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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV - 6 1953

224 New Customhouse
Denver 2, Colorado

November 2, 1953

Memorandum

To: Administrator, Defense Minerals Exploration Administration, Attention: 210

From: Field Team, Region IV

Subject: Report of Examination - DMEA Docket 2652 (Lead-Zinc), Harry and Kenneth Knapp, Burrows Mine, San Juan County, Colorado

Enclosed are four copies of the report of examination on the subject property.

Six copies of the contract were sent to the applicants on November 20, 1952, but they had lost interest in the proposed exploration work at that time as evidenced by later correspondence.

The docket was closed September 1, 1953.

W. H. King
W. H. King

for E. N. Harshman
A. H. Koschmann

Enclosure

HMC:fwo

cc WMTraver
Subject
Chron
Koschmann

Reviewed by
DMEA OPERATING COMMITTEE
11-16-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 23 1953

Mining Division
Region IV

November 19, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2652, (Lead-Zinc) Harry G. and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado

Enclosed are eight copies of the engineering report on DMEA-2652.

The applicant proposed drifting, raising and diamond drilling at an estimated cost of $23,662.75. The examining engineers recommend the drifting and raising be cost $14,694.50, Government participation $7,347.25.

We concur in this recommendation.

W. E. King
W. E. King

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE
11-16-53
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 14, Colorado
November 14, 1952

Memorandum

To: Executive Officer, Field Team, Region IV

From: Chief, Colorado Branch, Mining Division, Region IV

Subject: DMEA 2652 (Lead-zinc), Harry G. Knapp and Kenneth E. Knapp (Burrows mine), San Juan County, Colorado

Please find enclosed the original and eight copies of the "Summary, Conclusions, and Recommendations", by E. N. Harshman and Russell E. McLellan, and of McLellan's "Engineering Report" on the above docket.

McLellan concludes that, although it is doubtful if the operators will ever be able to repay the Government loan, they will, however, produce a substantial amount of lead-zinc ore from the limited exploration program proposed. He recommends 350 feet of drifting on the lower Burrows level and 75 feet of raising at a favorable location. If a contract is prepared on a short form MF-200(A), drifting should average about $42.00 per foot and raising $55.00 per foot for a total over-all cost of $14,696.00.

The costs appear high but are fully justified as explained in the engineering report.

I approve the recommendations.

The brochure furnished by the Region IV Field Team is returned herewith.

W. A. Traver, Jr.

W. A. Traver, Jr.

Enclosures

WAT/ch

cc: 8
DMEA 2652
DMEA Chron.

Reviewed by
DMEA OPERATING COMMITTEE
11-16-53
(date)

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

200 New Customhouse
Denver 2, Colorado

October 22, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2652, Dr. Harry G. and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado.

Attached are 8 copies of the geologic report by E. N. Harshman covering DMEA Docket 2652, Burrows Mine, San Juan County, Colorado.

The applicant proposes to explore the Burrows vein on subject property for lead-zinc ore by 400 feet of drifting, 100 feet of diamond drilling, and by 90 feet of raises at an estimated cost of $23,662.75.

The Burrows vein occupies a fault in the Silverton volcanic series. The vein can be followed on the surface for about 2 miles. It ranges from 20 to 45 feet in width. The vein consists of white quartz which encloses tabular zones or small masses of silicified country rock. Galena, sphalerite, pyrite, and chalcopyrite are disseminated through irregular zones in the vein, or are concentrated in high grade shoots up to 5 feet wide.

The property is developed by 2 adits at different levels. About 1800 tons of sulfide ore have been produced from stopes above the upper level, but exploration to date on the lower level has been disappointing. However, Harshman concludes that further exploration in the Burrows mine is warranted and recommends that an exploration loan be approved. He suggests an exploration program modified somewhat from the original, estimated by the U. S. Bureau of Mines to cost about $17,451.00.

I concur in his recommendations.

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

Reviewed by
DMEA OPERATING COMMITTEE
11-16-53
(date)

Enclosures (8)

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 2652, Burrows Mine

San Juan County, Colorado

Lead-zinc

E. N. Harshman, Geologist
U. S. Geological Survey

Russell R. McLellan, Mining Engineer
Bureau of Mines

November 4, 1952

Reviewed by
DMEA OPERATING COMMITTEE
11-16-53
(date)

DMEA 2652

MERCUR MINE
SAN JUAN COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By R. H. Matthews
Geologist
U. S. Geological Survey

and

Russell R. Whelan
Mining Engineer
Bureau of Mines

DRAFT 2/53

BURROWS MINE
SAN JUAN COUNTY, COLORADO

SUMMARY, RECOMMENDATIONS, AND [illegible] BUDGET [illegible]

By Russell E. McLellan and E. N. Harshman

Dr. Harry G. Knapp, of Canon City, Colo., and Kenneth E. Knapp, of Silverton, Colo., have applied to the Government for assistance to explore for lead and zinc in the Burrows Mine, San Juan County, Colo. The applicants proposed a program of drifting, raising, and diamond drilling, at a cost of approximately $23,[illegible]2.75. A revised program is recommended which includes the footage for drifting and raising and eliminates the diamond drilling. The total estimated cost of the revised program is $17,451.00. The Government's share of the cost amounts to 50 percent, or $8,725.50. A short form contract could be substituted, resulting in a reduction in the over-all cost to $14,[illegible]98.00, Government participation--$7,3[illegible].00.

The Burrows Mine workings are on a strong, wide, fissure vein that can be traced on the surface for several miles. The vein strikes northeasterly and dips steeply to the northwest. On the surface and in the existing workings the vein forms the contact between two members of the Silverton volcanic series, the Burns latite on the north or hanging wall side and the Eureka rhyolite on the south.

The Burrows vein is at least 45 feet wide, and in the Burrows Mine area sulfides of lead, zinc, and copper are concentrated along the footwall and to a lesser degree near the hanging wall. Sulfide deposition appears to have followed the formation of the wide Burrows vein, and ore-bearing solutions were probably guided by somewhat open fracture zones.

The Burrows mine exposes sufficient lead-zinc mineralization to justify a limited exploration program. The applicant is experienced and sufficiently well equipped and financed to conduct the exploration successfully. The project costs are not considered excessive in view of the high elevation, rugged terrain, and short operating season.

The following proposals are recommended for approval:

1. Extend the lower Burrows drift 150 feet westward.
2. Extend the lower Burrows drift 100 feet eastward.
3. From a point on the lower level approximately 95 feet southwest of the crosscut, raise to explore for the bottom of the ore shoot--this raise not to exceed 75 feet.

D. M. Larrabee

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D. M. Larrabee

D. M. Larrabee

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DR. HARRY G. AND KENNETH E. KNAPP

BURROSS MINE

SAN JUAN COUNTY, COLORADO

DMEA DOCKET 2652

Geologic Report

By G. N. Hershman
U. S. Geological Survey

Reviewed by
DMEA OPERATING COMMITTEE

11-16-53
(date)

BURROWS MINE
SAN JUAN COUNTY, COLORADO

INTRODUCTION

Dr. Harry G. Knapp, P. O. Box 827, Canon City, Colorado, and Kenneth E. Knapp, P. O. Box 614, Silverton, Colorado, have applied for government assistance, DMEA Docket 2652, to explore for lead-zinc ore in the Burrows mine.

The partners own 2 patented and 3 unpatented claims in the California Gulch area, about 2 miles west of Animas Forks, and 10 miles airline northeast of Silverton, Colorado. Access to the Burrows mine is by way of State Highway No. 110, a graded dirt road which passes within a few hundred feet of the workings.

The applicants propose to explore the Burrows vein by 400 feet of drifting and 100 feet of diamond drilling on either of 2 mine levels, and by a total of 60 feet of raising from the lower level (fig. 2). Their estimated cost of the program is $23,692.75 (Government participation 50%).

The property was examined on September 17, 1952, in company with Kenneth E. Knapp, one of the applicants. His assistance is acknowledged. R. R. McClellan of the U. S. Bureau of Mines examined the property on September 23, 1952. It is concluded that the property has merit and that small lead-zinc ore bodies may be discovered by exploration from the lower level. An exploration program slightly less extensive than that proposed by the applicant is recommended.

GEOLOGY

The regional geology of the Silverton area has been well described by F. L. Ransome (1901); Whitman Cross, Ernest Howe, and F. L. Ransome (1905); W. S. Burbank (1933)(1941); Whitman Cross and E. S. Larsen (1935); and V. C. Kelley (1946).

Geologically the Burrows mine is located on one of a number of radial faults which surround the Silverton volcanic basin or caldera of subsidence. In the vicinity of the Burrows mine only rocks of the Silverton volcanic series are exposed; the Burrows vein forms the contact between the Burns latite to the north and the Eureka rhyolite to the south. According to Kelley (1946) displacement along the fault occupied by the Burrows vein is about 400 feet, with the hanging or north wall downthrown with respect to the footwall.

The Burrows vein is a conspicuous feature and can be traced on the surface for almost 2 miles. It ranges from 20 to at least 65 feet in width, strikes N. 45° E., and dips 70°-80° northwest. It consists of white massive quartz containing tabular zones or small masses of partly silicified country rock. Galena, sphalerite, pyrite and some chalcopyrite occur disseminated through irregular areas in the vein, or concentrated in high grade shoots 1 inch to 3 feet wide.

In the southeast part of the upper level, high grade sulfide ore is found along the footwall of the Burrows vein. However, in the vicinity of the crosscut, and northeast of it, the ore occurs toward the hanging wall side of the vein (fig. 2). Although the geological evidence is not conclusive, it appears that the sulfide ore was formed during a period of

mineralization subsequent to the formation of the wide Burrows vein, and that solutions were guided by longitudinal and cross fractures in the earlier formed and rather barren quartz.

About 1600 tons of sulfide ore have been produced from stopes above the upper level. This ore contained slightly over 21% combined lead and zinc and 2.4 ounces of silver per ton. Exploration to date on the lower level (100 feet below the upper level) has been disappointing, for the ore of this horizon has been very narrow and rather low grade. The ore bodies in this part of the Silverton area are lenticular in habit and it is probable that the decrease in width and tonnage of the ore between the upper and lower levels is a local feature and does not indicate that the bottom of the zone of ore deposition has been reached.

ORE RESERVES

Based upon ore assignments made from stopes above the upper level, and assuming that similar ore extends downward 50 feet below these stopes, ore reserves are as follows:

TYPE	TONS	oz. Ag	% Pb	% Zn
Measured	none	---	---	---
Indicated	2000	2.0	8.0	12.0
Inferred	2000	2.0	8.0	12.0

The inferred ore tonnage is based on rather good showings of sulfides in the vein outcrop in the area southwest of the present mine workings, and on the probability that ore will extend downward at least 50 feet.

EXPLORATION

In the one month interval between the filing of the application for exploration assistance and the examination, the applicants extended the lower drift about 30 feet southwest and 40 feet northeast. This work exposed vein material containing sulfide minerals, and the southwest drift was being driven on a 6 inch to 8 inch streak of high grade galena and sphalerite. A 6 foot channel sample, No. RCM-35, taken across the face of the southwest drift by the U. S. Bureau of Mines, contained 0.9 oz. of silver per ton, 2.4% Pb, and 1.6% Zn. Exploration on the lower level, extending the southwest drift along the vein and under the exposure of sulfides in the outcrop, appears to be justified (fig. 3).

Exploration to the northeast will expose the Burrows vein on or near its hanging wall. To date, the ore along the hanging wall of the vein has not been shipping grade, but insufficient work has been done to prove or disprove value of this horizon as an ore producer. An extension of the lower level drift to the northeast appears justified (fig. 3).

The ore shoot mined in the southwest stope on the upper level does not appear to extend to the lower level. A short raise from the lower level will be required to determine the bottom of this ore shoot.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that exploration in the Burrows mine might lead to the discovery of additional lead-zinc ore (1) beneath the southwest stope mined on the upper level; (2) in the area to the southwest of the present workings on the lower level; and (3) possibly in the area to the northeast of these workings.

The following exploration program, estimated by the U. S. Bureau of Mines to cost $17,451.00 (Government participation $8,725.50), is recommended:

1. Extend the lower level drift 150 feet to the southwest (fig. 3).

2. Extend the lower level drift 100 feet to the northeast (fig. 3).

3. From a point on the lower level 95 feet southwest of the crosscut, raise to explore for the bottom of the ore shoot; this raise not to exceed 75 feet in length (fig. 3).

It is recommended that DMEA Docket 2552 be approved for the exploration project outlined above.

REFERENCES

Ransome, F. L., A report on the economic geology of the Silverton quadrangle, Colo.: U. S. Geol. Survey Bull. 182, 1901.

Cross, Whitman; Howe, Ernest; and Ransome, F. L., U. S Geological Survey, Geological Atlas, Silverton folio, No. 120, 1905.

Burbank, W. S., Vein systems of the Arrastre Basin and regional geologic structure in the Silverton and Telluride quadrangles, Colo.: Colorado Sci. Soc. Proc., Vol. 13, No. 5, 1933.

Cross, Whitman, and Larsen, E. S., A brief review of the geology of the San Juan region of southwestern Colorado: U. S. Geol. Survey Bull. 843, 1935.

Burbank, W. S., Structural control of ore deposition in the Red Mountain, Sneffels, and Telluride districts of the San Juan Mountains, Colo.: Colorado Sci. Soc. Proc., Vol. 14, No. 5, 1941.

Kelley, V. C., Geology, ore deposits, and mines of the Mineral Point, Poughkeepsie, and Upper Uncompahgre districts, Ouray, San Juan, Hinsdale Counties, Colo.: Colorado Sci. Soc. Proc., Vol. 14, No. 7, 1939.

D SA 2652

EUREKA MINE
SAN JUAN COUNTY, COLORADO

Engineering Report

By Russell R. McLellan
Mining Engineer
Bureau of Mines

DMEA 2592

BURROWS MINE
SAN JUAN COUNTY, COLORADO

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ILLUSTRATIONS

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2. Plan and longitudinal section of Burrows mine, Silverton, San Juan County, Colorado	*
3. Claim map, Burrows mine, San Juan County, Colorado	5

* See figure with Geologic Report.

DMEA 2652

BURROWS MINE
SAN JUAN COUNTY, COLORADO

ENGINEERING REPORT

By

Russell R. McLellan

INTRODUCTION

Dr. Harry G. Knapp, of Canon City, Colo., and Kenneth E. Knapp, of Silverton, Colo., applied for assistance to explore for lead and zinc in the Burrows mine, San Juan County, Colo. The applicants proposed spending approximately $23,662.75 for 400 feet of drifting, 90 feet of raising, and 100 feet of diamond drilling. The Government's share of the cost would be approximately $11,531.38. A revised program is recommended which reduces the footage of drifting and raising and eliminates the diamond drilling for a total estimated cost of $17,451.00. If a short form contract is prepared on a footage basis, the over-all cost can be reduced to $14,696.00.

The property was examined by Russell R. McLellan, of the Bureau of Mines, and E. N. Harshman, of the U. S. Geological Survey, in September 1952.

ACKNOWLEDGMENTS

K. E. Knapp supplied the examining engineer and geologist with maps, settlement sheets, and general information concerning the property.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Burrows mine is in California Gulch, 2 miles west of Animas Forks and 12 miles by road northeast of Silverton, San Juan County, Colo. (fig. 1). The mine, at an elevation of approximately 12,000 feet, usually is accessible for about 5 month each year. Heavy snowfall and dangerous snowslides discourage wintertime operations in the area.

Supplies may be obtained at Silverton. Heavy equipment usually is transported by truck from Denver or Grand Junction. Sufficient water is available for mining and drilling. Electric power is not available. The nearest living accommodations are in Silverton, which is within commuting distance of the mine.

HISTORY AND PRODUCTION

The early history and production of the Burrows mine is unknown. Operators previous to 1946 shipped approximately 125 tons of ore from open-cuts and a 40-foot shaft, and drove a crosscut 85 feet in length to cut the Burrows vein approximately 50 feet below the outcrop. The present owners and operators drove a lower crosscut to the vein, and, from 1946 through 1951, they produced 1,788.5 tons of ore having an average grade of 2.38 ounces silver per ton, 8.76 percent lead, 12.71 percent zinc, and 0.21 percent copper.

OWNERSHIP

The only claim directly concerned with the proposed exploration is the Burrows, U. S. Survey No. 108, which is owned by the applicants, Kenneth E. Knapp, of Silverton, Colo., and his father, Dr. Harry C. Knapp, of Canon City, Colo.

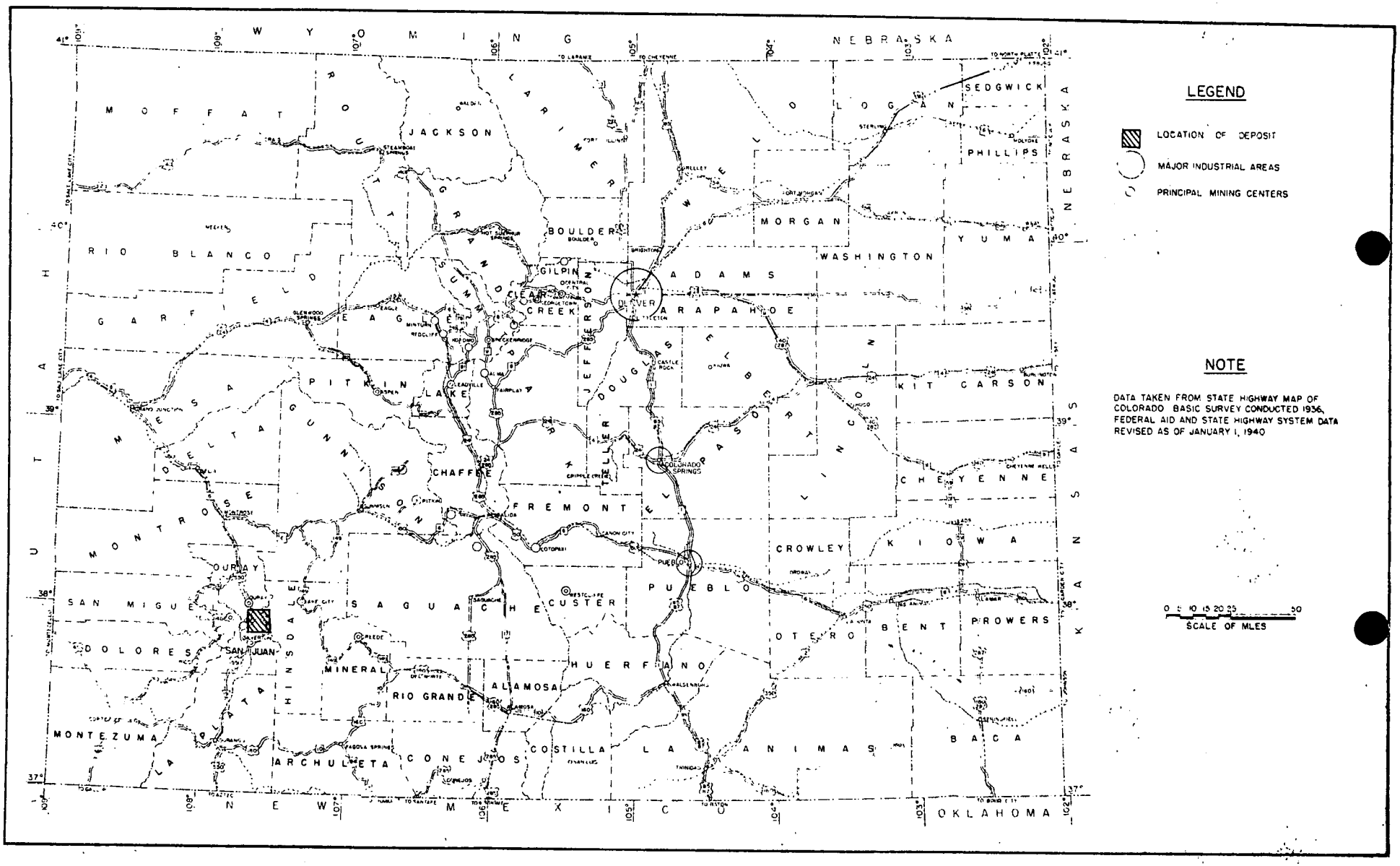

Fig. 1, Location Map, Burrows Mine, San Juan County, Colorado, DMEA-2652

DESCRIPTION OF THE DEPOSIT

Two lenticular shoots of ore have been partially developed in the Burrows mine (fig. 2 with the geological report). On the upper level the shoots were found to be 50 to 60 feet in length and averaged about 4 feet in width. One shoot was mined to the surface, a distance of approximately 50 feet. The ore is in the footwall of a quartz vein which, in this area, is 40 to 50 feet in width. A total of 624.56 tons of ore mined from the shoot immediately west of the crosscut averaged 0.012 ounce gold and 2.86 ounces silver per ton, 10.69 percent lead, 15.49 percent zinc, and 0.31 percent copper. A total of 205.47 tons of ore mined from the second shoot averaged 0.008 ounce gold and 3.21 ounces silver per ton, 12.01 percent lead, 11.94 percent zinc, and 0.12 percent copper. A total of 9.25 tons of ore mined from a small underhand stope in the second shoot on the upper level averaged 0.01 ounce gold and 3.49 ounces silver per ton, 14.10 percent lead, 17.59 percent zinc, and 0.20 percent copper. The ore shoots apparently pinch out below the upper level as they were not encountered in the lower adit, and raises will have to be driven to locate them.

Lead-zinc ore is visible in the surface exposure of the vein about 50 feet west of the present drift headings. No attempt has been made to trace this mineralization at depth.

In general, the deposit appears to be typical of the area in which isolated lenses and pods of fairly high-grade ore are found within extremely wide quartz veins.

MINERAL RESERVES

Development work is insufficient to establish measured ore reserves. An estimated 2,000 tons of indicated ore remain between the upper and lower levels, and an estimated 2,000 tons of inferred ore may exist between and ahead of the present west drifts. Both indicated and inferred ore probably will average 2.0 ounces silver per ton, 8.0 percent lead, 12 percent zinc, and 0.20 percent copper.

PRESENT STATUS

Exploration and Development

The upper level of the Burrows mine consists of an 85-foot crosscut and approximately 190 feet of drift westward along the vein. After stoping the two ore shoots, work was discontinued on this level. A lower crosscut was driven 277 feet to the vein, and, on the examination date, drifts had been driven on the vein approximately 115 feet west and 50 feet east from the crosscut.

Drifting to the west was in progress on this level at the time, and the breast of a raise being driven 10 feet east of the crosscut was 40 feet above the track.

Mining and Milling and Other Facilities

The following equipment is owned by the applicants and is available at the mine:

1 [illegible] Cleveland drifter
1 [illegible] Cleveland stoper
1 [illegible] ase stationary engine [illegible]
1 [illegible]-4, 210 Chicago-Pneumatic compressor
1 Ingersoll-[illegible] and portable compressor, 160 c.f.m.
1 [illegible] Osmond reconnaissance car

2 50-foot air hoses
2 50-foot water hoses
1 Oxygen and acetylene welding outfit
3 Mine cars, 1-ton, end dump
3 Mine cars, 3/4-ton, end dump
1 Gardner-Denver loader, rented by the applicant

Surface buildings consist of one badly damaged compressor shed and one inadequate ore bin of 25-ton capacity.

No milling equipment is available on the property. Ore is trucked to the Shenandoah-Dives mill at Silverton, a distance of 9 miles, or to the American Zinc, Lead, and Smelting Company mill at Ouray, a distance of 38 miles. Until greater ore storage capacity is available at the mine, ore will be treated at custom mills. Present production goes to Ouray where the haulage rate is $5.50 per ton and milling charge is $4.50 per ton.

PROJECT PROPOSALS, WITH COSTS

The following revised exploration program (fig. 3) is proposed for the Burrows mine:

Project 1. Extend the lower drift 150 feet westward.

Project 2. Extend the lower drift 100 feet eastward.

Project 3. Drive a 75-foot raise from the lower level at a point approximately 100 feet from the crosscut.

Time required to complete the program is estimated at 5 months.

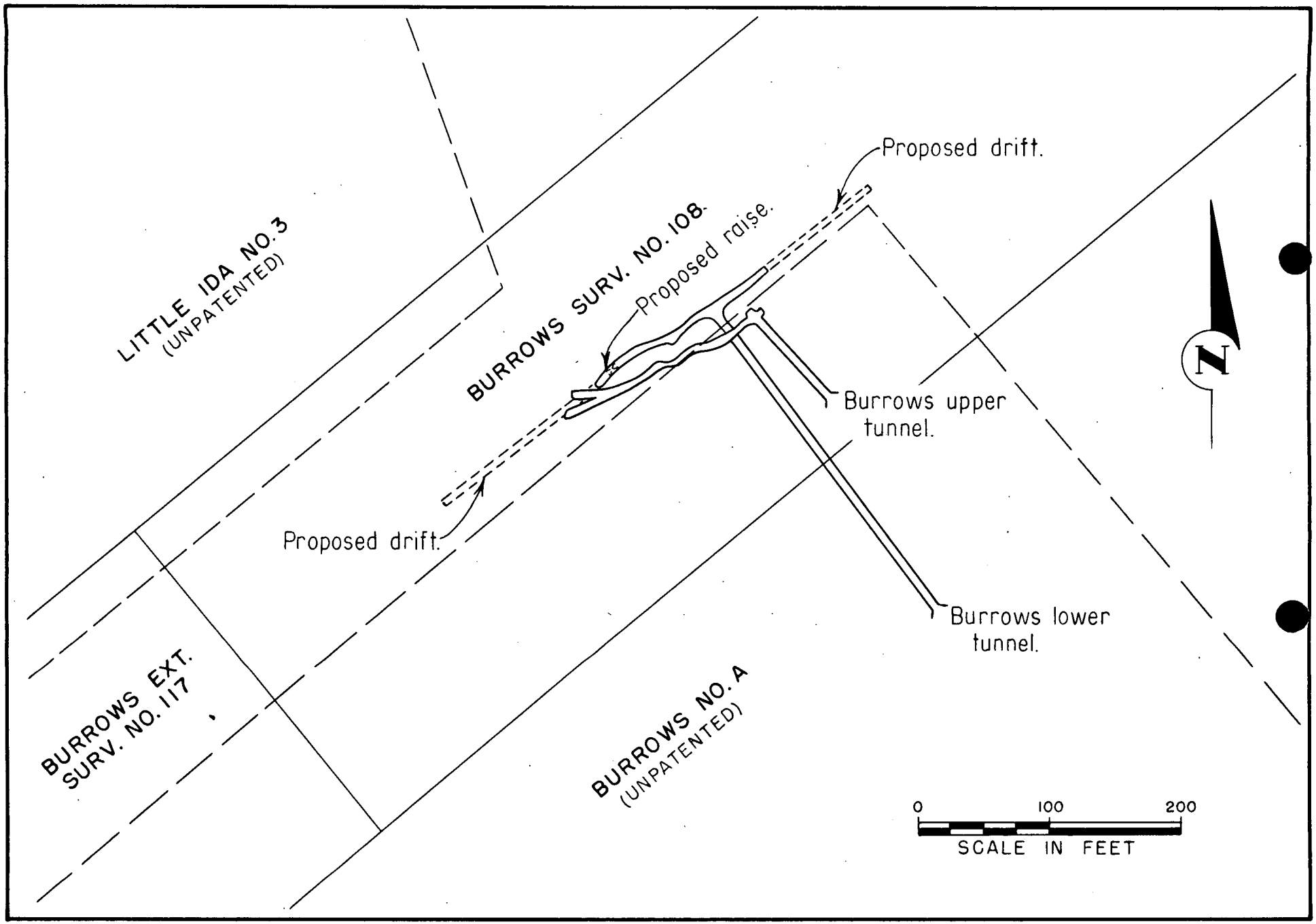

FIGURE 3 – CLAIM MAP, BURROWS MINE, SAN JUAN COUNTY, COLO., DMEA 2652

The estimated costs of each project are as follows:

Project 1
Drift 150 feet west
(2 months)

Labor			
2 miners, contract, 150 feet at $13.50 per foot, including overtime	$2,025.00		
1 helper and topman, $1.50 per hour, including overtime, for 2 months	676.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$2,701.00	
Supervision			
1 supervisor and engineer (K. E. Knapp), $400.00 per month, for 2 months		800.00	
Total labor and supervision			$ 3,501.00
Operating Materials and Supplies			
Timber		$ 150.00	
Explosives, caps, fuses		525.00	
Pipe, with fittings		150.00	
Track, ties, spikes, bolts, plates		150.00	
Drill steel and bits		300.00	
Gas and oil for compressor		480.00	
Gas and oil for truck		70.00	
Air and water hose		30.00	
Small tools		40.00	
Other supplies		100.00	
Total operating materials and supplies			1,995.00
Operating Equipment			
Rental			
1 Gardner-Denver loader at $85.00 per month, for 2 months		$ 170.00	
Purchase			
1 drifter, prorated cost		600.00	
Depreciation			
1 Chicago-Pneumatic compressor 210 c.f.m., powered by 1 Case stationary engine, 2 months at $100.00 per month	$ 200.00		
1 command car for transportation at $40.00 per month	80.00		
6 mine cars, 2 months at $100.00 per month	20.00	300.00	
Total operating equipment			$ 1,070.00

Miscellaneous			
Repairs to equipment		$ 350.00	
Sampling and analysis		25.00	
Bookkeeper, 2 months at $25.00 per month		50.00	
Social security		53.00	
Workmens' compensation at $2.95 per $100.00		104.00	
Freight		100.00	
Total miscellaneous			$ 682.00
Total cost of project 1			$ 7,248.00

Project 2
Drift 100 feet east
(1-1/2 months)

Labor			
2 miners, contract, 100 feet at $13.50 per foot, including overtime	$1,350.00		
1 helper and topman, $1.50 per hour, including overtime, for 1-1/2 months	507.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$1,857.00	
Supervision			
1 supervisor and engineer (K. B. Knapp), $400.00 per month, for 1-1/2 months		600.00	
Total labor and supervision			2,457.00
Operating Materials and Supplies			
Timber		$ 100.00	
Explosives, caps, fuses		350.00	
Pipe, with fittings		100.00	
Track, ties, spikes, bolts, plates		100.00	
Drill steel and bits		250.00	
Gas and oil for compressor		320.00	
Gas and oil for truck		60.00	
Air and water hose		30.00	
Small tools		30.00	
Other supplies		75.00	
Total operating materials and supplies			$ 1,415.00

Operating Equipment

Rental			
1 Gardner-Denver loader at $85.00 per month for 1-1/2 months		$ 128.00	
Purchase			
1 drifter, prorated cost		400.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., powered by Case stationary engine, 1-1/2 months at $100.00 per month	150.00		
1 command car for transportation, 1-1/2 months at $40.00 per month	60.00		
6 mine cars, 1-1/2 months at $10.00 per month	15.00	$ 225.00	
Total operating equipment			$ 753.00

Miscellaneous

Repairs to equipment	$ 350.00	
Sampling and analysis	25.00	
Bookkeeper, 1-1/2 months at $25.00 per month	37.00	
Social security	37.00	
Workmens' compensation, at $2.95 per $100.00	72.00	
Freight	75.00	
Total miscellaneous		$ 596.00
Total cost of project 2		$ 5,221.00

Project 3
Raise 75 feet
(1-1/2 months)

Labor			
2 miners, contract, 75 feet at $22.00 per foot, including overtime	$1,650.00		
1 helper and topman, $1.50 per hour, including overtime, for 1-1/2 months	507.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$2,157.00	
Supervision			
1 supervisor and engineer (E. S. Knapp), $400.00 per month, for 1-1/2 months	$ 600.00	$ 600.00	
Total labor and supervision			$ 2,757.00

Operating Materials and Supplies			
Timber		$ 350.00	
Explosives, caps, fuses		260.00	
Pipe, with fittings		75.00	
Drill steel and bits		200.00	
Gas and oil for compressor		320.00	
Gas and oil for truck		60.00	
Air and water hose		30.00	
Small tools		30.00	
Other supplies		75.00	
Total operating materials and supplies			$ 1,400.00
Operating Equipment			
Rental			
1 Gardner-Denver loader, 2 weeks at $85.00 per month		$ 42.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., powered by Case stationary engine, 1-1/2 months at $100.00 per month	$ 150.00		
1 command car for transportation, 1-1/2 months at $40.00 per month	60.00		
6 mine cars, 1-1/2 months at $10.00 per month	15.00	$ 225.00	
Total operating equipment			$ 267.00
Miscellaneous			
Repairs to equipment		$ 300.00	
Sampling and analysis		20.00	
Bookkeeper, 1-1/2 months at $25.00 per month		38.00	
Social security		42.00	
Workmens' compensation at $2.95 per $100.00		83.00	
Freight		75.00	
Total miscellaneous			$ 558.00
Total cost of project 3			$ 4,[illegible]
Total cost of all projects			$17,[illegible]

Summary of Costs

Labor

Project 1		
2 miners, contract, 150 feet at $13.50 per foot	$2,025.00	
1 helper and teamsm, $1.50 per hour	675.00	$2,700.00
Project 2		
2 miners, contract, 100 feet at $13.50 per foot	$1,350.00	
1 helper and teamsm, $1.50 per hour	507.00	$1,857.00
Project 3		
2 miners, contract, 75 feet at $22.00 per foot	$1,650.00	
1 helper and teamsm, $1.50 per hour	507.00	$2,157.00
Total labor		$6,715.00

Supervision

Project 1			
1 superintendent engineer at $400.00	$ 800.00		
Project 2			
1 superintendent engineer at $400.00	$ 600.00		
Project 3			
1 superintendent engineer at $400.00	$ 400.00		
Total supervision		$2,000.00	
Total labor and supervision			$ 8,715.00

Operating Materials and Supplies, 3 projects

Timber	$ 600.00	
Explosives, caps, fuses	1,350.00	
Pipe, with fittings	325.00	
Track, ties, spikes, bolts, plates	250.00	
Drill steel and bits	750.00	
Gas and oil for compressor	1,120.00	
Gas and oil for truck	190.00	
Air and water hose	90.00	
Small tools	100.00	
Other supplies	250.00	
Total operating materials and supplies		$ 4,810.00

Operating Equipment, 3 projects

Rental			
1 loader, 4 months at $85.00 per month		$ 340.00	
Purchase			
1 drifter		1,000.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., with Case stationary engine, 5 months at $100.00 per month	$ 500.00		
1 command car, 5 months at $40.00 per month	200.00		
6 mine cars, 5 months at $10.00 per month	50.00	$ 750.00	
Total operating equipment			$ 2,090.00

Miscellaneous, 3 projects

Repairs to equipment	$1,000.00	
Sampling and analysis	90.00	
Bookkeeper, 5 months at $25.00 per month	125.00	
Social security	132.00	
Workmens' compensation, at $2.95 per $100.00	299.00	
Freight	250.00	
Total miscellaneous		$ 1,896.00
Total estimated cost of exploration		$17,451.00

Should a short form contract be considered, the following items could be eliminated from the above costs:

Item	Cost reduction for each project Proj. 1	Proj. 2	Proj. 3
1 helper and teamsman	$ 676.00	$ 507.00	$ 507.00
1 Bookkeeper	50.00	37.00	38.00
Depreciation of equipment	300.00	225.00	225.00
Gas and oil for truck	70.00	60.00	60.00
Total reduction per project	$1,096.00	$ 829.00	$ 830.00

The total cost of 250 feet of drifting, Project 1 and Project 2, will be reduced from $12,469.00 to $10,544.00 and will average $42.17 per foot. The cost of 75 feet of raising, Project 3, will be reduced from $4,982.00 to $4,152.00 and will average $55.36 per foot. The total cost of the project will thus be reduced from $17,451.00 to $14,696.00. The Government's share will amount to $7,348.00, or 50 percent.

CONCLUSIONS

Although it is doubtful that the present operators of the Barrows mine will produce sufficient ore to repay the Government in full for financial aid, it is certain that a substantial tonnage of fairly high-grade ore will be produced as a result of additional exploration.

RECOMMENDATIONS

The following program of exploration is recommended for the Barrows mine:

Project 1. Extend the lower drift 150 feet southwest.

Project 2. Extend the lower drift 160 feet northeast.

Project 3. From a point on the lower level approximately 95 feet southwest from the crosscut, raise to explore for the bottom of the ore sheet—this raise not to exceed 75 feet.

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

Department of the Interior
Defense Minerals Administration
RECEIVED
NOV - 6 1953

224 New Customhouse
Denver 2, Colorado

November 2, 1953

Memorandum

To: Administrator, Defense Minerals Exploration Administration, Attention: 210

From: Field Team, Region IV

Subject: Report of Examination - DMEA Docket 2652 (Lead-Zinc), Harry and Kenneth Knapp, Burrows Mine, San Juan County, Colorado

Enclosed are four copies of the report of examination on the subject property.

Six copies of the contract were sent to the applicants on November 20, 1952, but they had lost interest in the proposed exploration work at that time as evidenced by later correspondence.

The docket was closed September 1, 1953.

W. H. King
W. H. King

for E. N. Harshman
A. H. Koschmann

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 6 1953

Mining Division
Region IV

November 19, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2652, (Lead-Zinc) Harry G. and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado

Enclosed are eight copies of the engineering report on DMEA-2652.

The applicant proposed drifting, raising and diamond drilling at an estimated cost of $23,662.75. The examining engineers recommend the drifting and raising to cost $14,694.50, Government participation $7,347.25.

We concur in this recommendation.

W. H. King
W. H. King

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Region IV

Building 20, Room 137
Denver Federal Center
Denver 14, Colorado
November 14, 1952

Memorandum

To: Executive Officer, Field Team, Region IV

From: Chief, Colorado Branch, Mining Division, Region IV

Subject: DMEA 2652 (Lead-zinc), Harry G. Knapp and Kenneth E. Knapp (Burrows mine), San Juan County, Colorado

Please find enclosed the original and eight copies of the "Summary, Conclusions, and Recommendations", by E. N. Marshman and Russell R. McLellan, and of McLellan's "Engineering Report" on the above docket.

McLellan concludes that, although it is doubtful if the operators will ever be able to repay the Government loan, they will, however, produce a substantial amount of lead-zinc ore from the limited exploration program proposed. He recommends 250 feet of drifting on the lower Burrows level and 75 feet of raising at a favorable location. If a contract is prepared on a short form MT-200(A), drifting should average about $42.00 per foot and raising $55.00 per foot for a total over-all cost of $14,696.00.

The costs appear high but are fully justified as explained in the engineering report.

I approve the recommendations.

The brochure furnished by the Region IV Field Team is returned herewith.

W. M. Traver, Jr.

W. M. Traver, Jr.

enclosures

WMT/cb

cc 8
DMEA 2652
DMEA Chron.

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

200 New Customhouse
Denver 2, Colorado

October 22, 1952

Memorandum

To: DMEA Field Team, Region IV

From: A. H. Koschmann

Subject: DMEA Docket 2652, Dr. Harry G. and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado.

Attached are 8 copies of the geologic report by E. N. Harshman covering DMEA Docket 2652, Burrows Mine, San Juan County, Colorado.

The applicant proposes to explore the Burrows vein on subject property for lead-zinc ore by 400 feet of drifting, 100 feet of diamond drilling, and by 90 feet of raises at an estimated cost of $23,662.75.

The Burrows vein occupies a fault in the Silverton volcanic series. The vein can be followed on the surface for about 2 miles. It ranges from 20 to 45 feet in width. The vein consists of white quartz which encloses tabular zones or small masses of silicified country rock. Galena, sphalerite, pyrite, and chalcopyrite are disseminated through irregular zones in the vein, or are concentrated in high grade shoots up to 5 feet wide.

The property is developed by 2 adits at different levels. About 1800 tons of sulfide ore have been produced from stopes above the upper level, but exploration to date on the lower level has been disappointing. However, Harshman concludes that further exploration in the Burrows mine is warranted and recommends that an exploration loan be approved. He suggests an exploration program modified somewhat from the original, estimated by the U. S. Bureau of Mines to cost about $17,451.00.

I concur in his recommendations.

A. H. Koschmann

A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (8)

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

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA 2652, Burrows Mine

San Juan County, Colorado

Lead-zinc

E. N. Harshman, Geologist
U. S. Geological Survey

Russell R. McLellan, Mining Engineer
Bureau of Mines

November 4, 1952

DMEA 2652

BURROWS MINE
SAN JUAN COUNTY, COLORADO

Summary, Conclusions, and Recommendations

By E. N. Harshman
Geologist
U. S. Geological Survey

and

Russell R. McLellan
Mining Engineer
Bureau of Mines

DMEA 2652

BURROWS MINE
SAN JUAN COUNTY, COLORADO

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

By Russell R. McLellan and E. N. Harshman

Dr. Harry G. Knapp, of Canon City, Colo., and Kenneth E. Knapp, of Silverton, Colo., have applied to the Government for assistance to explore for lead and zinc in the Burrows mine, San Juan County, Colo. The applicants proposed a program of drifting, raising, and diamond drilling, at a cost of approximately $23,662.75. A revised program is recommended which includes the footage for drifting and raising and eliminates the diamond drilling. The total estimated cost of the revised program is $17,451.00. The Government's share of the cost amounts to 50 percent, or $8,725.50. A short form contract could be substituted, resulting in a reduction in the over-all cost to $14,696.00, Government participation--$7,348.00.

The Burrows mine workings are on a strong, wide, fissure vein that can be traced on the surface for several miles. The vein strikes northeasterly and dips steeply to the northwest. On the surface and in the existing workings the vein forms the contact between two members of the Silverton volcanic series, the Burns latite on the north or hanging wall side and the Eureka rhyolite on the south.

The Burrows vein is at least 45 feet wide, and in the Burrows mine area sulfides of lead, zinc, and copper are concentrated along the footwall and to a lesser degree near the hanging wall. Sulfide deposition appears to have followed the formation of the wide Burrows vein, and ore-bearing solutions were probably guided by somewhat open fracture zones.

The Burrows mine exposes sufficient lead-zinc mineralization to justify a limited exploration program. The applicant is experienced and sufficiently well equipped and financed to conduct the exploration successfully. The project costs are not considered excessive in view of the high elevation, rugged terrain, and short operating season.

The following proposals are recommended for approval:

1. Extend the lower Burrows drift 150 feet westward.
2. Extend the lower Burrows drift 100 feet eastward.
3. From a point on the lower level approximately 95 feet southwest of the crosscut, raise to explore for the bottom of the ore shoot--this raise not to exceed 75 feet.

DR. HARRY G. AND KENNETH E. KNAPP

BURROWS MINE

SAN JUAN COUNTY, COLORADO

DMEA DOCKET 2652

Geologic Report

By E. N. Harshman
U. S. Geological Survey

BURROWS MINE
SAN JUAN COUNTY, COLORADO

INTRODUCTION

Dr. Harry G. Knapp, P. O. Box 827, Canon City, Colorado, and Kenneth E. Knapp, P. O. Box 614, Silverton, Colorado, have applied for government assistance, DMEA Docket 2652, to explore for lead-zinc ore in the Burrows mine.

The partners own 2 patented and 3 unpatented claims in the California Gulch area, about 2 miles west of Animas Forks, and 10 miles airline northeast of Silverton, Colorado. Access to the Burrows mine is by way of State Highway No. 110, a graded dirt road which passes within a few hundred feet of the workings.

The applicants propose to explore the Burrows vein by 400 feet of drifting and 100 feet of diamond drilling on either of 2 mine levels, and by a total of 90 feet of raising from the lower level (fig. 2). Their estimated cost of the program is $23,662.75 (Government participation 50%).

The property was examined on September 17, 1952, in company with Kenneth E. Knapp, one of the applicants. His assistance is acknowledged. R. R. McClellan of the U. S. Bureau of Mines examined the property on September 23, 1952. It is concluded that the property has merit and that small lead-zinc ore bodies may be discovered by exploration from the lower level. An exploration program slightly less extensive than that proposed by the applicant is recommended.

GEOLOGY

The regional geology of the Silverton area has been well described by F. L. Ransome (1901); Whitman Cross, Ernest Howe, and F. L. Ransome (1905); W. S. Burbank (1933)(1941); Whitman Cross and E. S. Larsen (1935); and V. C. Kelley (1946).

Geologically the Burrows mine is located on one of a number of radial faults which surround the Silverton volcanic basin or caldera of subsidence. In the vicinity of the Burrows mine only rocks of the Silverton volcanic series are exposed; the Burrows vein forms the contact between the Burns latite to the north and the Eureka rhyolite to the south. According to Kelley (1946) displacement along the fault occupied by the Burrows vein is about 400 feet, with the hanging or north wall downthrown with respect to the footwall.

The Burrows vein is a conspicuous feature and can be traced on the surface for almost 2 miles. It ranges from 20 to at least 45 feet in width, strikes N. 45° E., and dips 70°-80° northwest. It consists of white massive quartz containing tabular zones or small masses of partly silicified country rock. Galena, sphalerite, pyrite and some chalcopyrite occur disseminated through irregular zones in the vein, or concentrated in high grade shoots 1 inch to 5 feet wide.

In the southwest part of the upper level, high grade sulfide ore is found along the footwall of the Burrows vein. However, in the vicinity of the crosscut, and northeast of it, the ore occurs toward the hanging wall side of the vein (fig. 2). Although the geological evidence is not conclusive, it appears that the sulfide ore was formed during a period of

mineralization subsequent to the formation of the wide Burrows vein, and that solutions were guided by longitudinal and cross fractures in the earlier formed and rather barren quartz.

About 1800 tons of sulfide ore have been produced from stopes above the upper level. This ore contained slightly over 21% combined lead and zinc and 2.4 ounces of silver per ton. Exploration to date on the lower level (100 feet below the upper level) has been disappointing, for the ore at this horizon has been very narrow and rather low grade. The ore bodies in this part of the Silverton area are lenticular in habit and it is probable that the decrease in width and tenor of the ore between the upper and lower levels is a local feature and does not indicate that the bottom of the zone of ore deposition has been reached.

ORE RESERVES

Based upon ore shipments made from stopes above the upper level, and assuming that similar ore extends downward 50 feet below these stopes, ore reserves are as follows:

TYPE	TONS	oz. Ag	% Pb	% Zn
Measured	none	---	---	---
Indicated	2000	2.0	8.0	12.0
Inferred	2000	2.0	8.0	12.0

The inferred ore tonnage is based on rather good showings of sulfides in the vein outcrop in the area southwest of the present mine workings, and on the probability that ore will extend downward at least 50 feet.

EXPLORATION

In the one month interval between the filing of the application for exploration assistance and the examination, the applicants extended the lower drift about 50 feet southwest and 40 feet northeast. This work exposed vein material containing sulfide minerals, and the southwest drift was being driven on a 6 inch to 8 inch streak of high grade galena and sphalerite. A 4 foot channel sample, No. RRM-35, taken across the face of the southwest drift by the U. S. Bureau of Mines, contained 0.9 oz. of silver per ton, 2.4% Pb, and 1.6% Zn. Exploration on the lower level, extending the southwest drift along the vein and under the exposure of sulfides in the outcrop, appears to be justified (fig. 3).

Exploration to the northeast will expose the Burrows vein on or near its hanging wall. To date, the ore along the hanging wall of the vein has not been shipping grade, but insufficient work has been done to prove or disprove value of this horizon as an ore producer. An extension of the lower level drift to the northeast appears justified (fig. 3).

The ore shoot mined in the southwest stope on the upper level does not appear to extend to the lower level. A short raise from the lower level will be required to determine the bottom of this ore shoot.

CONCLUSIONS AND RECOMMENDATIONS

It is concluded that exploration in the Burrows mine might lead to the discovery of additional lead-zinc ore (1) beneath the southwest stope mined on the upper level; (2) in the area to the southwest of the present workings on the lower level; and (3) possibly in the area to the northeast of these workings.

The following exploration program, estimated by the U. S. Bureau of Mines to cost $17,451.00 (Government participation $8,725.50), is recommended:

1. Extend the lower level drift 150 feet to the southwest (fig. 3).

2. Extend the lower level drift 100 feet to the northeast (fig. 3).

3. From a point on the lower level 95 feet southwest of the crosscut, raise to explore for the bottom of the ore shoot; this raise not to exceed 75 feet in length (fig. 3).

It is recommended that DMEA Docket 2652 be approved for the exploration project outlined above.

REFERENCES

Ransome, F. L., A report on the economic geology of the Silverton quadrangle, Colo.: U. S. Geol. Survey Bull. 182, 1901.

Cross, Whitman; Howe, Ernest; and Ransome, F. L., U. S Geological Survey, Geological Atlas, Silverton folio, No. 120, 1905.

Burbank, W. S., Vein systems of the Arrastre Basin and regional geologic structure in the Silverton and Telluride quadranges, Colo.: Colorado Sci. Soc. Proc., Vol. 13, No. 5, 1933.

Cross, Whitman, and Larsen, E. S., A brief review of the geology of the San Juan region of southwestern Colorado: U. S. Geol. Survey Bull. 843, 1935.

Burbank, W. S., Structural control of ore deposition in the Red Mountain, Sneffels, and Telluride districts of the San Juan Mountains, Colo.: Colorado Sci. Soc. Proc., Vol. 14, No. 5, 1941.

Kelley, V. C., Geology, ore deposits, and mines of the Mineral Point, Poughkeepsie, and Upper Uncompahgre districts, Ouray, San Juan, Hinsdale Counties, Colo.: Colorado Sci. Soc. Proc., Vol. 14, No. 7, 1946.

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

224 New Customhouse
Denver 2, Colorado

September 1, 1953

Dr. Harry G. Knapp
Box 381
Rifle, Colorado

Re: Docket No. DMEA 2652

Dear Dr. Knapp:

This will acknowledge receipt of your letter dated August 29, 1953, requesting that your contract be held for future use.

On November 20, 1952, we sent you six copies of an exploration project contract for your signature and to be returned to this office. On January 27, 1953, we requested you to return all six copies of the contract. Your letter of February 8, 1953, stated the mine would not be opened until about July 1 and that some changes would have to be made in the contract before it could be signed, but you did not specify the changes which you desired. On June 2, 1953, we wrote you that when you returned the six copies of the contract we would be pleased to complete the contract. We received no answer to this letter, and on August 14 we placed your application in the inactive file and so advised you.

Your lack of interest in this exploration project is evidenced by your failure to return the signed copies of the contract. Therefore, your application has been cancelled.

Very truly yours,

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

DMEA Field Team, Region IV

HMC:jp
cc Subject
Chron
WMTraver)
AHKoschmann)w/copy incoming ltr
COMittendorf)

COPY

HARRY G. KNAPP, M. D.

Rifle, Colo.
Aug. 29, 1953

Mr. W.H. King
224 New Customhouse
Denver, Colo.

Dear Mr. King:

I have your letter of Aug. 14th regarding the contract for the Burrows -- DMEA 2652.

We want this contract held for next year if this can be done. As you know, last year we spent a lot of money on the Burrows hoping that the contract would come thru in time to be of help to us. But it was late fall and the mine was closed for the winter when it came thru.

This year, our money is low and the market is not favorable, so we do this year will be a minimum amount -- on our own. We would like the contract held for future use -- next year. Can this be done?

I am getting the copies together as you suggested but will hold up the returning of them until I hear from you.

Yours very truly,

/s/ Harry G. Knapp

Change my address to: (Rifle, Colo.
(Box 881

DMEA 2652

BURROWS MINE
SAN JUAN COUNTY, COLORADO

Engineering Report

By Russell R. McLellan
Mining Engineer
Bureau of Mines

DMEA 2592

BURROWS MINE
SAN JUAN COUNTY, COLORADO

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ILLUSTRATIONS

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* See figure with Geologic Report.

DMEA 2652

BURROWS MINE
SAN JUAN COUNTY, COLORADO

ENGINEERING REPORT

By

Russell R. McLellan

INTRODUCTION

Dr. Harry G. Knapp, of Canon City, Colo., and Kenneth E. Knapp, of Silverton, Colo., applied for assistance to explore for lead and zinc in the Burrows mine, San Juan County, Colo. The applicants proposed spending approximately $23,662.75 for 400 feet of drifting, 90 feet of raising, and 100 feet of diamond drilling. The Government's share of the cost would be approximately $11,531.38. A revised program is recommended which reduces the footage of drifting and raising and eliminates the diamond drilling for a total estimated cost of $17,451.00. If a short form contract is prepared on a footage basis, the over-all cost can be reduced to $14,696.00.

The property was examined by Russell R. McLellan, of the Bureau of Mines, and E. N. Harshman, of the U. S. Geological Survey, in September 1952.

ACKNOWLEDGMENTS

K. E. Knapp supplied the examining engineer and geologist with maps, settlement sheets, and general information concerning the property.

LOCATION, TOPOGRAPHY, AND PHYSICAL FEATURES

The Burrows mine is in California Gulch, 2 miles west of Animas Forks and 12 miles by road northeast of Silverton, San Juan County, Colo. (fig. 1). The mine, at an elevation of approximately 12,000 feet, usually is accessible for about 5 month each year. Heavy snowfall and dangerous snowslides discourage wintertime operations in the area.

Supplies may be obtained at Silverton. Heavy equipment usually is transported by truck from Denver or Grand Junction. Sufficient water is available for mining and drilling. Electric power is not available. The nearest living accommodations are in Silverton, which is within commuting distance of the mine.

HISTORY AND PRODUCTION

The early history and production of the Burrows mine is unknown. Operators previous to 1946 shipped approximately 125 tons of ore from open-cuts and a 40-foot shaft, and drove a crosscut 85 feet in length to cut the Burrows vein approximately 50 feet below the outcrop. The present owners and operators drove a lower crosscut to the vein, and, from 1946 through 1951, they produced 1,788.5 tons of ore having an average grade of 2.38 ounces silver per ton, 8.76 percent lead, 12.71 percent zinc, and 0.21 percent copper.

OWNERSHIP

The only claim directly concerned with the proposed exploration is the Burrows, U. S. Survey No. 108, which is owned by the applicants, Kenneth E. Knapp, of Silverton, Colo., and his father, Dr. Harry G. Knapp, of Canon City, Colo.

DESCRIPTION OF THE DEPOSIT

Two lenticular shoots of ore have been partially developed in the Burrows mine (fig. 2 with the geological report). On the upper level the shoots were found to be 50 to 60 feet in length and averaged about 4 feet in width. One shoot was mined to the surface, a distance of approximately 50 feet. The ore is in the footwall of a quartz vein which, in this area, is 40 to 50 feet in width. A total of 624.56 tons of ore mined from the shoot immediately west of the crosscut averaged 0.012 ounce gold and 2.86 ounces silver per ton, 10.69 percent lead, 15.49 percent zinc, and 0.31 percent copper. A total of 205.47 tons of ore mined from the second shoot averaged 0.008 ounce gold and 3.21 ounces silver per ton, 12.01 percent lead, 11.94 percent zinc, and 0.12 percent copper. A total of 9.25 tons of ore mined from a small underhand stope in the second shoot on the upper level averaged 0.01 ounce gold and 3.49 ounces silver per ton, 14.10 percent lead, 17.59 percent zinc, and 0.20 percent copper, The ore shoots apparently pinch out below the upper level as they were not encountered in the lower adit, and raises will have to be driven to locate them.

Lead-zinc ore is visible in the surface exposure of the vein about 50 feet west of the present drift headings. No attempt has been made to trace this mineralization at depth.

In general, the deposit appears to be typical of the area in which isolated lenses and pods of fairly high-grade ore are found within extremely wide quartz veins.

MINEABLE ORE RESERVES

Development work is insufficient to establish measured ore reserves. An estimated 2,000 tons of indicated ore remain between the upper and lower levels, and an estimated 2,000 tons of inferred ore may exist between and ahead of the present west drifts. Both indicated and inferred ore probably will average 2.0 ounces silver per ton, 8.0 percent lead, 12 percent zinc, and 0.20 percent copper.

PRESENT STATUS

Exploration and Development

The upper level of the Burrows mine consists of an 85-foot crosscut and approximately 190 feet of drift westward along the vein. After stoping the two ore shoots, work was discontinued on this level. A lower crosscut was driven 277 feet to the vein, and, on the examination date, drifts had been driven on the vein approximately 115 feet west and 50 feet east from the crosscut.

Drifting to the west was in progress on this level at the time, and the breast of a raise being driven 10 feet east of the crosscut was 40 feet above the track.

Mining and Milling and Other Facilities

The following equipment is owned by the applicants and is available at the mine:

1 D24 Cleveland drifter
1 S22 Cleveland stoper
1 Case stationary engine LAE
1 PB-4, 210 Chicago-Pneumatic compressor
1 Ingersoll-Rand portable compressor, 160 c.f.m.
1 Command Reconnaissance car

2 50-foot air hoses
2 50-foot water hoses
1 Oxygen and acetylene welding outfit
3 Mine cars, 1-ton, end dump
3 Mine cars, 3/4-ton, end dump
1 Gardner-Denver loader, rented by the applicant

Surface buildings consist of one badly damaged compressor shed and one inadequate ore bin of 25-ton capacity.

No milling equipment is available on the property. Ore is trucked to the Shenandoah-Dives mill at Silverton, a distance of 9 miles, or to the American Zinc, Lead, and Smelting Company mill at Ouray, a distance of 38 miles. Until greater ore storage capacity is available at the mine, ore will be treated at custom mills. Present production goes to Ouray where the haulage rate is $5.50 per ton and milling charge is $4.50 per ton.

PROJECT PROPOSALS, WITH COSTS

The following revised exploration program (fig. 3) is proposed for the Burrows mine:

Project 1. Extend the lower drift 150 feet westward.

Project 2. Extend the lower drift 100 feet eastward.

Project 3. Drive a 75-foot raise from the lower level at a point approximately 100 feet from the crosscut.

Time required to complete the program is estimated at 5 months.

The estimated costs of each project are as follows:

Project 1
Drift 150 feet west
(2 months)

Labor			
2 miners, contract, 150 feet at $13.50 per foot, including overtime	$2,025.00		
1 helper and topman, $1.50 per hour, including overtime, for 2 months	676.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$2,701.00	
Supervision			
1 supervisor and engineer (K. E. Knapp), $400.00 per month, for 2 months		800.00	
Total labor and supervision			$ 3,501.00
Operating Materials and Supplies			
Timber		$ 150.00	
Explosives, caps, fuses		525.00	
Pipe, with fittings		150.00	
Track, ties, spikes, bolts, plates		150.00	
Drill steel and bits		300.00	
Gas and oil for compressor		480.00	
Gas and oil for truck		70.00	
Air and water hose		30.00	
Small tools		40.00	
Other supplies		100.00	
Total operating materials and supplies			1,995.00
Operating Equipment			
Rental			
1 Gardner-Denver loader at $85.00 per month, for 2 months		$ 170.00	
Purchase			
1 drifter, prorated cost		600.00	
Depreciation			
1 Chicago-Pneumatic compressor 210 c.f.m., powered by 1 Case stationary engine, 2 months at $100.00 per month	$ 200.00		
1 command car for transportation at $40.00 per month	80.00		
6 mine cars, 2 months at $100.00 per month	20.00	300.00	
Total operating equipment			$ 1,070.00

Miscellaneous			
Repairs to equipment		$ 350.00	
Sampling and analysis		25.00	
Bookkeeper, 2 months at $25.00 per month		50.00	
Social security		53.00	
Workmens' compensation at $2.95 per $100.00		104.00	
Freight		100.00	
Total miscellaneous			$ 682.00
Total cost of project 1			$ 7,248.00

Project 2
Drift 100 feet east
(1-1/2 months)

Labor			
2 miners, contract, 100 feet at $13.50 per foot, including overtime	$1,350.00		
1 helper and topman, $1.50 per hour, including overtime, for 1-1/2 months	507.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$1,857.00	
Supervision			
1 supervisor and engineer (K. E. Knapp), $400.00 per month, for 1-1/2 months		600.00	
Total labor and supervision			2,457.00
Operating Materials and Supplies			
Timber		$ 100.00	
Explosives, caps, fuses		350.00	
Pipe, with fittings		100.00	
Track, ties, spikes, bolts, plates		100.00	
Drill steel and bits		250.00	
Gas and oil for compressor		320.00	
Gas and oil for truck		60.00	
Air and water hose		30.00	
Small tools		30.00	
Other supplies		75.00	
Total operating materials and supplies			$ 1,415.00

Operating Equipment

Rental			
1 Gardner-Denver loader at $85.00 per month for 1-1/2 months		$ 128.00	
Purchase			
1 drifter, prorated cost		400.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., powered by Case stationary engine, 1-1/2 months at $100.00 per month	$ 150.00		
1 command car for transportation, 1-1/2 months at $40.00 per month	60.00		
6 mine cars, 1-1/2 months at $10.00 per month	15.00	$ 225.00	
Total operating equipment			$ 753.00

Miscellaneous

Repairs to equipment		$ 350.00	
Sampling and analysis		25.00	
Bookkeeper, 1-1/2 months at $25.00 per month		37.00	
Social security		37.00	
Workmens' compensation, at $2.95 per $100.00		72.00	
Freight		75.00	
Total miscellaneous			$ 596.00
Total cost of project 2			$ 5,221.00

Project 3
Raise 75 feet
(1-1/2 months)

Labor			
2 miners, contract, 75 feet at $22.00 per foot, including overtime	$1,650.00		
1 helper and topman, $1.50 per hour, including overtime, for 1-1/2 months	507.00		
1 timberman, $1.65 per hour, when needed			
1 mechanic, $1.75 per hour, when needed		$2,157.00	
Supervision			
1 supervisor and engineer (K. E. Knapp), $400.00 per month, for 1-1/2 months	$ 600.00	$ 600.00	
Total labor and supervision			$ 2,757.00

Operating Materials and Supplies			
Timber		$ 350.00	
Explosives, caps, fuses		260.00	
Pipe, with fittings		75.00	
Drill steel and bits		200.00	
Gas and oil for compressor		320.00	
Gas and oil for truck		60.00	
Air and water hose		30.00	
Small tools		30.00	
Other supplies		75.00	
Total operating materials and supplies			$ 1,400.00
Operating Equipment			
Rental			
1 Gardner-Denver loader, 2 weeks at $85.00 per month		$ 42.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., powered by Case stationary engine, 1-1/2 months at $100.00 per month	$ 150.00		
1 command car for transportation, 1-1/2 months at $40.00 per month	60.00		
6 mine cars, 1-1/2 months at $10.00 per month	15.00	$ 225.00	
Total operating equipment			$ 267.00
Miscellaneous			
Repairs to equipment		$ 300.00	
Sampling and analysis		20.00	
Bookkeeper, 1-1/2 months at $25.00 per month		38.00	
Social security		42.00	
Workmens' compensation at $2.95 per $100.00		83.00	
Freight		75.00	
Total miscellaneous			$ 558.00
Total cost of project 3			$ 4,982.00
Total cost of all projects			$17,451.00

Summary of Costs

Labor

Project 1			
2 miners, contract, 150 feet at $13.50 per foot	$2,025.00		
1 helper and topman, $1.50 per hour	676.00	$2,701.00	
Project 2			
2 miners, contract, 100 feet at $13.50 per foot	$1,350.00		
1 helper and topman, $1.50 per hour	507.00	$1,857.00	
Project 3			
2 miners, contract, 75 feet at $22.00 per foot	$1,650.00		
1 helper and topman, $1.50 per hour	507.00	$2,157.00	
Total labor		$6,715.00	

Supervision

Project 1			
1 superintendent engineer at $400.00	$ 800.00		
Project 2			
1 superintendent engineer at $400.00	$ 600.00		
Project 3			
1 superintendent engineer at $400.00	$ 600.00		
Total supervision		$2,000.00	
Total labor and supervision			$ 8,715.00

Operating Materials and Supplies, 3 projects

Timber	$ 600.00	
Explosives, caps, fuses	1,350.00	
Pipe, with fittings	325.00	
Track, ties, spikes, bolts, plates	250.00	
Drill steel and bits	750.00	
Gas and oil for compressor	1,120.00	
Gas and oil for truck	190.00	
Air and water hose	90.00	
Small tools	100.00	
Other supplies	250.00	
Total operating materials and supplies		$ 4,810.00

Operating Equipment, 3 projects

Rental			
1 loader, 4 months at $85.00 per month		$ 340.00	
Purchase			
1 drifter		1,000.00	
Depreciation			
1 Chicago-Pneumatic compressor, 210 c.f.m., with Case stationary engine, 5 months at $100.00 per month	$ 500.00		
1 command car, 5 months at $40.00 per month	200.00		
6 mine cars, 5 months at $10.00 per month	50.00	$ 750.00	
Total operating equipment			$ 2,090.00

Miscellaneous, 3 projects

Repairs to equipment	$1,000.00	
Sampling and analysis	70.00	
Bookkeeper, 5 months at $25.00 per month	125.00	
Social security	132.00	
Workmens' compensation, at $2.95 per $100.00	299.00	
Freight	250.00	
Total miscellaneous		$ 1,836.00
Total estimated cost of exploration		$17,451.00

Should a short form contract be considered, the following items could be eliminated from the above costs:

Item	Cost reduction for each project		
	Proj. 1	Proj. 2	Proj. 3
1 helper and topman	$ 676.00	$ 507.00	$ 507.00
1 bookkeeper	50.00	37.00	38.00
Depreciation of equipment	300.00	225.00	225.00
Gas and oil for truck	70.00	60.00	60.00
Total reduction per project	$1,096.00	$ 829.00	$ 830.00

The total cost of 250 feet of drifting, Project 1 and Project 2, will be reduced from $12,469.00 to $10,544.00 and will average $42.17 per foot. The cost of 75 feet of raising, Project 3, will be reduced from $4,982.00 to $4,152.00 and will average $55.36 per foot. The total cost of the project will thus be reduced from $17,451.00 to $14,696.00. The Government's share will amount to $7,348.00, or 50 percent.

CONCLUSIONS

Although it is doubtful that the present operators of the Burrows mine will produce sufficient ore to repay the Government in full for financial aid, it is certain that a substantial tonnage of fairly high-grade ore will be produced as a result of additional exploration.

RECOMMENDATIONS

The following program of exploration is recommended for the Burrows mine:

Project 1. Extend the lower drift 150 feet southwest.

Project 2. Extend the lower drift 100 feet northeast.

Project 3. From a point on the lower level approximately 95 feet southwest from the crosscut, raise to explore for the bottom of the ore shoot—this raise not to exceed 75 feet.

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

224 New Customhouse
Denver 2, Colorado

September 29, 1953

Dr. Harry G. Knapp
Box 881
Rifle, Colorado

Re: Docket DMEA 2652

Dear Dr. Knapp:

This will acknowledge receipt of your letter dated September 25, 1953 and five (5) unsigned copies of the six (6) copies of an Exploration Project Contract, which were forwarded you from this office November 20, 1952 for your signature.

As stated by the Field Team in their letter to you dated September 1, 1953 your application has been cancelled.

Very truly yours,

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

HMC:fwo

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Subject
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Koschmann

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

224 New Customhouse
Denver 2, Colorado

September 1, 1953

Dr. Harry G. Knapp
Box 881
Rifle, Colorado

Re: Docket No. DMEA 2652

Dear Dr. Knapp:

This will acknowledge receipt of your letter dated August 25, 1953, requesting that your contract be held for future use.

On November 20, 1952, we sent you six copies of an exploration project contract for your signature and to be returned to this office. On January 27, 1953, we requested you to return all six copies of the contract. Your letter of February 8, 1953, stated the mine would not be opened until about July 1 and that some changes would have to be made in the contract before it could be signed, but you did not specify the changes which you desired. On June 2, 1953, we wrote you that when you returned the six copies of the contract we would be pleased to complete the contract. We received no answer to this letter, and on August 14 we placed your application in the inactive file and so advised you.

Your lack of interest in this exploration project is evidenced by your failure to return the signed copies of the contract. Therefore, your application has been cancelled.

Very truly yours,

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

DMEA Field Team, Region IV

HMC:jp
cc Subject
Chron
WMTraver
AHKoschmann } w/copy incoming ltr
COMittendorf

COPY

HARRY G. KNAPP, M. D.

Rifle, Colo.
Aug. 29, 1953

Mr. W.H. King
224 New Customhouse
Denver, Colo.

Dear Mr. King:

I have your letter of Aug. 14th regarding the contract for the Burrows -- DMEA 2652.

We want this contract held for next year if this can be done. As you know, last year we spent a lot of money on the Burrows hoping that the contract would come thru in time to be of help to us. But it was late fall and the mine was closed for the winter when it came thru.

This year, our money is low and the market is not favorable, so we do this year will be a minimum amount -- on our own. We would like the contract held for future use -- next year. Can this be done?

I am getting the copies together as you suggested but will hold up the returning of them until I hear from you.

Yours very truly,

/s/ Harry G. Knapp

Change my address to: (Rifle, Colo.
(Box 881

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

224 New Customhouse
Denver 2, Colorado

August 14, 1953

REGISTERED MAIL

Dr. Harry Knapp
P. O. Box 881
Rifle, Colorado

Re: Docket No. DMEA 2652

Dear Dr. Knapp:

We have received no answer to our letter of June 2, 1953 in which we inquired if you were still interested in your proposed exploration work. We assume that you are no longer interested in this project, and are therefore, placing your application in our inactive file.

On November 20, 1952, we sent you six copies of an exploration project contract between the Government and a partnership consisting of Dr. Harry Knapp, and Kenneth E. Knapp.

Will you please return all six copies of this contract.

Very truly yours,

W. H. King

W. H. King
Executive Officer
DMEA Field Team
Region IV

HMC:es

cc: Mittendorf
Contract
Chron.
Traver
Koschmann (2)

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

224 New Customhouse
Denver 2, Colorado

June 2, 1953

Dr. Harry Knapp
Box 881
Rifle, Colorado

Re: Docket 2652 (Lead-Zinc)
Burrows Mine, San Juan
County, Colorado

Dear Dr. Knapp:

On May 19 we advised you that effective April 15, 1953, funds for certain specified metals had been denied and since your application related to lead and zinc it was accordingly denied.

We are pleased to inform you that since your application was received prior to May 15, 1953, we are now authorized to process it if you are still interested in exploration assistance.

When you return the six copies of the signed contract which we forwarded to you on November 20, 1952, we will be pleased to complete the contract.

Yours very truly,

W. H. KING

W. H. King
Executive Officer
DMEA Field Team, Region IV

HHC:ld

cc Mittendorf
Koschmann
Traver
sub
chron

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

224 New Customhouse
Denver 2, Colorado

May 19, 1953

Dr. Harry Knapp
Box 881
Rifle, Colorado

Re: Docket 2652 (Lead-Zinc) Burrows Mine, San Juan County, Colorado

Dear Dr. Knapp:

This is to inform you that effective April 15, 1953, the commitment of funds allocated to the Defense Minerals Exploration Administration for exploration assistance under the Defense Production Act was restricted to certain specified metals and minerals still in short supply. Lead and Zinc were not specified, and consequently were automatically removed from the list of metals or minerals eligible for exploration assistance.

We regret to advise you that, since your application relates to Lead-Zinc, and was pending on the date of the restrictive order, we are without authority or funds to enter into a contract for exploration and your application is accordingly denied. This action is taken without prejudice to the merits of the proposed project. Will you please return all six copies of the contract which we forwarded to you on November 20, 1952.

The staff of the Defense Minerals Exploration Administration wishes to express its appreciation for your interest in the exploration program and for your cooperation during the period your application has been under consideration.

Sincerely yours,

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

Ogden Tweto
for A. H. Koschmann
Field Team, Region IV

HMC:es

cc: Mittendorf
Docket
Chron.
Traver
Koschmann (2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

224 New Customhouse
Denver 2, Colorado

WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

NOV 24 1952

November 19, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2652, (Lead-Zinc) Harry G. Knapp and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado

The application for Government assistance in exploration work estimated to cost $14,694.50 has been approved by us and a contract is being prepared.

Government participation will be 50 percent, or $7,347.25.

Four copies of the Final Report will be forwarded with your copy of the contract.

W. H. King
W. H. King

for Ogden Tweto
A. H. Koschmann

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

224 New Customhouse
Denver 2, Colorado

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
NOV 2 - 1952

November 19, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2652, (Lead-Zinc) Harry G. Knapp and Kenneth E. Knapp, Burrows Mine, San Juan County, Colorado

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W. H. King
W. H. King

Ogden Tevis
for A. H. Koschmann

DMEA Form 3b
(Revised)

DEFENSE MINERALS EXPLORATION ADMINISTRATION

CONTROLLED DOCUMENT
Revised Abstract

DMEA Docket No. 2652

Name of Applicant Harry G. Knapp and Kenneth E. Knapp

Change:	From		To	
	III 1	☐	III 1	☒ 11-18-52
	III 2	☐	III 2	☐
	III 3	☐	III 3	☐
	III 4	☒	III 4	☐
	III 5	☐	III 5	☐

Add:

II 7 $ 23,662.75

II 8 $ 14,694.50

II 8a % 50

Remarks:

Initials of person preparing sheet H.M.C.

Date sheet prepared 11-18-52

17367

DMEA Form 3b
(Revised)

DEFENSE MINERALS EXPLORATION ADMINISTRATION

CONTROLLED DOCUMENT
Revised Abstract

DMEA Docket No. 2652

Name of Applicant Harry G. Knapp and Kenneth E. Knapp

Change:	From		To	
	III 1	☐	III 1	☒ 1118-52
	III 2	☐	III 2	☐
	III 3	☐	III 3	☐
	III 4	☒	III 4	☐
	III 5	☐	III 5	☐

Add:

II 7 $ 23,662.75

II 8 $ 14,694.50

II 8a % 50

Remarks:

Initials of person preparing sheet M.M.C.

Date sheet prepared 11-18-52

17367

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

224 New Customhouse
Denver 2, Colorado

August 8, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration, Attention: Code 210

From: Executive Officer, Field Team, Region IV

Subject: Docketing for Exploration Assistance

Enclosed herewith in duplicate are DMA Forms 3a and MF-103 in triplicate and supporting data pertaining to the following applications for Government assistance in exploration work:

DMEA-2650 James L. McBroom and L.R. Allen
Box 372A, Route 2
Boulder, Colorado

DMEA-2651 Joe E. Miera and Valentin Burrola
Box 215
San Antonio, New Mexico

DMEA-2652- Dr. Harry Knapp and Kenneth E. Knapp
Box 614
Silverton, Colorado

W. H. King
W. H. King

Enclosures

Returned in duplicate 3 applications and supporting data to Region IV.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA-2652
Metal or Mineral
Date Received 8-14-52
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Partnership
Dr. Harry G. Knapp. Box 827 Canon City Colo
Kenneth E. Knapp. Box 614 Silverton, Colo

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Group of 5 contiguous claims as follows:

Patented: Burrows - M.S. Survey 108; Two Nucks M.S. Survey 17890; Burrows "A". Book 172 - Page 114

Unpatented: Bulldog A Book 172 - Page 114; Bulldog Book 172 Page 136; Nancy M Book 172 Page 135

(*b*) State any mine name by which the property is known. Burrows Mine

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it None

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power.

5. *The exploration project.*—(*a*) [redacted]e the mineral or minerals for which you wis[redacted] explore .....

.....

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc.

(*c*) The work will start within ..... days and be completed within ..... months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations.

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.).

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants.

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel.

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be.

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project.

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project.

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes.

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs.

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)?

(*b*) How do you propose to furnish your share of the costs?

[X] Money [X] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated Aug 4, 195.2.

Kenneth E. Knapp
(Applicant)

Dr Harry G. Knapp
applicant

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—66551-1

MF-103 Burrows Mine, Silverton, Colorado

4. Physical description:

(a). Operations, etc.: Previous operators of the Burrows Mine drove an 85 ft. tunnel to intersect the vein about 50 ft. below the outcrop and shipped approx. 135 tons of ore from an open cut and a 40 ft. shaft. The present operators, who are also the owners, have operated the mine during the 5 month working season of each year since 1946. In the years 1946-1949, incl., 190 ft. of drifting on the vein was done on the level of the short tunnel mentioned above, and ore was stoped above the drift. In 1950 a 277 ft. tunnel was driven through waste to intersect the vein 98 ft. below the upper level and a 17 ft. diamond-drill hole was drilled, locating 3 ft. of good ore. In 1951 this tunnel was advanced 14 ft., and 65 ft. of drifting on the vein was completed. The ore found in drifting was lower in grade and not as wide on an average as that on the upper level, however, a raise drivento a point 44 ft. above the track level (see map), at the operations were suspended for the 1951 season due to the onset of winter, showed improvement in the width and value of the ore. Mining operations were resumed on July 21, 1952, the drift to the west (see map) having been advanced 12 ft. as of July 25, 1952. Production facilities include a compressor house, a 40 ton ore bin, a 12 ton ore bin, track and switches, roads, and mining equipment. The mine workings are all open and reasonably accessible for examination.

(b). Production: Present production is almost nil, nearly alll of the muck from drifting done this season having been put on the dump. From 1946 to 1951, incl. 1788.5 tons of ore were produced, having an average grade as follows: silver- 2.38 oz/ton, lead- 8.76%, copper- 0.21%, zinc- 12.71%.

Ore reserves: There is no thoroughly "proven" or "measured" ore at the Burrows Mine. All ore reserves fall in the "inferred"and "indicated categories. There is no ore remaining above the upper level, but sample cuts on the outcrop to the west indicate that ore could probably be developed on that level by drifting . The bottom of the upper drift shows ore of commercial grade over approx. ½ of the length of that drift. "Inferred"ore could well be placed at 1,000 tons and "Indicated" ore at 2,000 to 4,000 tons.

MF-103 Burrows Mine, Silverton, Colorado

4. (cont'd)

(c). Geologic features: Wide quartz vein with prominent outcrop and nearly vertical dip. Name of vein - Burrows or Sewell. Lead, zinc, silver, ore occurs in high-grade "lenses" of 4 ft. average width at intervals along outcrop for distance of several hundred feet. Ore minerals are galena, sphalerite, and chalcopyrite.

An exploration program, consisting mainly of drifting is desired to locate either the downward extensions of known ore bodies or new "lenses" of ore, and subsequently bring them into production.

(d). Accessibility, etc.: The mine is located in California Gulch 15 miles north of Silverton, Colorado and is easily reached by road during the working season of about 5 months. The supply and residence point is Silverton. Shipping points are 13 and 45 miles distant, being the custom plants of the Shenandoah-Dives Mining Co., Silverton, Colo. and the American Zinc, Lead & Smelting Co., Ouray, Colo.

(e). Manpower, materials, etc.: Good miners are not plentiful, however, two are now employed at the mine. Materials, supplies, and equipment usually readily available locally. Water for drilling purposes is supplied both by gravity and by pressure tanks. Power used is provided by a Case gasolene engine.

5. <u>The exploration project</u>:

(b). The proposed work consists mainly of drifting and possibly some diamond-drilling to locate ore in the wide Burrows vein. Though drifting is now in progress, available funds for this purpose are low, making it necessary to request government aid. It is wished to have included in this project a total of 400 ft. of drifting in either or both directions (east and west) on the lower level of the mine, as shown on the accompanying map, and any drifting we may choose to do on the upper level, though the latter is unlikely. Because of the possibility that drifting on the narrow, mineralized "lead" (as is now being done) may not develop any bodies of ore, it is also wished to include in this project the driving of a raise from the west drift of the lower level, to be driven for the same purpose as drifting - to find ore. The approval of a total of 90 ft. of raising is desired. The proposed work also includes the building of another small bin (about 15 tons) and the preparation of a site for and the building of a new compressor house.

(d). The Burrows Mine is supervised by the applicant, Kenneth T. Knapp, graduate in 1941 in Mining Engineering at the Colorado School of Mines, Golden, Colo. His mining experience includes operation of the Burrows Mine 1946-1952

MF-103 Burrows Mine, Silverton, Colorado

5. (d). (cont'd).
and operation of the Caledonian Mine near Silverton, 1948-1951. His metallurgical experience includes that of mill operator, metallurgical chemist, ore testing, etc. in four mills in the vicinity of Silverton, as well as one at Siscoe Gold Mines, Quebec, Canada and for four years at the mill of U. S. Vanadium Corp., Bishop, Calif.

6. Estimate of Costs:

(a). Independent Contracts (Labor):
400 ft. of drifting @ $12.00/ft.--$4,800.00
90 ft. of raising @ $20.00/ft.-- 1,800.00
100 ft. diamond dr. @ 2.50/ft.-- 250.00

(b). Labor, etc.:
General Labor @ $1.50/hr. ------- 2,000.00 $8,850.00
Supervision, engineering, etc.
To be done by applicant - max.
of 6 months/yr. during 2 yr.
allowable period of project @ $400.00/mo.--$4,800.00

(c). Materials and Supplies:
Gasolene, motor oil, compressor oil, rock & drill oil, drill bits, drill steel, dynamite, caps, fuse, shovels, picks, wrenches, nails, hammers, carbide lamps, carbide, timber, lumber, wedges, pipe &fittings, rail & fittings, oxygen and acetylene, air and water hoses, etc. ---------- 4,000.00

(d). Operating Equipment:
Owned by applicant
1-D 24 Cleveland drifter
1-SS 22 " stoper
85 pieces of drill steel(total length-300 ft.)
8 " of Swede dr. steel " " - 44 ft.)
500 Timken drill bits
40 Throwaway bits
1-Case stationary engine LAE
1-PB-4 210 Chicago Pneumatic compressor
1-Ingersoll-Rand portable compressor-160 cf/m
1-Command Reconaisance car
2-50 ft. air hoses
2-50 ft. water "
1-Oxygen & acetylene welding outfit
3-Mine cars (1 ton - end dump)
3- " " (3/4 " " "

MF-103 Burrows Mine, Silverton, Colorado

6. (cont'd)

To be purchased

1-Swede rock drill (or similar drill) and accessories and drill steel (to be purchased if deemed advisable)--------	$800.00
2- Mine cars (if required) ----------	200.00

To be rented

1-Gardner Denver mucking machine (now rented at $85.00/month----------	850.00
1-Diamond drill & accesories (if needed) $10.00/day	100.00

(e). Repairs:

Canvas or metal top for Command Recon, car ---	100.00
Build two walls of compressor house destroyed by snow slide----------	100.00
Replace worn parts in 38 22 stoper----------	50.00

(f). New buildings, etc.:

Compressor house at portal of lower level, including excavation for site for house, construction of which is planned for 1953-- (Old compressor house is located in snow slide area and not convenient to lower portal)	1,000.00
Ore bin - Small(15 ton) bin to be built this year to give total ore storage capacity of 25 tons at the lower portal.----------	250.00

(g). Miscellaneous:

Repairs to operating equipment:
The D 24 drifter and the Case engine have recently been overhauled at considerable expense and are in good condition. Due to the difficulty of foreseeing the nature and cost of various repairs to equipment in the future, the following figure is suggested as an allowance for repairs---------1,000.00

Analytical work---------- (other than that normally done in connection with settlements made on ore shipments)	30.00
Accounting - Usually done by applicant, however, this project may necessitate some assistance in this matter. Suggested allowance--------	100.00

MF-103 Burrows Mine, Silverton, Colorado

6. (g). (cont'd)

Workman's Compensation Insurance
Rate is $2.95/$100.00 with $250.00/mo. used as the basis for each contractor's pay. Minimum premium for 2 years------- $300.00

Payroll Taxes
F.I.C.A. - 1½% of $8,850.00---------- 132.75

(h). Contingencies:
Allowance for possible raise in the costs of labor, materials, and supplies---------- 1,000.00

Total 23,662.75

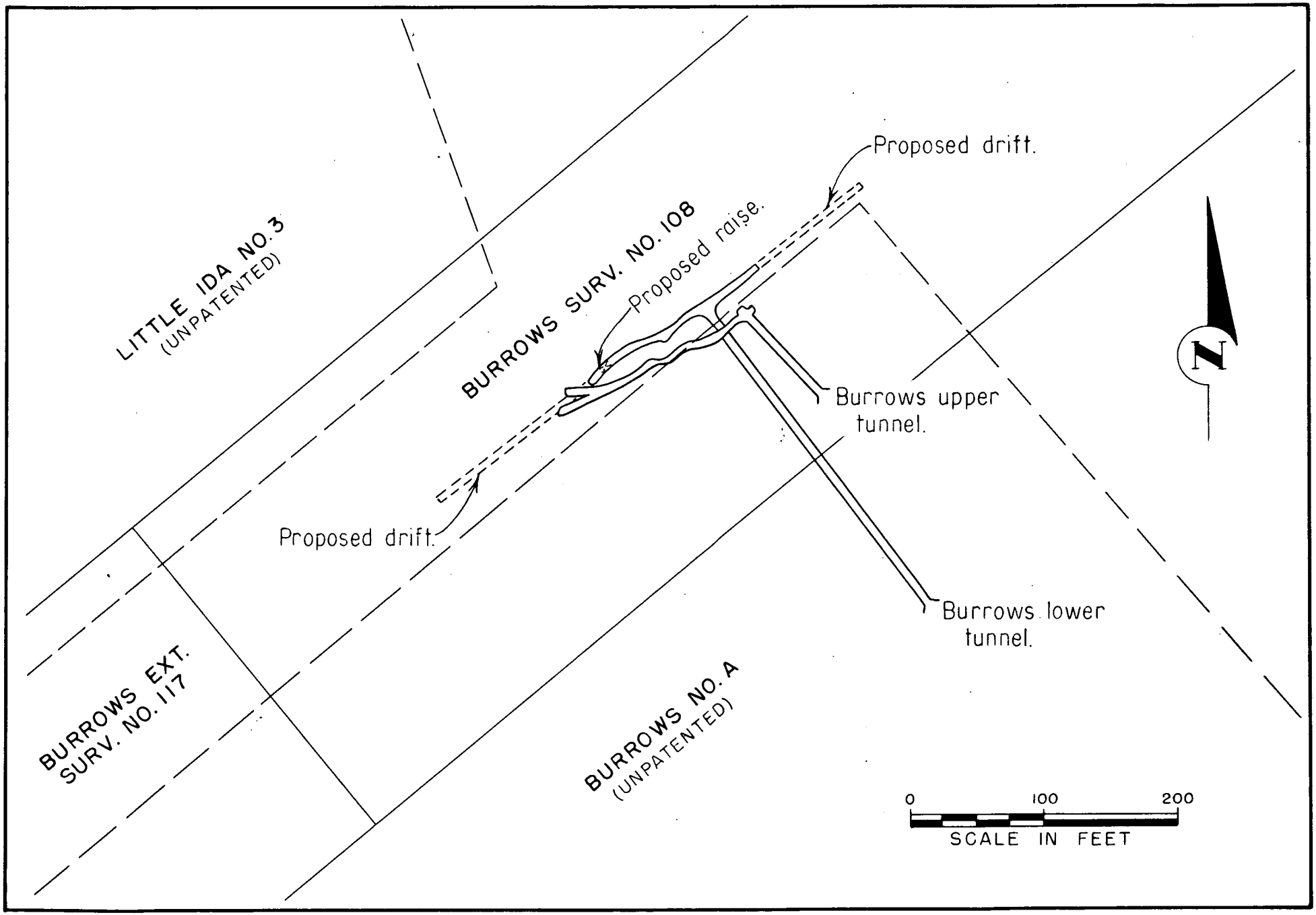


FIGURE 3 – CLAIM MAP, BURROWS MINE, SAN JUAN COUNTY, COLO., DMEA 2652

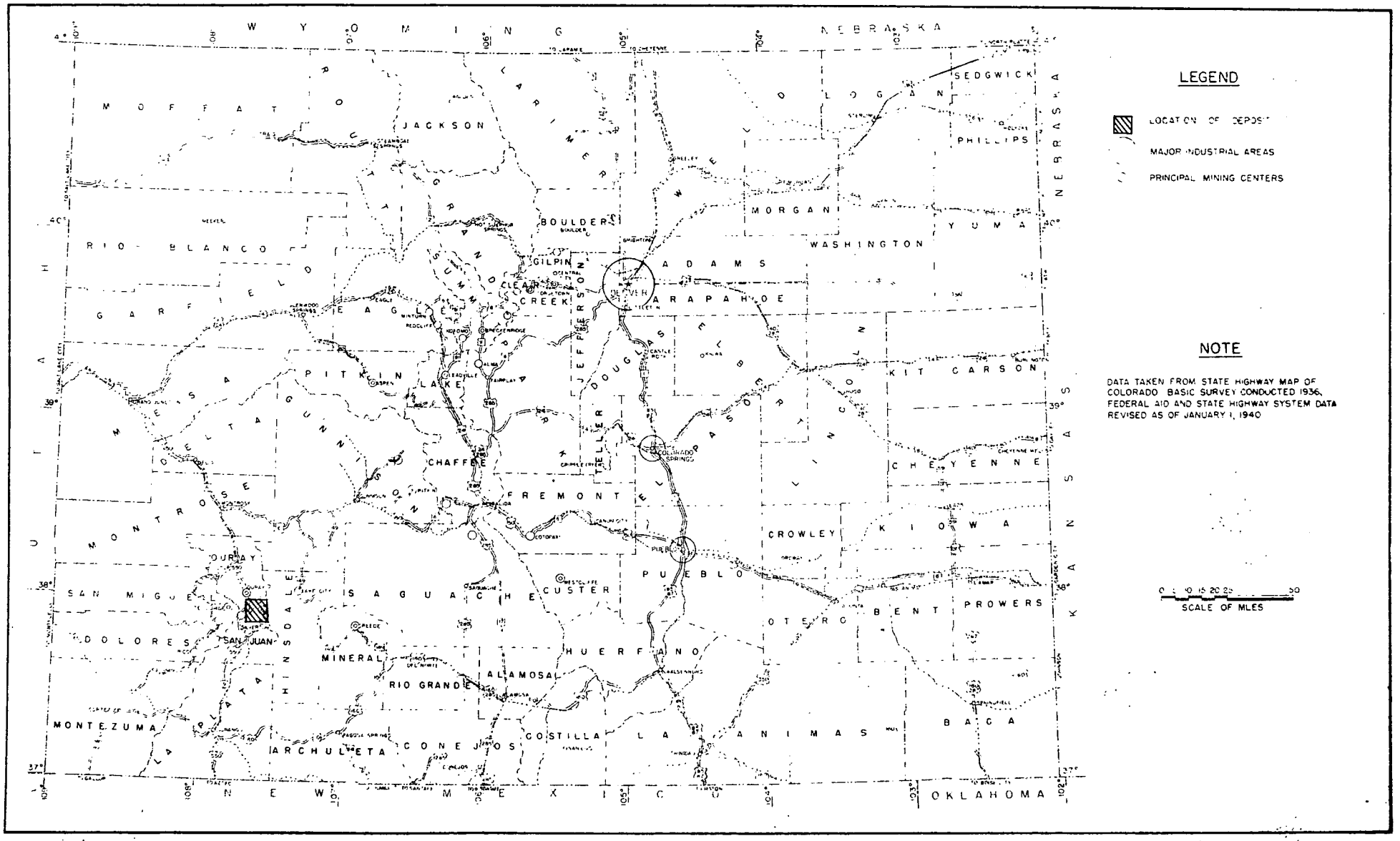
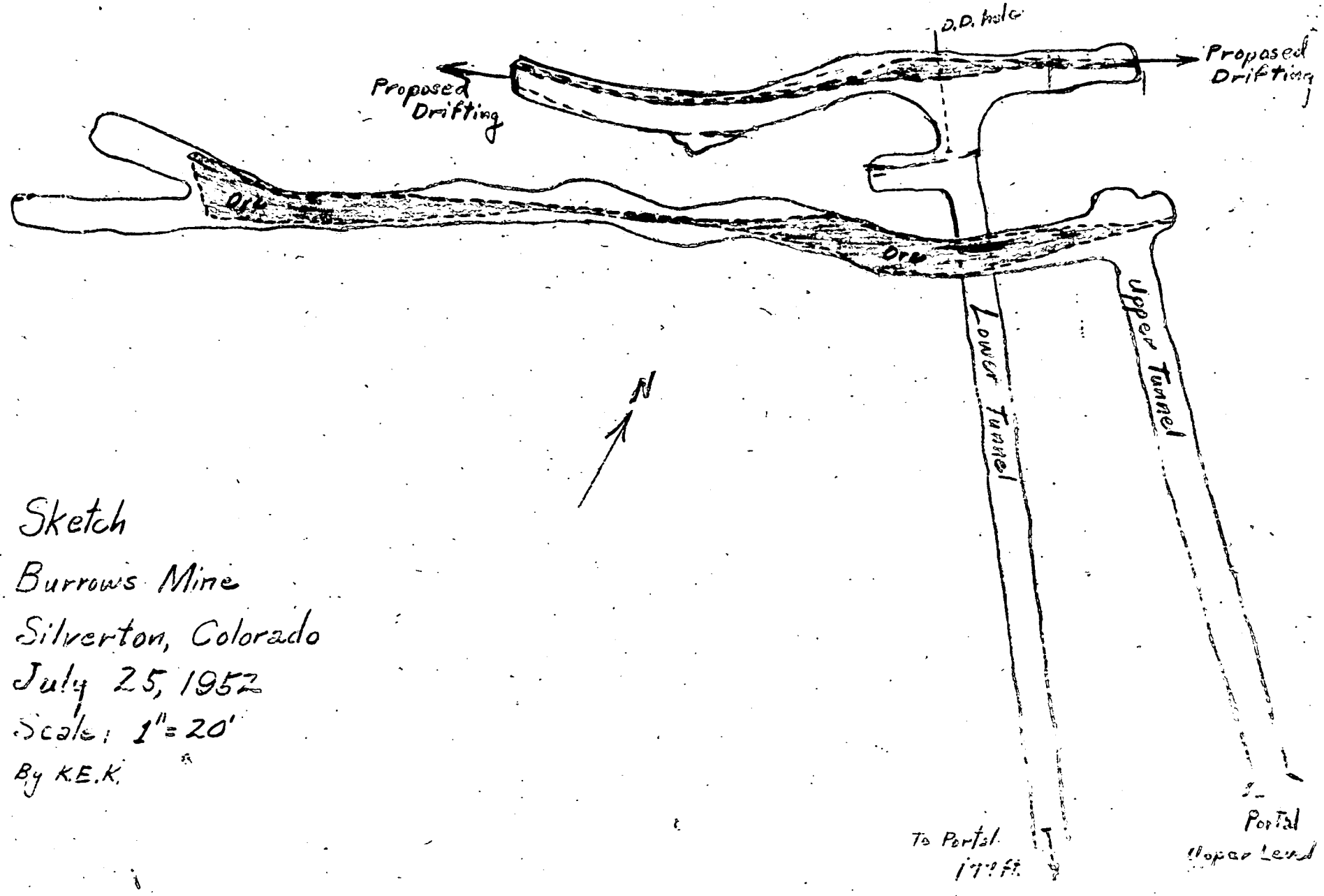
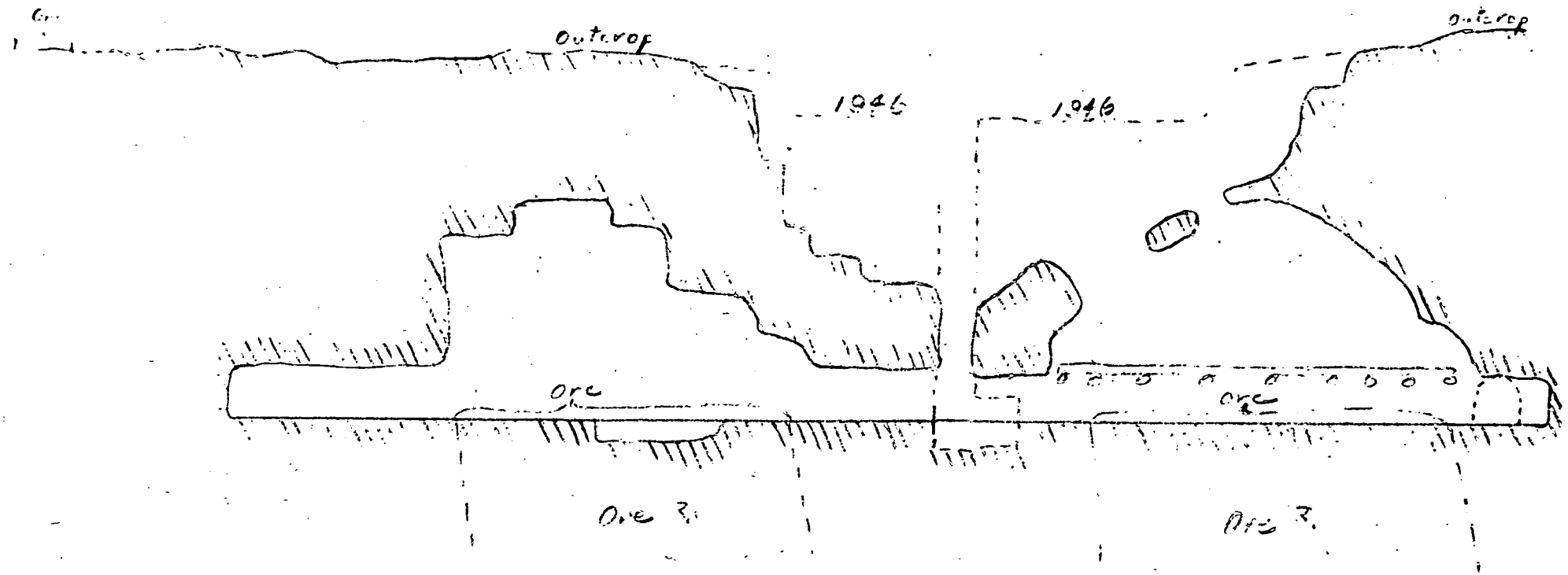
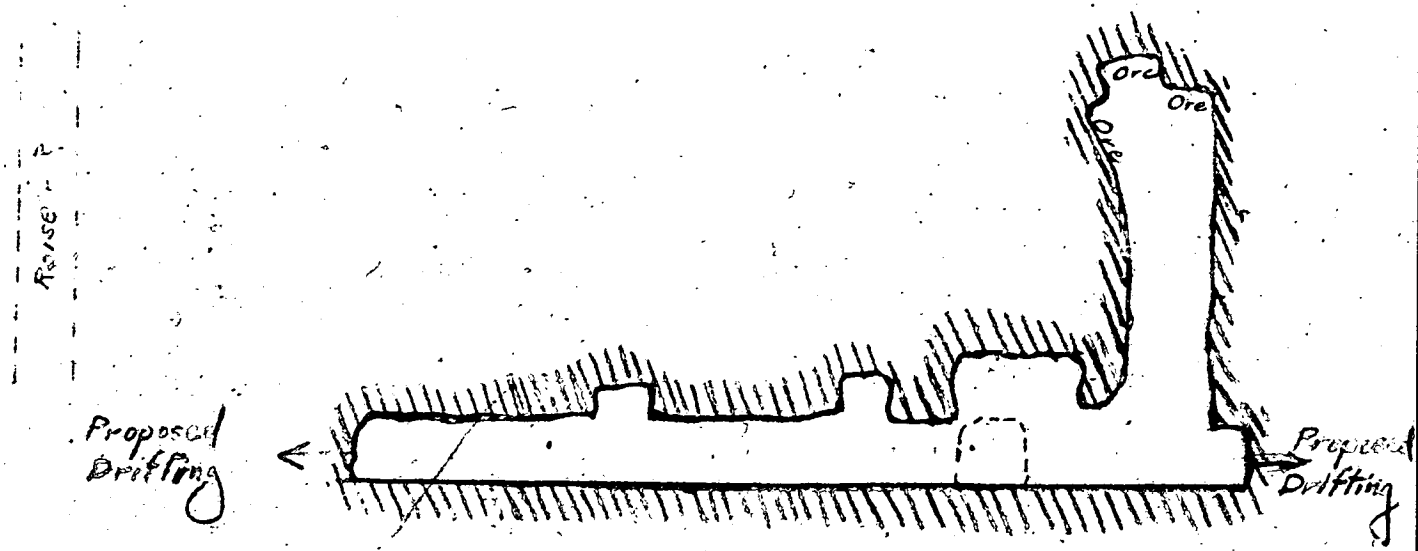


Fig. 1, Location Map, Burrows Mine, San Juan County, Colorado, DMEA-2652



Sketch
Burrows Mine
Silverton, Colorado
July 25, 1952
Scale: 1" = 20'
By K.E.K.





Sketch

Burrows Mine

Silverton, Colorado

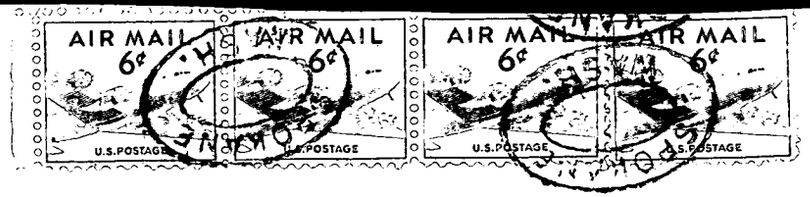
July 25, 1952

Scale : 1" = 20'

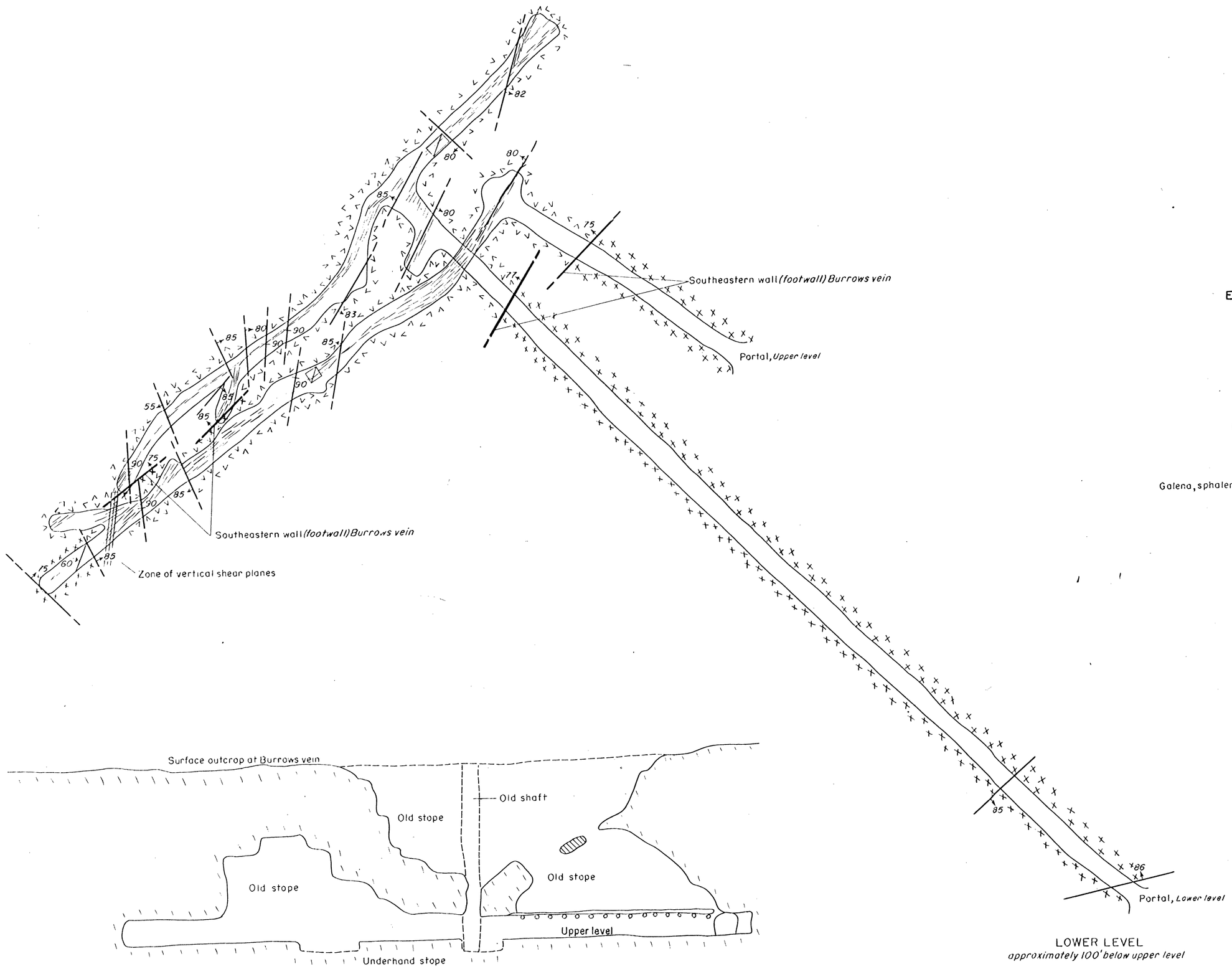
By K.E.K.

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
1201 NORTH DIVISION STREET
SPOKANE 2, WASHINGTON

OFFICIAL BUSINESS



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



EXPLANATION

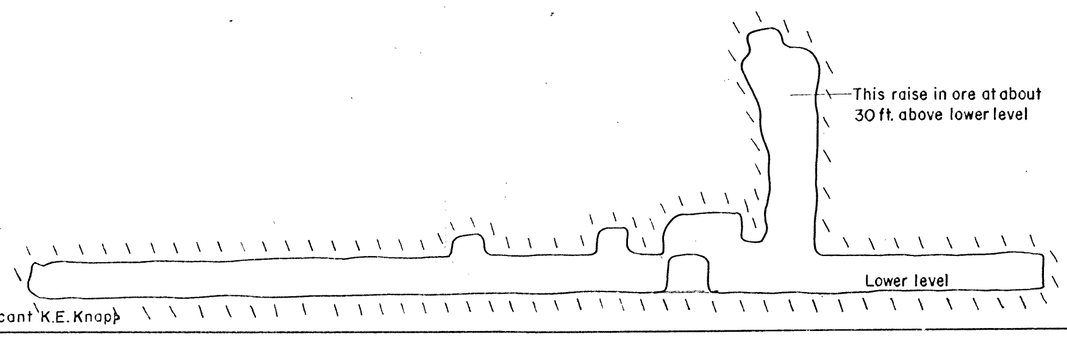
Quartz
Burrows vein

Rhyolite and latite

Galena, sphalerite and pyrite in quartz gangue

N

LONGITUDINAL SECTION ON BURROWS VEIN



Note: Plan and section of workings furnished by applicant K.E. Knapp

Geology by E.N. Harshman September 1952

FIGURE 2.— PLAN AND LONGITUDINAL SECTION OF BURROWS MINE SILVERTON, SAN JUAN COUNTY, COLORADO

20 0 20 40 60 Feet