mineral faults.

The mineralized sheeting planes of the Lead and Silver Group are not characterized by steep angle vein walls. Rather the mineralized stringers containing galena, quartz and calcite with varying amounts of hematite in vugs follow the prevalent east dip of the diabase sill. Three inclined shafts sunk down the dip of the diabase from the mineralized outcrops on the ridge are partially filled with slough such that the galena-bearing stringers evidently exposed down the foot wall of the inclines some thirty to forty feet are now obscured by fill.

Exploration

The Belle Fissure as a possible west extension of the Magma vein offers a highly speculative chance to develop a strongly mineralized fissure. The encouraging evidence is primarily structural. The character of the outcrop of the Belle Fissure is not necessarily convincing with regard to economic concentrations of metals since the strike length of more than one-half mile reveals only several lenses of oxidized copper mineralization. A 500-foot diamond drill hole reaching a depth of 400 feet below Potts Canyon in the Belle Fissure could be drilled at a steep angle to the north from the west bank of Potts Canyon wash about 150 feet south of the Belle Fissure. At this depth primary mineralization could

be reached and a fair test of the ore-bearing possibilities of the Belle Fissure below oxidation would be achieved.

The Prudential mine requires more surface exploration work along the Prudential fault before diamond drilling could be recommended. The hanging wall limestone alteration zone should be crosscut the entire width. Several crosscuts farther south from the shaft should be driven across the Prudential fault. If the intense alteration and well-developed iron oxide gosson are exposed over a greater strike length along the Prudential fault the possibilities of commercial ore in this north-south contrary-striking fissure are greatly increased.

The Lead and Silver Group mineralized stringers are in their attitude well positioned for diamond drilling. Several 100-foot holes drilled steeply down to the west from the ridge above the outcrops would intersect the series of sheetin planes where mineralization occurs well down the dip from the outcrop. Such drilling is again highly speculative but for a different reason in this instance the lack of strong vein structure. Nevertheless it is possible that the thin scattered seams of galena exposed on the surface improve with depth but it is indicated that such was not the case in the thirty to forty-foot inclines now obscured by fill. Any diamond drilling of these galena-bearing sheeting planes in the diabase should be preceded by a general repair and cleaning of the partially filled inclines in order to evaluate the persistence of the stringers with that much depth.

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Potts Canyon Shaft.

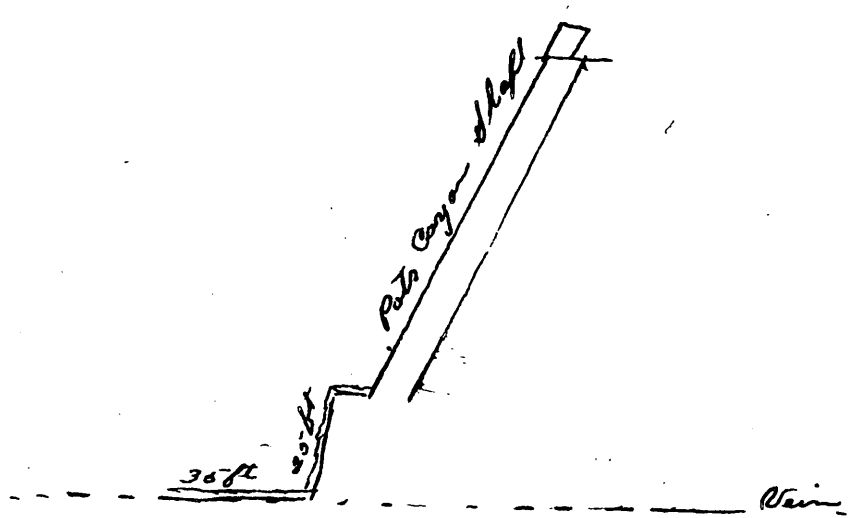

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PLATE I

AREAL GEOLOGY of the POTTS CANYON MINING AREA PINAL COUNTY, ARIZONA

Scale - 1/7200

1" = 603'

Contour Interval - 50 Feet

Datum Is Mean Sea Level

TRIANGULATION by H.R.Wardwell, W.G.Hogue

TOPOGRAPHY by H.R.Wardwell, K.Koenzbeck, T.Marvin

GEOLOGY by H.R.Wardwell

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EXPLANATION

SEDIMENTARY ROCKS

QUATERNARY

- Qd — Alluvium

TERTIARY

- Tdc — Dacite Conglomerate
- Ttu — Tuff

CAMBRIAN

- Ct — Troy Quartzite

PRE-CAMBRIAN

- pЄm — Mescal Limestone
- pЄds — Dripping Spring Quartzite, Barnes Conglomerate
- pЄp — Pioneer Shale, Scanlan Conglomerate
- pЄps — Pinal Schist

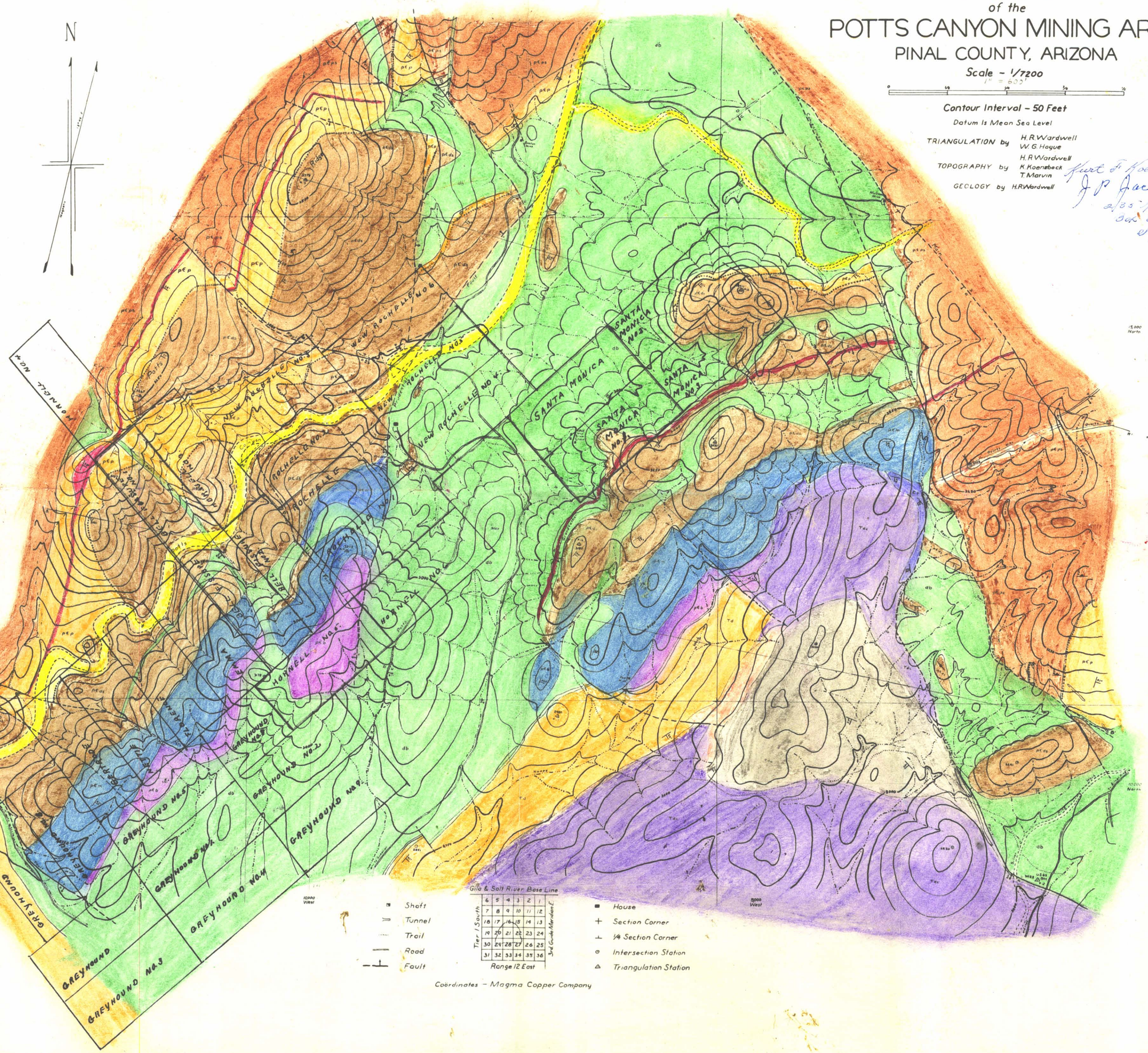
IGNEOUS ROCKS

TERTIARY

- Tb — Basalt
- Td — Dacite
- Obsidian Tuff
- Andesite Porphyry

PRE-CAMBRIAN PALEOZOIC

- db — Diabase
- pЄb — Basalt



Coördinates - Magma Copper Company