DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

CONTROLLED DOCUMENT

DMA Docket No. 2138

DO NOT DETACH THIS SLIP

Action on this document is recorded and controlled in Reports and Records Branch. Any movement of this document between divisions or offices of DMA or movement outside DMA must be reported to the Reports and Records Branch. Actions taken that affect status of the case must also be reported.

This document has been recorded as

_____

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

Routing Slip

To:	Coord. Comm.	Date	11/2/51
To:		Date	
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INT.-DUP. SEC., WASH., D.C. 98868

DMA Form 2

DEFENSE MINERALS ADMINISTRATION

Status Change Notice

DMA Docket No. ~~2138~~

To: Reports and Records Branch

From: ~~Tungsten Branch~~

Date: ~~November 2, 1951~~

The following action has been taken this date on the above Controlled Document.

Forwarded to ~~Field Team Region III Through Coord. Comm.~~

Type of request changed to:

Denied ☐ Withdrawn ☐

Approved in amount of $

Other action, specify:

DMA Form 1

WO3

DEFENSE MINERALS ADMINISTRATION
Control Slip Hill top mine white Pine Co. Nev

CONTROLLED DOCUMENT

DMA Docket No. 2138

DO NOT DETACH THIS SLIP

Action on this document is recorded and controlled in Reports and Records Branch. Any movement of this document between divisions or offices of DMA or movement outside DMA must be reported to the Reports and Records Branch. Actions taken that affect status of the case must also be reported.

This document has been recorded as

EXPLORATION

Any action taken to change the type of request for assistance must be promptly reported to the Reports and Records Branch. Use DMA Form 2 for submitting these reports.

Routing Slip
Code 340

To: Ferro-Alloys Br. Date 10/9/51

To: _____ Date _____

To: _____ Date _____

To: _____ Date _____

To: _____ Date _____

To: _____ Date _____

To: _____ Date _____

To: _____ Date _____

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To: _____ Date _____

DO NOT DETACH

CONTROLLED DOCUMENT

February 13, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration

From: Iron and Ferro-Alloy Division, Defense Minerals Exploration Administration

Subject: Denial of exploration project in the amount of $31,370.50
Docket No. DMA 213SX - Tungsten
Baltimore Comma Mines, Inc.
Hilltop Mine, Minerva District
White Pine County, Nevada

The subject application was denied by this Division for the following reasons:

1. The scheelite occurs in a nearly vertical quartz vein 6" to 30" in width cutting nearly horizontal beds of pre-Cambrian limestone. The upper or "white" limestone has produced most of the output of the district, while the underlying "gray" or "middle" limestone has produced but little. The immediate area at the mine is complexly faulted, the past production coming fromfour segments of the faulted vein. The present adit level is approximately at the base of the "white" limestone.

2. The proposed loan is for the driving of an adit from a point 130 feet lower in elevation, to intersect and to drift along the vein.

3. All data, including the field team report, point to the unlikelihood of making a significant discovery in the "grey" limestone, whose exploration is envisioned under this project.

4. The Commodity Division and the field team recommend denial.

SIGNED

G. C. Selfridge, Acting Chief
Iron and Ferro-Alloy Division

QLBrewer'lm
2/13/52

cc: Admn. Reading File
Docket
G. C. Selfridge
~~XXXXXXXXX~~
Q. L. Brewer

21

Baltimore Comas Mines, Inc.
601 Bostman Building
Boise, Idaho

FEB 19 1952

Re: Docket No. DMA 213X - Tungsten
Hilltop Mine, Minerva District
White Pine County, Nevada

Gentlemen:

We have now reviewed your application for an exploration loan and other data made available to us in Washington.

The information notes that in your proposed project for the investigation in depth of the Hilltop vein in the grey limestone, there is little probability of making a significant discovery.

We regret, therefore, to inform you that your application is denied.

We wish to thank you for your interest and effort in the Defense Minerals Program.

Sincerely yours,

C. O. Mittenderf

Acting Administrator
Defense Minerals Exploration
Administration

DLBrewer:lm
2/13/52

cc: Admn. Reading File
Docket
R. W. Geehan, USBM
D. M. Lemmon, USGS
Field Team Reg. III
G. G. Selfridge
G. L. Brewer

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

C-FG-DML

February 1, 1952

Memorandum

To: George S. Salfridge, FWAA

From: D. M. Lemmon, G.S.O.S.

Subject: Field report DMA 2138 - Tungsten
Hilltop mine, Minerva District
White Pine County, Nevada
Baltimore Kansas Mines, Inc.

The Hilltop mine was examined November 30, 1951 by E. P. Muller of the Bureau of Mines, and R. P. Smith and J. J. Sharp of the Geological Survey. Their report, dated January 18, 1952, recommends denial of the application for an exploration project costing $31,370.50 because the chance of making a significant discovery is poor.

I concur with the field report and recommend denial of the application. The amount of inferred ore remaining in the ore shoot is too small to warrant high cost exploration by a bunch of promoters who do not appear to have any mining competence.

D M Lemmon

DMLemmon:gt

Copies to: Director's read. file
Branch read. file

FILE COPY
SURNAME:

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

Brewer
Gibson
Selfridge
Gilbert
Mayer
Johnson

FEB 19 1952

Baltimore Camas Mines, Inc.
601 Eastman Building
Boise, Idaho

Re: Docket No. DMA 2138X - Tungsten
Hilltop Mine, Minerva District
White Pine County, Nevada

Gentlemen:

We have now reviewed your application for an exploration loan and other data made available to us in Washington.

The information notes that in your proposed project for the investigation in depth of the Hilltop vein in the grey limestone, there is little probability of making a significant discovery.

We regret, therefore, to inform you that your application is denied.

We wish to thank you for your interest and effort in the Defense Minerals Program.

Sincerely yours,

C. O. Mittendorf (for)

Acting Administrator
Defense Minerals Exploration
Administration

QLBrewer:lm
2/13/52

cc: Admn. Reading File
Docket
R. W. Geehan, USBM
D. M. Lemmon, USGS
Field Team Reg. III
G. C. Selfridge
Q. L. Brewer

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

February 13, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration

From: Iron and Ferro-Alloy Division, Defense Minerals Exploration Administration

Subject: Denial of exploration project in the amount of $31,370.50
Docket No. DMA 2138X - Tungsten
Baltimore Camas Mines, Inc.
Hilltop Mine, Minerva District
White Pine County, Nevada

The subject application was denied by this Division for the following reasons:

1. The scheelite occurs in a nearly vertical quartz vein 6" to 30" in width cutting nearly horizontal beds of ~~pre~~-Cambrian limestone. The upper or "white" limestone has produced most of the output of the district, while the underlying "grey" or "middle" limestone has produced but little. The immediate area at the mine is complexly faulted, the past production coming fromfour segments of the faulted vein. The present adit level is approximately at the base of the "white" limestone.

2. The proposed loan is for the driving of an adit from a point 130 feet lower in elevation, to intersect and to drift along the vein.

3. All data, including the field team report, point to the unlikelihood of making a significant discovery in the "grey" limestone, whose exploration is envisioned under this project.

4. The Commodity Division and the field team recommend denial.

G. C. Selfridge

G. C. Selfridge, Acting Chief
Iron and Ferro-Alloy Division

FILE COPY
SURNAME:

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

Brewer
Gehan
Selfridge
Johnson

February 13, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration

From: Iron and Ferro-Alloy Division, Defense Minerals Exploration Administration

Subject: Denial of exploration project in the amount of $31,370.50
Docket No. DMA 2138X - Tungsten
Baltimore Camas Mines, Inc.
Hilltop Mine, Minerva District
White Pine County, Nevada

The subject application was denied by this Division for the following reasons:

1. The scheelite occurs in a nearly vertical quartz vein 6" to 30" in width cutting nearly horizontal beds of pre-Cambrian limestone. The upper or "white" limestone has produced most of the output of the district, while the underlying "grey" or "middle" limestone has produced but little. The immediate area at the mine is complexly faulted, the past production coming fromfour segments of the faulted vein. The present adit level is approximately at the base of the "white" limestone.

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3. All data, including the field team report, point to the unlikelihood of making a significant discovery in the "grey" limestone, whose exploration is envisioned under this project.

4. The Commodity Division and the field team recommend denial.

SIGNED

G. C. Selfridge, Acting Chief
Iron and Ferro-Alloy Division

QLBrewer:lm
2/13/52

cc: Admn. Reading File
Docket
G. C. Selfridge
~~XXXXXXXX~~
Q. L. Brewer

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 2-4-52

REFERRED TO:

1. CODE 400-RM-3538
2.
3.
4.

FOR:

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

REMARKS: .....

Check (X) before the items needing attention.

Adams (MD)
Initials of sender.

GPO 16—63815-1

Get WBM Concurrence
on Denial

IN REPLY REFER TO:

G-MD-DML

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

February 1, 1952

Memorandum

To: George C. Selfridge, DMEA

From: D. M. Lemmon, U.S.G.S.

Subject: Field report DMA 2138 - Tungsten
Hilltop mine, Minerva District
White Pine County, Nevada
Baltimore Camas Mines, Inc.

The Hilltop mine was examined November 30, 1951 by L. F. Muller of the Bureau of Mines, and R. M. Smith and B. J. Sharp of the Geological Survey. Their report, dated January 18, 1952, recommends denial of the application for an exploration project costing $31,370.50 because the chance of making a significant discovery is poor.

I concur with the field report and recommend denial of the application. The amount of inferred ore remaining in the ore shoot is too small to warrant high cost exploration by a bunch of promoters who do not appear to have any mining competence.

Dwight M. Lemmon

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

G-MD-DML

February 1, 1952

Memorandum

To: George C. Selfridge, DMEA

From: D. M. Lemmon, U.S.G.S.

Subject: Field report DMA 2138 - Tungsten
Hilltop mine, Minerva District
White Pine County, Nevada
Baltimore Camas Mines, Inc.

The Hilltop mine was examined November 30, 1951 by L. F. Muller of the Bureau of Mines, and H. W. Smith and B. J. Sharp of the Geological Survey. Their report, dated January 18, 1952, recommends denial of the application for an exploration project costing $31,370.50 because the chance of making a significant discovery is poor.

I concur with the field report and recommend denial of the application. The amount of inferred ore remaining in the ore shoot is too small to warrant high cost exploration by a bunch of promoters who do not appear to have any mining competence.

Don Lemmon

DMLemmon:gt

Copies to: Director's read. file
Branch read. file

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

G-MD-D'L

February 1, 1952

Memorandum

To: George C. Selfridge, DMSA

From: D. M. Lemmon, U.S.G.S.

Subject: Field report DMA 2138 - Tungsten
Hilltop mine, Minerva District
White Pine County, Nevada
Baltimore Camas Mines, Inc.

The Hilltop mine was examined November 30, 1951 by L. F. Muller of the Bureau of Mines, and M. W. Smith and E. J. Sharp of the Geological Survey. Their report, dated January 18, 1952, recommends denial of the application for an exploration project costing $31,370.50 because the chance of making a significant discovery is poor.

I concur with the field report and recommend denial of the application. The amount of inferred ore remaining in the ore shoot is too small to warrant high cost exploration by a bunch of promoters who do not appear to have any mining competence.

DM Lemmon

DMLemmon:gt

Copies to: Director's read. file
Branch read. file

OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 28 1952

Office of
Executive Officer
DMEA Field Team
Region III

1012 Flood Building
870 Market Street
San Francisco 2, Calif.

January 24, 1952

Memorandum

To: Defense Minerals Exploration Administration, Interior Building, Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMA-2138 (Tungsten) Baltimore Camas Mines, Inc. Hilltop Mine, Minerva Mining District, White Pine County, Nevada

Reference is made to the letter request dated November 13, signed by Mr. Tom Lyon, for an examination of the subject property.

Attached are four copies of a report, "Docket DMA-2138, (Tungsten) Baltimore Camas Mines, Inc., Hilltop Mine, Minerva Mining District, White Pine County, Nevada", by L. F. Muller and George H. Holmes, Jr., mining engineers, U. S. Bureau of Mines, and R. M. Smith, geologist, U. S. Geological Survey, dated January 18, 1952.

According to the examining engineers of the Bureau of Mines, and geologist of the U. S. Geological Survey, they do not believe that a significant discovery of tungsten would be found in the white limestone near the existing level. They also state that the cost of exploring the upper level is too high to be justified by the small inferred ore reserve tonnage. They have recommended that the application be denied.

The tungsten branch suggested in a letter to the applicant that he submit a counter proposal designed to explore the west and east blocks (faulted continuations of the ore shoot in the favorable limestone unit).

The applicant in a reply stated that there was no change of formation between the existing level and the site of the proposed crosscut, and that recent work has disclosed new data regarding the stratigraphy. He requested a DMA examination of the property. As a result, the Coordinating Committee requested the Field Team, Region III, to examine the property with particular emphasis on determining whether the additional work done may have changed the picture.

The examining engineers and geologist carefully checked the Hilltop mine and determined that there has been no new work done since Lemmon mapped the mine in 1943; they confirm that the lithologic change shown on Lemmon's maps is present.

A representative of the applicant was present at the time of examination and was informed of these facts. He also agreed that Lemmon's map showed the true picture of the stratigraphy. He did not concur in the opinion that the lower member was unfavorable for tungsten deposition, but was unable to offer any evidence to the contrary. He stated that his company would not be interested in performing work in the west and east blocks in the favorable unit because the tonnage to be expected is small.

The docket and correspondence relating to it are returned herewith.

H. C. Miller
Executive Officer
DMEA Field Team, Region III

Attachments

Copy to E. H. Bailey, USGS

Reviewed by
DMEA OPERATING COMMITTEE
2-1-52
(date) (kb)

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

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DOCKET DMA-2138, (TUNGSTEN) BALTIMORE CAMAS MINES, INC.

HILLTOP MINE, MINERVA MINING DISTRICT

WHITE PINE COUNTY, NEVADA

L. F. Muller, Mining Engineer
U. S. Bureau of Mines

George H. Holmes, Jr., Mining Engineer
U. S. Bureau of Mines

R. M. Smith, Geologist
U. S. Geological Survey

January 18, 1952

Docket DMA 2138, (Tungsten) Baltimore Camas Mines, Inc.

Hilltop Mine, Minerva Mining District

White Pine County, Nevada

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Baltimore Camas Mines, Inc. Hilltop tungsten mine is in southeast White Pine County, Nev., about 50 miles southeast of Ely. The property was located in 1915 and some minor shipments were made in 1916. During the period 1938-1942, 3000 tons of ore were shipped which averaged about 1.23 percent WO_3.

The tungsten deposit at the Hilltop mine is in a quartz vein that cuts limestone of Cambrian age. The ore is composed of finely disseminated scheelite in quartz.

The ore shoot is 160 feet long, up to 8 feet wide, and was mined down dip for about 40 feet. The ore shoot, where mined, is confined to a limestone unit that extends only a few feet below the present workings. Ore of good grade but narrow width occurs in a gray limestone (underlying the favorable unit) which extends to about 50 feet below the workings.

There are no measured or indicated ore reserves in the Hilltop mine. The inferred reserves are 200 tons of ore containing 1.0 percent WO_3 above the existing level, and about 1100 tons containing 1.0 percent WO_3 below the level.

It is concluded that although ore may be found in the favorable white limestone near the existing level, the chance of making a significant discovery at depth is poor. The cost of exploring

the upper level is too high to be justified by the small inferred ore reserve tonnage. It is recommended, therefore, that the application be denied.

INTRODUCTION

The Hilltop mine was examined on November 30, 1951 by representatives of the U. S. Bureau of Mines[1/] and U. S. Geological Survey[2/]. S. L. Bida, the Baltimore Camas Mines, Inc. engineer, accompanied the DMEA field team to the property.

The 6 unpatented lode claims are in T. 11 N., R. 68 E., M.D.B.&M., Minerva Mining District, White Pine County, Nev. (fig. 1). The nearest supply center is Ely, approximately 50 miles to the northwest, which is serviced by U. S. Highways 6, 50, and 93 and the Nevada Northern Railroad connecting with the Southern Pacific and Western Pacific to the north.

The property is reached by traveling southward from Ely on U. S. Highway 6 for 40.3 miles, then southeasterly 7.5 miles on an improved, graveled road, and then eastward 2.5 miles over an unimproved road to the base of the west flank of the Snake Range.

HISTORY

The property was discovered in 1915 by Arnold Millick, the present owner. Production records and accounts by the owner, show several minor shipments in 1916 and shipments totaling 3,133.8 units of plus 60 percent WO_3 concentrate by several leasing companies

1/ L. F. Muller
2/ Roscoe M. Smith and Byron J. Sharp.

during the period from May 1938 through April 1942. The mine has been idle since 1942.

Where sufficient records were available, it was estimated the mine run ore averaged about 1.23 percent WO_3.

Mining consisted of stoping to the surface from the main level for a strike length of 160 feet with stope widths up to 8 feet, and underhand stoping to depths up to 10 feet below the level (fig. 3).

Ore was transported, and equipment brought to the adit by means of a 1000 foot aerial tram extending to the end of the present road in the canyon floor. This tram has been completely dismantled.

PHYSICAL FEATURES

The 6 claims lie along the west slope of the northerly trending Snake Range at elevations from 6,500 feet to 7,200 feet. A 35 degree average slope exists between the upper and lower claims. Shallow overburden covers the steep, irregular limestone surface. A foot trail connects the main upper workings with the end of the road which is inadequate for transportation of machinery and equipment. Any significant future production would necessitate building either an aerial tram or extending the road. Road building would require approximately 800 linear feet of heavy rock-work.

Climate varies from warm, dry summers to moderate winters. Mining activity is impeded by severe snow conditions for several months of the year. Snow removal equipment is necessary for keeping the roads open.

Water for mine use would have to be hauled by tank truck four miles from a well near the Minerva District mill. Diesel or gasoline driven generators and compressors would be required to supply power and compressed air. There is no equipment at the mine.

LABOR AND LIVING CONDITIONS

Current wages for miners in the area are $14 a day. As larger mines are active in less isolated places in the district, an incentive plan would be necessary to attract and hold good men. Housing would have to be constructed nearby, as Ely, the nearest town, is 50 miles to the north.

SAMPLING

Six samples were taken by the DMEA field team across the mineralized quartz veins. Sample locations are shown on figure 4 with the following analyses:

Sample No.	Width/Ft.	%, WO_3
1	1.5	0.69
2	2.0	1.78
3	0.5	5.71
4	1.5	0.68
5	2.5	0.43
6	1.2	1.49
Weighted Average	1.53	1.23

GEOLOGY

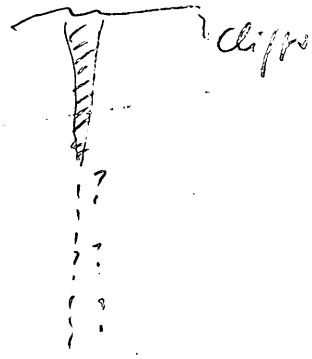
The rock in the area is limestone of Cambrian age that is gently tilted west and is displaced by faults of several systems.[3] The oldest faults are occupied by scheelite-bearing quartz veins.

The limestone in the mine area has been subdivided by Lemmon into different units. Listed in order of youngest to oldest they

3/ Lemmon, D. M., Tungsten Deposits in the Minerva District, White Pine County, Nevada: Open File Report, Strategic Minerals Investigations, 1944.

are:

Upper white limestone (Cuw)		180 feet
Lower black limestone		
Middle gray limestone (Cmg)		50 feet
Thin-bedded limestone (Ctb)		40 feet
Lower gray limestone		100 feet
Lower white limestone	over	50 feet



The upper white limestone is cliff-forming unit; it is fine-grained, massive, light gray with a pinkish cast, and contains a few thin, lenticular beds of dark gray limestone. In general, the lower black limestone is dark gray, mottled, and indistinctly to well bedded. In the mine area, the middle gray unit is massive and forms steep cliffs. All the beds strike north and dip 5°-22° W. in the mine area. The workings of the Hilltop Mine are in the upper white and middle gray units (fig. 3).

Faults that cut the limestone are nearly all normal and have displacements of as much as 75 feet. They strike northeast, north, or northwest, and most of them dip steeply eastward. The fault occupied by the Hilltop quartz vein strikes northeast and dips 45°-75° NW. The displacement of the limestone on this fault is estimated to be less than 20 feet.

ORE DEPOSITS

The tungsten ore body that has been mined is a quartz vein along a fault that strikes northeast and dips 45°-75° NW. The ore shoot is about 160 feet long, as much as 8 feet wide, and has been mined to a depth of 40 feet (fig. 3).

The ore mineral is scheelite; it occurs finely disseminated throughout the quartz vein, and, to a slight extent, in the limestone wall rock adjacent to the vein. The average grade of approximately 3,000 tons of ore mined was about 1.23 percent WO_3.

Mention the white ones, too!

The ore body pinches and swells along the strike and down the dip and ranges from a few inches to 8 feet wide. On the surface the average width of the vein is 1 foot, and along the drift it is 1-1/2 feet. It has been offset by many normal faults having displacements of as much as 75 feet (fig. 2).

The ore shoot appears to be locallized at a brecciated zone in the vein. Lemmon (1945, p. 10) considered that the massiveness of the upper white limestone influenced brecciation, and thus zones favorable to scheelite deposition were formed. In the Hilltop mine, the vein has been productive only in this unit. Scheelite also occurs in the vein in the middle gray unit (samples No. 3 and 4, fig. 4), but the width of the ore found thus far has been too narrow to be mined profitably.

ORE RESERVES

There are no reserves of measured or indicated ore in the Hilltop mine. About 200 tons of ore containing about 1.0 percent WO_3 may be inferred above the level in the offset segment of the vein at the west end of the mine. This block is 40 feet long, 1.5 feet wide, and extends 40 feet down the dip below the upper level (fig. 3).

A small additional tonnage may be found in the upper white limestone below the level. As the middle gray limestone is also massive,

it is possible that the vein may be productive in it. If this is true, the ore shoot may continue to an average depth of about 50 feet vertically below the level, and the maximum reserves that may be inferred are about 1100 tons of ore averaging about 1.0 percent WO_3, contained in the block 160 feet long, 1.5 feet wide and extending 57 feet down the dip of the vein.

PROPOSED EXPLORATION

The applicant has proposed to explore the downward continuation of the ore shoot by driving a crosscut 225 feet north from the face of the cliff 130 feet below the workings to intersect the vein, to drift along the vein 100 feet in each direction, and to raise 130 feet to the existing level. This work would provide a haulage way as well as explore the deposit. The applicant also proposes to construct 1/2 mile of road to gain access to the portal of the proposed crosscut. He estimated that the total cost of the project would be $31,000.

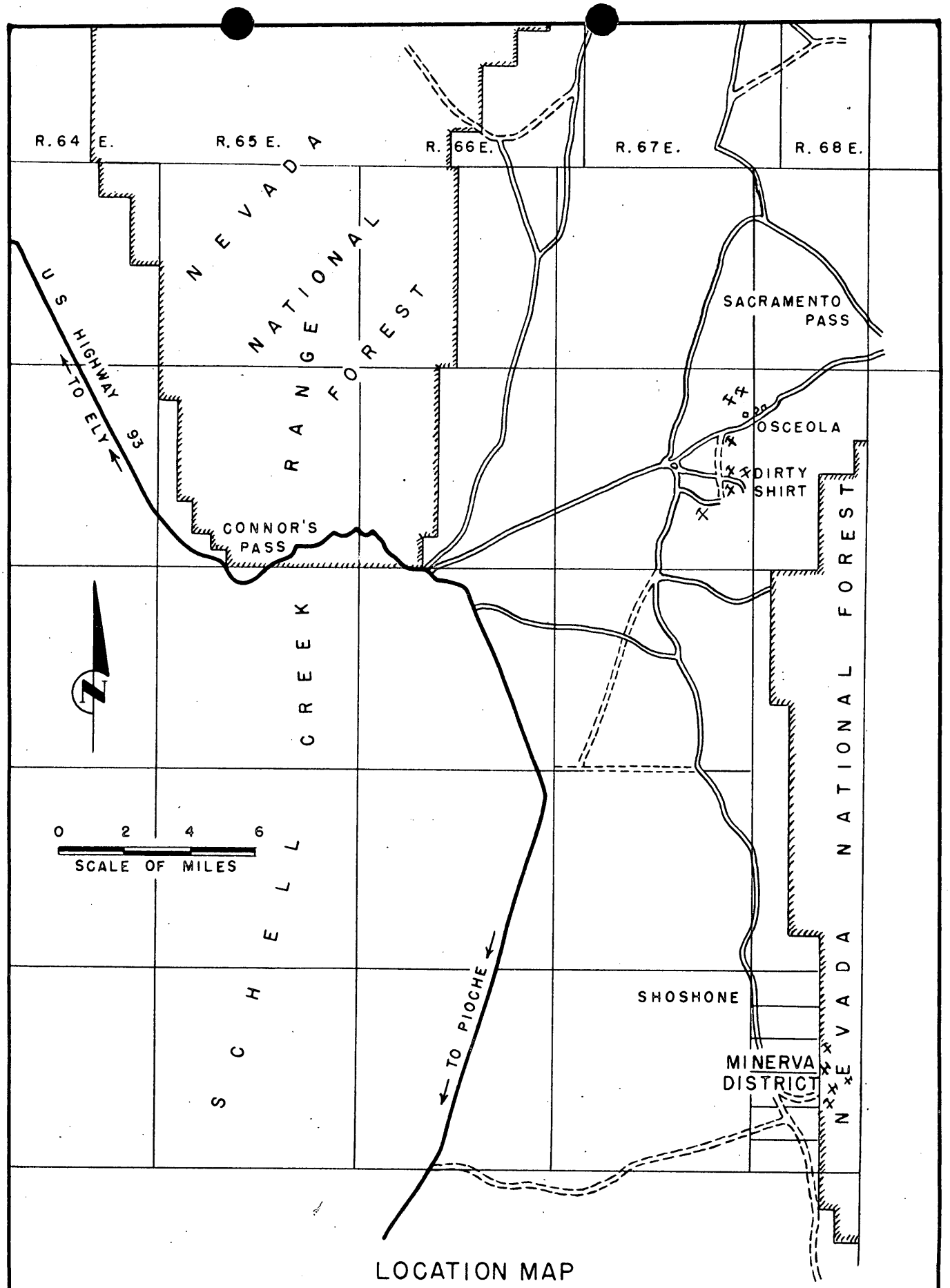
This program does not appear to be sound, as all but about 57 feet of the 130 feet of new depth is believed to be in an unfavorable limestone unit, and the chances of making a significant discovery in this unit are considered to be small.

The tungsten branch suggested in a letter to the applicant (Holderer, 10/22/51) that he submit a counter proposal designed to explore the west and east blocks (faulted continuations of the ore shoot in the favorable limestone unit).

The applicant in a reply (letter of 10/28/51) stated that there was no change of formation between the existing level and the site of the proposed crosscut, and that recent work has disclosed new data regarding the stratigraphy. He requested a DMA examination of the property. As a result, the Coordinating Committee requested the Field Team, Region III (letter of Lyon, 11/13/51) to examine the property with particular emphasis on determining whether the additional work done may have changed the picture.

The examining engineer and geologists carefully checked the Hilltop mine and determined that there has been no new work done since Lemmon mapped the mine in 1943; they confirm that the lithologic change shown on Lemmon's maps is present.

A representative of the applicant was present at the time of examination and was informed of these facts. He also agreed that Lemmon's map showed the true picture of the stratigraphy. He did not concur in the opinion that the lower member was unfavorable for tungsten deposition, but was unable to offer any evidence to the contrary. He stated that his company would not be interested in performing work in the west and east blocks in the favorable unit because the tonnage to be expected is small.



LOCATION MAP

MINERVA TUNGSTEN DISTRICT - WHITE-PINE CO., NEV.

FIG. 1

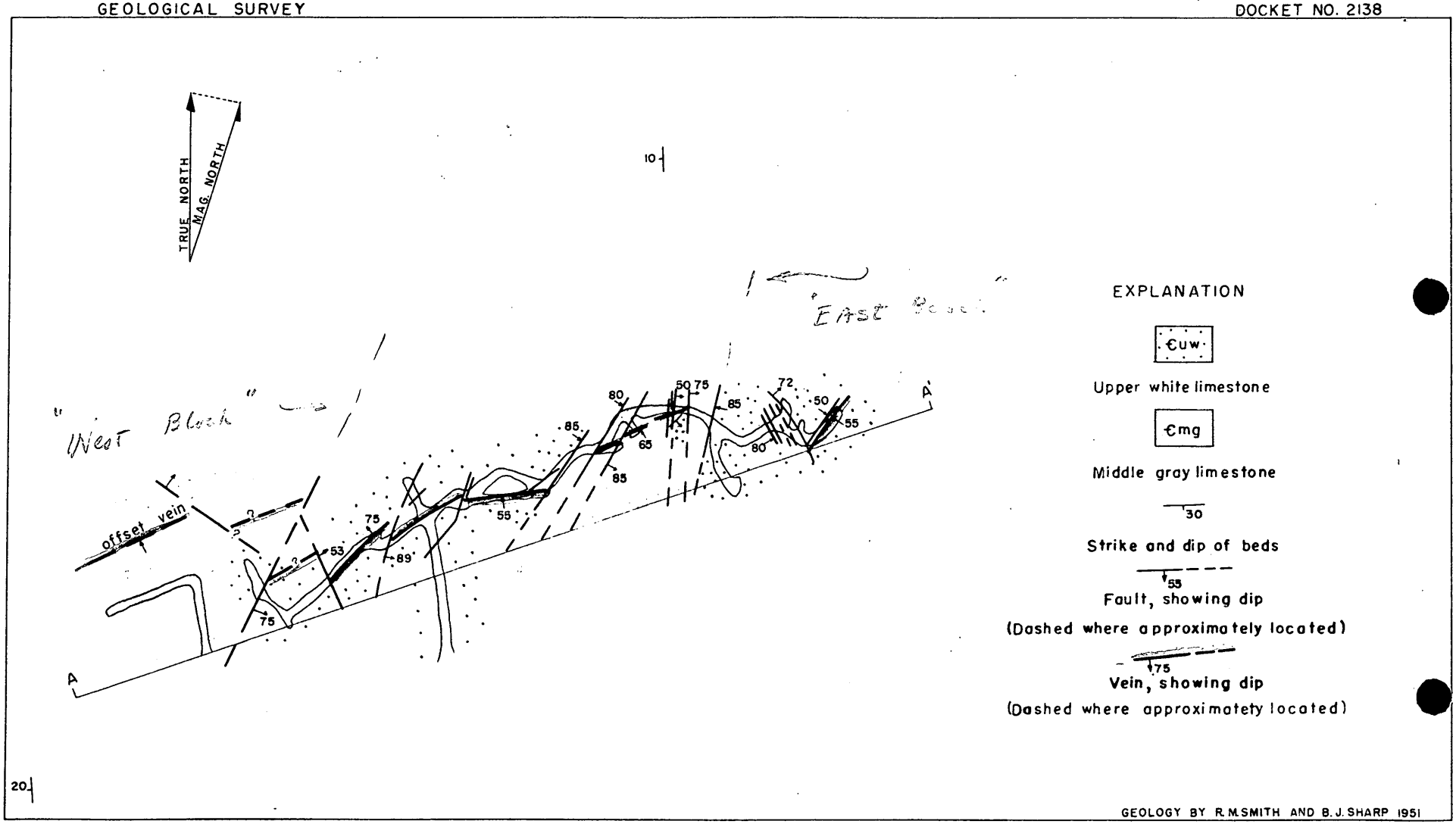


FIG. 2

GEOLOGIC MAP OF HILLTOP MINE
MINERVA MINING DISTRICT
WHITE PINE COUNTY, NEVADA

0 100 200 FEET
Scale

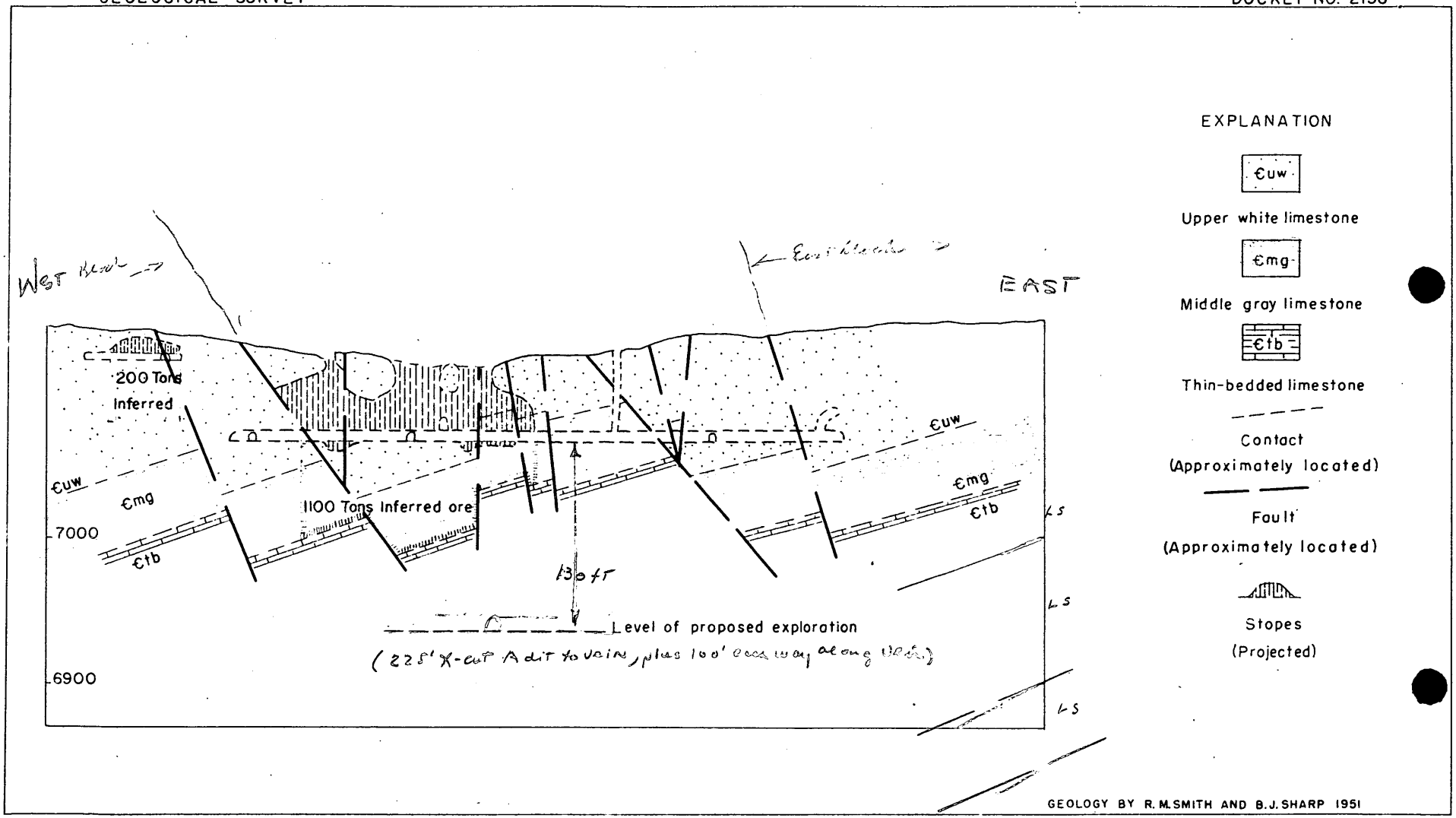


FIG. 3

SECTION ALONG LINE A-A'
HILLTOP MINE, MINERVA MINING DISTRICT
WHITE PINE COUNTY, NEVADA

0 100 200 FEET
Scale

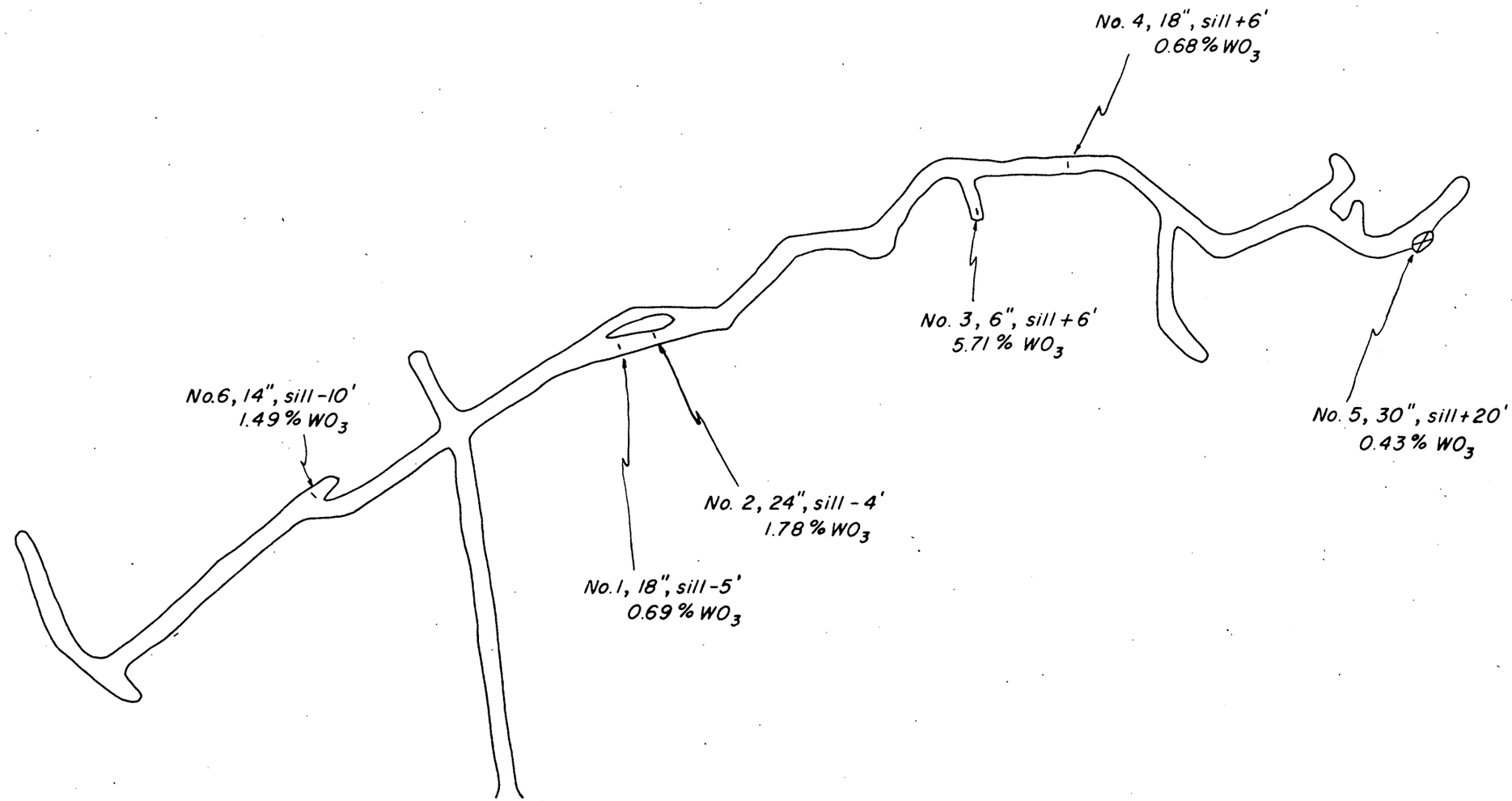


Figure 4, Assay map, Hilltop Mine

Reviewed by
DMEA OPERATING COMMITTEE
2-1-52
(date) hl

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

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III

DOCKET DMA-2138, (TUNGSTEN) BALTIMORE CAMAS MINES, INC.

HILLTOP MINE, MINERVA MINING DISTRICT

WHITE PINE COUNTY, NEVADA

L. F. Muller, Mining Engineer
U. S. Bureau of Mines

George M. Holmes, Jr., Mining Engineer
U. S. Bureau of Mines

R. M. Smith, Geologist
U. S. Geological Survey

January 18, 1952

Docket DMA 2138, (Tungsten) Baltimore Gamma Mines, Inc.

Hilltop Mine, Minerva Mining District

White Pine County, Nevada

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The Baltimore Gamma Mines, Inc. Hilltop tungsten mine is in southeast White Pine County, Nev., about 50 miles southeast of Ely. The property was located in 1918 and some minor shipments were made in 1916. During the period 1938-1942, 3000 tons of ore were shipped which averaged about 1.25 percent WO_3.

The tungsten deposit at the Hilltop mine is in a quartz vein that cuts limestone of Cambrian age. The ore is composed of finely disseminated scheelite in quartz.

The ore shoot is 160 feet long, up to 5 feet wide, and was mined down dip for about 40 feet. The ore shoot, where mined, is confined to a limestone unit that extends only a few feet below the present workings. Ore of good grade but narrow width occurs in a gray limestone (underlying the favorable unit) which extends to about 30 feet below the workings.

There are no measured or indicated ore reserves in the Hilltop mine. The inferred reserves are 200 tons of ore containing 1.0 percent WO_3 above the existing level, and about 1100 tons containing 1.0 percent WO_3 below the level.

It is concluded that although ore may be found in the favorable white limestone near the existing level, the chance of making a significant discovery at depth is poor. The cost of exploring

the upper level is too high to be justified by the small inferred ore reserve tonnage. It is recommended, therefore, that the application be denied.

INTRODUCTION

The Hilltop mine was examined on November 30, 1961 by representatives of the U. S. Bureau of Mines[1] and U. S. Geological Survey[2]. S. L. Bida, the Baltimore Gamma Mines, Inc. engineer, accompanied the DMEA field team to the property.

The 6 unpatented lode claims are in T. 11 N., R. 68 E., M.D.B.&M., Minerva Mining District, White Pine County, Nev. (fig. 1). The nearest supply center is Ely, approximately 50 miles to the northwest, which is serviced by U. S. Highways 6, 50, and 93 and the Nevada Northern Railroad connecting with the Southern Pacific and Western Pacific to the north.

The property is reached by traveling southward from Ely on U. S. Highway 6 for 40.3 miles, then southeasterly 7.5 miles on an improved, graveled road, and then eastward 2.5 miles over an unimproved road to the base of the west flank of the Snake Range.

HISTORY

The property was discovered in 1915 by Arnold Millick, the present owner. Production records and accounts by the owner, show several minor shipments in 1916 and shipments totaling 3,133.8 units of plus 60 percent WO_3 concentrate by several leasing companies

1/ L. F. Muller
2/ Roscoe M. Smith and Byron J. Sharp.

during the period from May 1938 through April 1942. The mine has been idle since 1942.

Where sufficient records were available, it was estimated the mine run ore averaged about 1.23 percent WO_3.

Mining consisted of stoping to the surface from the main level for a strike length of 100 feet with stope widths up to 8 feet, and underhand stoping to depths up to 10 feet below the level (fig. 3).

Ore was transported, and equipment brought to the adit by means of a 1000 feet aerial tram extending to the end of the present road in the canyon floor. This tram has been completely dismantled.

PHYSICAL FEATURES

The 6 claims lie along the west slope of the northerly trending Snake Range at elevations from 6,500 feet to 7,200 feet. A 36 degree average slope exists between the upper and lower claims. Shallow overburden covers the steep, irregular limestone surface. A foot trail connects the main upper workings with the end of the road which is inadequate for transportation of machinery and equipment. Any significant future production would necessitate building either an aerial tram or extending the road. Road building would require approximately 800 linear feet of heavy rock-work.

Climate varies from warm, dry summers to moderate winters. Mining activity is impeded by severe snow conditions for several months of the year. Snow removal equipment is necessary for keeping the roads open.

Water for mine use would have to be hauled by tank truck four miles from a well near the Minerva District mill. Diesel or gasoline driven generators and compressors would be required to supply power and compressed air. There is no equipment at the mine.

LABOR AND LIVING CONDITIONS

Current wages for miners in the area are $14 a day. As larger mines are active in less isolated places in the district, an incentive plan would be necessary to attract and hold good men. Housing would have to be constructed nearby, as Ely, the nearest town, is 50 miles to the north.

SAMPLING

Six samples were taken by the BMEA field team across the mineralized quartz veins. Sample locations are shown on figure 4 with the following analyses:

Sample No.	Width/Ft.	%, WO_3
1	1.5	0.69
2	2.0	1.79
3	0.5	5.71
4	1.5	0.68
5	2.5	0.45
6	1.2	1.49

GEOLOGY

The rock in the area is limestone of Cambrian age that is gently tilted west and is displaced by faults of several systems.[3] The oldest faults are occupied by scheelite-bearing quartz veins.

The limestone in the mine area has been subdivided by Lemmon into different units. Listed in order of youngest to oldest they

3/ Lemmon, D. M., Tungsten Deposits in the Minerva District, White Pine County, Nevada: Open File Report, Strategic Minerals Investigations, 1944.

are:

Upper white limestone (Cuw)	180 feet
Lower black limestone	
Middle gray limestone (Cmg)	80 feet
Thin-bedded limestone (Cth)	40 feet
Lower gray limestone	100 feet
Lower white limestone over	50 feet

The upper white limestone is cliff-forming unit; it is fine-grained, massive, light gray with a pinkish cast, and contains a few thin, lenticular beds of dark gray limestone. In general, the lower black limestone is dark gray, mottled, and indistinctly to well bedded. In the mine area, the middle gray unit is massive and forms steep cliffs. All the beds strike north and dip 5°-22° W. in the mine area. The workings of the Hilltop Mine are in the upper white and middle gray units (fig. 3).

Faults that cut the limestone are nearly all normal and have displacements of as much as 75 feet. They strike northeast, north, or northwest, and most of them dip steeply eastward. The fault occupied by the Hilltop quartz vein strikes northeast and dips 45°-75° NW. The displacement of the limestone on this fault is estimated to be less than 20 feet.

ORE DEPOSITS

The tungsten ore body that has been mined is a quartz vein along a fault that strikes northeast and dips 45°-75° NW. The ore sheet is about 180 feet long, as much as 8 feet wide, and has been mined to a depth of 40 feet (fig. 3).

The ore mineral is scheelite; it occurs finely disseminated throughout the quartz vein, and, to a slight extent, in the limestone wall rock adjacent to the vein. The average grade of approximately 3,000 tons of ore mined was about 1.25 percent WO_3.

The ore body pinches and swells along the strike and down the dip and ranges from a few inches to 8 feet wide. On the surface the average width of the vein is 1 foot, and along the drift it is 1-1/2 feet. It has been offset by many normal faults having displacements of as much as 75 feet (fig. 2).

The ore shoot appears to be localized at a brecciated zone in the vein. Lemmon (1945, p. 10) considered that the massiveness of the upper white limestone influenced brecciation, and thus zones favorable to scheelite deposition were formed. In the Hilltop mine, the vein has been productive only in this unit. Scheelite also occurs in the vein in the middle gray unit (samples No. 3 and 4, fig. 4), but the width of the ore found thus far has been too narrow to be mined profitably.

ORE RESERVES

There are no reserves of measured or indicated ore in the Hilltop mine. About 200 tons of ore containing about 1.0 percent WO_3 may be inferred above the level in the offset segment of the vein at the west end of the mine. This block is 40 feet long, 1.5 feet wide, and extends 40 feet down the dip below the upper level (fig. 3).

A small additional tonnage may be found in the upper white limestone below the level. As the middle gray limestone is also massive,

it is possible that the vein may be productive in it. If this is true, the ore shoot may continue to an average depth of about 50 feet vertically below the level, and the maximum reserves that may be inferred are about 1100 tons of ore averaging about 1.0 percent WO_3, contained in the block 180 feet long, 1.5 feet wide and extending 57 feet down the dip of the vein.

PROPOSED EXPLORATION

The applicant has proposed to explore the downward continuation of the ore shoot by driving a crosscut 225 feet north from the face of the cliff 130 feet below the workings to intersect the vein, to drift along the vein 100 feet in each direction, and to raise 130 feet to the existing level. This work would provide a haulage way as well as explore the deposit. The applicant also proposes to construct 1/2 mile of road to gain access to the portal of the proposed crosscut. He estimated that the total cost of the project would be $31,000.

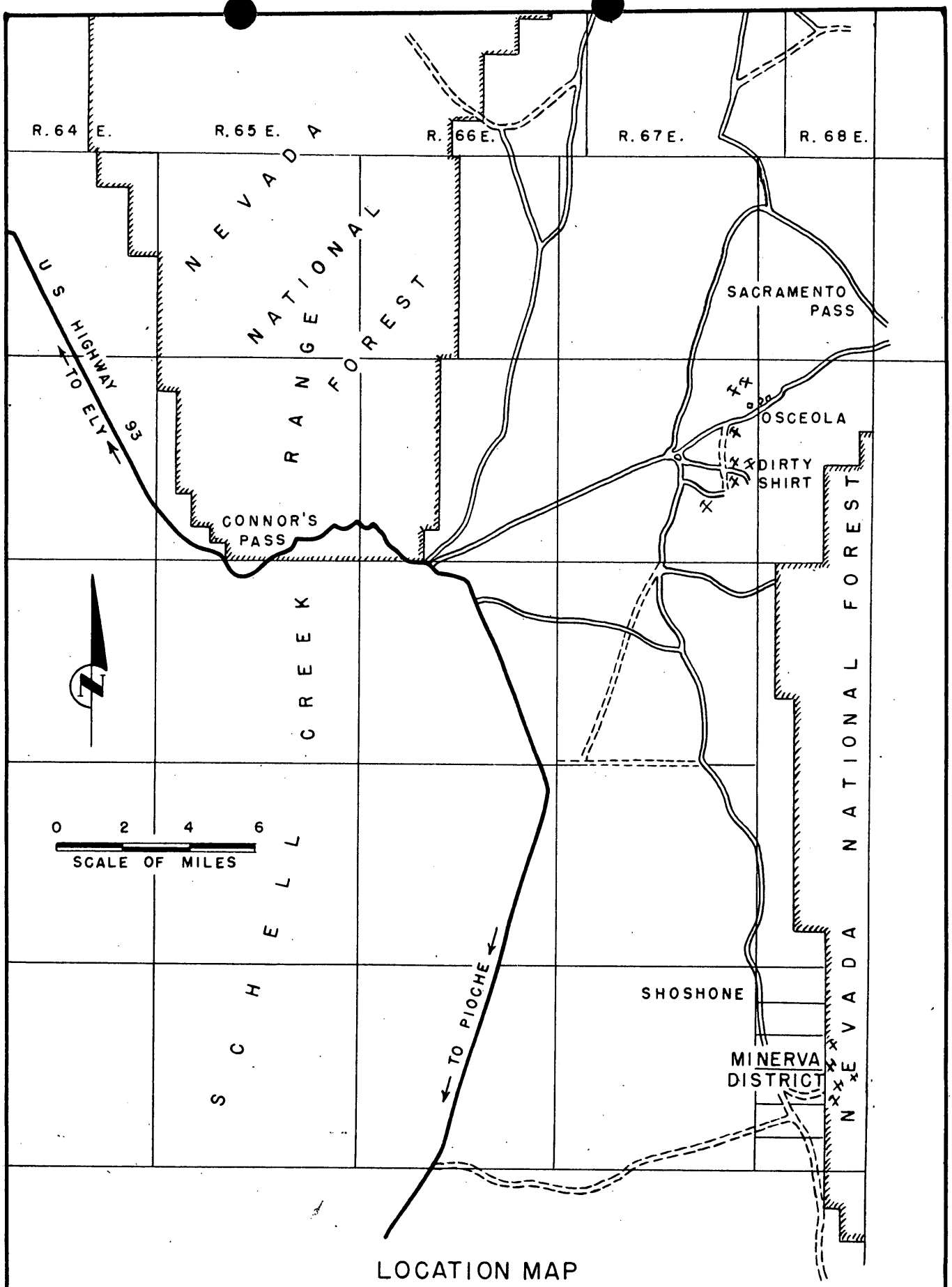
This program does not appear to be sound, as all but about 57 feet of the 130 feet of new depth is believed to be in an unfavorable limestone unit, and the chances of making a significant discovery in this unit are considered to be small.

The tungsten branch suggested in a letter to the applicant (Holderer, 10/22/51) that he submit a counter proposal designed to explore the west and east blocks (faulted continuations of the ore shoot in the favorable limestone unit).

The applicant in a reply (letter of 10/20/51) stated that there was no change of formation between the existing level and the site of the proposed crosscut, and that recent work has disclosed new data regarding the stratigraphy. He requested a DMA examination of the property. As a result, the Coordinating Committee requested the Field Team, Region III (letter of Lyon, 11/13/51) to examine the property with particular emphasis on determining whether the additional work done may have changed the picture.

The examining engineer and geologists carefully checked the Hilltop mine and determined that there has been no new work done since Lemmon mapped the mine in 1945; they confirm that the lithologic change shown on Lemmon's maps is present.

A representative of the applicant was present at the time of examination and was informed of these facts. He also agreed that Lemmon's map showed the true picture of the stratigraphy. He did not concur in the opinion that the lower member was unfavorable for tungsten deposition, but was unable to offer any evidence to the contrary. He stated that his company would not be interested in performing work in the west and east blocks in the favorable unit because the tonnage to be expected is small.



LOCATION MAP

MINERVA TUNGSTEN DISTRICT - WHITE PINE CO., NEV. FIG. 1

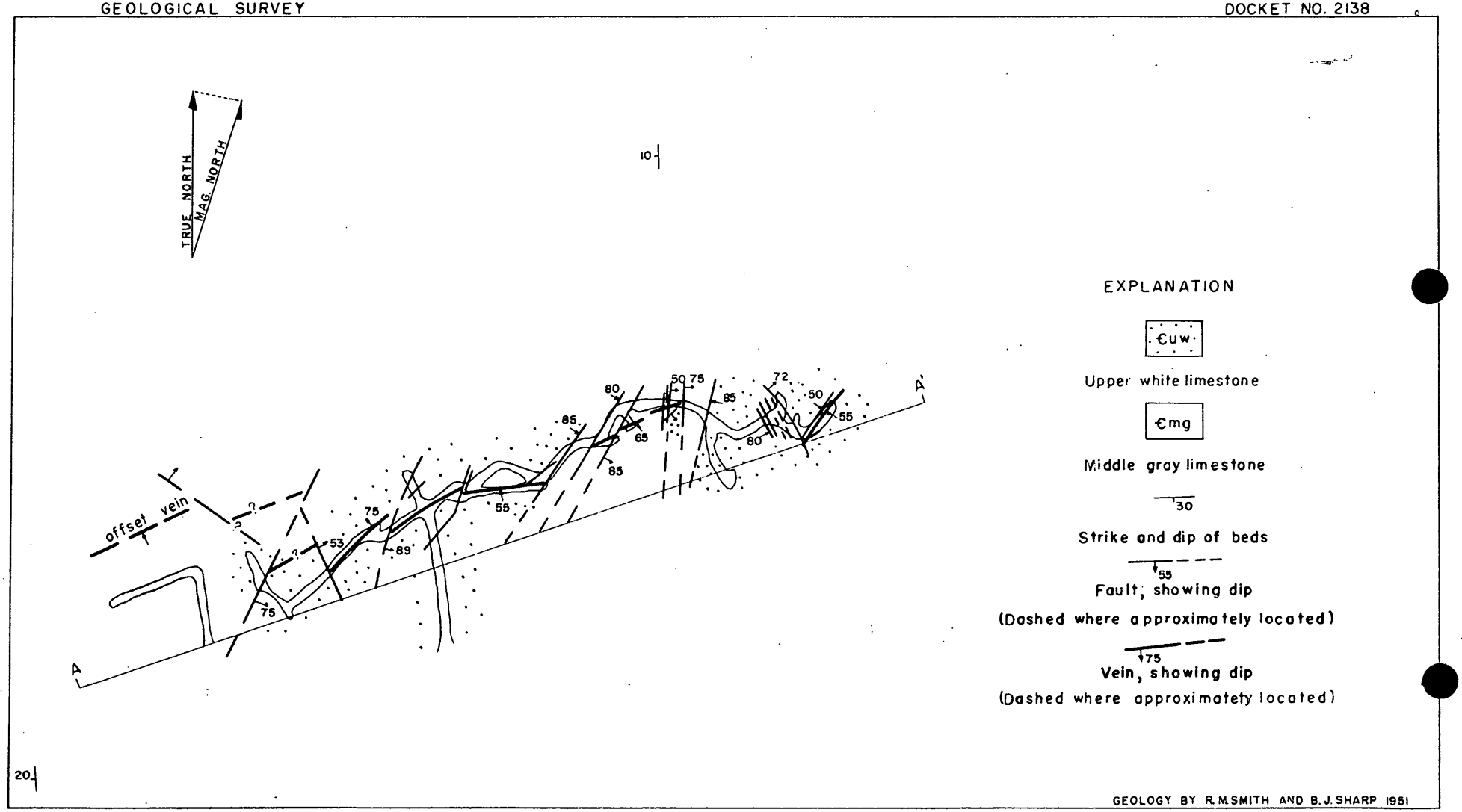
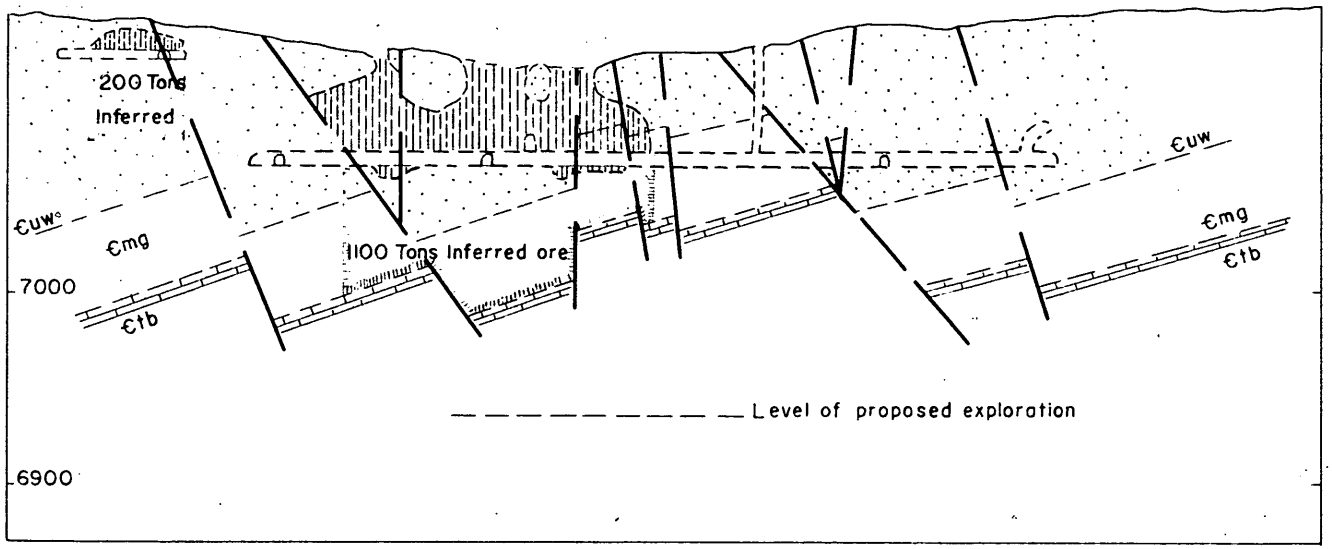


FIG. 2

GEOLOGIC MAP OF HILLTOP MINE
MINERVA MINING DISTRICT
WHITE PINE COUNTY, NEVADA

0 100 200 FEET
Scale



EXPLANATION

€uw
Upper white limestone

€mg
Middle gray limestone

€tb
Thin-bedded limestone

Contact
(Approximately located)

Fault
(Approximately located)

Stopes
(Projected)

GEOLOGY BY R. M. SMITH AND B. J. SHARP 1951

FIG. 3

SECTION ALONG LINE A-A'
HILLTOP MINE, MINERVA MINING DISTRICT
WHITE PINE COUNTY, NEVADA

0 100 200 FEET
Scale

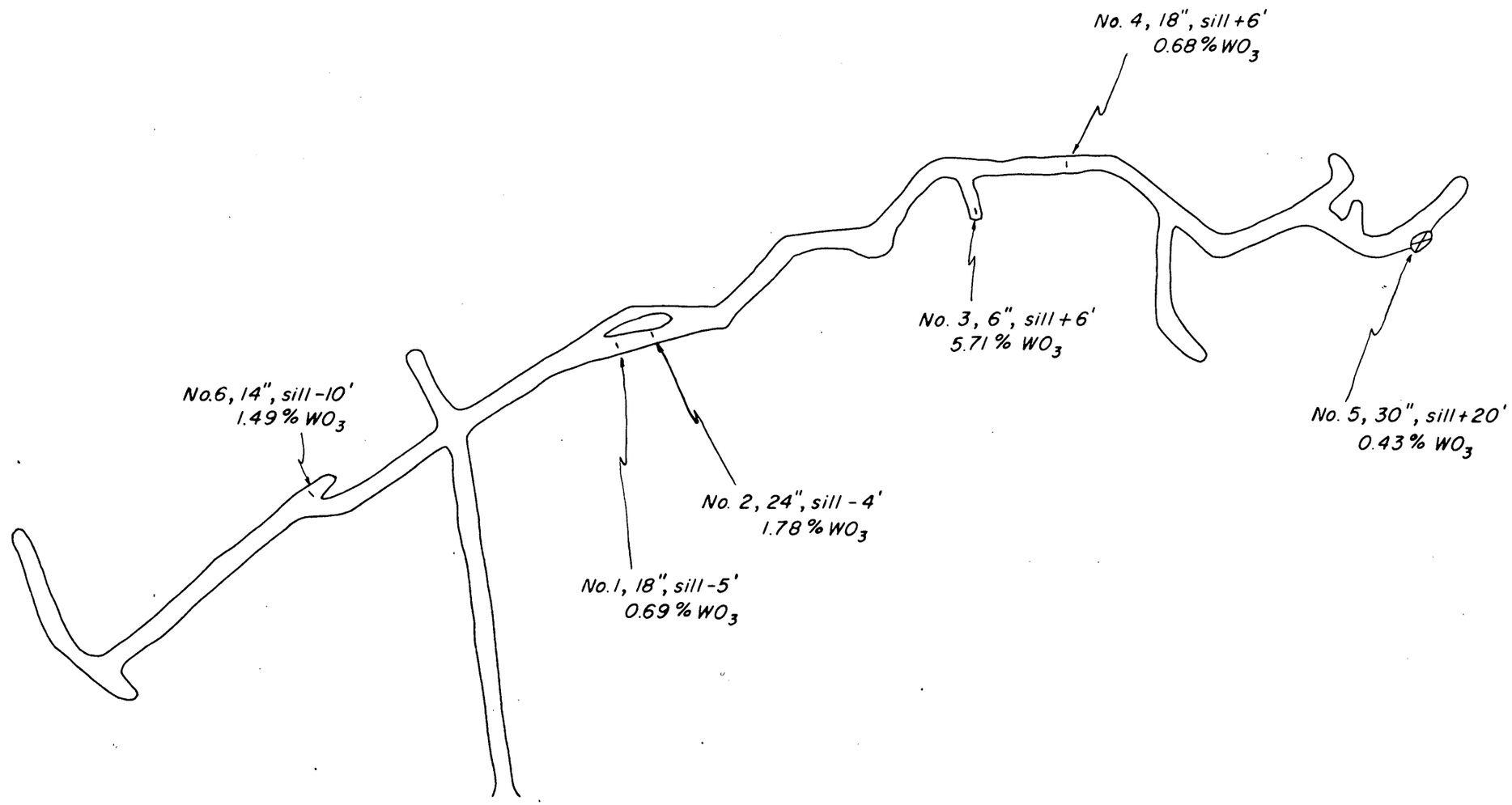


Figure 4, Assay map, Hilltop Mine

DMA-2138

COPY

January 18, 1952

Mr. C. P. Williams, President
Baltimore Camas Mines
601 Eastman Building
Boise, Idaho

Dear Mr. Williams:

This will confirm my phone conversation of this date in which I advised that the field team expects to make an examination of the Ajax Tungsten property in Juab County, Utah, just as soon as snow conditions will permit.

Reports on the Shafer Mine and Hilltop Mine in White Pine County, Nevada, we understand have been finished by the field team and those reports should be received here in Washington at an early date. Just as soon as Mr. Holderer has received the analysis we will contact you and then you can come on here for the purpose of discussing these properties and the question of financial aid you have requested in connection with the moving of a mill from Idaho to Nevada.

As I have advised you, arrangements are being considered for taking concentrates to a central digester. This will eliminate part of the expenditure you have considered heretofore.

Very truly yours,

/Signed/ HOWARD I. YOUNG

Howard I. Young
Deputy Administrator

HIY:owb
cc: Mr. Larson
Senator Dworshak
Congressman Baring
Mr. Douglas
Mr. Lyon
Mr. Holderer
DMPA Files
Admin. Files

OFFICE OF THE ADMINISTRATOR

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION

WASHINGTON 25, D. C.

1012 Flood Building
870 Market Street
San Francisco 2, Calif.

Office of
Executive Officer
DMEA Field Team
Region III

January 3, 1952

Memorandum

To: C. O. Mittendorf, Acting Administrator, Defense Minerals Exploration Administration, Washington, D. C.

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMA-2138X - Tungsten - Hilltop Mine, White Pine County, Nevada - Baltimore Camas Mines, Inc., Eastman Building, Boise, Idaho.

Reference is made to your subject letter to me dated December 29.

The Geological Survey to whom the subject docket was referred informs me that the report on the Hilltop Mine is in preparation and should be completed shortly.

H. C. Miller
Executive Officer
DMEA Field Team, Region III

Copy to E. H. Bailey, USGS

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
FILE
JAN 8 1952

undated
set for file
1-2-52

Mr. H. C. Miller
Executive Officer, Region III
1012 Flood Building
870 Market Street
San Francisco 2, California

Re: Docket No. DMA 213EX - Tungsten
Hilltop Mine, White Pine Co., Nevada
Baltimore Gamma Mines, Inc.
Dastman Building, Boise, Idaho

Dear Mr. Miller:

A field appraisal of the above noted property was requested of your office by letter dated November 13, 1951, the said letter emphasizing the geologic aspects of the ore occurrence.

Please advise us as to the progress of your investigation at this time.

Sincerely yours,

C. O. Mittendorf

Acting Administrator
Defense Minerals Exploration
Administration

CLBrewer:lm
12/28/51

cc: Admn. Reading File
Mails and Files Br.
C. O. Mittendorf
R. W. Gaehan, USBM
D. M. Lemmon, USGS
Field Team, Reg. III
✓ Docket
G. C. Selfridge
Q. L. Brewer

FILE COPY
SURNAME:

Brewer
Selfridge

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

DEC 29 1951

Mr. H. C. Miller
Executive Officer, Region III
1012 Flood Building
870 Market Street
San Francisco 2, California

Re: Docket No. DMA 2138X - Tungsten
Hilltop Mine, White Pine Co., Nevada
Baltimore Camas Mines, Inc.
Eastman Building, Boise, Idaho

Dear Mr. Miller:

A field appraisal of the above noted property was requested of your office by letter dated November 13, 1951, the said letter emphasizing the geologic aspects of the ore occurrence.

Please advise us as to the progress of your investigation at this time.

Sincerely yours,

C. O. Mittendorf (for) 12-29

Acting Administrator
Defense Minerals Exploration
Administration

QLBrewer:lm
12/28/51

cc: Admn. Reading File
Mails and Files Br.
C. O. Mittendorf
R. W. Geehan, USBM
D. M. Lemmon, USGS
Field Team, Reg. III
Docket
G. C. Selfridge
Q. L. Brewer

QL

340
FILE COPY
SURNAME:

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

Mr. Clark
Thayer
Selfridge
Holderer
Geehan
Moon

NOV 13 1951

Baltimore Camas Mines, Inc.
601 Eastman Building
Boise, Idaho

In reply please refer to
DMA 2138, Tungsten

Gentlemen:

We are referring your application for an exploration contract on the Hilltop Mine, White Pine County, Nevada, to Mr. H. C. Miller, 1012 Flood Building, 870 Market Street, San Francisco 2, California, for a field examination.

Please contact Mr. Miller and offer your cooperation.

Very truly yours,

SIGNED

Tom Lyon, Director
Supply Division

11-13

TJBallard:dgs
2 Nov 1951

CC: DMA Docket File
Adm. Reading File
Mr. Holderer
Mr. Geehan
Mr. Lemmon
Coord. Comm.
Fld Team, Reg III

DMA Docket 340
File

FILE COPY
SURNAME:

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

Holdeen
Waldeck
Gehan

NOV 13 1951

Mr. H. C. Miller, Executive Officer
DMA Field Team, Region III
1012 Flood Building
870 Market Street
San Francisco 2, California

Subject: DMA-2138 - Tungsten- Exploration project $31,370.50
Baltimore Camas Mines, Inc.
601 Eastman Building
Boise, Idaho
Property: Hilltop Mine, Minerva Mining District,
White Pine County, Nevada.

Dear Mr. Miller:

The subject applicant has three exploration applications docketed. Two are in Nevada and one in Utah. The application on the Shafer mine, White Pine County, Nevada was referred to you on October 31.

Our information on the Hilltop mine (DMA-2138), indicates that the proposed work would be in unfavorable strata as stated in our letter to the applicant and shown on the enclosed sketch. However, their engineer has a different interpretation and states that additional work done since Lemmon's examination of the property may have changed the picture.

Please have an examination made of the property with particular emphasis on the geologic conditions as outlined in the foregoing paragraph. In this connection, it will be advisable to have a geologist on the examining team.

If the property merits exploration, the applicant should be assisted in preparing a program consistent with the facts and in setting up the necessary exhibits for the contract.

Furthermore, the application states that a copy of the purchase contract is to be submitted, which we have not received.

Very truly yours,

SIGN

Tom Lyon, Chairman
Coordinating Committee

Enclosures

SIGNED

Bureau of Mines

SIGNED

Geological Survey

TJBallard:ec
~~XX/XX/XX~~ 11/2/51

CC: DMA Docket File
Adm. Reading File
Mr. Holderer
Mr. Geehan
Mr. Lemmon
Coord. Comm.

BALTIMORE CAMAS MINES, Inc.
501 Eastman building
Boise, Idaho

OCT 31 1951
Recd by
Mr. Holderer

October 28, 1951

OFFICIAL FILE COPY

To	Initials	Date
340		

Defense Minerals Administration
Washington 25, D. C.

Attention: Mr. George B. Holderer
Chief, Tungsten Branch

Reference: DMA-2138

Gentlemen:

Your letter of October 23, 1951 relative to the proposed exploration project on the Hilltop deposit has been referred to me for appraisal.

While I do not have available your geologic report of 1943 on the Hilltop property, I feel it advisable to make mention of the following observations. (1) Some work has been done on the property since that time which may have altered the picture of the upper level; (2) We have, this summer, made careful study of the formation of the central block where the main or No. 1 ore shoot was mined and find no formation change or unconformity in this block between the upper level and the proposed site of the lower level cross-cut. A marked unconformity is, however, present just below the site of the proposed new cross-cut and in all probability does radically interfere with the downward continuity of any west ore body but will not cut the objective ore shoot above this level. The east ore shoot, exposed on the surface, has been shifted by major cross faults hence we did not deem it advisable to immediately include this in our exploration program, at least until the fault pattern in that sector was a little more clearly defined. (3) The problem of working accessibility to the present upper level renders exploration through that adit prohibitively costly and we feel the same results can be achieved from the lower level with a very good chance of developing a sizeable block of ore on the main shoot.

OCT 31 8 50 AM '51
DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.

I make these observations not in an effort to refute the suggestions you have submitted but to more fully clarify the reasons why we laid out the program as we did. I do believe, however, that in view of the divergence of opinion on how best to attack this project, it would be most advantageous to have your DMA field team check the Hilltop geology before we submit a counter proposal. Since both the Baltimore Camas and your office are desirous of accomplishing the objective most economically and expeditiously I am sure that a few hours on the property with your engineers will serve to fully clarify any problems that may at present remain clouded.

Thank you for the attention you have given this project and we assure you that any suggestions as to changes in our proposed projects are welcomed and given careful consideration.

Respectfully,

D. E. Anderson

D. E. Anderson, E. M.

BALTIMORE CAMAS MINES, Inc.

601 Eastman Building

BOISE, IDAHO

DEPARTMENT OF THE INTERIOR
RECEIVED
NOV 1 9 1951
Defense Minerals Administration,
Production Expansion Division.

October 25, 1951

Defense Minerals Administration
Washington, D. C.

Refer:
Docket No. D.M.A. 2138

Attention: Mr Selfridge

Gentlemen:

We are herewith enclosing the required signed copies of LANDLORD'S SUBORDINATION AGREEMENTS relative to the exploration loan applications on the MILLICK (HILLTOP) GROUP.

In addition copies of original contracts and transfer transactions from the original contracts to the present operational status are enclosed.

Any additional imformation relative to these projects will be supplied upon request.

Respectfully,

G. P. Williams

G. P. Williams, President
Baltimore Camas Mines, Inc.

gpw/cp

OFFICAL FILE COPY

To	Name	Date
210		

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 9 1951

340
FILE COPY
SURNAME:

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

Holderer
Mr. Holderer

Air Mail

OCT 2 3 1951

G. E. C.

The Baltimore Camas Mines, Inc.
601 Eastman Building
Boise, Idaho

In reply please refer
to DMA-2138 Tungsten

Gentlemen:

We have reviewed your application for an exploration project on the Hilltop deposit and our appraisal follows:

You propose to drive a crosscut 225 feet to intersect the vein at a depth of 120 feet below the present upper-level crosscut, to drift 200 feet along the vein, and to raise 130 feet to the upper level. Our information on file, based upon an examination by our geologist in 1943, indicates that your proposed crosscut would be entirely in a barren limestone zone and would be regarded as a gamble into unknown but probably unfavorable ground. The pinching in the west drift on your map by Bida and Anderson appears to be due to crossing a small fault which puts the drift in the lower, unfavorable, stratigraphic zone.

The present proposal cannot be approved on the basis of unfavorable geologic grounds. Therefore, we suggest that you submit a counter proposal to explore the east and west blocks. At the west end, 75 feet of drift and 50 feet of raise along the vein should tell the story and about 30 feet of raise at the east end would reach the surface. Shallow winzes in the underhand stopes should give the downward extension of the vein.

Please let us have your decision on our suggestions.

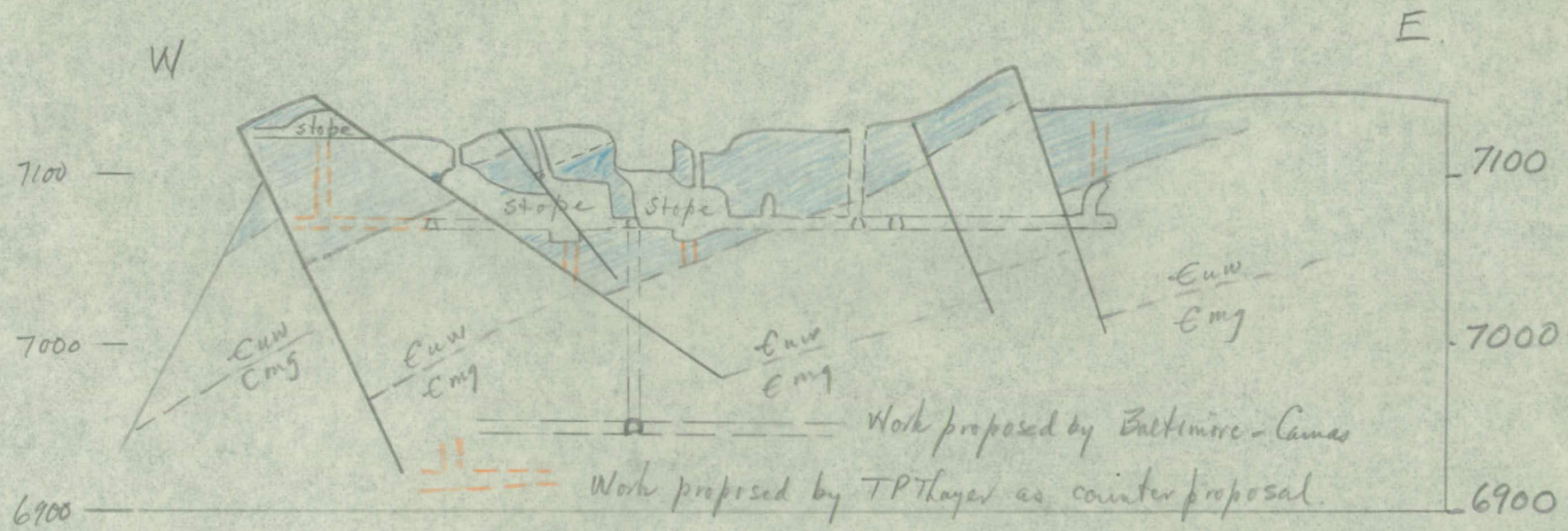
Very truly yours,

George B. Holderer

George B. Holderer
Chief, Tungsten Branch

TJBallard:ec
10/22/51

CC: Adm. Reading File
DMA Docket File
Mr. Holderer
Field Team Region II



Proposed exploration in Hilltop mine, White Pine Co, Nevada.
Projection along vein, showing relation of stopes to favorable limestone zone.
Geology by D. M. Lemmon, 1943. Scale, 1" = 100 ft.

(Agreed with Thayer - R.W. Stringer)

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : George B. Holderer DATE: October 16, 1951

FROM : T. P. Thayer *Thayer*

SUBJECT: DMA-2138 Tungsten. Hilltop mine, White Pine Co., Nevada. Baltimore Camas Mines, Inc., Boise, Idaho.

A report and map by D. M. Lemmon corresponds as to workings with the report by the company, indicating that little work has been done since Lemmon's mapping in 1943.

Lemmon's report on the Minerva district as a whole indicates rather strong stratigraphic control of scheelite mineralization. His projection of the Hilltop mine along the vein indicates strongly that the deep crosscut proposed would be entirely in a barren limestone zone (see sketch). The proposed crosscut 120 feet below the present crosscut, therefore, should be regarded as a gamble into unknown but probably unfavorable ground.

Dwight agrees that exploration of the 50 feet of backs in the east end of the workings is a logical step, but that the most favorable unexplored block of ground lies to the west. The pinching in the west drift indicated on Bida and Anderson's map is explained by Dwight as due to crossing a small fault which puts the drift in the lower, unfavorable, stratigraphic zone.

It is recommended that the present proposal be denied, on unfavorable geologic grounds, and that a counterproposal to explore the east and west ore blocks be substituted. Lemmon indicates that perhaps 1000 tons of 1-2 percent ore might be found at small cost. At the west end 75 feet of drift and 50 feet of raise along the vein should tell the story, and about 30 feet of raise at the east end would reach the surface. Shallow winzes in the underhand stopes should give the needed information on downward extension of the vein.

If the company is interested in such a counter proposal, the docket should be referred to the field for evaluation as to the probable economics of mining and milling.

October 9, 1951

Mr. G. P. Williams, President
Baltimore Camas Mines, Inc.
601 Eastman Building
Boise, Idaho

Subject: Exploration Loan
Re: DMA-2138

My dear Mr. Williams:

This will acknowledge receipt of your application dated October 5, 1951 for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMA-2138 and referred to the Ferro Alloys Branch.

Kindly refer to DMA-2138 in any future correspondence relating to your application.

Sincerely yours,

Robert E. Adams

Robert E. Adams, Chief
Reports and Records Unit

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMA 2138
Metal or Mineral
Date Received 10-9-51
Amount $
Participation (Government %)

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.
OCT 9 3 18 PM '51

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

Name and address of applicant

Date Oct. 5, 1951

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

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Baltimore Camas Mines, Inc.
(Name of company)

By D. E. Anderson
(Signature of authorized official)

October 5, 1951
(Date)

for G. P. Williams, Pres.
(Title)

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

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

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

1. (a) The property entailed in this exploration project is the HILLTOP Mine consisting of six unpatented lode mining claims in the Minerva Mining District of White Pine County, Nevada. Claim names are as follows: HILLTOP: TONY; TONY No.1: TONY No. 2: TONY No. 3: and TONY No. 4. Claims are in section 16 T11N, R68E and are about 50 miles southeast of Ely, Nevada.

(b) Copy of purchase contract to be submitted.

(c) The exploration entailed in this application will specifically be on the HILLTOP claim.

There are no loans or other encumberances against the property and purchase contract specifies that a Government Loan agreement may be entered into.

2. (a) Tungsten

(b) Complete engineer's report and maps are submitted with this application (Report and Maps need not be returned)

Baltimore Camas Mines, Inc
601 Eastman Bldg.
Boise, Idaho

3. (a) The proposed work will be as follows: HILLTOP will require construction of 1/2 mile of road to allow direct access to site of new project. This road has already been surveyed and the county will aid in building the lower end up to the point where the rock work begins.

Then a 225 foot crosscut will be driven to the main vein from the base of the cliff directly below the present upper level cross-cut. This new cross-cut is calculated to tap the main ore shoot near the center of its lateral extent and about 130 ft. (dip distance) below the present upper level. Two hundred feet of drift along the vein on the new level will be required to expose its entire strike distance on the main shoot. A 130 foot raise will be driven to interconnect the two levels.

See geologic map for location of proposed project.

Total cost of this project will be $31,370.50

(b) This project can be started within one week after approval and completed within seven months after that date.

4. Maps attached

5. There are no existing facilities, buildings, installations, or fixtures.

6. Access road to be constructed at a total cost of 1512.00 but 1200.00 charged to equipment rental leaving balance of $312.00 which will provide two jackhammer men for 2 weeks. 312.00

Compressor house and shop--labor 400.00
Material 1000.00 1400.00

Total $1712.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

7. (a) None

(b)

1—210 cu. ft. diesel compressor (portable)	6500.00
850 feet of 16# rail	400.00
425 feet of 3" pipe	350.00
Gasoline slusher (surplus stock)	500.00
Tank truck	750.00
Trailer house (crew housing)	950.00
Total	$9450.00

(c)

	Unit Cost	Rental
Baltimore Camas will provide an H. D. 15 tractor with dozer and driver for 18 days which includes 12 days roadbuilding and 6 days snowplowing @100.00/day		1800.00
Lyner and jackhammer	700.00	81.50
3 mine cars	450.00	22.50
Gardner Denver tugger hoist		70.00
1949 Ford pickup	900.00	105.00
Total rental		$2079.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

8. Before entering a statement of labor costs it may be well to state that as much as possible of this program will be handled on a contract basis since recent experience in the district shows that both from a standpoint of speed and efficiency the contract basis is the most satisfactory and economical.

A maximum of 15.00/ft. is allowed for labor cost of drifts, cross-cuts, and raises.

Drifts and cross-cut will be 5 x7 and raise 4 x 6. Rock is hard and little timber required.

555 feet of cross-cut, drift, and raise @ $15.00/Ft. $8325.00

Cross-cut will be driven on a two shift basis employing 4 miners @13.00/day—25 days per month.

Raise will be driven simultaneously with drift and 4 men will be employed on a single shift.

Monthly cost exclusive of 1st month when time will be consumed in road building and house building

4 men	1300.00
Add 10% comp.etc.	130.00
Total	1430.00

An average advance of 95 feet per month is estimated.

1—General Supt. @500.00/mo.
1—Foreman @15.00/day
1—Engineer @500.00/mo.
1—Project Accountant @250.00/mo.
(Note: Supt., engineer, and accountant will serve three projects, hence only 1/3 of this cost is charged to this project)

Total supervisory, engineering, and accounting at 1/3 of above rates $5642.00
t

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

9. Material and supplies, including explosives, steel bits, fuel, hand tools, machinery upkeep and repair, and timber have been computed on a basis of $7.50 per foot against x-cuts, drifts, and raise.

The breakdown of this per foot figure is as follows:

Explosives/ft.	4.15
Bits	1.15
Steel	o.25
Fuel	1.10
Incidental	0.85
	7.50

555 feet @ $7.50/foot $4162.50

10. (a) $7842.63, which represents 25% of the total cost and of which $2079.00 will be paid by equipment rental or depreciation.

(b) Yes

11. This project is designed to explore the downward continuation of the main ore shoot mined from the upper level and which is continuing downward strongly in the floor of that upper level. Ore mined from the u per level at a depth only fifty feet below the surface outcrop produced about 2500 units of tungsten trioxide.

Baltimore Comac Mines, Inc.
611 Eastman Bldg.
Boise, Idaho

6. (a) Baltimore Comac Mines, Inc. has been actively operating in the Hailey, Idaho District for the past 10 years. G. F. Williams, President, has had 20 years experience in mining and milling operation.

(b) General superintendency of all operations is and will be handled by Loren Smith of Boise, Idaho. Mr. Smith has 20 years experience in mining and mine operation, including management of Texas-Owyhee (Mayflower Mine) in the Boise, Basin District, Idaho, Gateway Gold and Copper, Valley County Idaho in 1947, and the Comac Mine at Hailey, Idaho in 1951.

A competent foreman will be employed to direct the labor and maintain adequate supplies for the project and engineering will be handled by S. L. Bidn, B. S. (University of Idaho, 1939) and now employed by Baltimore Comac Mines, Inc. Additional engineering will be enlisted from competent consulting engineers as the need arises.

Metallurgical problems are in the charge of Mr. Murphy, of Hailey, Idaho a recognized metallurgist of many years experience.

Form MF-100
(May 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

GENERAL TECHNICAL DATA
FOR USE UNDER THE
DEFENSE PRODUCTION ACT OF 1950

NOT TO BE FILLED IN BY APPLICANT

Docket No. dmo/2138

Date received 10-9-51

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.
OCT 9 3 17 PM '51

Baltimore Camas Mines, Inc.
1501 Eastman Bldg.
Boise, Idaho

Name and address of applicant

Date October 5, 1951

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (5) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products? Tungsten
   (*b*) What are the byproducts, if any? None
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings including the following: HILLTOP
   (*a*) Linear feet of shafts. 0
   (*b*) Linear feet of drifts and crosscuts. 500
   (*c*) Linear feet of tunnels or adits. 117
   (*d*) Linear feet of other mine openings (explain briefly).
   Indicate whether mine is flooded or not. Describe any pumping or other equipment or productive capacity. No water
3. For each operation listed above supply the following: Not in production
   (*a*) Distance and direction from nearest town and shipping point. 50 miles S. of Ely, Nevada
   (*b*) Mining district. Minerva
   (*c*) Township, Section, Range. Sec. 16, T11N, R68E
   (*d*) County, State. White Pine County, Nevada
4. (*a*) State whether or not property is now in operation, and if not operation, by whom operated. not operating
   (*b*) Are you operating this property as:
   - ☐ Owner.
   - ☐ Lessee.
   - ☒ Contractor.
5. Number of years in production ____
   If not in production or operation, estimated date when production will begin not now in production April 1952
6. Experience of operators:
   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project. See attached sheet.
7. History:
   (*a*) Give statements, complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation. See attached sheet.
   (*b*) State briefly the known history and production of adjoining and neighboring properties.
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation: Common (e)	Number of Shares Held in Applicant Corporation: Preferred (f)	Life Insurance Carried for Benefit of Applicant: Amount (g)	Life Insurance Carried for Benefit of Applicant: Net Cash Surrender Value After Loans (h)
G. P. Williams Boise, Idaho	Pres. (D)	8000	200,000	750,000	None	None	
C. E. Carver, M.D. Pasadena, Cal.	Vice-P. (D)	—	150,000	350,000			
C. V. Peckham Caldwell, Idaho	(D)	—	400,000	400,000			
E. P. McDonald Boise, Idaho	Sec-Treas. (D)	4000	20,000	50,000			
L. C. Hamilton Nampa, Idaho	(D)	—	100,000	150,000			
M. G. Taylor Rexburg, Idaho	(D)	—	300,000	300,000			
Winton S. Gray Sun Valley, Idaho	(D)	—	80,000	70,000			
Orville Boehlke Rexburg, Idaho	(D)	—		100,000			
	Total	10000	x x x x x	2,170,000		x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. Capital Stock Issues:

For Corporate Applicants

Item	Authorized (a)	Outstanding (b)	Par Value (c)	Number of Shares Outstanding (d)	Dividend Rate Last Paid* (e)
Common stock	$1,000,000	$ 680,000	$ 0.10	6,800,000	—
Preferred stock None	$	$	$		

*Indicate period covered.

10. Production:

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)	Approximately 2500 units of WO3 were produced by earlier operators with ore averaging about 1.5% in grade.				
2. Quantity of product processed (specify unit of measure and type of process)					
3. Quantity and grade of product sold or shipped (specify units of measure)					

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change. The development program expected to make possible a 25 ton per day production.

12. Ore or Mineral Reserves:

(a) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves.

Scheelite occurs in a quartz fissure vein which cuts favorable limestone beds.

16—63792-1

(*b*) If deposit is other than placer:

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve. See geologic map and report

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows:

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)	70	2%	126.00	1.5	25.00
Indicated (probable)	Expect to develop 3000 tons				

(*c*) If placer: Not applicable

(1) Give estimated total yardage and average marketable mineral content of each deposit.

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each.

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough.

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount.

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves.

13. Access Roads: 50 miles to shipping and supply, 10 miles to residencem roads good
Give road distances to shipping, supply and residence points, stating kind and condition of roads.

14. Water Supply: Water must be hauled 5 miles by tank truck

State source and quantity of water available for operations and whether sufficient for all seasons of year.

15. Power: Gasoline and diesel power to be used

State amount of power used, rate per hour, and source thereof.

16. Labor: None

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

17. Equipment and Facilities: None on property

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation. See MF-103

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

No.

CERTIFICATION

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

Baltimore Camas Mines, Inc.
(Name of company)

By D. E. Anderson
(Signature of authorized official)

October 5, 1951
(Date)

for G. P. Williams, Pres.
(Title)

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

U. S. GOVERNMENT PRINTING OFFICE 16—63792-1

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. dma 2138
Metal or Mineral
Date Received 10-9-51
Amount $
Participation (Government %)

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

Name and address of applicant

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.
OCT 9 3 18 PM '51

Date October 5, 1951

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

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

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Baltimore Camas Mines, Inc.
(Name of company)

By D. E. Anderson
(Signature of authorized official)

Oct. 5, 1951
(Date)

for G. P. Williams, Pres.
(Title)

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

Baltimore Cassa Mines, Inc.
501 Eastman Bldg.
Boise, Idaho

1. (a) The property entailed in this exploration project is the HILLTOP Mine consisting of six unpatented lode mining claims in the Minerva Mining District of White Pine County, Nevada. Claim names are as follows: HILLTOP: TONY; TONY No.1: TONY No. 2: TONY No. 3: and TONY No. 4. Claims are in section 16 T11N, R68E and are about 50 miles southeast of Ely, Nevada.

(b) Copy of purchase contract to be submitted.

(c) The exploration entailed in this application will specifically be on the HILLTOP claim.

There are no loans or other encumberances against the property and purchase contract specifies that a Government Loan agreement may be entered into.

2. (a) Tungsten

(b) Complete engineer's report and maps are submitted with this application (Report and Maps need not be returned)

Baltimore Camas Mines, Inc
601 Eastman Bldg.
Boise, Idaho

3. (a) The proposed work will be as follows: HILLTOP will require construction of 1/2 mile of road to allow direct access to site of new project. This road has already been surveyed and the county will aid in building the lower end up to the point where the rock work begins.

Then a 225 foot crosscut will be driven to the main vein from the base of the cliff directly below the present upper level cross-cut. This new cross-cut is calculated to tap the main ore shoot near the center of its lateral extent and about 130 ft. (dip distance) below the present upper level. Two hundred feet of drift along the vein on the new level will be required to expose its entire strike distance on the main shoot. A 130 foot raise will be driven to interconnect the two levels.

See geologic map for location of proposed project.

Total cost of this project will be $31,370.50

(b) This project can be started within one week after approval and completed within seven months after that date.

4. Maps attached

5. There are no existing facilities, buildings, installations, or fixtures.

6. Access road to be constructed at a total cost of 1512.00 but 1200.00 charged to equipment rental leaving balance of $312.00 which will provide two rockhammer men for 2 weeks. 312.00

Compressor house and shop--labor 400.00
Material 1000.00 1400.00

Total $1712.00

Baltimore Comas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

7. (a) None

(b)

1—210 cu. ft. diesel compressor (portable)	6500.00
650 feet of 16# rail	400.00
655 feet of 3" pipe	350.00
Gasoline slusher (surplus stock)	500.00
Tank truck	750.00
Trailer house (crew housing)	950.00
Total	$9450.00

(c) Baltimore Comas will provide an H. D. 15 tractor with dozer and driver for 18 days which includes 12 days roadb ilding and 6 days snowplowing @100.00/day

	Unit Cost	Rental
		1800.00
Lynar and jackhammer	700.00	81.50
3 mine cars	450.00	22.50
Gardner Denver tugger hoist		70.00
1949 Ford pickup	900.00	105.00
Total rental		$2079.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

6. Before entering a statement of labor costs it may be well to state that as much as possible of this program will be handled on a contract basis since recent experience in the district shows that both from a standpoint of speed and efficiency the contract basis is the most satisfactory and economical.

A maximum of 15.00/ft. is allowed for labor cost of drifts, cross-cuts, and raises.

Drifts and cross-cut will be 5 x 7 and raise 4 x 6. Rock is hard and little timber required.

555 feet of cross-cut, drift, and raise @ $15.00/ft. $8325.00

Cross-cut will be driven on a two shift basis employing 4 miners @13.00/day—25 days per month.

Raise will be driven simultaneously with drift and 4 men will be employed on a single shift.

Monthly cost exclusive of 1st month when time will be consumed in road building and house building

4 men	1300.00
Add 10% comp.etc.	130.00
Total	1430.00

An average advance of 95 feet per month is estimated.

1—General Supt. @500.00/mo.
1—Foreman @16.00/day
1—Engineer @500.00/mo.
1—Project Accountant @250.00/mo.
(Note: Supt., engineer, and accountant will serve three projects, hence only 1/3 of this cost is charged to this project)

Total supervisory, engineering, and accounting at 1/3 of above rates $6642.00

Baltimore Cassa Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

9. Material and supplies, including explosives, steel bits, fuel, hand tools, machinery upkeep and repair, and timber have been computed on a basis of $7.50 per foot against x-cuts, drifts, and raise.

The breakdown of this per foot figure is as follows:

Explosives/ft.	4.15
Bits	1.15
Steel	0.25
Fuel	1.10
Incidental	0.35
	7.50

556 feet @ $7.50/foot $4162.50

10. (a) $7842.63, which represents 25% of the total cost and of which $2079.00 will be paid by equipment rental or depreciation.

(b) Yes

11. This project is designed to explore the downward continuation of the main ore shoot mined from the upper level and which is continuing downward strongly in the floor of that upper level. Ore mined from the upper level at a depth only fifty feet below the surface outcrop produced about 2500 units of tungsten trioxide.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMA 2138
Metal or Mineral
Date Received 10-9-51
Amount $
Participation (Government %)

Name and address of applicant

Baltimore-Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

Date October 5, 1951

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D. C.
OCT 9 3 17 PM '51

If you have already filed MF-100, give date filed Oct. 5, 1951, type of assistance requested Exploration Loan,

DMA Docket Number (if available)

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Baltimore Camas Mines, Inc.
(Name of company)

By H. E. Anderson
(Signature of authorized official)

for G. P. Williams, Pres.
(Title)

October 5, 1951
(Date)

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

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

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

1. (a) The property entailed in this exploration project is the HILLTOP Mine consisting of six unpatented lode mining claims in the Minerva Mining District of White Pine County, Nevada. Claim names are as follows: HILLTOP: TONY; TONY No.1: TONY No. 2: TONY No. 3: and TONY No. 4. Claims are in section 16 T11N, R68E and are about 50 miles southeast of Ely, Nevada.

(b) Copy of purchase contract to be submitted.

(c) The exploration entailed in this application will specifically be on the HILLTOP claim.

There are no loans or other encumberances against the property and purchase contract specifies that a Government Loan agreement may be entered into.

2. (a) Tungsten

(b) Complete engineer's report and maps are submitted with this application (Report and Maps need not be returned)

Baltimore Camas Mines, Inc
601 Eastman Bldg.
Boise, Idaho

3. (a) The proposed work will be as follows: HILLTOP will require construction of 1/2 mile of road to allow direct access to site of new project. This road has already been surveyed and the county will aid in building the lower end up to the point where the rock work begins.

Then a 225 foot crosscut will be driven to the main vein from the base of the cliff directly below the present upper level cross-cut. This new cross-cut is calculated to tap the main ore shoot near the center of its lateral extent and about 130 ft. (dip distance) below the present upper level. Two hundred feet of drift along the vein on the new level will be required to expose its entire strike distance on the main shoot. A 130 foot raise will be driven to interconnect the two levels.

See geologic map for location of proposed project.

Total cost of this project will be $31,370.50

(b) This project can be started within one week after approval and completed within seven months after that date.

4. Maps attached

5. There are no existing facilities, buildings, installations, or fixtures.

6. Access road to be constructed at a total cost of 1512.00 but 1200.00 charged to equipment rental leaving balance of $312.00 which will provide two Jackhammer men for 2 weeks. 312.00

Compressor house and shop--labor 400.00
Material 1000.00 1400.00

Total $1712.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

7. (a) None

(b)

1--210 cu. ft. diesel compressor (portable)	6500.00
850 feet of 16# rail	400.00
425 feet of 3" pipe	350.00
Gasoline slusher (surplus stock)	500.00
Tank truck	750.00
Trailer house (crew housing)	950.00
Total	$9450.00

(c) Baltimore Camas will provide an H. D. 15 tractor with dozer and driver for 18 days which includes 12 days roadbuilding and 6 days snowplowing @100.00/day — Rental 1800.00

	Unit Cost	Rental
Lyner and jackhammer	700.00	81.50
3 mine cars	450.00	22.50
Gardner Denver tugger hoist		70.00
1949 Ford pickup	900.00	105.00
Total rental		$2079.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

8. Before entering a statement of labor costs it may be well to state that as much as possible of this program will be handled on a contract basis since recent experience in the district shows that both from a standpoint of spped and efficiency the contract basis is the most satisfactory and economical.

A maximum of 15.00/ft. is allowed for labor cost of drifts, cross-cuts, and raises.

Drifts and cross-cut will be 5 x7 and raise 4 x 6. Rock is hard and little timber required.

555 feet of cross-cut, drift, and raise @ $15.00/Ft. $8325.00

Cross-cut will be driven on a two shift basis employing 4 miners @13.00/day--25 days per month.

Raise will be driven simultaneously with drift and 4 men will be employed on a single shift.

Monthly cost exclusive of 1st month when time will be consumed in road building and house building

4 men	1300.00
Add 10% comp.etc.	130.00
Total	1430.00

An average advance of 95 feet per month is estimated.

1--General Supt. @500.00/mo.
1--Foreman @15.00/day
1--Engineer @500.00/mo.
1--Project Accountant @250.00/mo.
(Note: Supt., engineer, and accountant will serve three projects, hence only 1/3 of this cost is charged to this project)

Total supervisory, engineering, and accounting at 1/3 of above rates $5642.00

Baltimore Camas Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

9. Material and supplies, including explosives, steel bits, fuel, hand tools, machinery upkeep and repair, and timber have been computed on a basis of $7.50 per foot against x-cuts, drifts, and raise.

The breakdown of this per foot figure is as follows:

Explosives/ft.	4.15
Bits	1.15
Steel	o.25
Fuel	1.10
Incidental	0.85
	7.50

555 feet @ $7.50/foot $4162.50

10. (a) $7842.63, which represents 25% of the total cost and of which $2079.00 will be paid by equipment rental or depreciation.

(b) Yes

11. This project is designed to explore the downward continuation of the main ore shoot mined from the upper level and which is continuing downward strongly in the floor of that upper level. Ore mined from the upper level at a depth only fifty feet below the surface outcrop produced about 2500 units of tungsten trioxide.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. dma 2138
Metal or Mineral
Date Received 10-9-51
Amount $
Participation (Government %)

DEFENSE MINERALS ADMINISTRATION WASHINGTON, D.C.
OCT 9 3 14 PM '51

Baltimore Camas Mines, Inc.
604 Eastman Bldg.
Boise, Idaho

Name and address of applicant

Date October 5, 1951

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

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Baltimore Camas Mines, Inc.
(Name of company)

By R. E. Erickson
(Signature of authorized official)

October 5, 1951
(Date)

for G. P. Williams, Pres.
(Title)

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

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

Baltimore Gases Mines, Inc.
801 Eastman Bldg.
Boise, Idaho

1. (a) The property entailed in this exploration project is the [illegible] Mine consisting of six unpatented lode mining claims in the Minerva Mining District of White Pine County, Nevada. Claim names are as follows: [illegible]; [illegible]; [illegible] No. 1; [illegible] No. 2; [illegible] No. 3; and [illegible] No. 4. Claims are in section 16 [illegible], [illegible] and are about 50 miles southeast of Ely, Nevada.

(b) Copy of purchase contract to be submitted.

(c) The exploration entailed in this application will specifically be on the [illegible] claim.

There are no loans or other encumbrances against the property and purchase contract specifies that a Government Loan Agreement may be entered into.

2. (a) Tungsten

(b) Complete engineer's report and maps are submitted with this application (Report and Maps need not be returned)

Baltimore Cheese Mines, Inc
601 Eastman Bldg.
Boise, Idaho

3. (a) The proposed work will be as follows: [illegible] will require construction of 1/2 mile of road to allow direct access to site of new project. This road has already been surveyed and the county will aid in building the lower end up to the point where the rock work begins.

Then a 225 foot crosscut will be driven to the main vein from the base of the cliff directly below the present upper level cross-cut. This new cross-cut is calculated to tap the main ore shoot near the center of its lateral extent and about 120 ft. (dip distance) below the present upper level. Two hundred feet of drift along the vein on the new level will be required to expose its entire strike distance on the main shoot. A 130 foot raise will be driven to interconnect the two levels.

See geologic map for location of proposed project.

Total cost of this project will be $21,370.50

(b) This project can be started within one week after approval and completed within seven months after that date.

4. Maps attached

5. There are no existing facilities, buildings, installations, or fixtures.

6. Access road to be constructed at a total cost of 1512.00
But 1200.00 charged to equipment rental leaving balance of
$312.00 which will provide two bulldozer men for 2 weeks. 312.00

Compressor house and shop—labor 400.00
Material 1000.00 1400.00

Total $1712.00

Baltimore Gems Mines, Inc.
601 Eastern Bldg.
Boise, Idaho

7. (a) None

(b)

1—315 cu. ft. diesel compressor (portable)	5000.00
500 feet of 1½" rail	400.00
450 feet of 6" pipe	850.00
Gasoline shucker (surplus stock)	500.00
Cook truck	750.00
Trailer house (crew housing)	950.00
Total	$9450.00

(c) Baltimore Gems will provide an H. D. 15 tractor with dozer and driver for 18 days which includes 12 days road building and 6 days sampling $100.00/day

	Unit Cost	Rental
		1800.00
Lynn and jackhammer	700.00	21.50
3 cubic yard	45.00	22.50
Gardner Denver tugger hoist		70.00
1963 Ford pickup	900.00	165.00
Total rental		$2079.00

Baltimore Gamma Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

6. Before entering a statement of labor costs it may be well to state that as much as possible of this program will be handled on a contract basis since recent experience in the district shows that both from a standpoint of speed and efficiency the contract basis is the most satisfactory and economical.

A maximum of $15.00/ft. is allowed for labor cost of drifts, cross-cuts, and raises.

Drifts and cross-cut will be 5 x7 and raise 4 x 6. Rock is hard and little timber required.

565 feet of cross-cut, drift, and raise @ $15.00/ft. $8475.00

Cross-cut will be driven on a two shift basis employing 4 miners @$3.00/day—25 days per month.

Raise will be driven simultaneously with drift and 4 men will be employed on a single shift.

Monthly cost exclusive of 1st month when time will be consumed in road building and house building

	4 men	1320.00
Add 10%	comp.etc.	130.00
Total		1450.00

An average advance of 25 feet per month is estimated.

1—General Supt. $300.00/mo.
1—Foreman $15.00/day
1—Engineer $300.00/mo.
1—Project Accountant $250.00/mo.
(Note: Supt., engineer, and accountant will serve three projects, hence only 1/3 of this cost is charged to this project)

Total supervisory, engineering, and accounting at 1/3 of above rates $642.00

Baltimore Cross Mines, Inc.
601 Eastman Bldg.
Boise, Idaho

9. Material and supplies, including explosives, steel bits, fuel, hand tools, machinery upkeep and repair, and timber have been computed on a basis of $7.50 per foot against x-cuts, drifts, and raises.

The breakdown of this per foot figure is as follows:

Explosives/ft.	4.15
Bits	1.15
Steel	0.25
Fuel	1.10
Incidental	0.85
	7.50

555 feet @ $7.50/foot $4162.50

10. (a) $7062.63, which represents 25% of the total cost and of which $2079.00 will be paid by equipment rental or depreciation.

(b) Yes

11. This project is designed to explore the downward continuation of the main ore shoot cut from the upper level and which is continuing downward strongly in the floor of that upper level. Ore mined from the upper level at a depth only fifty feet below the surface contains produced about 2500 units of tungsten trioxide.

ENGINEERING

REPORT

ON

HILLTOP

for

BALTIMORE CAMAS MINES, INC.

by

D. E. Anderson

&

S. L. Bida

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MINE

The HILLTOP MINE includes six unpatented lode mining claims in the Minerva Mining District of White Pine County, Nevada. Claim names are as follows: HILLTOP; TONY NO. 1; TONY NO. 2; TONY NO. 3; TONY NO. 4; and TONY.

Owner and locator of the HILLTOP group is Arnold Millick of Ely, Nevada, who first discovered the property in 1915. Claim records are on file in the White Pine County Recorder's Office at Ely.

Baltimore - Camas Mines, Inc. of Boise, Idaho has recently taken over the property under a purchase contract after the property had been thoroughly examined and sampled by engineers of that company.

LOCATION

The HILLTOP is located in the Minerva Mining District some 50 miles SE of Ely, Nevada from which rail and supply center it may be reached by traveling south on Highway 93 for 35 miles, then turning east on a gravel road some 12 miles to the mine which is situated low on the west flank of the Snake Range.

The district is partly active and steadily becoming more so as interest in tungsten mining becomes more acute. The CHIEF is maintaining some production and several other properties are reviving.

HISTORY

The first mining activity on record in the Minerva District was in 1869, when silver was first discovered in the area. Some high grade silver ore was found and mined but no important deposits of this metal were found and only a few small operations were attempted until 1915, when tungsten was discovered. Since then some sizeable tungsten mining operations have been carried out and an unpublished Geological Survey Report of March, 1943 gives the district production through January of that year as 72,000 units of WO_3. Nevada State Bureau of Mines records show that Tungsten Metals Co., operating in the Minerva District from 1936 to 1945 produced 83,000 units of WO_3 from 110,000 tons of ore.

The HILLTOP itself was discovered in 1915 and first worked by Arnold Millick in 1916. The major development and production on the property was achieved during the 1930's when the mine was operated by the Shoshone Mining Co. At that time, the present adit was driven and the main or No. 1 ore shoot opened up and mined at a level approximately 50 feet below the surface outcrop. The HILLTOP was later taken over and

operated by the Veridot Company who mined some additional lower grade ore remaining in the No. 1 shoot, and attempted to develop the east ore body. This later development showed lack of geologic knowledge of structural conditions encountered and failed to reach the objective.

ECONOMIC ASPECTS

The HILLTOP property has been examined and rechecked as to volume and grade of ore as well as from the standpoint of formation and structural features essential to ore deposition. Documentary evidence of past production has been studied, and problems of new development have been weighed.

All information relative to this property has been assembled and correlated to obtain the following economic picture:

Sampling of the presently exposed ore sections has shown the tenor of ore in the minable shoots to be highly satisfactory. Further, and unquestionably more reliable evidence as to the grade of ore in the main body is found from the past production records which show that the bulk of ore mined showed a recovery averaging better than 1.5% WO_3.

Secondly, observation of stoped areas and remaining exposed ore faces shows that a mining width of at least two feet can be expected in the ore shoot areas.

Study of formation and vein characteristics show no tangible reason why the ore bodies should not continue downward sufficiently far to provide a production potential far in excess of that previously attained. This statement is based on the fact that the ore is continuing downward strongly in the upper exposed section, the formation shows no major changes or unconformities in the downward block over the area from which the new development is contemplated.

Review of past operations reveals that the ore has been mined and treated successfully and profitably in all except perhaps the last attempt when no actual objective was reached. The present metal prices (WO_3 at $63.00 unit) is about 3 times what the former operators received and more than balances the increased cost of operation.

While no important tonnage of commercial ore is available for immediate mining, the cost of developing the lower block will not be considerable as mining developments go, and there is every assurance that the ore to be expected from such development will produce far out of proportion to the expenditure required to ready the property for mining.

GEOLOGY & MINERALIZATION

The general rock formations of the region are bedded limestones, shales, and quartzites placed in the Cambrian geologic age. Granites of a much younger age, probably Jurassic, are exposed a few miles to the north. Mineralization is related to the granitic intrusives and may have occurred as late as the Tertiary epoch. Recent geologic reports on the Minerva District in general are "TUNGSTEN MINES IN THE MINERVA DISTRICT" by Dwight M. Lemmon (a U S G S unpublished report of March, 1943), and Bureau of Mines Report of Investigations, 4648 by Newman, Geehan, and Trengove, published in March, 1950.

The general strike of the lime beds in the area where the ore deposits occur is east - west with a gentle dip to the south. Local faulting has caused tilting and rotation of large blocks of the formation with resulting unconformities in evidence in the vicinity of the HILLTOP claims.

Ore deposits occur in distinct fissure - type veins which cut the limestone beds. These fissures represent ancient fault planes which were later to provide channels for the mineralizing gases and solutions which segregated out of underlying intrusive masses. The most prominent and highly mineralized fissures at the HILLTOP as well as in other mines in the district have an east-west strike and dip at variable degrees to the north. Some cross fissures which intersect the main vein at a slight angle were noted and have a tendency to form ore concentrations at or near these intersections. In contrast to the main HILLTOP vein, the TONY vein, upon which some work has been done and which occurs in a lower block to the west, has a north - south strike. Mineralization has been less intense along this fissure and whether or not this is a true cross-fissure or a once parallel vein that has been rotated by fault movement, has not been determined.

Tungsten is the chief ore mineral present, although occasional spots of silver have been found in the vicinity. Quartz makes up the main gangue mineral although minor amounts of calcite are present in the places the ore has penetrated the limestone walls for a short distance. Megascopic examination of the ore indicates that the scheelite mineralization has very closely followed the quartzing. The scheelite occurs for the most part as a fine dissemination throughout the quartz matrix. This fineness of texture is especially predominant in the TONY vein ore where the distribution of fine grained sheelite gives the appearance, under a mineralite, that the ore is of a much higher grade than assay values prove.

Cross faulting is apparent along the HILLTOP vein as shown on the geologic map where an offset of more than 50 feet has occured between the main and west ore shoots. Another fault, of even greater displacement is indicated a few hundred feet farther east where the

entire vein structure has been displaced several hundred feet to the northeast. Quite a complex fault pattern is evidenced in the block traversed by the unexplored west section of the HILLTOP vein. The main ore shoot, however, appears undisturbed for at least 150 feet on its downward course. Below this point a major unconformity was noted, the true attitude of which has not been determined.

The main vein fissure of the property appears to have been strong and remarkably continuous along its strike until post mineral faulting has interrupted this continuity by several systems of offsetting.

Structural features most closely related to ore concentration are the intersecting cross-fractures and local flattening along the dip of the vein which tends to widen and richen the scheelite bearing quartz.

ORE DEPOSITS AND ESTIMATED RESERVES

The HILLTOP has been developed by a 70 foot cross-cut and a little more than 300 feet of drift on the main vein. This drift averages only about 50 feet in depth below the vein outcrop and the main or No. 1 ore shoot has been stoped from this level throughout its length of something over 150 feet. In addition, some 200 feet of drifting and minor stoping has been carried out on the TONY vein.

Nearly all the past production of the HILLTOP has stemmed from mining of the main ore shoot as described above. This ore shoot was mined selectively over a 180 foot length and average 50 foot depth. Mining widths averaged a little over two feet although locally the ore pinched to as little as one foot and in other places, especially where the dip flattened, widened to as much as four feet. All the better ore has been extracted from this area and only pillars of lower grade material now remain. Although no exact tonnage figures are available for this mined area, the figure must have been somewhere around 1500 tons. Underhand stopes were extended downward about ten feet on both the east and west sides of the cross-cut and observation and sampling of these sections show the ore to be continuing downward with as good or better width and grade than that originally worked above the drift level.

The east ore shoot occurs about 130' east of the main shoot and its surface dimensions show a minable length of 40 feet and average width of two feet. This ore shoot was the objective of the Veridot Company's development program and they had extended the drift eastward to tap this ore source. However, the cross-fractures and fault which offset the vein between the two ore shoots evidently proved too complex for these operators and their purpose was not achieved. Our recent mapping, however, indicates that Veridot's latest exploration carried them to a point in the raise near the drift's end that is either on or very close to the downward extension of the objective ore shoot. Further exploration in this immediate vicinity will allow more exact estimation of what may be expected from this ore body.

There is some indication that a third ore shoot may exist on the west extension of this same vein, near the point where it emerges from the sheer cliff faces that front to the valley. Scheelite has been found on the outcrops in this vicinity but no underground exploration has been essayed.

The TONY vein has disclosed two minor ore lenzes and some mining (tonnage unknown) has been done. Here no impressive ore bodies are anticipated and the two unmined sections of the ore lenzes indicate that 50 to 70 tons of ore can be had from this vein by simply gouging out the remaining ore above the drift level.

The following estimates of ore resources will be based on a comparison of past production from the main ore body with the vein area to be opened up by a cross-cut and drift 100 feet lower, on surface measurements of the east ore body and on estimation of immediately available tonnage on the TONY. Assuming the same average width and length of ore as above, the lower development would provide a stoping volume approximately double that above or 3,000 tons. The east ore shoot, assuming it to go down only 40 feet, that is, half the distance to the present drift level (such condition might arise because of a fault structure) would produce 250 tons, and the TONY, as previously stated, can be depended on for about 60 tons. This gives an overall estimate of 3300 tons of "very probable" ore.

It must be emphasized that these estimates include only what can reasonably be expected as the immediate result of the proposed deeper development, and once the ore has been definitely proven by the cross-cut to exist on the lower level, these estimates will in all probability be revised upward.

The question of tenor of ore available and expected has been checked as thoroughly as practicable for the present and the results are as follows: The bulk of ore mined and milled by the Shoshone Mining Co. gave a <u>recovered</u> value of 1.52% WO_3, while the recovered value of the ore mined by Veridot Co. was 0.9%. In all fairness, it should be stated that the later operation was for the most part a scavenging project whereby the lower grade ore in pillars left by former operators was mined. It is likely that the average head assay of the Shoshone Co's production was nearly 2%, since the figures above deal with only the tonnage milled and concentrates sold and make no mention of tailing loss. Documentary evidence of these figures has been checked in the course of our investigation. Our own assays taken from the main ore body were mainly concerned with the downward extent of the ore and returned more than 4% WO_3.

A general surface sample taken on the east ore shoot outcrop showed 1.4% WO_3 while two samples on the ore remaining at the TONY gave a 1.77% WO_3 average.

All assay results are tabulated and appended to this report.

Thus, it may be seen that a 1.5% WO_3 recovery can be conservatively expected from the average ore to be mined on the HILLTOP.

TOPOGRAPHY

The region is made up of broad, high valleys bounded by rugged, barren mountain ranges. The HILLTOP, while only some 600 feet above the valley, is, however, in a singularly rough section where high cliffs are cut by deep canyons. An aerial tram was necessary to gain access to the upper workings,and ladders up the last 50 feet of the nearly vertical west cliff face represent the only present way to ascend to the main adit. The proposed new development will start from the bottom of the cliff face and will not pose such extreme difficulty to gain access.

CLIMATE, ALTITUDE & ACCESSIBILITY

The climate is moderate, with hot, dry summers and occasional snow and cold weather in the winter months. Year around operation is feasible with only a few weeks delay possible from an unusually heavy snowstorm.

Average altitude of the region is about 6500 feet and the elevation of the site of the proposed new project will be in the neighborhood of 7,000 feet.

The property may be reached from Ely, Nevada by driving 35 miles south on highway 93, thence some 12 miles farther southeast on a gravel road which extends to and follows along the west flank of the Snake Range. The more specific problem of gaining access to the scene of the mine workings presents a more acute problem and will later be discussed more fully.

TIMBER, WATER & POWER

No timber other than scrub Pinon Pine and Juniper is available on or near the property but fortunately the ground requires little or no timber for support and sawed timber may be purchased in Ely or shipped in from more distant sources.

There is no water on the property and thus allowance must be made to transport water from several miles up the valley for drinking as well as mine machinery and drilling use. A tank truck or barrels will be required to transport the required water.

No public power source is available in the vicinity and gasoline and diesel power units must be relied on to meet the mine machinery requirements.

MACHINERY & BUILDINGS

All machinery used in previous operation has been removed from the HILLTOP and it will be necessary to supply compressor, air hammers, pipe, track, cars and hand tools from the company inventory to launch this

project. Mr. Millick has informed us that, in event a tram is decided upon, the equipment formerly used, including air pipe, is available at another property and can be had on a low cost rental basis.

No buildings remain and some arrangement will be necessary to provide crews' quarters as well as rough sheds for machinery and workshop.

METALLURGY

No laboratory tests or comprehensive metallurgical research was entered into during this investigation. However, definite proof was shown that the ore has been successfully concentrated and a readily marketable product obtained by past operators. Hence, there is no conceivable reason why, with present improved milling procedure, and the undeniably competent metallurgical experience of Mr. Murphy, an equally good, if not better, ratio of recovery can be made by Baltimore - Camas.

The ore, as previously stated, contains a fine grained disseminated scheelite contained in a quartz matrix and as such will require fine grinding and flotation.

A flow sheet of a plant where such ore was successfully treated is shown in Figure 11 of Bureau of Mines Report of Investigations 4648.

CONCLUSIONS & RECOMMENDATIONS

After assembling and studying all available data considered pertinent to resumption of operations on the HILLTOP property, the following facts have been brought to light: (1) The property has conclusively not been exhausted of ore reserves, and in all probability only a minor part of its production potential has yet been attained. (2) Conditions of rock formation, intensity of mineralization, and structural continuity are favorable for continuity of the major ore body and at least one other ore body, as yet untouched, adds substantially to the anticipated productive capacity of the property. (3) Comparative estimates of potential ore to be expected by new development show the returns to be conservatively anticipated far outweigh the risk of carrying out this project. This risk is still further minimized by the fact that there are already a few hundred tons of ore available in the old stopes, the TONY, and east ore shoot which could be mined from the levels already open. (4) The most complex initial problem remains the selection of a means of access to the site of operations. (5) The future of the property, beyond the present estimates and projected developments, remains indeterminate until such development has proceeded well beyond its initial stages, but the property does have opportunity to provide additional ore bodies both above and below the levels now contemplated.

As an additional point of interest as regards HILLTOP possibilities, we will here take the liberty to state that Loren Smith, who has had many years of experience in mining operation and is presently in charge of operations for Baltimore - Camas, has ventured the opinion that this property may possess an even greater potential than the SCHAFER. While declining comment on this statement chiefly because of the fact that sound ge-

ologic and engineering reasoning dictates that we must at present confine our estimates and expectations to the limitations outlined previously, we do at least concur that the HILLTOP does rate among the top three properties yet visited in the area as regards future ore possibility.

In view of the foregoing conclusions we strongly recommend that a development program be launched on the HILLTOP along the following lines: (1) A cross-cut should be driven to the main HILLTOP vein (this cross-cut will be 250 ft. - in length, dependent on dip of vein) from a point at the base of the south face of the cliff, parallel to and almost vertically under the upper level cross-cut (see geologic map). (2) Once the vein is cut by this cross-cut (this level will be a little more than 100 feet below the present level) a drift should be extended under the entire length of the main ore shoot. (3) A raise should be driven from this level to the upper level near the center of the ore shoot. This raise will not only serve to aid in developing the main ore body between those two levels, but will enable the operator to gain access to the east ore body without necessity of entering the upper level adit.

The main objective of the above program is, of course, to develop the downward continuation of the major ore body, while a lesser but still important objective is to render accessible for exploration the east ore body and remove ore remaining in pillars without the necessity of working from the difficult position of the present upper-level cross-cut.

The question of whether a road or tram should service the site of this new development is a matter which should be more thoroughly studied and the answer based entirely on the overall economics of the operation. No doubt a tram could be installed for a lesser initial cost, but whether or not the disadvantages of increased personnel travel time and equipment and supply haulage cost by such a method would outweigh the difference in cost as compared to a road that would allow truck transportation directly to the desired point, is questionable. With the earth moving and rock breaking equipment now available, the road building program would seem more advisable.

The question of mining the ore presently available on the TONY is left solely to the judgment of the managers of Baltimore - Camas, who will base that decision according to the time-table of immediate ore requirements.

In conclusion, we again reiterate that the advocated development program is entirely advisable in that it has every reasonable assurance of greatly increasing Baltimore - Camas productive capacity.

Respectfully submitted,

D. E. Anderson

D. E. Anderson

S. L. Bida

S. L. Bida

TABULATED ASSAY RESULTS

No.	Description	% WO_3	Value @ $63.00/unit
1.	Vein sample, S 30° E, 15' Station X-cut.	4.25	$267.75
2.	Underhand Stope 24" wide	4.45%	280.35
3.	Lower working face of Tony stope - 24"	0.45	28.35
4.	East Face near top last raise	0.01	0.63
5.	36" surface sample near center cast ore shoot	1.40	88.20
6.	Tony vein - 24" on top of small ore body	3.10	195.30

Note: Samples 1, 2 and 3 taken by S. Bida.

Samples 4, 5 and 6 by Anderson - All assays by Idaho Assay Office, Hailey, Idaho.

EUREKA CORPORATION, LTD.

Richmond-Eureka Mine

Eureka, Nevada

August 2, 1951

Mr. Arnold Milleck
Ely,
Nevada

Dear Arnold:

Following is the production of the Hill-Top Mine as shown by my records.

Company	Date 1941	Tons Milled	Lbs. Cons.	Units WO_3
N. D. Lease	Feb. & March	470	26650	897.394
Scheelite Lease	May thru Oct.	547	20939	647.750

My records do not show the production of the Vendot Mining Company as they made monthly payments to the Shoshone Mining Company. I believe Frank Hoagland might be able to give you this information from the records of Tungsten Metals Corporation.

Regards,

(Signed) AJO
A. J. O'Connell

AJO'C:ej

Appendix II

Kimberly, Nevada
August 16, 1951

Mr. Arnold Millick
Box 363
Ely, Nevada

Dear Arnold:

The Tungsten Metals Corporation records show that Virdot Development Co.

The Tungsten Metals Corporation records show that Virdot Development Co. sent 450 tons of ore through the mill from Dec. 1941 through April, 1942. This ore produced 12,940 pounds of concentrates, which yielded 401 units of WO3, based upon a 62% concentrate.

Yours very truly,

(Signed) Frank Hoagland

Frank Hoagland

Appendix III.

MF-202

LANDLORD'S SUBORDINATION AGREEMENT

KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, the undersigned is the owner in fee simple of that certain parcel of ground in the county of White Pine, State of Nevada, described in a certain Exploration Project Contract dated October 5, 1951, between G. P. Williams,

the Lessee of said property, and the United States of America;

NOW, THEREFORE, the undersigned, as Lessor of said property under lease dated Sept. 21, 1951, does by these presents subordinate all of his right, title, and interest under the provisions of said lease to the right, title, and interest of the United States of America under the provisions of said Exploration Project Contract, and agrees that the lien and claim of the United States of America under the provisions of said contract shall be prior to the undersigned's rights to rentals or royalties under the terms of said lease; and

The undersigned further agrees that if said leasehold interest should be surrendered or if said lease should terminate at any time prior to the expiration of the rights of the United States of America under said Exploration Project Contract, the undersigned shall assume and does hereby assume all of the obligations of the Lessee under said Exploration Project Contract to make repayment to the United States of America according to the terms of said contract; and

The undersigned agrees to commit no act, nor assert any claim under judicial process or otherwise that may contravene or conflict with the prior lien and claim of the United States of America under the provisions of said Exploration Project Contract.

This undertaking and covenant shall be binding upon the heirs, successors, and assigns of the undersigned.

Dated this 22nd day of October, 1951

D. Arnold Mellick

Mrs. Amelia W. Mellick

U. S. GOVERNMENT PRINTING OFFICE 16—64582-1

MF-202

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Dated this 22nd day of October, 1951.

P. Russell Williams

Mrs. Gracia W. Williams

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Mrs. Amelia W. Millikin

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Dated this 22nd day of October, 1951

R. Arnold Millbrook

Mrs. Agnes W. Millbrook

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This undertaking and covenant shall be binding upon the heirs, successors, and assigns of the undersigned.

Dated this 22nd day of October, 1951

R. Arnold Millick

Mrs. Amelia W. Millick

U. S. GOVERNMENT PRINTING OFFICE 16—64582-1

ESCROW AGREEMENT

THIS AGREEMENT, made and entered into this 21st day of September, 1951, by and between R. ARNOLD MILLICK and AMELIA W. MILLICK, husband and wife, of the City of Ely, County of White Pine, State of Nevada, the party of the first part, and G. P. WILLIAMS of the City of Boise, County of Ada, State of Idaho, the party of the second part,

W I T N E S S E T H:

That Whereas the party of the first part signed and acknowledged a Mining Grant, Bargain and Sale Deed to the party of the second part dated September 21st, 1951, and all the interest of the party of the first part in and to the following described lode mining claims situated in the Minerva Mining District, Shoshone, County of White Pine, State of Nevada, and more particularly described as follows, to-wit:

Hill Top Lode, recorded in Book 148, Page 304, Mining Locations Record;

Tony Lode, recorded in Book 158, Pages 19 and 20, White Pine Mining Records;

Tony Lode No. 1, recorded in Book 158, Pages 19 and 20, White Pine Mining Records;

Tony Lode No. 2, recorded in Book 158, Pages 19 and 20, White Pine Mining Records;

Tony Lode No. 3, recorded in Book 158, Pages 19 and 20, White Pine Mining Records.

Together with all the dips, spurs and angles, and also all the metals, ores, rock and earth therein; and all rights, privileges and franchises thereto incident, appendant, and appurtenant, or therewith usually had and enjoyed; and also all and singular the tenements, hereditaments and appurtenances, thereto belonging or in any wise appertaining and the rents, issues and profits thereof.

AND WHEREAS, the party of the second part has agreed to pay as consideration for the said property the sum of Thirty-five Thousand ($35,000.00) Dollars, lawful money of the United States of America, no part of which sum has been paid, except the sum of One Thousand ($1,000.00)

Dollars down, the receipt of which is hereby acknowledged.

NOW, THEREFORE, the purchase price of said mining claims is Thirty-four Thousand ($34,000.00) Dollars, lawful money of the United States of America, said purchase price is to be paid by royalties, except as herein otherwise provided, and said royalties to be calculated in the manner as hereinafter set forth. Said royalties shall be determined as follows, to-wit:

Royalties in the amount of ten percent (10%) of the net smelter or mill returns. All royalty payments to be applied on and in reduction of the purchase price herein provided; said royalty payments to be paid through the First National Bank of Ely at Ely, Nevada, as hereinafter provided for.

Said party of the second part agrees to pay to the said party of the first part a sum of not less than Two Hundred ($200.00) Dollars per month, which said sum of Two Hundred ($200.00) Dollars per month may be paid either through royalties in the amount of ten percent (10%) of the net smelter or mill returns, by direct money payments, or both, provided that until such time as the purchase price is paid in full the said party of the second part will pay to the said party of the first part a sum of not less than Two Hundred ($200.00) Dollars monthly, said payments to commence on the first day of October, 1951, and made payable to the account of R. ARNOLD MILLICK at the First National Bank of Ely, at Ely, Nevada; provided further, however, that all payments made hereunder, whether by royalties or otherwise, shall be applied upon and in reduction of the said purchase price.

It is mutually covenanted and agreed by and between the parties hereto, that the said party of the second part and his assigns shall have the right of and be entitled to the possession of all of the said mining claims above-named and described from the date hereof and during the life of this agreement.

NOW, THEREFORE, THIS AGREEMENT WITNESSETH: That a Mining Grant, Bargain and Sale Deed to the said mining claims shall be placed

in Escrow with the First National Bank of Ely, at Ely, Nevada, to remain there until the said party of the second part shall have paid all of the said installments herein provided, by paying or causing to be paid all royalties and/or minimum payments hereunder required to the credit of the party of the second part, and fulfilling all the obligations of this agreement upon his part.

If the party of the second part shall fully pay and discharge said balance of the purchase price by paying or causing to be paid all royalties and/or minimum payments hereinabove required, and fulfill all the obligations of this Agreement upon his part the said Bank shall thereupon, and not otherwise, deliver the said Deed to the party of the second part.

That a Quitclaim Deed to the mining Claims shall be placed in Escrow with the First National Bank of Ely, at Ely, Nevada, by the party of the second part, conveying unto the said party of the first part all rights he may have in and to the said mining claims by means of this or any other contract of any nature whatsoever, and the Bank is instructed that in the event that the said party of the second part fails to make payments above-mentioned at the times or in the manner herein provided for, said Bank shall deliver to the said party of the first part, upon written demand by him the said Deed made and executed by the said party of the first part together with the Quitclaim Deed made and executed by the said party of the second part, and all copies of this or any other agreement made and entered into between the parties hereto.

TIME IS OF THE ESSENCE OF THIS AGREEMENT, and if the party of the second part, shall make default for a period of thirty (30) days in the payment of any installment when due, as herein provided, or in the fulfillment of any terms, covenants or conditions of this agreement upon his part, the party of the first part may, at his option, declare this agreement void, thereupon demand and receive said Deed and Quitclaim Deed from said Bank; and thereupon the party of the second part agrees to promptly and peaceably surrender to the party of the first part, the possession of

the above described premises, PROVIDED, however, that before the party of the first part shall default the party of the second part for breach of this Agreement, said party of the first part shall notify the party of the second part of said default by registered mail addressed to said party at 601 Eastman Building, Boise, Idaho, from which date said registered letter is received said party of the second part shall have thirty (30) days thereafter to make payment or correct the condition warranting default.

In case of such default and of such return of said Deeds, the party of the first part shall not be under any obligation to return any portion of the monies theretofore paid him by the said party of the second part, but the sum or sums so paid shall be deemed agreed as payment for the use and occupation of said premises, and as liquidated damages to be retained by the party of the first part for the breach of this agreement.

The provisions for a forfeiture of this agreement shall be deemed continuing ones, so that a waiver of the party of the first part of his right to enforce such forfeiture for one or more defaults shall not be construed to be a waiver of his right to enforce such forfeiture of any subsequent default.

In consideration of the premises, the said party of the second part hereby covenants and agrees as follows:

1. To pay, or cause to be paid, all royalties and/or minimum payments hereunder required to the credit of the said Second Party at the First National Bank of Ely, at Ely, Nevada.

2. To deliver to said First National Bank of Ely, at Ely, Nevada, true copies of all smelter or mill returns or receipts upon all ore shipped, which returns or receipts are to show the tonnage of said ore shipped or milled.

3. To keep at Ely, Nevada, and/or the mine, a full, true and correct record of all ores mined and shipped and to permit said First Party, his agent or agents, to examine such record at reasonable times.

4. To cause all workmen employed and working in or upon the said above described mining claims to be fully insured under the Nevada Industrial Insurance Act, the Nevada Occupational Diseases Act, and all amendments thereto, and keep, during the life of this agreement, all such employees so insured.

5. That during the life of this agreement, they will not do any act or thing which would cause mechanic's or other liens to be placed upon said property or any part thereof, and said Second Party further agrees to post and keep posted in a conspicuous place or places on said mining premises a notice in writing signed by said First Party, reading to the effect that work of development and mining the said premises, and the construction of improvements thereon, are being done wholly and solely at the expense of said Second Party, and that said First Party will not be responsible for any indebtedness for labor made or at all created by said Second Party; said Second Party further agrees to cause a duplicate original of said notice of non-responsibility to be recorded in the office of the County Recorder of White Pine County, and that said notice will be posted and recorded within the time provided for by law.

6. To permit the said First Party, his agent or agents, to inspect the said premises and the working thereon at reasonable times during the life of this agreement.

7. To well and sufficiently timber said mine at all points where proper and to perform all work upon said premises in a minerlike manner, keeping at all times the working drifts, shafts, tunnels, and other passages in working of said above described premises fairly clear of loose rocks and rubbish of all kinds.

It is mutually covenanted and agreed by and between the parties hereto that all machinery, equipment and tools placed thereon by said Second Party may be removed by said Second Party within a reasonable time after the date of the expiration of this agreement, or if forfeiture in the event that it is forfeited prior to the completion of this Escrow

Agreement, provided, however, that all such machinery, equipment or tools which are not so removed within a reasonable time period shall be left upon said premises for the benefit of said First Party. If said machinery or equipment, however, be sold by the Second Party, it is mutually agreed that the First Party shall have the right to the first refusal thereof.

It is further mutually covenanted and agreed by and between the parties hereto that the said Second Party will pay or cause to be paid all bullion taxes upon the net proceeds of said above described premises, which bullion taxes are levied by the State of Nevada, and/or the County of White Pine.

Said Second Party agrees to promptly pay any and all Social Security taxes levied by the United States Government or unemployment compensation taxes levied by the Unemployment Compensation Division of the State of Nevada, upon him as the employer and to permit no delinquencies to be created therein. Said Second Party further covenants and agrees to pay any and all taxes levied by the State of Nevada, the County of White Pine, or any political subdivision of the State of Nevada against any and all improvements and equipment, mining machinery, or buildings or structures during the life of this agreement.

It is further mutually covenanted and agreed by and between the parties hereto that this agreement shall extend to and be enforceable against and binding upon the heirs, executors, administrators and assigns of the parties hereto.

The Party of the First Part hereby consents to the party of the second part obtaining any Government Loan or assistance which the Second Party may deem necessary in furtherance of his mining operations.

The party of the second part hereby agrees to do all annual labor and assessment work on each and every claim and to fully protect the interests of the party of the first part in and to said claims.

It is further mutually agreed that the said party of the second part may pay the entire purchase price or any balance thereof remaining at any time during the life thereof.

IN WITNESS WHEREOF, the parties have hereunto signed their names the day and year first above written.

SIGNED: AMELIA W. MILLICK

SIGNED R. ARNOLD MILLICK
Party of the First Part.

SIGNED: G. P. WILLIAMS
Party of the Second Part.

STATE OF NEVADA)
: ss.
COUNTY OF WHITE PINE)

On this 21st day of September, 1951, personally appeared before me, a Notary Public in and for said County and State, R. ARNOLD MILLICK, known to me to be the person described in and who executed the foregoing instrument; who duly acknowledged to me that he executed the same freely and voluntarily and for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

SIGNED: NANCY MILLER
Notary Public
My Commission Expires: January 11, 1954.

STATE OF NEVADA)
: ss.
COUNTY OF WHITE PINE)

On this 21st day of SEptember, 1951, personally appeared before me, a Notary Public in and for said County and State, G. P. WILLIAMS, known to me to be the person described in and who executed the foregoing instrument; who duly acknowledged to me that he executed the same freely and voluntarily and for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

SIGNED: NANCY MILLER
Notary Public

My Commission Expires: January 11, 1954.

STATE OF NEVADA)
: ss.
COUNTY OF WHITE PINE)

On this 21st day of September, 1951, personally appeared before me, a Notary Public in and for said County and State, AMELIA W. MILLICK, known to me to be the person described in and who executed the foregoing instrument; who duly acknowledged to me that he executed the same freely and voluntarily and for the uses and purposes therein mentioned.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

SIGNED: NANCY MILLER
Notary Public

My Commission Expires: January 11, 1954.

APPENDIX

Further, ad addition to the agreement above mentioned, it is mutually agreed by all parties hereto that the party of the second part may at any time by defaulting on any of the payments above-mentioned, from date of this agreement, relinquish all rights in equity which he, his heirs or assigns, may obtain in said premises without further liability or charge, it being expressly understood that the party of the second part, his heirs or assigns, shall not be liable for the full purchase price should he or they default or relinquish possession of the claims or premises above-mentioned. It being understood, also, that in the event of defalt or relinquishing possession of said premises that all monies paid to said first parties by the party of the second part, his heirs or assigns, shall be considered payment in full for use of said premises and liquidated damages.

Dated this 21st day of September, 1951.

SIGNED: R. ARNOLD MILLICK

(S) AMELIA W. MILLICK (S) R. ARNOLD MILLICK
Parties of the 1st Part.

SIGNED: G. P. WILLIAMS

(S) G. P. WILLIAMS
Party of the 2nd Part.

Subscribed and sworn to before me this_____day of Sept. 1951.

(S) NANCY MILLER
Notary Public

BALTIMORE CAMAS MINES, Inc.

601 Eastman Building

BOISE, IDAHO

October 31, 1951

Defense Minerals Administration
Washington 25, D. C.

Attention Mr. Selfridge
Tungsten Branch

Refer: Docket No. 2136

Gentlemen:

We are herewith enclosing the required signed copies of LANDLORD'S SUBORDINATI N AGREEMENTS relative to the exploration loan applicationf on the APEX-TUNGSTEN property.

In addition copies of original contract and transfer transactions from the original contracts to the present operational status are enclosed.

Any additional information relative to these projects will be supplied upon request.

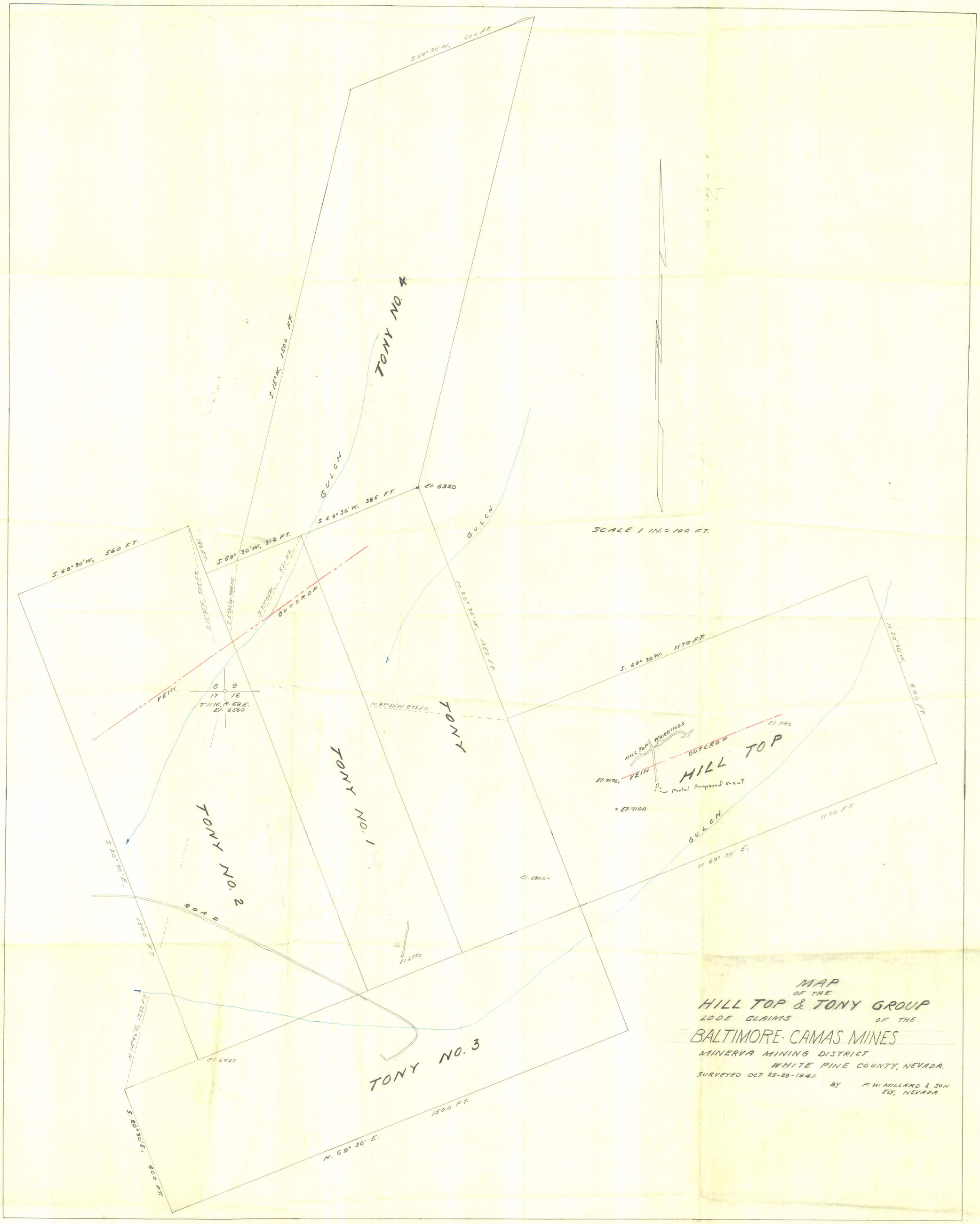
Respectfully,

G. P. Williams

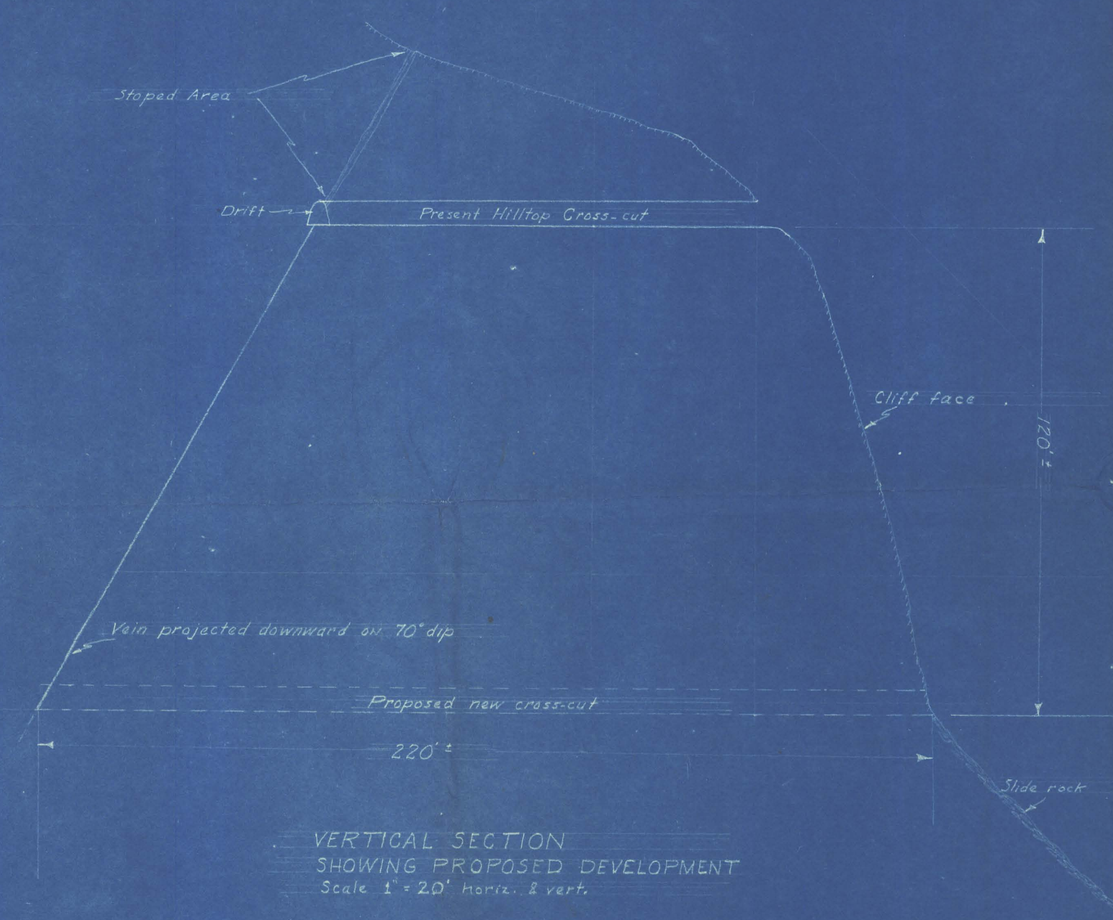
G. P. Williams, President
Baltimore Camas Mines, Inc.

gpw/aep

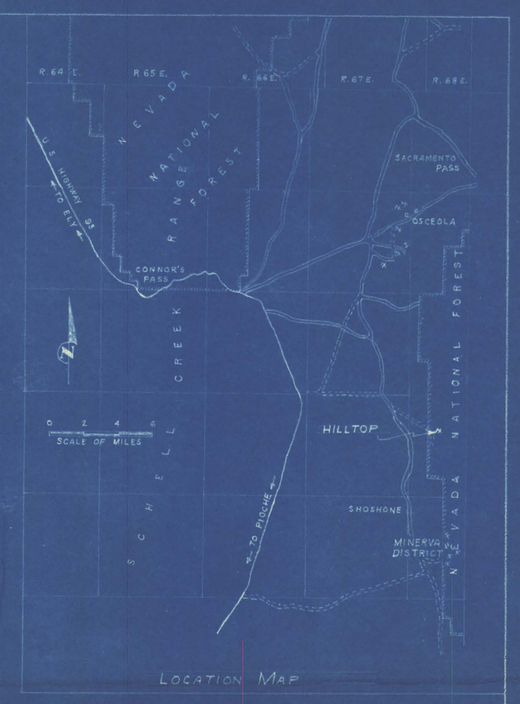
Above documents sent to Region 4 in connection with DMA-2136 application
7/30/52 L.S.



MAP
OF THE
HILL TOP & TONY GROUP
LODE CLAIMS OF THE
BALTIMORE-CAMAS MINES
MINERVA MINING DISTRICT
WHITE PINE COUNTY, NEVADA.
SURVEYED OCT. 25-29-1941.
BY F. W. MILLARD & SON
ELY, NEVADA

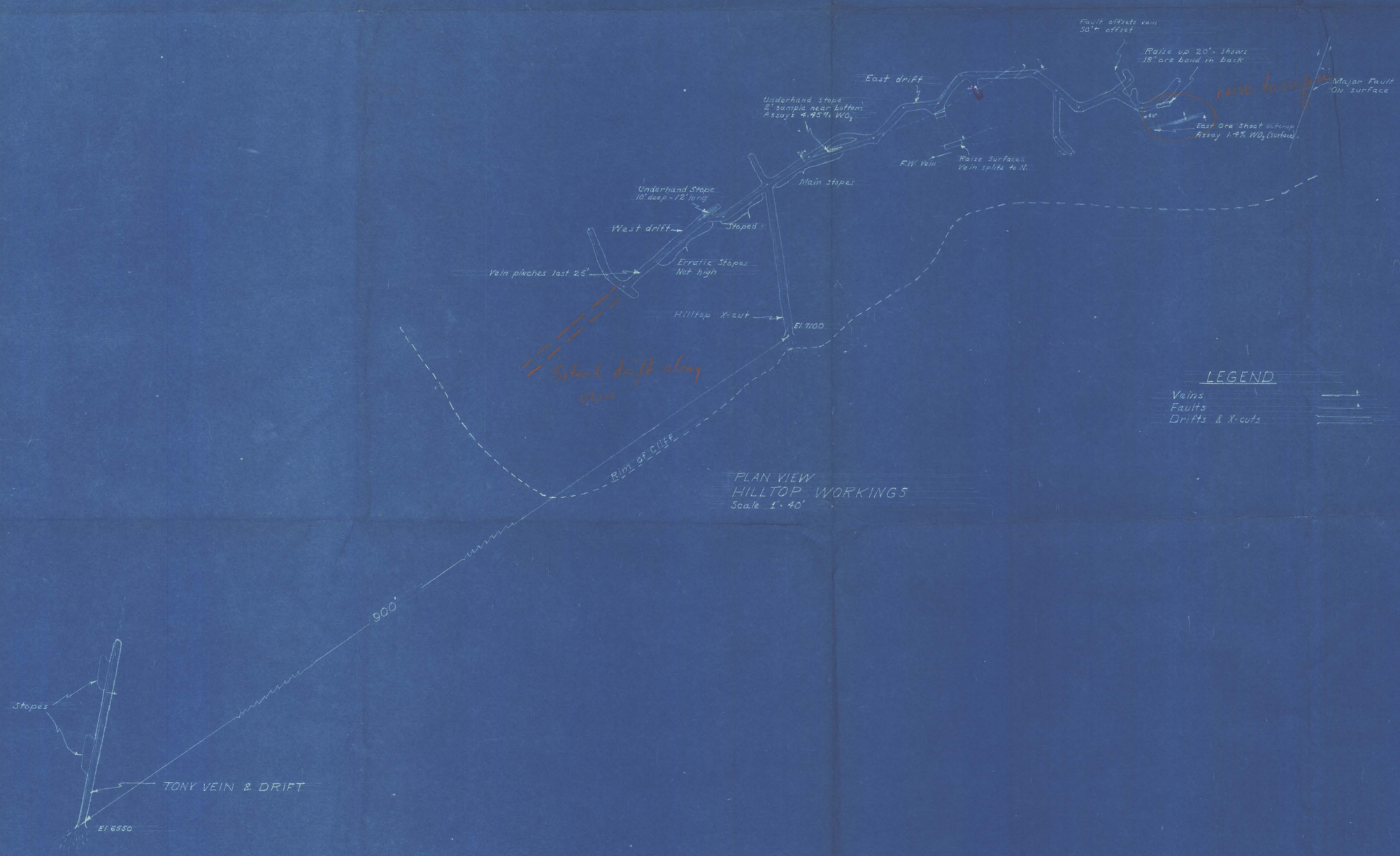


VERTICAL SECTION
SHOWING PROPOSED DEVELOPMENT
Scale 1" = 20' Horiz. & vert.



LOCATION MAP

N



PLAN VIEW
HILLTOP WORKINGS
Scale 1" = 40'

LEGEND
Veins
Faults
Drifts & X-cuts

BALTIMORE-CAMAS MINES, INC.
HILLTOP MINE
GEOLOGIC MAP
Brunton Survey by Bida & Anderson
Drawn by Anderson
Checked by Bida
Scale as shown

Sept. 1951