DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

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DMEA ~~DMA~~ Docket No. 2598

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This document has been recorded as

EXPLORATION PROJECT

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 Copies to USBM, and USGS. One copy retained by Region II.

To: Code 400, Rm. 3538 Date 7-1-52

To: Dy Comm Date 7-7-52

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STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : R. E. Adams, Chief, Oper. Control and Statistics Division, DMEA

DATE: Oct. 29, 1952

FROM : Iron and Ferro-Alloy Division, DMEA

SUBJECT: Removal of application from active file
Docket No. DMEA 2598 - Tungsten
Carl C. Martin
Perry Canyon Tungsten Deposits
Madison County, Montana

BL

The applicant has requested that his application for Government assistance in exploring the referenced deposits be withdrawn.

Therefore, we are removing the docket from the active files. The docket is transmitted herewith.

G. C. Selfridge

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

Attachment

FILE COPY
SURNAME:

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

R. E. Adams, Chief, Oper. Control and Statistics Division, DMEA

Oct. 29, 1952

Rutledge
GCSelfridge

Iron and Ferro-Alloy Division, DMEA

Removal of application from active file
Docket No. DMEA 2598 - Tungsten
Carl G. Martin
Perry Canyon Tungsten Deposits
Madison County, Montana

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George C. Selfridge

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

Attachment

FARutledge'lm
10/29/52

cc: Admn. Reading File
Docket
G. C. Selfridge
F. A. Rutledge

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D. C.~~
So. 157 Howard Street
Spokane 4, Washington

10/29/52

October 22, 1952

Mr. F. E. Johnson, Chairman
Operating Committee, DMEA
Dept. of the Interior
Washington 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 27 1952

Dear Mr. Johnson:

Enclosed is a letter from Mr. Carl C. Martin dated October 14, 1952 requesting that his application for an exploration contract be withdrawn. I have written him that we would withdraw it without prejudice and that he could resubmit it at a later date.

There has been a considerable delay in processing the application as Mr. Martin points out in his letter. We have not been as dilatory, however, as it might appear at first glance. The property was visited in July and at that time it appeared to our field men that a negative report would result, and Mr. Martin was informed that his chances for getting a contract did not look very good. However, to be sure that we were not overlooking anything and partly at Mr. Martin's urging, we returned at a later date to do more sampling. There was an unfortunate delay in getting these assay results and when they were received, the results were as low as expected and made a negative recommendation quite certain. Our field men being busy with other things did not prepare a report although Mr. Martin was told that the results were very discouraging although he was not given the assays. His letter requesting the withdrawl of the application is probably influenced by the fact that he knows that a negative recommendation is very probable, and therefore, he prefers to withdraw his application suspecting strongly that it would be turned down anyway.

We regret the considerable delay but processing of these applications with a limited staff does take a considerable amount of time.

Sincerely yours

A. E. Weissenborn THK.

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosure 1
cc: USBM (2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
~~WASHINGTON, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

October 22, 1952

Mr. Carl C. Martin
Whitehall, Montana

Dear Mr. Martin:

In reply to your letter of October 14, we will withdraw your application without prejudice and should you care to resubmit at some future time when you have developed more information, we would be quite willing to consider it again.

Sincerely yours

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

cc: DMEA (2)
USBM (2)

C
O
P
Y

Carl C. Martin
Whitehall, Montana
Oct. 14, 1952

Mr. A. E. Weissenborn
Executive Officer, D. M. E. A.
Field Team, Region II
South 157 Howard St.,
Spokane 4, Washington

Re: Docket # DMEA 2598 Tungsten
Perry Canyon tungsten deposits
Madison County, Montana

Dear Mr. Weissenborn;

This is a request to withdraw the above application for government assistance in exploring these deposits.

In view of the long delay and the apparent betterment in tungsten supply situation generally, as well as manner of the field teams sampling and evaluation of the deposit, it is doubtful that a loan would be approved at this time.

We are planning some underground exploration of the deposits on our own and therefor would appreciate not having an adverse decision against the property at this time. It may be that when this work is completed there will be a better opportunity to evaluate the deposits.

Very truly yours,

/s/ Carl C. Martin

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

July 11, 1952

Memorandum

To: G. C. Selfridge

From: R. W. Geehan

Subject: Perry Canyon Tungsten
Madison County, Montana

DMEA-2598

As I surnamed a letter transmitting the application to the Field on July 8, my copy of the docket is returned to you herewith.

Robert W. Geehan
R. W. Geehan

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
R. [illegible]
JUL 14 1952

400

FILE COPY
SURNAME:

Selfridge
Mayo
F. Johnson

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

Mr. Carl C. Martin
Box J
Whitehall, Montana

Re: Docket No. DMEA 2598 -
Tungsten
Perry Canyon tungsten
deposits
Madison County, Montana

Dear Mr. Martin:

Your application for assistance in exploring the Perry Canyon tungsten deposits in Madison County, Montana, has been reviewed by the Iron and Ferro-Alloy Division of the Defense Minerals Exploration Administration and has been referred to Mr. A. H. Weissenborn, Executive Officer, DMEA Field Team, Region II, South 157 Howard, Spokane 4, Washington, for a field examination.

The Regional Office will contact you at an early date in regard to the examination. Any assistance that you can render the members of the field team during the examination will be appreciated.

Sincerely yours,

C. O. Mittendorf (fw) 7/10/52

Acting Administrator
Defense Minerals Exploration
Administration

GCSelfridge:ls
7/7/52

CC: Docket
Admn. Reading File
Field Team, Reg. 2
G.C. Selfridge
D. M. Lemmon, USGS
R. W. Geehan, USBM
Operating Committee

400

FILE COPY
SURNAME:

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

Selfridge
Jackson

Mr. A. E. Weissenborn, Executive Officer
DMEA Field Team, Region II
South 157 Howard
Spokane 4, Washington

JUL 10 1952

Re: Docket No. DMEA 2598 - Tungsten
Carl C. Martin
Perry Canyon Tungsten Deposits
Madison County, Montana

Dear Mr. Weissenborn:

This is to acknowledge receipt of the three copies of the subject application. It is noted that you will schedule a field examination for the property as soon as possible. We concur that an examination should be made.

While reviewing the docket it was noted that Mr. McNabb of the Bureau of Mines had previously taken five samples on the property. Are the Bureau's assays available?

It was further noted that the items for assays and bits might be low and the item for gas high for the work contemplated. We believe that a definite time element should be involved in the item allowed for supervision. Probably some additional samples should be taken during the examination because the applicant seemingly has had trouble with his assays. The accompanying map and the narrative suggest that granite may not lie too deeply beneath the ore block. The feasibility of cleaning out and examining the bottom of shaft "F" for granite should be determined during the field examination.

A study of the legal documents shows and suggests, if the examination is favorable for exploration aid:

(1) Subordination agreements should be obtained from the Morgans.

(2) Consent of the Farmers Home Administration to the lease is required. This should be obtained.

(3) The permit for one year only by the Northern Pacific Railroad issued to Carl C. Martin and A.B. Martin is not assignable. Consent of the railroad to transfer by either permittee to the other is required and this consent should be obtained.

(4) The permit states that if the grantee discovers minerals in paying quantities within the terms of the permit he has a right to receive a 10-year lease from the railroad in terms of the lease accompanying the application. The exploration project should be such that it can be definitely terminated within one year from the date of the permit, which it can as now written. One question arises and that is what would happen if the mineralization is marginal and not commercial within the life of the permit but could become commercial within the next 10 years.

(5) If the railroad consents to assignment of the permit from one permittee to the other, then the lease should be drawn up and executed in the name of one.

(6) The lease grants a lien in the nature of a chattel mortgage to the railroad on all ore and improvements. If the applicant should place improvements on the property, the railroad's consent to lien would be required. In this particular case since improvements amount to only $200 the consent to lien could possibly be waived.

Sincerely yours,

(signed) FRANK E. JOHNSON (GHS) 7/10/52

Chairman, Operating Committee
Defense Minerals Exploration
Administration

Approved:

J. H. Hedges (GHS)

Member, Bureau of Mines

T. P. Thayer (GHS)

Member, Geological Survey

GCSelfridge:ls 7/7/52

CC: Docket
Admn. Read. File
G. C. Selfridge
Field Team, Reg. 2
D. M. Lemmon, USGS
R. W. Geehan, USBM
Operating Committee

1. Lease from W.H. Morgan & Wife to Carl C. Martin

✓ Contains provision that lessor will execute subordination agreement; this should be obtained.

✓ Consent of Farmers' Home Administration to lease is required; this should be obtained.

Contains provision that lessee may not use present water in excavated portions of property, but may use water developed by lessee.

2. ~~[illegible]~~

(a) Permit for 1 year only by Northern Pacific R.R. issued to Carl C. Martin and A.B. Martin.

✓ This permit is not assignable. Consent of R.R. to transfer by either permittee to the other is required. This should be obtained.

If "grantee discovers minerals in paying quantities within the term" of the permit he has right to receive 10 year lease from R.R. in terms of EXhibit "A" attached to the permit.

~~[illegible]~~ Can the project be completed certainly within the 1 yr.?

(b) The lease is in the names of both permittees. If the R.R. consents to assignment of the permit from one permittee to the other, then the lease would be drawn and executed in the name of one. The lease is not assignable ~~otherwise.~~

✓ The lease grants a lien (in nature of chattel mortgage) ~~to R.R. on all ore and~~ improvements. The R.R. is consent to lien is required. If the exploration contract contemplates improvements, the Consent to Lien of the R.R. cannot be waived is required. (See DME & Circular 20, paragraph 4)

IN REPLY REFER TO:

G-MD-DML

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

Memorandum July 1, 1952

To: George C. Selfridge, DMPA

From: D. M. Lemmon, USGS

Subject: Exploration application $19,920.98 DMEA 2598 - Tungsten
Carl C. Martin
Box J
Whitehall, Montana

Property: Perry Canyon tungsten deposit
Sec. 17, T. 1 S., R. 4 W.
Madison County, Montana
44 miles by road SE from Butte.

Comment: I have no information about this property. The voluminous discussion by Mr. Martin suggests that this deposit is another low-grade tactite similar to the Browns Lake and Lost Creek deposits in Beaverhead County. Apparently Martin has had difficulty in obtaining reliable tungsten assays. He does not give the source of the assays quoted. The proposal is made that the tungsten content be determined by panning the sample and assaying the concentrate. I suspect that this procedure would not be too practical because of human error.

The applicant has not presented enough geological information to justify the proposed underground work. Surface stripping, sampling and mapping, followed by core drilling, might be more satisfactory.

Recommendation: The Field Team states that an examination will be made. For the record, I suggest that a formal request be made for the examination.

Dwight M. Lemmon

Copy retained 400

JUL 8 - 1952

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

JUN 30 1952

MF-103
(Revised April 1952)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 30 1952

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. DMEA-2598
Metal or Mineral
Date Received 6-30-52
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Carl C. Martin, Mining and Metallurgical Engineer
Box J, Whitehall, Montana

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

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

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

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

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

(*b*) State any mine name by which the property is known. Perry Canyon Tungsten

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

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

(*e*) If you own the land, describe any liens or encumbrances on it Mineral Rights are held by leases

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

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

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

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

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

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

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Shcelite
(A mineral of Tungsten)

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

(*c*) The work will start within 10 days from notification of approval of project and be completed within 3 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated JUNE 22, 1952

Carl C. Martin
(Applicant)

By

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

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Perry Canyon Tungsten - Carl C. Martin, Whitehall, Montana

Attachments and Information to Accompany Application for Aid in an Exploration Project under the Defense Minerals Exploration Administration.

1. Name of applicant; (a) Carl C. Martin, Mining and Metallurgical Engineer, Box J, Whitehall, Montana.

3. Applicants property rights; (a) The applicant holds the mineral rights to the land he wishes to explore by two separate lease agreements. The land on which the most of the exploration work would be performed is in Section 17, T1S-R4W and is owned by the Northern Pacific Railway, on which the applicant has a prospecting permit on 640 acres and a mining lease option on 160 acres. (See attached copy of T & M contract #3498, February 20, 1952 between the Northern Pacific Railway Company and the applicant.) Carl C. Martin is trustee of this agreement and at such time as an exploration loan is approved, the A. B. Martin interest in this contract will be assigned to the applicant. A small amount of the exploration work would be done on agricultural land holding the mineral rights on the E½ of SE¼ of section 18, T1S-R4W, on which the applicant has a lease and option to purchase the mineral rights. (See attached copy of lease agreement between Wilbur H. Morgan and Carl C. Martin, April 24, 1952.) All exploration work including roads will be upon land held under one or the other of these two agreements.

(b) The name of the property is Perry Canyon Tungsten. Although some prospecting had been done on the property 40 to 50 years ago there is no other name, to the applicants knowledge, by which the property has been known.

(c) The applicant is lessee of the mineral rights to the land under the provisions of the contracts attached to this application.

(e) The land is held by lease agreements.

(f) There are no unpatented or patented mining claims as the land and mineral rights are on deeded land.

4. Physical description; (a) The Perry Canyon Tungsten property on which the proposed exploration would be done is situated in Madison County, Montana on the east side of the Jefferson River Valley about 6 miles from the post office of Waterloo. It is at an elevation of about 4600 feet. The mineralized area is mainly in the W½ of the SW¼ of Section 17, T1S - R4W. There has been no production of record but rumor has it that about $17,000 in high-grade silver-lead oxide ore was produced from this property about 1910. Considerable early prospecting of the mineralized area was done by short tunnels and shafts. The most important of these workings are shown on the attached 20 feet per inch scale plan of the area in which the proposed exploration work would be done. They consist of one adit approximately 149 feet in length shown at A with 52 feet of cross-cut shown at B, two surface cuts shown at C and H, a shaft approximately 35 feet deep at D and a shaft 25 feet deep shown at F. One surface cut C is in ore showing about 18 feet of width, and both shafts D and F are in the ore horizon, the dumps of which consist mainly of high grade ore. Elevations of these workings given on the plan map show the relation between these ore showings. The approximately 900 feet of bull-dozer work done on the property by the applicants in an endeavor to establish continuity of the mineralization is shown on the map. This work was of almost no value because the overburden is so heavy that exploration of this type

is impractical. There are no production facilities on the property at the present time, however, all the tunnels and shafts shown on the attached map are accessible for examination purposes.

(b) and (c) There has been no production of tungsten from the property and only a rumored production of a small amount of high-grade lead-silver ore. An examination of the present workings shows no evidence of ore stoping and it is doubtful that any production has ever been made. The property is of value because of its excellent showings of scheelite mineralization. There is no present production and the exploration loan is required to explore the indicated ore horizons so that an evaluation of the ore occurrences can be made.

Ore reserve estimates must be made on rather meager information both as to ore grades and geological evidence. The geology consists of a pendant of limestone in an intrusion of granite. The presence of the pendant is indicated by the limestone (silicified) shown in the tunnel A and by outcrops at e, f, g, and h on the attached map. The strike of the pendant appears to be S 10° E and the dip 60° to 75° E and NE. From the information available at this time there appears to be a zone of tactite carrying scheelite mineralization along both the hanging wall and footwall contacts of the limestone with the granite. The footwall tactite is indicated by ore outcrops at D, d, C, l and E. The hanging wall tactite is indicated in the shaft F and by outcrops at i, j, and G.

On the basis of the above outcrops and exposures ore reserves are estimated as follows:

1. Affirmed reserves; Footwall ore. The cut C has an exposed ore width on the south side of 18' from which a cut sample over this width contained 0.73% WO_3; The north side of this cut exposes an ore width of 21 feet from which a cut sample contained 0.82% WO_3. The strike of the ore is S 6° E. The shaft at D is vertical for 16 feet and inclined for approximately 20 feet at a dip of about 60°, N 80° E. There is a small drift from the bottom of this shaft extending north about 16 feet. The hanging wall of the shaft and drift, from the degree of floresecence, appears to be in very good ore. The floresecence is considerable better in the bottom than it is at the shaft collar. From the north end of the bottom level a short x-cut to the west is in an extremely siliceous phase of the intrusive, however, the high grade scheelite mineralization in the tactite apparently continues on to the north. An outcrop of ore grade garnet occurs at d on the map. From the above information an estimate of the ore in this area may be made in the following manner.

If the tactite ore in the cut C continues south to the ore float shown at l and north to the face of the lower level from shaft D, which is in excellent ore, there would be an ore length along the strike of at least 65 feet. The width of the ore showing in cut C is at least 18 feet and the width of ore indicated by the collar of shaft D and the ore outcrop at d is approximately 14 feet, indicating an average ore width of 16 feet. Because of some low grade tactite showing on the dump of shaft D the average ore width probably should be reduced to about 10 feet. The inclined section of the shaft D is on the same dip and strike as that of ore shown in the cut and the formation in the shaft appears to be in place and undistrubed structurally, therefore it is reasonable to expect the mineralization to continue downward another 15 or 20 feet to a depth of approximately 50 feet. From the data available this area should contain an ore body approximately 65 feet long by 10 feet wide by 50 feet deep containing about 3250 short tons of an average grade of 0.70% WO_3.

Hanging Wall Ore: The dump from shaft F on the accompanying map contains an abundance of extremely high grade ore containing from 1.5% WO_3 to in excess of 5.0% WO_3. High grade ore pieces are of such size as to indicate that ore widths of at least 20 inches had been encountered. The shaft at present is about 25 feet deep but the amount of caving would indicate that it was originally about 20 feet deeper. The exposed part of the shaft is entirely in tactite, the most of which has a florescence indicating about 0.40% WO_3 content. Some granite occurs on the dump and the location of some of the highest grade ore indicates that the high grade ore and the granite were encountered at about the same location. Outcrops of ore grade scheelite occur at j and i on the map. There is no exposure indicating the length of the ore body but from an indicated shaft depth of 45 feet it is probable the ore will persist for a distance of 25 feet on each side of the shaft. The width from the collar of the shaft, which is in good ore, to the ore outcrop at j is approximately 30 feet but because the ore exposures are so indefinite in this area and the actual width of the high grade ore is unknown an average ore width of 8 feet has been considered. The difference in elevation between the bottom level of shaft D and the collar of shaft F is about 93 feet. The bottom level of shaft D is in very good ore and the geology that determines the ore occurrences is the same on both ore horizons, therefore it is reasonable to assume that the mineralization in shaft F will continue to approximately the same depth as that in shaft D. This would indicate an ore depth of about 100 feet in the vicinity of shaft F. From the data available the hanging wall area should have an affirmed ore body 50 feet long by 8 feet wide by 100 feet deep containing about 4000 short tons of an estimated grade of 0.60% WO_3. An estimate of the total tonnage of affirmed ore summarized from the above data and calculations is 7250 short tons containing 0.65% WO_3.

2. Signified ore reserves: Reserves of this class can be estimated by expanding the tonnage of affirmed ore to the indicated limits of the undisturbed tactite horizons. The limestone pendant is apparently cut by nearly vertical faults on both the north and south ends. The northern fault shown on the map has produced a wide zone of disturbance but there is little evidence of the exact strike or the direction of movement. At the point where this fault crosses the tunnel A as shown on the map the fault is nearly vertical and strikes S55°E, however the major faults in this part of the mountain range generally trend E-W and the conditions revealed in the bull-dozer cut on the north end of the area shown on the map indicate that this fault may strike nearer E-W than is indicated by the evidence in tunnel A. The southern fault shown on the map is evidenced in the face of the caved surface cut I. At this point the fault evidence is positive and the strike and dip apparent. The west end of the southernmost bull-dozer cut, where it approaches the S end of the survey base line is apparently in fault rubble or float and contains large pieces of silicified limestone and granite mixed. The tunnel A which for about 120 feet is in the mass of limestone along its strike shows little evidence of cross faulting, the outcrops of limestone at e and f show no apparent evidence of cross-faulting, the cut H showed no apparent cross-faulting and the shaft D shows the dip of the tactite to correspond to the apparent dip of the limestone with no indication of serious

horizontal disturbance, therefore it is reasonable to assume that the limestone pendant within the area between the northern and southern faults shown on the map is relatively intact and mineable. From these structural features and the presence of ore at G, F, i, j, and J on the hanging wall contact of the granite with the limestone pendant, and also the presence of ore and tungsteniferous tactite at D, d, C, l and E on the footwall contact of the granite and limestone pendant; it is reasonable to estimate the reserves of signified ore in the following manner.

Signified Reserves; Hanging-wall Ore. The strike distance on the surface between the northern and southern faults on the hanging wall side of the pendant is about 240 feet. The indicated width of ore from F to j is over 30 feet and the width of ore indicated in the pit G is about 4 feet, or an overage width of 17 feet. Because contact mineralization of this type is usually irregular this indicated average width should be reduced by 25% to an average of 12 3/4 feet. The faulting in this range generally trends E-W and indications available show the displacement here to be near vertical, therefore it may be assumed that horizontal faults of large displacement probably will not be encountered within the limestone pendent. The depth of mineralization will be limited by the downward extension of the pendant and if it is assumed that the downward extension is approximately equal to the surface length of the pendant, then the signified ore body in the hanging wall tactite is approximately 220 feet long by 200 feet deep by 12 feet wide. Because the grade of ore exposed at the pit G is lower grade than the grade of ore indicated by the dump from shaft F the estimate of average grade of the hanging wall signified ore should be reduced to 0.45% WO_3 from the value of 0.60% WO_3 used for affirmed ore estimate in this area. On this basis the signified ore in the hanging wall contact zone would be about 53,000 short tons having an estimated tungsten content of 0.45% WO_3.

Footwall Ore. The strike distance along the footwall side of the limestone pendant between the northern and southern faults is approximately the same as it is on the hanging wall side or 240 feet. The width of ore in the cut C is at least 18 feet, the width of ore from the collar of shaft D to the ore outcrop at d is about 14 feet and the outcrop of tungsteniferous tactite at E has an indicated width of about 4 feet. This would indicate an average width of at least 10 feet. Because there is surface evidence of granite in place between shaft D and the northern fault and because the tactite outcrop at E is not of ore grade, the length of signified ore in this zone should be reduced in length to 160 feet and the width reduced to about 8 feet. If it is assumed that the footwall structure extends downward to the same level as was used for the hanging wall ore estimate then the vertical dimension of the footwall tactite ore would be 150 feet. Because the tactite exposed at E is not of ore grade the estimated average of the signified ore in this zone should be reduced to 0.50% WO_3 from the grade of 0.70% WO_3 used for the affirmed ore estimate in this area. On this basis the signified ore on the footwall contact zone would be about 30,000 short tons having an estimated tungsten content of 0.50% WO_3.

An estimate of the total tonnage of signified ore summarized from the above data and calculations is 83,000 short tons having a tungsten content of 0.47% WO_3.

3. Possible ore reserves. It is impossible to develop tonnage estimates or ore grades for ores of this class that have any significance because there has been no sampling outside of the area covered by the estimate of signified ore. Favorable geologic structure exists both to the north and the south of the area shown on the attached map. The granite intrusion continues south from the southern fault a distance of about 800 feet where it contacts massive limestone. The surface along this distance contains float of granite with considerable hornstone and mineralized tactite and occasionally small pieces of tungstoniferous garnet. In the limestone near the granite contact the joints and seams sparsely contain relatively large crystals of scheelite. If the lime pendant which was considered in the previous ore reserve estimates continues south of the southern fault as indicated by surface float, there no doubt would be some ore grade tactite in this extension. If the granite-pendant structure continues south to the massive limestone and contains 50% as much ore per unit of length as signified by the known structure previously considered, then the possible ore in this extension would be approximately 150,000 tons.

The northern fault shown on the map appears to be of considerable extent and it may be that less favorable conditions for scheelite mineralization exist in a northern extension of the area. The granite intrusion continues to the north for a distance of at least 2600 feet. A caved tunnel located about 2000 feet north of the northern fault shown on the map apparently bears about S 80° E and x-cuts the course of the hornstones. The dump from this tunnel indicates that it is about 300 feet long and consists essentially of granite. Sufficient hornstone and tactite is present in the dump to indicate that some metamorphosed granite-lime contacts were encountered. A few large tactite boulders on the dump have sufficient florescence to indicate a near ore grade scheelite content. If the northern extension of possible granite-limestone structure continues to the site of this tunnel and contains 25% as much ore per unit of length as that signified in the area shown on the attached map, then the possible ore reserves in this extension would be approximately 350,000 tons. The total possible ore in both the northern and southern extensions of the granite-limestone contact structure would be about 500,000 tons.

There is sufficient geological evidence of pendants and possible tactite zones occurring parallel to the ones considered in this estimate to justify the assumption that some additional tonnage may occur in this manner. It would be ridiculous, however, to attempt to develop the calculation of the possible tonnage from this source.

Sampling: All the scheelite observed in the area covered by the signified ore reserves has a blue white to white florescence under the ultra-violet light. Judged from a color comparator chart for molybdenum content the scheelite mineral will contain less than 0.1% molybdenum. A sample taken by breaking small pieces from ore float scattered over the area shown on the attached map (probably from 80 to 100 separate pieces of high grade float) contained 5.12% WO_3. A portion of the reject from this sample crushed to minus ¼ inch was panned to give a concentrate containing 50.95% WO_3 and trace of MoO_2 and represented 69.5% recovery. Both the grade of concentrate and recovery on this test are unusually good when the coarseness of the feed taken into consideration. The low molybdenum content checks the conclusion made from the color comparator chart.

A cut sample taken of the south side of cut C for a width of 18 feet contained 0.73% WO_3.

A cut sample taken of the north side of cut C for a width of 21 feet contained 0.82% WO_3. The reject from this sample was crushed through 48 mesh and panned to produce a gravity concentrate and a middling. The concentrate assayed 37.40% WO_3 and represented 92.7% recovery. The middling contained 3.35% WO_3 and represented 11.8% recovery. This indicates a recoverable content of 0.86% WO_3.

The dump at the portal of tunnel A shown on the attached map consists mainly of large boulders of dense tactite containing some scheelite mineralization. This material probably came from a zone of tactite traversed by the tunnel in the area of J shown on the map. A sampling of the dump taken without an ultra-violet light by breaking pieces from a large number of boulders on the dump gave an assay return of 0.16% WO_3. Because the fluorescence of this material indicated a higher tungsten content than the analysis showed and because recovery information on the lower grade ore was desired, the reject of this sample was crushed through 48 mesh and panned to produce a gravity concentrate and a gravity middling. The gravity tails were subjected to a flotation test which appeared to recover only a portion of the very fine scheelite. The gravity concentrate contained 42.44% WO_3 and represented 99.0% recovery, the middling contained 1.48% WO_3 and represented 16.4% recovery and the rougher flotation concentrate contained 0.77% WO_3 and represented 21.1% recovery. This accounts for a recovery based on the original assay return of 136.5% and indicates a recoverable content of 0.25% WO_3. From the observed amount of fine scheelite and middlings left in the tailing it is probable that the actual recovery made on this test is not more than 75% and certainly not 136%. This would indicate the true tungsten content of this dense tactite material from tunnel A is about 0.33% WO_3.

The two previous laboratory tests show definite proof that the assay determinations on samples of low grade tactite are inaccurate. It is becoming generally realized that the standard wet method for determination of WO_3 tends to give low results when applied to low grade tactite material. This difficulty is causing concern in the evaluation of other tungsten occurrences in Montana, such as the Brown's Lake and Lost Creek deposits. The Minerals Engineering Company has recently spent several months of research in an effort to develop a more dependable method of determining WO_3 content in these deposits and have come to the conclusion that relatively large samples of the ore subjected to pressure digestion of the tungsten-molybdenum content followed by precipitation and recovery of the tungsten as synthetic scheelite (calcium tungstate) is the most practical method of determining the true recoverable tungsten content of this type of ore. In the case of the Perry Canyon Tungsten deposit the assaying error is of a serious degree and may be sufficient to adversely affect an evaluation of this deposit.

In discussing the problem of establishing true WO_3 content of low grade tactite material with Mr. Clarence Hall, Manager, Black Rock Mine, Wah Chang Company, Bishop, California, he revealed that a practical method employed by them for eliminating the inherent error in the method of determining tungsten content of low grade tactite ores was to concentrate the samples by panning. The concentrate product from panning to contain at least 20% WO_3 if possible. Then from the assay and ratio of concentration of the concentrate a conservative estimate of the recoverable WO_3 in the original sample can be calculated.

This method is suited to the Perry Canyon tactite because the scheelite mineral has a high specific gravity due to a very low molybdenum content. The results of tests of this nature are also of interest because there is an idle 30 ton per day gravity concentration - flotation mill located within 13 miles of the tungsten deposit that could be used to treat the ore by these processes.

Three samples were taken which represent the three main types and grades of ore occurring in the Perry Canyon deposits.

1. A large sample representing the dump from the cut C was crushed and treated by gravity concentration. The tungsten content of the gravity concentrate was 21.6% WO_3 and represented a gravity recoverable tungsten content in the ore of 1.18% WO_3.

2. A sample taken to represent the avera e of the tactite encountered in the shaft D by a thorough sampling of the shaft dump was crushed and treated by gravity concentration. The tungsten content of the gravity concentrate was 17.5% WO_3 and represented a gravity recoverable tungsten content in the ore of 0.33% WO_3.

3. A sample taken to represent the average of the high grade ore encountered in shaft F was taken by chip sampling the ore piles and the large pieces of high grade ore scattered over the shaft dump. This sample was also subjected to a gravity concentration test. The tungsten content of the concentrate was 14.4% WO_3 and represented a gravity recoverable tungsten content in the ore of 1.78% WO_3.

The original assay certificates and rough laboratory notes of all the assays and testwork shown in this application are available for inspection whenever they are required.

Mr. John S. McNabb, Jr, U. S. Bureau of Mines Engineer has examined the property and is familiar with the general geological structure of the area. He has taken five samples as shown on the attached map. The applicant has no knowledge as to the WO_3 content of these samples but would like to point out that samples #3 and #4 were taken from tactite outside of the affirmed and signified ore horizons and are probably low grade.

(d) The project is located five miles from a paved highway and is within one half mile of a maintained county road. There is no established road from the county road to the project but a car can be driven across the land to a point within about 100 feet of the workings. Some roadwork would be required before mining machinery could be hauled to the tunnel site.

A branch line of the Northern Pacific Railway passes within two miles of the property and the nearest present railroad siding is about six miles distant. There is a railroad ore loading ramp for trucks nine miles from the deposit.

The nearest supply point is Whitehall, a town of about 1200 population located approximately 14½ miles from the property. Butte is approximately 44 miles away, over 39 miles of paved highway and 5 miles of county road. Residence points for labor are Silver Star, a small mining town about 10 miles distant, Whitehall, and Waterloo, an agricultural community about six miles from the property.

(e) Because of the recent discontinuence of mining activities at the Broadway mine at Silver Star and the Toledo mine near Sheridan (about 30 miles distant), the availability of experienced miners and mill

operators is excellent. The most of these men have established homes in this area and are now working as farm laborers or are driving long distances to their work. There is no indication at the present time that there will be any problem securing labor, particularly contract labor, for the proposed project.

Mining equipment including all the items shown under the application heading 6. Estimate of Costs. (d), Operating Equipment, can be rented from the Butte Machinery Company, Butte, Montana or the Miller Machinery Company, Missoula, Montana. It is probable that if the exploration work is done on a cost per foot basis, a deal can be made with local contract miners or leasers who have their own mining equipment complete.

There is a branch power line of the Montana Power Company serving the towns and mines in the district that passes within six miles of the property. The exploration work proposed in this application would be performed with gasoline or oil for power.

The Jefferson River is within one and one half miles of the project and a large irrigation canal is located about three-quarters of a mile away. There is also a water development excavation located on the agricultural land leased by the applicant from which water for drilling and other mining operations could be obtained.

5. The Exploration Project - (a) The mineral for which the exploration will be done is scheelite, a tungsten mineral.

(b) The proposed exploration work consists of a total of 580 feet of 5' x 7' cross-cut and drift to be performed in the vicinity of the ore zones considered under the estimate of tonnage of signified ore. The attached 20 foot per inch scale map shows the approximate location of the proposed exploration work. The work would be comprised of a total of 240 feet of cross-cutting tunnel and a total of 340 feet of drifting tunnel on the tactite horizons. The distribution of this work as shown on the attached map is as follows,

1. Cross-cutting from the portal X to the footwall ore zone at Y would require approximately 120 feet of cross-cutting.
2. Drifting north on the footwall tactite to approximately V would require about 80 feet of drifting.
3. Drifting south on the footwall tactite to the approximate position of U would require about 100 feet of drift.
4. Continuing the cross-cut through the hanging wall tactite zone to approximately the location of R would require about 120 feet of additional cross-cutting.
5. Drifting north on the hanging wall tactite to the approximate position T would require about 40 feet of drifting.
6. Drifting south on the hanging wall tactite to approximately the location of S would require about 120 feet of drifting.

The extension of tunnel A and cross-cutting to the east and west from it to the tactite horizons has been considered. This adit is located centrally between the hanging wall and footwall zones and is parallel to them for approximately 100 feet. The use of this tunnel for additional exploration would be unwise because it is a wheelbarrow tunnel and would require retimbering and enlarging throughout, it does not develop sufficient back to be of value as a production tunnel, and would explore the footwall ore body at a depth of only about 10 feet below the ore exposure in cut C. It would be of little value for future

development of the property because of the inconvenient location of its portal and also because of the small depth it can obtain.

The portal X of the proposed exploration tunnel was located at this particular site in order to obtain sufficient depth to contact the formation in place in the area of the footwall tactite horizon. The direction of the cross-cut which is about S 67° E was chosen so as to encounter the hanging wall tactite horizon in the vicinity of the shaft F which shows evidence of having encountered high grade ore. Another factor that influenced the location of the tunnel site at X was the presence of several feet of tungstoniferous tactite in the north dozer cut near N (the north end of the survey base line), that could be the northern extension of a tactite horizon located west of and parallel to the footwall zone.

The primary cross-cut from X to the footwall zone would be approximately 120 feet. This distance is indefinite because of the large width of ore exposed in the cut C and exploration in the tactite should follow the section containing the greatest mineralization.

The drift north on the footwall tactite from Y to a point located approximately at V will be in the zone containing the tonnage estimated as footwall affirmed ore. The bearing of this drift has been decided from the course of the bottom level in shaft D which appears to run parallel to the tactite structure at that point and encounters siliceous granite in the footwall. The final course of this drift should be determined from the geological conditions encountered in the cross-cut. A length of 80 feet will place the face of the north drift at a point vertically below surface indications of granite in place. At the level of the exploration tunnel the location of the granite of course is unknown and the extension of exploration plans further to the north on the basis of present geological information is unjustified.

The drift south in the footwall tactite is based on meager surface indications of ore in this direction. The last 100 feet of the tunnel A is located in the mass of the limestone pendant and shows very little evidence of serious cross faulting that would cut off the southward extension of the ore showing in the cut C, the outcrop of tungstoniferous tactite at E after allowing for dips and differences in elevation should be on the southward extension of the ore at C, and the presence of high grade float in the dozer cut at 1, all contribute to the assumption that the footwall tactite does extend south approximately on the course of the proposed south drift shown on the map. The bearing of this drift south from Y is shown as being the same as the apparent strike of the limestone pendant. A length of 100 feet will bring the face of the drift in the proximity of the southern fault. This should constitute a good location for a diamond drill station if additional exploration south of the fault is justified.

The extension of the main cross-cut for a distance of 120 feet from X to R will make the total cross-cut distance about 240 feet. This distance is not definite and the distance from Z to R has been allowed so that exploration of the full width of the tactite can be assured. The cross-cut will contact the hanging wall tactite zone at the northern limit of the area containing the tonnage estimated as hanging wall affirmed ore. The distance Y to Z cannot be estimated with accuracy at this time because of the possibility that the hanging wall contact between the granite and the pendant may not have the same dip and strike as the footwall tactite.

The location, bearing and length of the north exploration drift from Z to T have been shown without supporting geological information. The presence of ore outcropping at G with an eastward dip suggests that the hanging wall tactite may extend northward beyond the face of the 40 feet of drift shown on the map. This drift would make a good location for diamond drilling to explore the possibility of other zones of tactite occuring parallel to those under consideration at this time.

The drift south on the hanging wall tactite zone will go through the area containing the tonnage estimated as hanging wall affirmed ore at a depth of about 110 feet and would explore the possibility of downward extension of this ore zone. It would extend southward 120 feet to a point S near the downward extension of the southern fault. The face of this drift would provide an ideal location from which diamond drilling could explore the southward extension of the limestone-granite contacts.

Since the work suggested in this application will be truly exploratory and is at present based on assumptions developed from incomplete geological knowledge it is likely that some of the work outlined herein may become unnecessary in view of information acquired as the work progresses. If this should be the case the applicant is agreeable to the performance of an equal amount of work in some other manner providing the alternate work would be done within the area shown on the attached detail map. Any departure from the general exploration work as previously outlined will be subject to the approval of the DMEA engineer administering the loan contract.

(d) The applicant is a graduate mining engineer with an E. M. degree from the Colorado School of Mines. He is willing to supervise the exploration work on a half time basis. He has been manager of the Martin Brothers, a partnership, that has been active in mining in Montana for the last fifteen years. The mining activities of this association have been varied. From 1939-1942 it operated a milling operation on the Drumlummon tailing at Silver, Montana. The process, as a pretreatment to cyanidation, included roasting of the material with natural gas to expell the volatiles and deactivate the decomposed organic matter contained in the plant feed. From 1942-1944 it was engaged in the mining and milling of a lead-copper carbonate orebody at Marysville, Montana. This operation involved a unique flow-sheet developed especially for the recovery by flotation of mixed oxide and sulphide ores. From 1945-1947 this organization made an evaluation of the Golden Sunlight Mine near Whitehall, Montana that required the extensive diamond drilling and underground exploration of a marginal grade ore body containing about 15 million tons. Mr. Martin designed, built and operated a pilot mill for this examination that incorporated attrition grinding, sink-float, flotation, roasting and cyanidation. The mining and metallurgical engineering on this project proved to be correct but the marginal grade of the ore combined the continued inflation of labor and supply costs made the operation of the property unsound economically. The pilot mill used for this examination is now being erected at the Montana School of Mines to be used for metallurgical research. In 1948-1949 Martin Brothers made an evaluation of the Canyon Creek phosphate deposits and developed a cheap method of beneficiation for western phosphate ores. As a result of this engineering work the Victor Chemical Company, Chicago took over the Canyon Creek phosphate leases and constructed a ten million dollar

electric phosphate plant at Silver Bow, Montana. During 1950 and 1951 Mr. Martin was plant superintendent for the Domestic Manganese and Development Company, John H. Cole, president, Butte, Montana. During the summer of 1951 he performed several months of field work on the study of the Brown's lake-Lost Creek - Birch Creek tactite deposits and in late 1951 discovered the Perry Canyon Tungsten deposit, that the applicant now wishes to explore.

Mr. Martin has held positions of responsibility as metallurgical engineer or superintendent for several of the established mining companies. Some of these operations are as follows:

1. The American Zinc, Lead and Smelting Company
   Silver Dyke Mine, Niehart, Montana
2. The Saint Joseph Lead Company
   Hughesville Division, Hughesville, Montana
3. The Rio Tinto Copper Company
   Rio Tinto Mine, Rio Tinto, Spain
4. The Metaline Mining and Leasing Company
   Grandview Mine, Metaline Falls, Washington
5. The Domestic Manganese and Development Co.
   South Montana St., Butte, Montana

6. Estimate of Costs:

(a) Independent contractors. There are no facilities at the property at the present time and all equipment and structures for carrying on the proposed exploration work will have to be provided by the proceeds from the loan. Because of this situation and the exploratory nature of the project as well as the fact that the property is located in an area in which at present there is no other mining activity, it is suggested that all the work, including the provision of equipment, so far as possible, be done by contract. There are several contract miners and leasers in this area that have their own equipment and may be interested in this type of mining. It is urgently requested that consideration be given to the benefits of doing the underground work by contract to such an extent that the usual cost of a working foreman may be eliminated and the advance of the work speeded up by paying the labor on a progress basis. It is the understanding of the applicant that the DMEA is now making short-form contracts for exploration work that allow the work to be done on a cost per foot basis. This would be the prudent manner in which to execute the Perry Canyon project.

The following development of mining costs is based on the assumption that the applicant will be given a short-form contract with the DMEA and replaces the several headings on the application form titled (a) labor, (c) operating materials and supplies, (d) operating equipment. It is supplied purely for the purpose of assisting in arriving at a fair contract price.

Labor: In this general area mining labor contractors normally are expected to be able to make from $20.00 to $22.00 per day. This is true in the Butte camp and also in the outside mining districts such as the Maiden Rock Mine of the Victor Chemical Company and the Montana Phosphate Company at Garrison. Because the amount of work contemplated on this project would require a relatively short time contract and also because of the inconvenience of hauling drilling water and mining supplies, as well as the lack of proper change house facilities and the transportation hazards in the winter months, it will be necessary to allow contract miners to work on a six day basis

and earn as much per day as they can make working in the established mining camps. If it is assumed that the contractors will average four feet per day and work six days per week, then,

Labor Cost	Cost/Week	Cost/Foot
2 miners @ $22.00/day and 5 days	$220.00	
2 miners @ $33.00/day (6th day)	66.00	
Total labor cost (24 feet)	$286.00	$11.92

Operating Materials and Supplies. The cost of the operating materials and supplies for a tunnel contract have been estimated as follows:

Item		Cost/Round	Cost/Foot
Powder, 10# powder/ft. @ $24/cwt			2.40
Fuse, $42.50/3000' roll; 1.4¢/ft.			
12 holes/round @ 7'		1.18	.30
Caps, $22.50/M; 2¼¢ x 12		.27	.07
Bits, 12 bits/round @ 20¢		2.40	.60
Pipe, 2" airline @ 55¢/ft., 1" water @ 27¢ft.			.77
Rail, 16# rail @ $180.00/ton or			
11# of rail per foot @ 9¢/lb.			.99
Ties, 4" x 6" x 30" timber @ $75/M; 18¢ ea.			
at 2 ft. intervals or 290 x 18 ÷ 580			.09
Timbering (round), assuming 20% of			
footage timbered, or 23 sets @ $12.00/set			
prorated over 580' of work			.48
Power (gasoline and oil for compressor)			
8 gal/hr @ 22¢/gal	$14.08		
4 qts oil @ 20¢/qt	.80		
Total fuel/shift		14.88	3.82
Total cost of Material and Supplies			$9.42

(d) Operating Equipment. The following is a list of operating equipment that would be required by a contractor on which he would have to consider a rental service value. The cost is estimated on the basis of an average four foot round for twenty-five days per month.

Item	Rent/mo.	Cost/foot
Compressor	$200.00	$2.00
Mucking machine	180.00	1.80
Mine car	25.00	.25
Drilling machines, hoses, steel turn sheets, etc.	75.00	.75
Air receiver, 5' x 6'	25.00	.25
Pickup truck @ $1800 with depreciation $30 per mo.	30.00	.30
Ventilation blower and vent bag	50.00	.50
Hand tools	20.00	.20
Total operating equipment rental		$6.05

A Summary of the Contract Cost estimate for the proposed project is as follows:

Item of Cost	Cost/foot
Labor	11.92
Material and supplies	9.42
Equipment rental	6.05
Total Contract Cost per foot	$27.39

(b) Supervision. The applicant, who is a graduate Mining Engineer, is willing to supervise the project on a half time basis. In arriving at a reasonable compensation for his time consideration has been given to a recent offer from Manganese Incorporated, Henderson, Nevada at a starting salary of $700.00 per month. On this basis it would not be equitable for him to supervise the project on a half time basis for less than $300.00 per month because the project is located so that other engineering work could not be carried on simultaneously. To give the project daily attention will require practically full loss of earning power from any other source. For this reason, if supervision can be obtained for less cost and provide the technical ability and geological understanding to properly interpret and direct the work it will be agreeable to the applicant. The applicant, however, considers the supervision of the work of extreme importance because the intelligent interpretation of the geological knowledge gained during the progress of the exploration will to a great extent determine the ultimate worthiness of the project.

(f) Improvements. It will be necessary to construct about one-half mile of new road from the valley floor to the tunnel site in order to provide transportation of equipment and supplies. It is essential that a pick up truck be able to haul drilling water to the portal of the tunnel. The road could be built in approximately two days with a medium sized bull-dozer at an estimated cost of $150.00.

New Buildings. A compressor house would be required in order to provide a means of keeping equipment and supplies out of the weather. It would also serve as a work shop for the repair of equipment and tools. An estimate of the cost of a compressor house 10' x 12' is as follows:

1000 bd. ft. of rough 2 x 4, 2 x 6 and 1" siding	$77.00
2 rolls 3 ply roofing	12.00
2 rolls 3 ply tar paper	8.00
1 window and 1 door (used)	8.00
18# 16d nails @ 15¢	2.75
15# 20d nails @ 15¢	2.25
6 days labor @ $15.00/day	90.00
Total cost of compressor house	$200.00

(g) Miscellaneous.

Analytical work, 25 samples @ $5.00	125.00
State Industrial Accident @ 8.0% (7/1/52)	721.17
Federal insurance Contributions Act	
OAB @ 1½% from Employer	135.22
State Unemployment Compensation, 2.7%	243.39
Accounting and stenographical expense	210.00
Total miscellaneous	$1434.78

(h) Contingencies. There will be some unpredictable expense in connection with road maintenance during the winter weather. This cost will be essentially for snow removal and may include the cost of occasionally opening the last two miles of road to the property. An estimate of $300.00 has been made for this contingency.

Summary: A summary of the total cost of the project is as follows:

Account	Cost
Contract on 580 feet of crosscut and drift @ $27.39 per foot	$15,886.20
Supervision - 6½ months @ $300.00	1,950.00
Improvements - ½ mile of road	150.00
New Buildings - Compressor house	200.00
Miscellaneous - Essentially pay roll taxes	1,434.78
Contingency - Winter road maintenance	300.00
Estimated total cost of project	$19,920.98

7. (a) The applicant is prepared to furnish his share (25%) of the cost of the proposed project.

(b) The applicant proposes to furnish his share of the costs by carrying on the exploration work as finally approved. At intervals of not longer than monthly, the applicant will submit a statement of costs and footage of contract completed, supported by proper vouchers and affidavits as may be provided for in a short-form contract between the DMEA and the applicant. On approval of the said statement of costs by the DMEA administrator in this area the Government will reimburse the applicant with 75% of the amount of the approved cost statement. The applicant will be agreeable to whatever similar procedure that may have been worked out for exploration assistance loans provided the applicant will not be required to stand the full cost burden of the project for a period of more than one month.

Respectfully,

Carl C. Martin

Carl C. Martin

Lease Contracts

The following documents are the contracts whereby the applicant holds the mineral rights on the land upon which he wishes to perform the exploration work.

The contract covering the mining rights on section 17, T1S - R4W with the Northern Pacific Railway Company is a prospecting permit for a duration of one year that contains a provision whereby on page 2, second paragraph, the grantor agrees that upon the discovery of mineral of paying quantities the grantee may demand, and the grantor will execute and deliver to him a lease in the form of the attached Exhibit A which is a part of said prospecting permit. At such time as the Government may require it, the applicant will demand the execution of the lease designated as Exhibit A.

The lease and option agreement covering the SE¼ of the SE¼ of section 18 is a standard lease and option agreement and makes provision for possible exploration under a Government participation loan.

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT made this 20th day of February, 1952, between the NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, grantor, and CARL MARTIN AND A. B. MARTIN, of Butte, Montana, grantees.

The grantor in consideration of the sum of One Dollar ($1.00) to it paid, the receipt whereof is acknowledged, hereby grants unto the grantees during the term of one (1) year commencing with the date of this contract, the right to prospect for, mine and remove all valuable metalliferous minerals except such as are recoverable by placer mining methods, which may be contained in the following described land situate in Madison County, State of Montana, to wit:

All of fractional Section Seventeen (17), in Township One (1) South, Range Four (4) West of the Montana Principal Meridian, subject to the rights of a lessee of the premises for grazing purposes.

Should title to the premises fail, the grantor shall not be liable for more than the amount received hereunder with interest at four (4) per cent per annum; should title to a portion of the premises fail, such liability is limited to the amount received from or on account of the portion as to which title fails.

The grantees will commence explorations upon the premises and will diligently and continuously prosecute such work during the term (unless temporarily interrupted by causes beyond grantees' control) or until valuable minerals are earlier discovered in paying quantities; the grantees will expend the sum of Three Hundred Dollars ($300.00) in such exploration work during the term of said contract.

The grantees will furnish to the grantor monthly reports showing the progress and results of all explorations upon the premises as well as upon adjoining lands controlled by the grantees.

Should the grantees discover minerals in paying quantities within the term of this permit, they may within thirty (30) days after such discovery demand and the grantor will execute and deliver to them a lease in the form hereto attached marked Exhibit "A" covering four (4) forty-acre tracts or Government lots designated by the grantees in compact form.

For all ores or concentrates, except tungsten, shipped from the premises during the term of this contract, the grantees will pay to the grantor at its office in St. Paul, Minnesota, a royalty of fifteen (15) per cent of the net smelter returns, and for all tungsten ores or concentrates a royalty of fifteen (15) per cent of the net selling price, as such terms are defined in said Exhibit "A".

The grantor shall have the right by its agents and servants to enter upon the premises or upon the premises where the ore is being treated, at any time for the purpose of inspection and checking the operations of the grantees, not unnecessarily or unreasonably hindering or interrupting such operations, and shall have access at all times to all books and accounts of the grantees or other persons carrying on operations on the premises, or handling the ore removed therefrom, relative to the quantity and quality of ore mined or the value thereof.

Should the grantees fail to diligently and continuously prosecute the work contemplated by this contract or should they fail to carry out any other agreement by them to be performed, this contract shall become null and void and the grantor may re-enter the premises and exclude therefrom the grantees and all

persons claiming under them.

The rights hereby granted are personal and are not assignable.

IN WITNESS WHEREOF the parties have executed this instrument in duplicate.

Attest:

/s/ F. A. Bertelsen
Assistant to the Land Commissioner

NORTHERN PACIFIC RAILWAY COMPANY

By /s/ L. L. Schwarz
Land Commissioner

Witnesses:

/s/ Frank H. Way

/s/ Esther Finnsvid

/s/ R. C. Sherman

/s/ Joseph H. Briney, Jr.

/s/ A. B. Martin

/s/ Cayl C. Martin
Grantees.

Address: Butte, Montana

EXHIBIT "A"

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT MADE this _____ day of_____195_, between NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, lessor, and CARL MARTIN AND A. B. MARTIN, of Butte, Montana, lessees.

The lessor in consideration of the sum of One Dollar ($1.00) to it paid by the lessees, the receipt whereof is acknowledged, and in further consideration of the covenants herein contained to be performed by the lessees, hereby grants unto the lessees for the term of ten (10) years commencing with the date of this contract, the right to mine and remove all valuable metalliferous minerals except such as are recoverable by placer mining methods, which may be contained in the following described land situate in Madison County, State of Montana, to-wit:

(Here to be inserted the four (4) forty acre subdivisions or Government lots selected by the lessees in accordance with the provisions of contract dated February 20, 1952.)

1. The lessees forthwith will enter upon the premises and mine and remove therefrom the valuable metalliferous minerals contained therein, except such as are recoverable by placer mining methods, and will diligently and continuously pursue such work during the term.

2. The lessees will pay to the lessor as rental royalties on all ores produced from the premises, as follows:

For all direct shipping ores which shall contain a commercial amount of the metal tungsten for which the net selling price shall be Thirty Dollars ($30.00)

per ton or less, the royalty shall be ten (10) per cent of such net selling price; where the net selling price shall be in excess of Thirty Dollars ($30.00) per ton, the royalty shall be increased one (1) per cent for each increase of Ten Dollars ($10.00) per ton or fraction thereof of the net selling price of said tungsten ores, but in no event shall the royalty exceed twenty-five (25) per cent of such net selling price.

For all tungsten concentrates shipped from the premises, the lessees will pay a royalty of ten (10) per cent of the net selling price.

For all direct shipping ores other than tungsten ores, where the net smelter returns shall be Fifteen Dollars ($15.00) per ton or less, the royalty shall be ten (10) per cent of such returns; where the net smelter returns shall be in excess of Fiteen Dollars ($15.00) per ton, the royalty shall be increased one (1) per cent for each increase of Two Dollars ($2.00) per ton or fraction thereof of such returns, but in no event shall the royalty exceed thirty (30) per cent of such returns.

The lessee will pay a royalty of ten (10) percent of the net smelter returns upon all concentrates, except tungsten concentrates, and a royalty of ten (10) per cent of the net bullion returns upon all gold and/or silver precipitates and gold and/or silver bullion produced from ores from the premises milled by them.

The value of concentrates or bullion shall not be added to the value of smelter returns so as to increase the royalty rate dependent upon the amount of such returns.

"Net selling price" as referred to herein shall be defined as the amount received by the lessees for such tungsten ores or concentrates less a reasonable

trucking charge for transportation of such ores from the mine to the nearest railway point. "Net smelter returns" shall be the amount paid by the smelter after deducting the charges for railway freight and treatment and also charges for trucking ores and concentrates from the mine to the railway. "Net bullion returns" shall be defined as the amount received by the lessees from the mint or other lawful purchaser of gold and for all gold and/or silver bullion and gold and/or silver precipitates produced from milling ores from the premises milled by them. "Concentrates" shall be defined as any other material resulting from the treatment of ores from the premises which shall be removed.

Royalty payments shall be made to the lessor at St. Paul, Minnesota, on the 15th day of each month covering all operations of the preceding calendar month and shall be accompanied with a report of all such operations and duplicate copies of smelter, refinery, mint or other statements relating to the sale of valuable metalliferous minerals produced from the premises.

The lessees will pay to the lessor semi-annually in advance a rental at the rate of One Dollar ($1.00) per acre per annum, which rental shall be in addition to the royalties payable to the lessor under the provisions of this contract.

3. Commencing with those for the year of the date of this lease, the lessees agree to pay all taxes of every kind levied or imposed upon the lands hereby leased, and upon the improvements placed by them upon the premises; for the calendar year that this lease expires or in the event of earlier termination thereof, the lessees will pay such proportion of the taxes and assessments for that year as the number of months of the year the lease is in effect bears to twelve. The lessees will also pay all taxes levied or imposed upon the minerals produced, including all net proceeds

taxes, and will refund and repay to the lessor any taxes which the lessor may be required to pay to the State of Montana on royalty received; it being the intention that the lessor shall be relieved from the payment of any and all taxes upon the lands, improvements of the lessees, net proceeds, and all other State and local taxes on account of any mining operations by the lessees hereunder.

4. Promptly on demand from time to time the lessees will furnish to the lessor maps and plats based on actual survey showing their workings on the premises and adjoining lands.

5. The lessees will conduct all mining and other operations in such manner only as is usual and customary in skillful and proper operations of similar character to produce the largest possible recovery of the metals, and so as not to cause or permit any unnecessary or unusual permanent injury to the mines or inconvenience or hindrance to subsequent operation of same, and will deposit all earth, rocks and other useless material in such places and in such manner as will not conflict with or embarrass future mining operations.

6. The lessor shall have the right by its agents and servants to enter upon the premises at any time for the purpose of inspection and checking the operations of the lessees, not unnecessarily or unreasonably hindering or interrupting such operations, and shall have access at all times to all books and accounts, of the lessees or other persons carrying on operations on the premises, or handling the ore removed therefrom, relating to the quantity and quality of ore mined or the value thereof.

7. The lessees shall not assign this lease or any interest therein, or sublet the right to work said mines or any part thereof, without the written consent of the lessor.

8. The uninterrupted right of the l ssees to take, use and carry away the ore shall continue unsuspended notwithstanding any disagreement between the parties, provided payment, according to the terms hereof shall be duly made for all ore removed from the premises.

9. At the expiration of the term or upon the earlier termination of this agreement, the lessees shall have ninety (90) days in which to remove all engines, tools, machinery and structures, but shall not remove or impair any supports placed in the mines or any timbers or frameworks necessary to the use and maintenance of the shafts or other approaches to the mines nor any tramways within the mines.

10. The lessees may at any time surrender this lease upon six (6) months written notice to the lessor served by mail addressed to it at St. Paul, Minnesota.

11. If the rent hereby reserved (the royalty being treated as rent), or any part thereof, shall remain unpaid after the time when same should be paid, or if the lessees shall fail to keep or perform any other covenant herein expressed to be performed on their part and such default shall continue for ten (10) days, the lessor at its option after thirty (30) days written notice, served by mail addressed to the lessees at Butte, Montana, may enter upon the premises and exclude therefrom the lessees and all persons claiming under them, and the lessor on like notice may terminate this lease if mining operations upon the premises shall at any time cease for the period of six (6(consecutive months, for any reason other than strikes or accidents.

12. When this lease shall for any cause terminate, the lessees will cause to be entered a certificate of that fact upon the proper books of record, provided this lease shall have been recorded.

13. The lessor shall at all times have a lien upon all ore mined and upon all improvements of the lessees, as security for any unpaid ballances due under this contract, such balances being treated as purchase money, which lien may be enforced in like manner as liens conferred by chattel mortgage under the laws of Montana or in any other proper and lawful manner.

14. Should title to the premises fail, the lessor shall not be liable for more than the amount received hereunder with interest at four (4) per cent per annum; should title to a portion of the premises fail such liability is limited to the amount received from or on account of the portion as to which title fails.

15. A material consideration moving to the lessor, without which this lease would not be made is the covenant by the lessees for themselves, their heirs and assigns, that all minerals and ores shipped from the premises shall be shipped over such railroad line as the lessor may designate, provided that the rates charged by such railroad, its available facilities and the service furnished by it shall be equal in all respects to those which could be furnished by any other competing railroad line; and provided that the cost per ton of haulage and shipment from the premises to the smelter is not greater than that of any other route.

16. Each obligation hereof shall be binding upon and every benefit hereof shall inure to the respective heirs and assigns of the parties.

IN WITNESS WHEREOF, the parties have executed this instrument in duplicate.

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT made this 20th day of March, 1952, between NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, grantor, and CARL MARTIN and A. B. MARTIN of Butte, Montana, grantees.

The parties for a valuable consideration from each to the other moving, the receipt whereof is acknowledged, hereby amend that certain contract between them dated February 20, 1952, relating to prospecting for, mining and removing metalliferous minerals in certain lands in Madison County, Montana, as follows:

1. Insert in the 2nd line on page 3 of Exhibit "A" attached to said contract, after the words "railway point", the following:

> "and less railway freight charges for the transportation of such ores or concentrates consigned to a purchaser at some point of destination within the State of Montana".

2. All other terms and conditions of said contract shall remain unaffected.

IN WITNESS WHEREOF the parties have executed this instrument in duplicate.

Attest:

/s/ F. A. Bertelsen
Assistant to the Land Commissioner

NORTHERN PACIFIC RAILWAY COMPANY

By/s/L. L. Schwarm
Land Commissioner

Witnesses:

/s/ James Sheire

/s/ Stewart Barker

/s/ S. A. Kambo

/s/ R. E. Setterstrom

A. B. Martin

Carl C. Martin
Grantees

Address Butte, Montana

LEASE AND OPTION AGREEMENT

1. THIS LEASE AND OPTION, Made and entered into this ____24 day of April, 1952, by and between Wilber H. Morgan, his wife, whose address is Whitehall, Montana, as the parties of the first part hereto and hereinafter referred to as the Lessors, and Carl C. Martin, whose address is Box J, Whitehall, Montana, as the party of the second part hereto and hereinafter referred to as the Lessee,

W i t n e s s e t h:-

2. That subject to and for and in consideration of these certain royalties, terms, covenants, and conditions hereinafter set forth and to be paid, kept, and performed by said Lessee as hereinafter provided, the said Lessors do hereby lease unto the said Lessee for a period of ten (10) years, commencing with the date of this agreement, unless sooner terminated as hereinafter provided, all of the Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights in and to that certain real property located in the County of Madison, State of Montana, described as follows, to-wit:-

> The East One-half of the Southeast Quarter of Section 18 of Township 1 South of Range 4 West, M.P.M., containing 80 acres, more or less, together with the right in the Lessee, during the life of this agreement, to go upon said property to such an extent as he deems necessary for his comtemplated mining operations and extract and remove and sell the minerals and mineral bearing ores therefrom, and to construct, install, and operate whatever structures, machinery, equipment and other facilities which he may deem necessary, including, without limiting the generality of the foregoing, mills, plants, equipment, and buildings of all kinds, roads, tunnels, shafts, ditches, pipe lines and power lines; it being understood and agreed, however, that the total surface area occupied by said structures, machinery, equipment, and other facilities shall not exceed three acres and that said three acres shall be situated above the level of a certain water development excavation presently situated approximately in the center of the area covered by this agreement, it being specifically understood and agreed that the right to the use of all water which may be developed in said water development excavation, which is now caved and unproductive, is reserved by the Lessors and shall be available to the Lessee only upon express written consent of the Lessors; however, it is understood that this limintation of water use or right is limited to the present water development excavation and the Lessee shall have the right to the use of water developed by his mining activities at other locations upon the premises. It is further understood that said roads, pipelines, and power lines shall be limited to a right of way sixteen feet in width along the present fence lines when traversing those areas within said premises that are under cultivation or that are arable and shall not interfere with the cultivation of premises outside of said right of way.

3. That for the use of said premises under this lease, the Lessee agrees to pay to the Lessors a rental and royalty of ten per cent (10%) of the net proceeds of all ores, concentrates, or minerals extracted, treated, sold, or removed from said premises, and the pruchaser to which said ores, concentrates, or minerals are sold shall be directed to remit, after each shipment, said royalties, together with a copy of the assay and settlement statement to the Whitehall State Bank, Whitehall, Montana, for the credit and information of the Lessors. By the term "net proceeds" shall be meant the net payment mady by the purchaser of said ores, concentrates, or minerals, with only the cost of transportation of said ores, concentrates, or minerals from the premises to the purchaser deducted. All royalties paid hereunder shall be applied on the purchase price for said property set out in the option to purchase hereinafter made a part of this agreement.

4. That it is understood and agreed that the Lessee plans to do exploration work for the discovery of ores upon the premises and that he may make application for an exploration loan from the Government of the United States to complete the exploration of such mineral deposits as the Lessee may discover upon said premises; that Lessors agree to subordinate their rights to such ores as may be discovered by the exploration work done with funds from such Government loan to the extent of permitting a five per cent (5%) royalty on said "net proceeds" to repay said loan; however, it is specifically agreed that this provision shall only apply to those ores actually explored or discovered as a result of work done with the use of funds provided by said Government loan, and in no event will extend for a period longer than ten (10) years from the date of the making of said Government loan. It is further specifically agreed that the royalty payment to the Government of the United States shall in no event reduce the royalty payments due the Lessors under the terms of this agreement, and that the provisions just set forth in this paragraph are necessary requirements of the Defense Minerals Exploration Administration on all strategic mineral exploration loans.

5. That the Lessee agrees that within forty-five days from the date of the consent of this lease and option agreement by the Farmers' Home Administration, he will enter upon said premises and begin geological

examination, prospecting, and/or active exploration thereon and that he will continue to expend not less than Four Hundred Dollars ($400.00) per year on the exploration and/or the mine production of said premises, for the first two years of the life of this agreement, and thereafter pay to said Lessors an annual rental of $80.00 for the remainder of the life of this agreement, but all royalties paid during any one year of the life of this agreement shall apply on said annual rental.

6. That the Lessee agrees to prosecute the exploration work with reasonable diligence and to notify the Lessors, in writing, within a reasonable time of any unfavorable developments or other reason, which in the sole discretion of the Lessee, will cause him to deem it advisable to abandon or cease his activities or work on the premises. In such case, the Lessee shall have the right, at any time, to surrender this Lease and Option Agreement to the Lessors, or one of them, together with a suitable and proper release of the same and all of his right s in said premises, and thereby be relieved and released from all further obligations hereunder.

7. That the Lessee agrees to pay when due and before delinquency the property tax, state and county, on all structures, improvements, machinery and equipment used by him in the operations contemplated under this agreement, and to pay when due and before delinquency all net proceeds tax or gross metals mine tax, if any, to become payable on all ores and proceeds from ores and minerals mined and treated under this agreement, and Lessee will not allow such taxes to go delinquent; that Lessors, for their part, will pay when due and before delinquency any and all royalty taxes levied against them on account of royalties paid to them under this agreement, and said Lessors will also pay such property taxes, state and county, as may be assessed against said lands, excluding the said structures, improvements, machinery, and other property and equipment that may be placed thereon by the Lessee, until the Lessee shall exercise his right of purchase under the option agreement hereinafter set forth and shall have received such deed or deeds as are agreed to be given thereunder.

8. That the Lessee undertakes and agrees to comply with the Workmen's Compensation Act of the State of Montana, and to comply with and abide by all of the laws of the United States and the State of Montana relative to mining

operations and work that may be done in connection with mining properties, and to adhere to the rules, regulations, and directions of the Inspector of Mines, acting under authority of law and the State Industrial Accident Board.

9. That the Lessee will so conduct the mining operations contemplated under this agreement so that undue hazards will not be created for others, and in this connection Lessee undertakes and agrees to indemnify and hold harmless the Lessors from and against the payment of any and all damages, claims, and demands of any kind or character whatsoever, resulting from the operations of the Lessee hereunder, except such claims and demands as may be caused or occasioned by the acts or negligence of the Lessors, their agents or employees.

10. That the Lessee will bear exclusively any and all expenses of mining operations carried on under this lease, and protect said property and the Lessors at all times from any and all claims and demands arising therefrom.

11. That the Lessee will cause all work done by him on the premises to be done in a good workman-like manner, with due regard to the safety, development and preservation of the premises as a workable mine.

12. That the Lessors or their agents may, at any and all reasonable times, go upon the premises hereby leased and examine and inspect the same and the underground workings, with the use of all means of ingress and egress.

13. That in the event of the failure of either party to this agreement to comply with or perform any one or more or all of the various terms, covenants, or conditions in this agreement contained, to be by such party complied with or performed as herein provided, then, in such event the other party may, at his or their option, declare this agreement at an end and forfeited by the other party, provided that the party claiming there is a default and forfeiture shall give the other party a notice in writing specifying the failure or default complained of, and the party so receiving such notice shall, within thirty (30) days after actual receipt of the notice, either make good any default of failure of which he is guilty, or this lease and agreement shall thereupon come to an end.

14. Upon the termination of this lease and agreement, whether by forfeiture or otherwise, the Lessee shall have the right to remove from the premises leased at any time within sixty (60) days from the date of such termination all structures

equipment, machinery, and other property placed thereon by the Lessee, provided there are no unfulfilled obligations of the Lessee due the Lessors at that time, and in their connection it is further understood the structures, equipment, machinery and other equipment mentioned in this paragraph may not be so removed until the Lessee has delivered to the Lessor evidence, acceptable to the Farmers Home Administration, that all property tax, state and county, on all structures, improvements, machinery and equipment used by lessor in the operations contemplated under this agreement and any other taxes and assessments constituting a lien on the land resulting from Lessor's operations, have been paid or sufficient funds deposited in escrow to assure their payment upon the amount thereof being ascertained.

15. That as a part and parcel of the foregoing lease and in consideration of the expenditures to be made thereunder by the Lessee and of his entering into said lease, the Lessors now give and grant to the Lessee the exclusive option to purchase at any time during the life of said lease for the sum of Fifteen Thousand Dollars ($15,000.00) from the Lessors all of Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights whatsoever in and to the above described premises, including the permanent right to occupy and use said three acres of surface area and said rights of way for roads, pipelines, and power lines, and telephone lines. In the exercise of this option to purchase, it is agreed that, as aforesaid, all royalties and rentals paid to the Lessors under the provisions of the foregoing lease shall apply on said purchase price of $15,000.00, and it is further agreed that the Lessee shall, in addition to said royalties, have the right to pay such further sums as he may desire to the Lessors on account of said purchase price, such additional payments, as well as said royalties, to be paid to The Whitehall State Bank, Whitehall, Montana, to the credit of said Lessors, and it is agreed that if at any time during the life of said lease the total of such additional payments, if any, and said royalty payments amounts to the sum of $15,000.00, the said Lessors will thereupon by good and sufficient deed convey to the Lessee, free from liens and encumbrances, all of Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights whatsoever

in and to the above described premises, including the right to occupy permanently said three acres of surface area and said rights of way for roads, pipelines, and power lines, and telephone lines. The foregoing lease shall be considered a part and parcel of this option to purchase, and a forfeiture of termination of said lease for any reason shall be considered a forfeiture or termination of this option to purchase, and in the event the said payments on account of said purchase price do not total said $15,000.00 within the life of said lease, then this option to purchase shall forthwith come to an end and be no longer of any force or effect, and the Lessors may retain all payments theretofore made to them, whether as royalties or otherwise, as reasonable rental for the use of said mineral rights and premises during the term this agreement was in effect.

16. It is specifically understood and agreed that both said lease and said option to purchase are subject to the consent of the Farmers Home Administration of the Department of Agriculture of the United States of America, who at the present time holds a mortgage on the premises covered by this agreement.

17. This agreement is binding upon all of the parties hereto, their heirs, executors, administrators and assigns.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands the day and year in this agreement first above written.

/s/ Wilber H. Morgan

/s/ Mary Morgan
Parties of the First Part - Lessors.

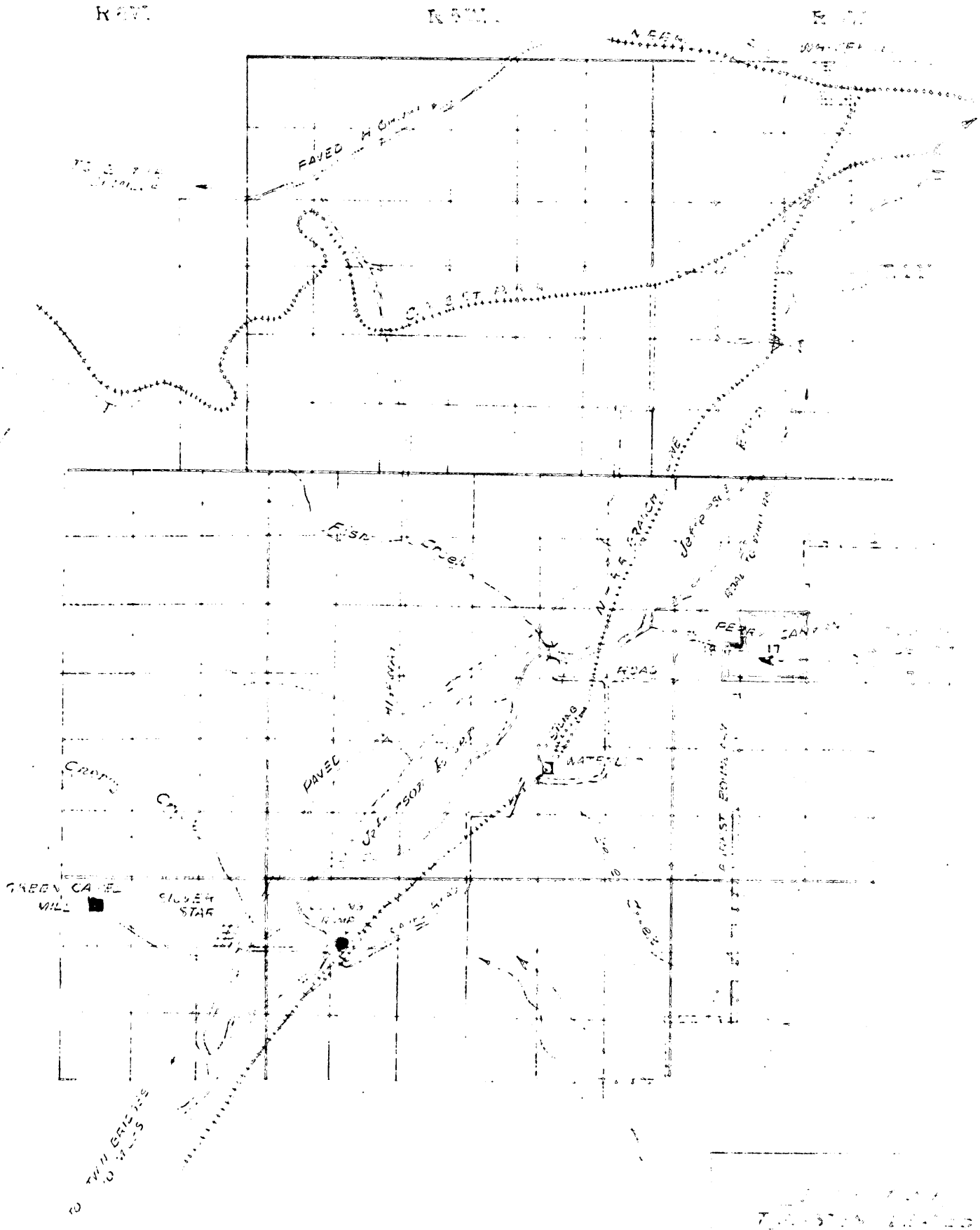
/s/ Carl C. Martin
Party of the Second Part - Lessee

STATE OF MONTANA,)
: ss.
County of Madison)

On this 24 day of April, in the year 1952, before me the undersigned Notary Public for the State of Montana, personally appeared Wilber H. Morgan and Mary Morgan, his wife, and Carl C. Martin known to me to be three of the persons whose names are subscribed to the within and foregoing instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand affixe my Notarial Seal the day and year in this certificate first above written.

/s/ Ben Krutzfeldt
Notary Public for the State of Mont. Residing at Waterloo, Mont. Commission expires Oct 10, 1953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~~Fiscal Division~~ ~~5434 Gen. Law. Off. Bldg.~~ ~~7th & D St. S.W.~~	RUN / STOP		RUN / STOP
~~Mr. E. Gee~~ ~~406 Lemon~~	RUN / STOP		RUN / STOP
~~Supv. Kraft~~ ~~GSA - 5328~~	RUN / STOP		RUN / STOP
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~~Mr. D.M. Lemon~~ ~~Rm. 5216, GSA~~	RUN / STOP		RUN / STOP
Mr Selfridge 3538 Interior	RUN / STOP		RUN / STOP
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EXPLORATION

Subject: DMEA-2598
Re: Exploration Loan
Perry Canyon Tungsten
July 1, 1952

Mr. Carl C. Martin
Box J
Whitehall, Montana

My dear Mr. Martin:

This will acknowledge receipt of your application dated June 22, 1952, for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMEA-2598 and referred to the Iron and Ferro-Alloys Division.

Kindly refer to DMEA-2598 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Administrative Officer

7862

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
So. 157 Howard Street
Spokane 4, Washington

June 27, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
JUN 30 1952

Chairman, Operating Committee
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.

Dear Sir:

Enclosed are three copies of an application for exploration aid submitted by Carl C. Martin, Box J, Whitehall, Montana. One copy of the application has been retained for our files, and a field examination will be scheduled as soon as possible.

Sincerely yours,

K. H. Gray
Kathryn Gray
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosures

cc: USBM

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

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DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 30 1952

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MT-103
(Revised April 1952)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 30 1952

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. DMEA-2598
Metal or Mineral
Date Received 6-30-52
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Carl C. Martin, Mining and Metallurgical Engineer
Box J, Whitehall, Montana

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

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

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

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

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

(*b*) State any mine name by which the property is known. Perry Canyon Tungsten

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

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

(*e*) If you own the land, describe any liens or encumbrances on it Mineral Rights are held by leases

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

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

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

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

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

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

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Scheelite
(A mineral of Tungsten)

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

(*c*) The work will start within 10 days from notification of approval of project and be completed within 6 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated JUNE 22, 1952

Carl C. Martin
(Applicant)

By

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

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Perry Canyon Tungsten - Carl C. Martin, Whitehall, Montana

Attachments and Information to Accompany Application for Aid in an Exploration Project under the Defense Minerals Exploration Administration.

1. Name of applicant; (a) Carl C. Martin, Mining and Metallurgical Engineer, Box J, Whitehall, Montana.

3. Applicants property rights; (a) The applicant holds the mineral rights to the land he wishes to explore by two separate lease agreements. The land on which the most of the exploration work would be performed is in Section 17, T1S-R4W and is owned by the Northern Pacific Railway, on which the applicant has a prospecting permit on 640 acres and a mining lease option on 160 acres. (See attached copy of T & M contract #3498, February 20, 1952 between the Northern Pacific Railway Company and the applicant.) Carl C. Martin is trustee of this agreement and at such time as an exploration loan is approved, the A. B. Martin interest in this contract will be assigned to the applicant. A small amount of the exploration work would be done on agricultural land holding the mineral rights on the E½ of SE¼ of section 18, T1S-R4W, on which the applicant has a lease and option to purchase the mineral rights. (See attached copy of lease agreement between Wilbur H. Morgan and Carl C. Martin, April 24, 1952.) All exploration work including roads will be upon land held under one or the other of these two agreements.

(b) The name of the property is Perry Canyon Tungsten. Although some prospecting had been done on the property 40 to 50 years ago there is no other name, to the applicants knowledge, by which the property has been known.

(c) The applicant is lessee of the mineral rights to the land under the provisions of the contracts attached to this application.

(e) The land is held by lease agreements.

(f) There are no unpatented or patented mining claims as the land and mineral rights are on deeded land.

4. Physical description; (a) The Perry Canyon Tungsten property on which the proposed exploration would be done is situated in Madison County, Montana on the east side of the Jefferson River Valley about 6 miles from the post office of Waterloo. It is at an elevation of about 4600 feet. The mineralized area is mainly in the W½ of the SW¼ of Section 17, T1S - R4W. There has been no production of record but rumor has it that about $17,000 in high-grade silver-lead oxide ore was produced from this property about 1910. Considerable early prospecting of the mineralized area was done by short tunnels and shafts. The most important of these workings are shown on the attached 20 feet per inch scale plan of the area in which the proposed exploration work would be done. They consist of one adit approximately 149 feet in length shown at A with 52 feet of cross-cut shown at B, two surface cuts shown at C and H, a shaft approximately 35 feet deep at D and a shaft 25 feet deep shown at F. One surface cut C is in ore showing about 18 feet of width, and both shafts D and F are in the ore horizon, the dumps of which consist mainly of high grade ore. Elevations of these workings given on the plan map show the relation between these ore showings. The approximately 900 feet of bull-dozer work done on the property by the applicants in an endeavor to establish continuity of the mineralization is shown on the map. This work was of almost no value because the overburden is so heavy that exploration of this type

is impractical. There are no production facilities on the property at the present time, however, all the tunnels and shafts shown on the attached map are accessible for examination purposes.

(b) and (c) There has been no production of tungsten from the property and only a rumored production of a small amount of high-grade lead-silver ore. An examination of the present workings shows no evidence of ore stoping and it is doubtful that any production has ever been made. The property is of value because of its excellent showings of sheelite mineralization. There is no present production and the exploration loan is required to explore the indicated ore horizons so that an evaluation of the ore occurrences can be made.

Ore reserve estimates must be made on rather meager information both as to ore grades and geological evidence. The geology consists of a pendant of limestone in an intrusion of granite. The presence of the pendant is indicated by the limestone (silicified) shown in the tunnel A and by outcrops at e, f, g, and h on the attached map. The strike of the pendant appears to be S 10° E and the dip 60° to 75° E and NE. From the information available at this time there appears to be a zone of tactite carrying sheelite mineralization along both the hanging wall and footwall contacts of the limestone with the granite. The footwall tactite is indicated by ore outcrops at D, d, C, l and E. The hanging wall tactite is indicated in the shaft F and by outcrops at i, j, and G.

On the basis of the above outcrops and exposures ore reserves are estimated as follows:

1. Affirmed reserves; Footwall ore. The cut C has an exposed ore width on the south side of 18' from which a cut sample over this width contained 0.73% WO_3; The north side of this cut exposes an ore width of 21 feet from which a cut sample contained 0.82% WO_3. The strike of the ore is S 6° E. The shaft at D is vertical for 16 feet and inclined for approximately 20 feet at a dip of about 60° N 80° E. There is a small drift from the bottom of this shaft extending north about 16 feet. The hanging wall of the shaft and drift, from the degree of fluorescence, appears to be in very good ore. The fluorescence is considerable better in the bottom than it is at the shaft collar. From the north end of the bottom level a short x-cut to the west is in an extremely siliceous phase of the intrusive, however, the high grade sheelite mineralization in the tactite apparently continues on to the north. An outcrop of ore grade garnet occurs at d on the map. From the above information an estimate of the ore in this area may be made in the following manner.

If the tactite ore in the cut C continues south to the ore float shown at l and north to the face of the lower level from shaft D, which is in excellent ore, there would be an ore length along the strike of at least 65 feet. The width of the ore showing in cut C is at least 18 feet and the width of ore indicated by the collar of shaft D and the ore outcrop at d is approximately 14 feet, indicating an average ore width of 16 feet. Because of some low grade tactite showing on the dump of shaft D the average ore width probably should be reduced to about 10 feet. The inclined section of the shaft D is on the same dip and strike as that of ore shown in the cut and the formation in the shaft appears to be in place and undistrubed structurally, therefore it is reasonable to expect the mineralization to continue downward another 15 or 20 feet to a depth of approximately 50 feet. From the data available this area should contain an ore body approximately 65 feet long by 10 feet wide by 50 feet deep containing about 3250 short tons of an average grade of 0.70% WO_3.

Hanging Wall Ore: The dump from shaft F on the accompanying map contains an abundance of extremely high grade ore containing from 1.5% WO_3 to in excess of 5.0% WO_3. High grade ore pieces are of such size as to indicate that ore widths of at least 20 inches had been encountered. The shaft at present is about 25 feet deep but the amount of caving would indicate that it was originally about 20 feet deeper. The exposed part of the shaft is entirely in tactite, the most of which has a fluorescence indicating about 0.40% WO_3 content. Some granite occurs on the dump and the location of some of the highest grade ore indicates that the high grade ore and the granite were encountered at about the same location. Outcrops of ore grade scheelite occur at j and i on the map. There is no exposure indicating the length of the ore body but from an indicated shaft depth of 45 feet it is probable the ore will persist for a distance of 25 feet on each side of the shaft. The width from the collar of the shaft, which is in good ore, to the ore outcrop at j is approximately 30 feet but because the ore exposures are so indefinite in this area and the actual width of the high grade ore is unknown an average ore width of 8 feet has been considered. The difference in elevation between the bottom level of shaft D and the collar of shaft F is about 93 feet. The bottom level of shaft D is in very good ore and the geology that determines the ore occurrences is the same on both ore horizons, therefore it is reasonable to assume that the mineralization in shaft F will continue to approximately the same depth as that in shaft D. This would indicate an ore depth of about 100 feet in the vicinity of shaft F. From the data available the hanging wall area should have an affirmed ore body 50 feet long by 8 feet wide by 100 feet deep containing about 4000 short tons of an estimated grade of 0.60% WO_3. An estimate of the total tonnage of affirmed ore summarized from the above data and calculations is 7250 short tons containing 0.65% WO_3.

2. Signified ore reserves: Reserves of this class can be estimated by expanding the tonnage of affirmed ore to the indicated limits of the undisturbed tactite horizons. The limestone pendant is apparently cut by nearly vertical faults on both the north and south ends. The northern fault shown on the map has produced a wide zone of disturbance but there is little evidence of the exact strike or the direction of movement. At the point where this fault crosses the tunnel A as shown on the map the fault is nearly vertical and strikes S55°E, however the major faults in this part of the mountain range generally trend E-W and the conditions revealed in the bull-dozer cut on the north end of the area shown on the map indicate that this fault may strike nearer E-W than is indicated by the evidence in tunnel A. The southern fault shown on the map is evidenced in the face of the caved surface cut I. At this point the fault evidence is positive and the strike and dip apparent. The west end of the southernmost bull-dozer cut, where it approaches the S end of the survey base line is apparently in fault rubble or float and contains large pieces of silicified limestone and granite mixed. The tunnel A which for about 120 feet is in the mass of limestone along its strike shows little evidence of cross faulting, the outcrops of limestone at e and f show no apparent evidence of cross-faulting, the cut H showed no apparent cross-faulting and the shaft D shows the dip of the tactite to correspond to the apparent dip of the limestone with no indication of serious

horizontal disturbance, therefore it is reasonable to assume that the limestone pendant within the area between the northern and southern faults shown on the map is relatively intact and mineable. From these structural features and the presence of ore at G, F, i, j, and J on the hanging wall contact of the granite with the limestone pendant, and also the presence of ore and tungsteniferous tactite at D, d, C, l and E on the footwall contact of the granite and limestone pendant; it is reasonable to estimate the reserves of signified ore in the following manner.

Signified Reserves; Hanging-wall Ore. The strike distance on the surface between the northern and southern faults on the hanging wall side of the pendant is about 240 feet. The indicated width of ore from F to j is over 30 feet and the width of ore indicated in the pit G is about 4 feet, or an overage width of 17 feet. Because contact mineralization of this type is usually irregular this indicated average width should be reduced by 25% to an average of 12 3/4 feet. The faulting in this range generally trends E-W and indications available show the displacement here to be near vertical, therefore it may be assumed that horizontal faults of large displacement probably will not be encountered within the limestone pendent. The depth of mineralization will be limited by the downward extension of the pendant and if it is assumed that the downward extension is approximately equal to the surface length of the pendant, then the signified ore body in the hanging wall tactite is approximately 220 feet long by 200 feet deep by 12 feet wide. Because the grade of ore exposed at the pit G is lower grade than the grade of ore indicated by the dump from shaft F the estimate of average grade of the hanging wall signified ore should be reduced to 0.45% WO_3 from the value of 0.60% WO_3 used for affirmed ore estimate in this area. On this basis the signified ore in the hanging wall contact zone would be about 53,000 short tons having an estimated tungsten content of 0.45% WO_3.

Footwall Ore. The strike distance along the footwall side of the limestone pendant between the northern and southern faults is approximately the same as it is on the hanging wall side or 240 feet. The width of ore in the cut C is at least 18 feet, the width of ore from the collar of shaft D to the ore outcrop at d is about 14 feet and the outcrop of tungsteniferous tactite at E has an indicated width of about 4 feet. This would indicate an average width of at least 10 feet. Because there is surface evidence of granite in place between shaft D and the northern fault and because the tactite outcrop at E is not of ore grade, the length of signified ore in this zone should be reduced in length to 160 feet and the width reduced to about 8 feet. If it is assumed that the footwall structure extends downward to the same level as was used for the hanging wall ore estimate then the vertical dimension of the footwall tactite ore would be 150 feet. Because the tactite exposed at E is not of ore grade the estimated average of the signified ore in this zone should be reduced to 0.50% WO_3 from the grade of 0.70% WO_3 used for the affirmed ore estimate in this area. On this basis the signified ore on the footwall contact zone would be about 30,000 short tons having an estimated tungsten content of 0.50% WO_3.

An estimate of the total tonnage of signified ore summarized from the above data and calculations is 83,000 short tons having a tungsten content of 0.47% WO_3.

3. Possible ore reserves. It is impossible to develop tonnage estimates or ore grades for ores of this class that have any significance because there has been no sampling outside of the area covered by the estimate of signified ore. Favorable geologic structure exists both to the north and the south of the area shown on the attached map. The granite intrusion continues south from the southern fault a distance of about 800 feet where it contacts massive limestone. The surface along this distance contains float of granite with considerable hornstone and mineralized tactite and occasionally small pieces of tungsteniferous garnet. In the limestone near the granite contact the joints and seams sparsely contain relatively large crystals of sheelite. If the lime pendant which was considered in the previous ore reserve estimates continues south of the southern fault as indicated by surface float, there no doubt would be some ore grade tactite in this extension. If the granite-pendant structure continues south to the massive limestone and contains 50% as much ore per unit of length as signified by the known structure previously considered, then the possible ore in this extension would be approximately 150,000 tons.

The northern fault shown on the map appears to be of considerable extent and it may be that less favorable conditions for sheelite mineralization exist in a northern extension of the area. The granite intrusion continues to the north for a distance of at least 2600 feet. A caved tunnel located about 2000 feet north of the northern fault shown on the map apparently bears about S 80° E and x-cuts the course of the hornstones. The dump from this tunnel indicates that it is about 300 feet long and consists essentially of granite. Sufficient hornstone and tactite is present in the dump to indicate that some metamorphosed granite-lime contacts were encountered. A few large tactite boulders on the dump have sufficient fluorescence to indicate a near ore grade sheelite content. If the northern extension of possible granite-limestone structure continues to the site of this tunnel and contains 25% as much ore per unit of length as that signified in the area shown on the attached map, then the possible ore reserves in this extension would be approximately 350,000 tons. The total possible ore in both the northern and southern extensions of the granite-limestone contact structure would be about 500,000 tons.

There is sufficient geological evidence of pendants and possible tactite zones occurring parallel to the ones considered in this estimate to justify the assumption that some additional tonnage may occur in this manner. It would be ridiculous, however, to attempt to develop the calculation of the possible tonnage from this source.

Sampling: All the sheelite observed in the area covered by the signified ore reserves has a blue white to white fluorescence under the ultra-violet light. Judged from a color comparator chart for molybdenum content the sheelite mineral will contain less than 0.1% molybdenum. A sample taken by breaking small pieces from ore float scattered over the area shown on the attached map (probably from 80 to 100 separate pieces of high grade float) contained 5.12% WO_3. A portion of the reject from this sample crushed to minus ¼ inch was panned to give a concentrate containing 50.95% WO_3 and trace of MoO_2 and represented 69.5% recovery. Both the grade of concentrate and recovery on this test are unusually good when the coarseness of the feed taken into consideration. The low molybdenum content checks the conclusion made from the color comparator chart.

A cut sample taken of the south side of cut C for a width of 18 feet contained 0.73% WO_3.

A cut sample taken of the north side of cut C for a width of 21 feet contained 0.82% WO_3. The reject from this sample was crushed through 48 mesh and panned to produce a gravity concentrate and a middling. The concentrate assayed 37.40% WO_3 and represented 92.7% recovery. The middling contained 3.35% WO_3 and represented 11.8% recovery. This indicates a recoverable content of 0.86% WO_3.

The dump at the portal of tunnel A shown on the attached map consists mainly of large boulders of dense tactite containing some sheelite mineralization. This material probably came from a zone of tactite traversed by the tunnel in the area of J shown on the map. A sampling of the dump taken without an ultra-violet light by breaking pieces from a large number of boulders on the dump gave an assay return of 0.16% WO_3. Because the fluorescence of this material indicated a higher tungsten content than the analysis showed and because recovery information on the lower grade ore was desired, the reject of this sample was crushed through 48 mesh and panned to produce a gravity concentrate and a gravity middling. The gravity tails were subjected to a flotation test which appeared to recover only a portion of the very fine sheelite. The gravity concentrate contained 42.44% WO_3 and represented 99.0% recovery, the middling contained 1.48% WO_3 and represented 16.4% recovery and the rougher flotation concentrate contained 0.77% WO_3 and represented 21.1% recovery. This accounts for a recovery based on the original assay return of 136.5% and indicates a recoverable content of 0.25% WO_3. From the observed amount of fine sheelite and middlings left in the tailing it is probable that the actual recovery made on this test is not more than 75% and certainly not 136%. This would indicate the true tungsten content of this dense tactite material from tunnel A is about 0.33% WO_3.

The two previous laboratory tests show definite proof that the assay determinations on samples of low grade tactite are inaccurate. It is becoming generally realized that the standard wet method for determination of WO_3 tends to give low results when applied to low grade tactite material. This difficulty is causing concern in the evaluation of other tungsten occurrences in Montana, such as the Brown's Lake and Lost Creek deposits. The Minerals Engineering Company has recently spent several months of research in an effort to develop a more dependable method of determining WO_3 content in these deposits and have come to the conclusion that relatively large samples of the ore subjected to pressure digestion of the tungsten-molybdenum content followed by precipitation and recovery of the tungsten as synthetic sheelite (calcium tungstate) is the most practical method of determining the true recoverable tungsten content of this type of ore. In the case of the Perry Canyon Tungsten deposit the assaying error is of a serious degree and may be sufficient to adversely affect an evaluation of this deposit.

In discussing the problem of establishing true WO_3 content of low grade tactite material with Mr. Clarence Hall, Manager, Black Rock Mine, Wah Chang Company, Bishop, California, he revealed that a practical method employed by them for eliminating the inherent error in the method of determining tungsten content of low grade tactite ores was to concentrate the samples by panning. The concentrate product from panning to contain at least 20% WO_3 if possible. Then from the assay and ratio of concentration of the concentrate a conservative estimate of the recoverable WO_3 in the original sample can be calculated.

This method is suited to the Perry Canyon tactite because the scheelite mineral has a high specific gravity due to a very low molybdenum content. The results of tests of this nature are also of interest because there is an idle 30 ton per day gravity concentration - flotation mill located within 13 miles of the tungsten deposit that could be used to treat the ore by these processes.

Three samples were taken which represent the three main types and grades of ore occurring in the Perry Canyon deposits.

1. A large sample representing the dump from the cut C was crushed and treated by gravity concentration. The tungsten content of the gravity concentrate was 21.6% WO_3 and represented a gravity recoverable tungsten content in the ore of 1.18% WO_3.

2. A sample taken to represent the average of the tactite encountered in the shaft D by a thorough sampling of the shaft dump was crushed and treated by gravity concentration. The tungsten content of the gravity concentrate was 17.5% WO_3 and represented a gravity recoverable tungsten content in the ore of 0.33% WO_3.

3. A sample taken to represent the average of the high grade ore encountered in shaft F was taken by chip sampling the ore piles and the large pieces of high grade ore scattered over the shaft dump. This sample was also subjected to a gravity concentration test. The tungsten content of the concentrate was 14.4% WO_3 and represented a gravity recoverable tungsten content in the ore of 1.78% WO_3.

The original assay certificates and rough laboratory notes of all the assays and testwork shown in this application are available for inspection whenever they are required.

Mr. John S. McNabb, Jr, U. S. Bureau of Mines Engineer has examined the property and is familiar with the general geological structure of the area. He has taken five samples as shown on the attached map. The applicant has no knowledge as to the WO_3 content of these samples but would like to point out that samples #3 and #4 were taken from tactite outside of the affirmed and signified ore horizons and are probably low grade.

(d) The project is located five miles from a paved highway and is within one half mile of a maintained county road. There is no established road from the county road to the project but a car can be driven across the land to a point within about 100 feet of the workings. Some roadwork would be required before mining machinery could be hauled to the tunnel site.

A branch line of the Northern Pacific Railway passes within two miles of the property and the nearest present railroad siding is about six miles distant. There is a railroad ore loading ramp for trucks nine miles from the deposit.

The nearest supply point is Whitehall, a town of about 1200 population located approximately 14½ miles from the property. Butte is approximately 44 miles away, over 39 miles of paved highway and 5 miles of county road. Residence points for labor are Silver Star, a small mining town about 10 miles distant, Whitehall, and Waterloo, an agricultural community about six miles from the property.

(e) Because of the recent discontinuence of mining activities at the Broadway mine at Silver Star and the Toledo mine near Sheridan (about 30 miles distant), the availability of experienced miners and mill

operators is excellent. The most of these men have established homes in this area and are now working as farm laborers or are driving long distances to their work. There is no indication at the present time that there will be any problem securing labor, particularly contract labor, for the proposed project.

Mining equipment including all the items shown under the application heading 6. Estimate of Costs. (d), Operating Equipment, can be rented from the Butte Machinery Company, Butte, Montana or the Miller Machinery Company, Missoula, Montana. It is probable that if the exploring work is done on a cost per foot basis, a deal can be made with local contract miners or leasers who have their own mining equipment complete.

There is a branch power line of the Montana Power Company serving the towns and mines in the district that passes within six miles of the property. The exploration work proposed in this application would be performed with gasoline or oil for power.

The Jefferson River is within one and one half miles of the project and a large irrigation canal is located about three-quarters of a mile away. There is also a water development excavation located on the agricultural land leased by the applicant from which water for drilling and other mining operations could be obtained.

5. The Exploration Project - (a) The mineral for which the exploration will be done is scheelite, a tungsten mineral.

(b) The proposed exploration work consists of a total of 580 feet of 5' x 7' cross-cut and drift to be performed in the vicinity of the ore zones considered under the estimate of tonnage of signified ore. The attached 20 foot per inch scale map shows the approximate location of the proposed exploration work. The work would be comprised of a total of 240 feet of cross-cutting tunnel and a total of 340 feet of drifting tunnel on the tactite horizons. The distribution of this work as shown on the attached map is as follows,

1. Cross-cutting from the portal X to the footwall ore zone at Y would require approximately 120 feet of cross-cutting.
2. Drifting north on the footwall tactite to approximately V would require about 80 feet of drifting.
3. Drifting south on the footwall tactite to the approximate position of U would require about 100 feet of drift.
4. Continuing the cross-cut through the hanging wall tactite zone to approximately the location of R would require about 120 feet of additional cross-cutting.
5. Drifting north on the hanging wall tactite to the approximate position T would require about 40 feet of drifting.
6. Drifting south on the hanging wall tactite to approximately the location of S would require about 120 feet of drifting.

The extension of tunnel A and cross-cutting to the east and west from it to the tactite horizons has been considered. This adit is located centrally between the hanging wall and footwall zones and is parallel to them for approximately 100 feet. The use of this tunnel for additional exploration would be unwise because it is a wheelbarrow tunnel and would require retimbering and enlarging throughout, it does not develop sufficient back to be of value as a production tunnel, and would explore the footwall ore body at a depth of only about 10 feet below the ore exposure in cut C. It would be of little value for future

development of the property because of the inconvenient location of its portal and also because of the small depth it can obtain.

The portal X of the proposed exploration tunnel was located at this particular site in order to obtain sufficient depth to contact the formation in place in the area of the footwall tactite horizon. The direction of the cross-cut which is about S 67° E was chosen so as to encounter the hanging wall tactite horizon in the vicinity of the shaft F which shows evidence of having encountered high grade ore. Another factor that influenced the location of the tunnel site at X was the presence of several feet of tungsteniferous tactite in the north dozer cut near N (the north end of the survey base line), that could be the northern extension of a tactite horizon located west of and parallel to the footwall zone.

The primary cross-cut from X to the footwall zone would be approximately 120 feet. This distance is indefinite because of the large width of ore exposed in the cut C and exploration in the tactite should follow the section containing the greatest mineralization.

The drift north on the footwall tactite from Y to a point located approximately at V will be in the zone containing the tonnage estimated as footwall affirmed ore. The bearing of this drift has been decided from the course of the bottom level in shaft D which appears to run parallel to the tactite structure at that point and encounters siliceous granite in the footwall. The final course of this drift should be determined from the geological conditions encountered in the cross-cut. A length of 80 feet will place the face of the north drift at a point vertically below surface indications of granite in place. At the level of the exploration tunnel the location of the granite of course is unknown and the extension of exploration plans further to the north on the basis of present geological information is unjustified.

The drift south in the footwall tactite is based on meager surface indications of ore in this direction. The last 100 feet of the tunnel A is located in the mass of the limestone pendant and shows very little evidence of serious cross faulting that would cut off the southward extension of the ore showing in the cut C, the outcrop of tungsteniferous tactite at E after allowing for dips and differences in elevation should be on the southward extension of the ore at C, and the presence of high grade float in the dozer cut at 1, all contribute to the assumption that the footwall tactite does extend south approximately on the course of the proposed south drift shown on the map. The bearing of this drift south from Y is shown as being the same as the apparent strike of the limestone pendant. A length of 100 feet will bring the face of the drift in the proximity of the southern fault. This should constitute a good location for a diamond drill station if additional exploration south of the fault is justified.

The extension of the main cross-cut for a distance of 120 feet from Y to R will make the total cross-cut distance about 240 feet. This distance is not definite and the distance from Z to R has been allowed so that exploration of the full width of the tactite can be assured. The cross-cut will contact the hanging wall tactite zone at the northern limit of the area containing the tonnage estimated as hanging wall affirmed ore. The distance Y to Z cannot be estimated with accuracy at this time because of the possibility that the hanging wall contact between the granite and the pendant may not have the same dip and strike as the footwall tactite.

The location, bearing and length of the north exploration drift from Z to T have been shown without supporting geological information. The presence of ore outcropping at G with an eastward dip suggests that the hanging wall tactite may extend northward beyond the face of the 40 feet of drift shown on the map. This drift would make a good location for diamond drilling to explore the possibility of other zones of tactite occuring parallel to those under consideration at this time.

The drift south on the hanging wall tactite zone will go through the area containing the tonnage estimated as hanging wall affirmed ore at a depth of about 110 feet and would explore the possibility of downward extension of this ore zone. It would extend southward 120 feet to a point S near the downward extension of the southern fault. The face of this drift would provide an ideal location from which diamond drilling could explore the southward extension of the limestone-granite contacts.

Since the work suggested in this application will be truly exploratory and is at present based on assumptions developed from incomplete geological knowledge it is likely that some of the work outlined herein may become unnecessary in view of information acquired as the work progresses. If this should be the case the applicant is agreeable to the performance of an equal amount of work in some other manner providing the alternate work would be done within the area shown on the attached detail map. Any departure from the general exploration work as previously outlined will be subject to the approval of the DMEA engineer administering the loan contract.

(d) The applicant is a graduate mining engineer with an E. M. degree from the Colorado School of Mines. He is willing to supervise the exploration work on a half time basis. He has been manager of the Martin Brothers, a partnership, that has been active in mining in Montana for the last fifteen years. The mining activities of this association have been varied. From 1939-1942 it operated a milling operation on the Drumlummon tailing at Silver, Montana. The process, as a pretreatment to cyanidation, included roasting of the material with natural gas to expell the volatiles and deactivate the decomposed organic matter contained in the plant feed. From 1942-1944 it was engaged in the mining and milling of a lead-copper carbonate orebody at Marysville, Montana. This operation involved a unique flow-sheet developed especially for the recovery by flotation of mixed oxide and sulphide ores. From 1945-1947 this organization made an evaluation of the Golden Sunlight Mine near Whitehall, Montana that required the extensive diamond drilling and underground exploration of a marginal grade ore body containing about 15 million tons. Mr. Martin designed, built and operated a pilot mill for this examination that incorporated attrition grinding, sink-float, flotation, roasting and cyanidation. The mining and metallurgical engineering on this project proved to be correct but the marginal grade of the ore combined the continued inflation of labor and supply costs made the operation of the property unsound economically. The pilot mill used for this examination is now being erected at the Montana School of Mines to be used for metallurgical research. In 1948-1949 Martin Brothers made an evaluation of the Canyon Creek phosphate deposits and developed a cheap method of beneficiation for western phosphate ores. As a result of this engineering work the Victor Chemical Company, Chicago took over the Canyon Creek phosphate leases and constructed a ten million dollar

electric phosphate plant at Silver Bow, Montana. During 1950 and 1951 Mr. Martin was plant superintendent for the Domestic Manganese and Development Company, John H. Cole, president, Butte, Montana. During the summer of 1951 he performed several months of field work on the study of the Brown's lake-Lost Creek - Birch Creek tactite deposits and in late 1951 discovered the Perry Canyon Tungsten deposit, that the applicant now wishes to explore.

Mr. Martin has held positions of responsibility as metallurgical engineer or superintendent for several of the established mining companies. Some of these operations are as follows:

1. The American Zinc, Lead and Smelting Company
   Silver Dyke Mine, Niehart, Montana
2. The Saint Joseph Lead Company
   Hughesville Division, Hughesville, Montana
3. The Rio Tinto Copper Company
   Rio Tinto Mine, Rio Tinto, Spain
4. The Metaline Mining and Leasing Company
   Grandview Mine, Metaline Falls, Washington
5. The Domestic Manganese and Development Co.
   South Montana St., Butte, Montana

6. Estimate of Costs:

(a) Independent contractors. There are no facilities at the property at the present time and all equipment and structures for carrying on the proposed exploration work will have to be provided by the proceeds from the loan. Because of this situation and the exploratory nature of the project as well as the fact that the property is located in an area in which at present there is no other mining activity, it is suggested that all the work, including the provision of equipment, so far as possible, be done by contract. There are several contract miners and leasers in this area that have their own equipment and may be interested in this type of mining. It is urgently requested that consideration be given to the benefits of doing the underground work by contract to such an extent that the usual cost of a working foreman may be eliminated and the advance of the work speeded up by paying the labor on a progress basis. It is the understanding of the applicant that the DMEA is now making short-form contracts for exploration work that allow the work to be done on a cost per foot basis. This would be the prudent manner in which to execute the Perry Canyon project.

The following development of mining costs is based on the assumption that the applicant will be given a short-form contract with the DMEA and replaces the several headings on the application form titled (a) labor, (c) operating materials and supplies, (d) operating equipment. It is supplied purely for the purpose of assisting in arriving at a fair contract price.

Labor: In this general area mining labor contractors normally are expected to be able to make from $20.00 to $22.00 per day. This is true in the Butte camp and also in the outside mining districts such as the Maiden Rock Mine of the Victor Chemical Company and the Montana Phosphate Company at Garrison. Because the amount of work contemplated on this project would require a relatively short time contract and also because of the inconvenience of hauling drilling water and mining supplies, as well as the lack of proper change house facilities and the transportation hazards in the winter months, it will be necessary to allow contract miners to work on a six day basis

and earn as much per day as they can make working in the established mining camps. If it is assumed that the contractors will average four feet per day and work six days per week, then,

Labor Cost	Cost/Week	Cost/Foot
2 miners @ $22.00/day and 5 days	$220.00	
2 miners @ $33.00/day (6th day)	66.00	
Total labor cost (24 feet)	$286.00	$11.92

Operating Materials and Supplies. The cost of the operating materials and supplies for a tunnel contract have been estimated as follows:

Item		Cost/Round	Cost/Foot
Powder, 10# powder/ft. @ $24/cwt			2.40
Fuse, $42.50/3000' roll; 1.4¢/ft. 12 holes/round @ 7'		1.18	.30
Caps, $22.50/M; 2¼¢ x 12		.27	.07
Bits, 12 bits/round @ 20¢		2.40	.60
Pipe, 2" airline @ 55¢/ft., 1" water @ 27¢ft.			..77
Rail, 16# rail @ $180.00/ton or 11# of rail per foot @ 9¢/lb.			.99
Ties, 4" x 6" x 30" timber @ $75/M; 18¢ ea. at 2 ft. intervals or 290 x 18 ÷ 580			.09
Timbering (round), assuming 20% of footage timbered, or 23 sets @ $12.00/set prorated over 580' of work			.48
Power (gasoline and oil for compressor)			
8 gal/hr @ 22¢/gal	$14.08		
4 qts oil @ 20¢/qt	.80		
Total fuel/shift		14.88	3.82
Total cost of Material and Supplies			$9.42

(d) Operating Equipment. The following is a list of operating equipment that would be required by a contractor on which he would have to consider a rental service value. The cost is estimated on the basis of an average four foot round for twenty-five days per month.

Item	Rent/mo.	Cost/foot
Compressor	$200.00	$2.00
Mucking machine	180.00	1.80
Mine car	25.00	.25
Drilling machines, hoses, steel turn sheets, etc.	75.00	.75
Air receiver, 5' x 6'	25.00	.25
Pickup truck @ $1800 with depreciation $30 per mo.	30.00	.30
Ventilation blower and vent bag	50.00	.50
Hand tools	20.00	.20
Total operating equipment rental		$6.05

A Summary of the Contract Cost estimate for the proposed project is as follows:

Item of Cost	Cost/foot
Labor	11.92
Material and supplies	9.42
Equipment rental	6.05
Total Contract Cost per foot	$27.39

(b) Supervision. The applicant, who is a graduate Mining Engineer, is willing to supervise the project on a half time basis. In arriving at a reasonable compensation for his time consideration has been given to a recent offer from Manganese Incorporated, Henderson, Nevada at a starting salary of $700.00 per month. On this basis it would not be equitable for him to supervise the project on a half time basis for less than $300.00 per month because the project is located so that other engineering work could not be carried on simultaneously. To give the project daily attention will require practically full loss of earning power from any other source. For this reason, if supervision can be obtained for less cost and provide the technical ability and geological understanding to properly interpret and direct the work it will be agreeable to the applicant. The applicant, however, considers the supervision of the work of extreme importance because the intelligent interpretation of the geological knowledge gained during the progress of the exploration will to a great extent determine the ultimate worthiness of the project.

(f) Improvements. It will be necessary to construct about one-half mile of new road from the valley floor to the tunnel site in order to provide transportation of equipment and supplies. It is essential that a pick up truck be able to haul drilling water to the portal of the tunnel. The road could be built in approximately two days with a medium sized bull-dozer at an estimated cost of $150.00.

New Buildings. A compressor house would be required in order to provide a means of keeping equipment and supplies out of the weather. It would also serve as a work shop for the repair of equipment and tools. An estimate of the cost of a compressor house 10' x 12' is as follows:

1000 bd. ft. of rough 2 x 4, 2 x 6 and 1" siding	$77.00
2 rolls 3 ply roofing	12.00
2 rolls 3 ply tar paper	8.00
1 window and 1 door (used)	8.00
18# 16d nails @ 15¢	2.75
15# 20d nails @ 15¢	2.25
6 days labor @ $15.00/day	90.00
Total cost of compressor house	$200.00

(g) Miscellaneous.

Analytical work, 25 samples @ $5.00	125.00
State Industrial Accident @ 8.0% (7/1/52)	721.17
Federal insurance Contributions Act OAB @ 1½% from Employer	135.22
State Unemployment Compensation, 2.7%	243.39
Accounting and stenographical expense	210.00
Total miscellaneous	$1434.78

(h) Contingencies. There will be some unpredictable expense in connection with road maintenance during the winter weather. This cost will be essentially for snow removal and may include the cost of occasionally opening the last two miles of road to the property. An estimate of $300.00 has been made for this contingency.

Summary: A summary of the total cost of the project is as follows:

Account	Cost
Contract on 580 feet of crosscut and drift @ $27.39 per foot	$15,886.20
Supervision - 6½ months @ $300.00	1,950.00
Improvements - ½ mile of road	150.00
New Buildings - Compressor house	200.00
Miscellaneous - Essentially pay roll taxes	1,434.78
Contingency - Winter road maintenance	300.00
Estimated total cost of project	$19,920.98

7. (a) The applicant is prepared to furnish his share (25%) of the cost of the proposed project.

(b) The applicant proposes to furnish his share of the costs by carrying on the exploration work as finally approved. At intervals of not longer than monthly, the applicant will submit a statement of costs and footage of contract completed, supported by proper vouchers and affidavits as may be provided for in a short-form contract between the DMEA and the applicant. On approval of the said statement of costs by the DMEA administrator in this area the Government will reimburse the applicant with 75% of the amount of the approved cost statement. The applicant will be agreeable to whatever similar proceedure that may have been worked out for exploration assistance loans provided the applicant will not be required to stand the full cost burden of the project for a period of more than one month.

Respectfully,

Carl C. Martin

Carl C. Martin

Lease Contracts

The following documents are the contracts whereby the applicant holds the mineral rights on the land upon which he wishes to perform the exploration work.

The contract covering the mining rights on section 17, T1S - R4W with the Northern Pacific Railway Company is a prospecting permit for a duration of one year that contains a provision whereby on page 2, second paragraph, the grantor agrees that upon the discovery of mineral of paying quantities the grantee may demand, and the grantor will execute and deliver to him a lease in the form of the attached Exhibit A which is a part of said prospecting permit. At such time as the Government may require it, the applicant will demand the execution of the lease designated as Exhibit A.

The lease and option agreement covering the SE½ of the SE¼ of section 18 is a standard lease and option agreement and makes provision for possible exploration under a Government participation loan.

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT made this 20th day of February, 1952, between the NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, grantor, and CARL MARTIN AND A. B. MARTIN, of Butte, Montana, grantees.

The grantor in consideration of the sum of One Dollar ($1.00) to it paid, the receipt whereof is acknowledged, hereby grants unto the grantees during the term of one (1) year commencing with the date of this contract, the right to prospect for, mine and remove all valuable metalliferous minerals except such as are recoverable by placer mining methods, which may be contained in the following described land situate in Madison County, State of Montana, to wit:

All of fractional Section Seventeen (17), in Township One (1) South, Range Four (4) West of the Montana Principal Meridian, subject to the rights of a lessee of the premises for grazing purposes.

Should title to the premises fail, the grantor shall not be liable for more than the amount received hereunder with interest at four (4) per cent per annum; should title to a portion of the premises fail, such liability is limited to the amount received from or on account of the portion as to which title fails.

The grantees will commence explorations upon the premises and will diligently and continuously prosecute such work during the term (unless temporarily interrupted by causes beyond grantees' control) or until valuable minerals are earlier discovered in paying quantities; the grantees will expend the sum of Three Hundred Dollars ($300.00) in such exploration work during the term of said contract.

The grantees will furnish to the grantor monthly reports showing the progress and results of all explorations upon the premises as well as upon adjoining lands controlled by the grantees.

Should the grantees discover minerals in paying quantities within the term of this permit, they may within thirty (30) days after such discovery demand and the grantor will execute and deliver to them a lease in the form hereto attached marked Exhibit "A" covering four (4) forty-acre tracts or Government lots designated by the grantees in compact form.

For all ores or concentrates, except tungsten, shipped from the premises during the term of this contract, the grantees will pay to the grantor at its office in St. Paul, Minnesota, a royalty of fifteen (15) per cent of the net smelter returns, and for all tungsten ores or concentrates a royalty of fifteen (15) per cent of the net selling price, as such terms are defined in said Exhibit "A".

The grantor shall have the right by its agents and servants to enter upon the premises or upon the premises where the ore is being treated, at any time for the purpose of inspection and checking the operations of the grantees, not unnecessarily or unreasonably hindering or interrupting such operations, and shall have access at all times to all books and accounts of the grantees or other persons carrying on operations on the premises, or handling the ore removed therefrom, relative to the quantity and quality of ore mined or the value thereof.

Should the grantees fail to diligently and continuously prosecute the work contemplated by this contract or should they fail to carry out any other agreement by them to be performed, this contract shall become null and void and the grantor may re-enter the premises and exclude therefrom the grantees and all

persons claiming under them.

The rights hereby granted are personal and are not assignable.

IN WITNESS WHEREOF the parties have executed this instrument in duplicate.

Attest:

/s/ F. A. Bertelsen
Assistant to the Land Commissioner

NORTHERN PACIFIC RAILWAY COMPANY

By /s/ L. L. Schwarz
Land Commissioner

Witnesses:

/s/ Frank H. Way

/s/ Esther Finnevid

/s/ R. C. Sherman

/s/ Joseph H. Briney, Jr.

/s/ A. B. Martin

/s/ Carl C. Martin
Grantees.

Address: Butte, Montana

EXHIBIT "A"

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT MADE this _____ day of_____195_, between NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, lessor, and CARL MARTIN AND A. B. MARTIN, of Butte, Montana, lessees.

The lessor in consideration of the sum of One Dollar ($1.00) to it paid by the lessees, the receipt whereof is acknowledged, and in further consideration of the covenants herein contained to be performed by the lessees, hereby grants unto the lessees for the term of ten (10) years commencing with the date of this contract, the right to mine and remove all valuable metalliferous minerals except such as are recoverable by placer mining methods, which may be contained in the following described land situate in Madison County, State of Montana, to-wit:

(Here to be inserted the four (4) forty acre subdivisions or Government lots selected by the lessees in accordance with the provisions of contract dated February 20, 1952.)

1. The lessees forthwith will enter upon the premises and mine and remove therefrom the valuable metalliferous minerals contained therein, except such as are recoverable by placer mining methods, and will diligently and continuously pursue such work during the term.

2. The lessees will pay to the lessor as rental royalties on all ores produced from the premises, as follows:

For all direct shipping ores which shall contain a commercial amount of the metal tungsten for which the net selling price shall be Thirty Dollars ($30.00)

per ton or less, the royalty shall be ten (10) per cent of such net selling price; where the net selling price shall be in excess of Thirty Dollars ($30.00) per ton, the royalty shall be increased one (1) per cent for each increase of Ten Dollars ($10.00) per ton or fraction thereof of the net selling price of said tungsten ores, but in no event shall the royalty exceed twenty-five (25) per cent of such net selling price.

For all tungsten concentrates shipped from the premises, the lessees will pay a royalty of ten (10) per cent of the net selling price.

For all direct shipping ores other than tungsten ores, where the net smelter returns shall be Fifteen Dollars ($15.00) per ton or less, the royalty shall be ten (10) per cent of such returns; where the net smelter returns shall be in excess of Fiteen Dollars ($15.00) per ton, the royalty shall be increased one (1) per cent for each increase of Two Dollars ($2.00) per ton or fraction thereof of such returns, but in no event shall the royalty exceed thirty (30) per cent of such returns.

The lessee will pay a royalty of ten (10) percent of the net smelter returns upon all concentrates, except tungsten concentrates, and a royalty of ten (10) per cent of the net bullion returns upon all gold and/or silver precipitates and gold and/or silver bullion produced from ores from the premises milled by them.

The value of concentrates or bullion shall not be added to the value of smelter returns so as to increase the royalty rate dependent upon the amount of such returns.

"Net selling price" as referred to herein shall be defined as the amount received by the lessees for such tungsten ores or concentrates less a reasonable

trucking charge for transportation of such ores from the mine to the nearest railway point. "Net smelter returns" shall be the amount paid by the smelter after deducting the charges for railway freight and treatment and also charges for trucking ores and concentrates from the mine to the railway. "Net bullion returns" shall be defined as the amount received by the lessees from the mint or other lawful purchaser of gold and for all gold and/or silver bullion and gold and/or silver precipitates produced from milling ores from the premises milled by them. "Concentrates" shall be defined as any other material resulting from the treatment of ores from the premises which shall be removed.

Royalty payments shall be made to the lessor at St. Paul, Minnesota, on the 15th day of each month covering all operations of the preceding calendar month and shall be accompanied with a report of all such operations and duplicate copies of smelter, refinery, mint or other statements relating to the sale of valuable metalliferous minerals produced from the premises.

The lessees will pay to the lessor semi-annually in advance a rental at the rate of One Dollar ($1.00) per acre per annum, which rental shall be in addition to the royalties payable to the lessor under the provisions of this contract.

3. Commencing with those for the year of the date of this lease, the lessees agree to pay all taxes of every kind levied or imposed upon the lands hereby leased, and upon the improvements placed by them upon the premises; for the calendar year that this lease expires or in the event of earlier termination thereof, the lessees will pay such proportion of the taxes and assessments for that year as the number of months of the year the lease is in effect bears to twelve. The lessees will also pay all taxes levied or imposed upon the minerals produced, including all net proceeds

taxes, and will refund and repay to the lessor any taxes which the lessor may be required to pay to the State of Montana on royalty received; it being the intention that the lessor shall be relieved from the payment of any and all taxes upon the lands, improvements of the lessees, net proceeds, and all other State and local taxes on account of any mining operations by the lessees hereunder.

4. Promptly on demand from time to time the lessees will furnish to the lessor maps and plats based on actual survey showing their workings on the premises and adjoining lands.

5. The lessees will conduct all mining and other operations in such manner only as is usual and customary in skillful and proper operations of similar character to produce the largest possible recovery of the metals, and so as not to cause or permit any unnecessary or unusual permanent injury to the mines or inconvenience or hindrance to subsequent operation of same, and will deposit all earth, rocks and other useless material in such places and in such manner as will not conflict with or embarrass future mining operations.

6. The lessor shall have the right by its agents and servants to enter upon the premises at any time for the purpose of inspection and checking the operations of the lessees, not unnecessarily or unreasonably hindering or interrupting such operations, and shall have access at all times to all books and accounts of the lessees or other persons carrying on operations on the premises, or handling the ore removed therefrom, relating to the quantity and quality of ore mined or the value thereof.

7. The lessees shall not assign this lease or any interest therein, or sublet the right to work said mines or any part thereof, without the written consent of the lessor.

8. The uninterrupted right of the lessees to take, use and carry away the ore shall continue unsuspended notwithstanding any disagreement between the parties, provided payment, according to the terms hereof shall be duly made for all ore removed from the premises.

9. At the expiration of the term or upon the earlier termination of this agreement, the lessees shall have ninety (90) days in which to remove all engines, tools, machinery and structures, but shall not remove or impair any supports placed in the mines or any timbers or frameworks necessary to the use and maintenance of the shafts or other approaches to the mines nor any tramways within the mines.

10. The lessees may at any time surrender this lease upon six (6) months written notice to the lessor served by mail addressed to it at St. Paul, Minnesota.

11. If the rent hereby reserved (the royalty being treated as rent), or any part thereof, shall remain unpaid after the time when same should be paid, or if the lessees shall fail to keep or perform any other covenant herein expressed to be performed on their part and such default shall continue for ten (10) days, the lessor at its option after thirty (30) days written notice, served by mail addressed to the lessees at Butte, Montana, may enter upon the premises and exclude therefrom the lessees and all persons claiming under them, and the lessor on like notice may terminate this lease if mining operations upon the premises shall at any time cease for the period of six (6(consecutive months, for any reason other than strikes or accidents.

12. When this lease shall for any cause terminate, the lessees will cause to be entered a certificate of that fact upon the proper books of record, provided this lease shall have been recorded.

13. The lessor shall at all times have a lien upon all ore mined and upon all improvements of the lessees, as security for any unpaid ballances due under this contract, such balances being treated as purchase money, which lien may be enforced in like manner as liens conferred by chattel mortgage under the laws of Montana or in any other proper and lawful manner.

14. Should title to the premises fail, the lessor shall not be liable for more than the amount received hereunder with interest at four (4) per cent per annum; should title to a portion of the premises fail such liability is limited to the amount received from or on account of the portion as to which title fails.

15. A material consideration moving to the lessor, without which this lease would not be made is the covenant by the lessees for themselves, their heirs and assigns, that all minerals and ores shipped from the premises shall be shipped over such railroad line as the lessor may designate, provided that the rates charged by such railroad, its available facilities and the service furnished by it shall be equal in all respects to those which could be furnished by any other competing railroad line; and provided that the cost per ton of haulage and shipment from the premises to the smelter is not greater than that of any other route.

16. Each obligation hereof shall be binding upon and every benefit hereof shall inure to the respective heirs and assigns of the parties.

IN WITNESS WHEREOF, the parties have executed this instrument in duplicate.

NORTHERN PACIFIC RAILWAY COMPANY

Montana Division

T&M Contract No. 3498

CONTRACT made this 20th day of March, 1952, between NORTHERN PACIFIC RAILWAY COMPANY, a corporation of Wisconsin, grantor, and CARL MARTIN and A. B. MARTIN of Butte, Montana, grantees.

The parties for a valuable consideration from each to the other moving, the receipt whereof is acknowledged, hereby amend that certain contract between them dated February 20, 1952, relating to prospecting for, mining and removing metalliferous minerals in certain lands in Madison County, Montana, as follows:

1. Insert in the 2nd line on page 3 of Exhibit "A" attached to said contract, after the words "railway point", the following:

> "and less railway freight charges for the transportation of such ores or concentrates consigned to a purchaser at some point of destination within the State of Montana".

2. All other terms and conditions of said contract shall remain unaffected.

IN WITNESS WHEREOF the parties have executed this instrument in duplicate.

Attest:

/s/ F. A. Bertelsen
Assistant to the Land Commissioner

NORTHERN PACIFIC RAILWAY COMPANY

By/s/L. L. Schwarm
Land Commissioner

Witnesses:

/s/ James Sheire

/s/ Stewart Barker

/s/ S. A. Kambo

/s/ R. E. Setterstrom

A. B. Martin

Carl C. Martin
Grantees

Address Butte, Montana

LEASE AND OPTION AGREEMENT

1. THIS LEASE AND OPTION, Made and entered into this _____24 day of April, 1952, by and between Wilber H. Morgan, his wife, whose address is Whitehall, Montana, as the parties of the first part hereto and hereinafter referred to as the Lessors, and Carl C. Martin, whose address is Box J, Whitehall, Montana, as the party of the second part hereto and hereinafter referred to as the Lessee,

W i t n e s s e t h:-

2. That subject to and for and in consideration of these certain royalties, terms, covenants, and conditions hereinafter set forth and to be paid, kept, and performed by said Lessee as hereinafter provided, the said Lessors do hereby lease unto the said Lessee for a period of ten (10) years, commencing with the date of this agreement, unless sooner terminated as hereinafter provided, all of the Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights in and to that certain real property located in the County of Madison, State of Montana, described as follows, to-wit:-

> The East One-half of the Southeast Quarter of Section 18 of Township 1 South of Range 4 West, M.P.M., containing 80 acres, more or less, together with the right in the Lessee, during the life of this agreement, to go upon said property to such an extent as he deems necessary for his contemplated mining operations and extract and remove and sell the minerals and mineral bearing ores therefrom, and to construct, install, and operate whatever structures, machinery, equipment and other facilities which he may deem necessary, including, without limiting the generality of the foregoing, mills, plants, equipment, and buildings of all kinds, roads, tunnels, shafts, ditches, pipe lines and power lines; it being understood and agreed, however, that the total surface area occupied by said structures, machinery, equipment, and other facilities shall not exceed three acres and that said three acres shall be situated above the level of a certain water development excavation presently situated approximately in the center of the area covered by this agreement, it being specifically understood and agreed that the right to the use of all water which may be developed in said water development excavation, which is now caved and unproductive, is reserved by the Lessors and shall be available to the Lessee only upon express written consent of the Lessors; however, it is understood that this limintation of water use or right is limited to the present water development excavation and the Lessee shall have the right to the use of water developed by his mining activities at other locations upon the premises. It is further understood that said roads, pipelines, and power lines shall be limited to a right of way sixteen feet in width along the present fence lines when traversing those areas within said premises that are under cultivation or that are arable and shall not interfere with the cultivation of premises outside of said right of way.

3. That for the use of said premises under this lease, the Lessee agrees to pay to the Lessors a rental and royalty of ten per cent (10%) of the net proceeds of all ores, concentrates, or minerals extracted, treated, sold, or removed from said premises, and the pruchaser to which said ores, contentrates, or minerals are sold shall be directed to remit, after each shipment, said royalties, together with a copy of the assay and settlement statement to the Whitehall State Bank, Whitehall, Montana, for the credit and information of the Lessors. By the term "net proceeds" shall be meant the net payment mady by the purchaser of said ores, concentrates, or minerals, with only the cost of transportation of said ores, concentrates, or minerals from the premises to the purchaser deducted. All royalties paid hereunder shall be applied on the purchase price for said property set out in the option to purchase hereinafter made a part of this agreement.

4. That it is understood and agreed that the Lessee plans to do exploration work for the discovery of ores upon the premises and that he may make application for an exploration loan from the Government of the United States to complete the exploration of such mineral deposits as the Lessee may discover upon said premises; that Lessors agree to subordinate their rights to such ores as may be discovered by the exploration work done with funds from such Government loan to the extent of permitting a five per cent (5%) royalty on said "net proceeds" to repay said loan; however, it is specifically agreed that this provision shall only apply to those ores actually explored or discovered as a result of work done with the use of funds provided by said Government loan, and in no event will extend for a period longer than ten (10) years from the date of the making of said Government loan. It is further specifically agreed that the royalty payment to the Government of the United States shall in no event reduce the royalty payments due the Lessors under the terms of this agreement, and that the provisions just set forth in this paragraph are necessary requirements of the Defense Minerals Exploration Administration on all strategic mineral exploration loans.

5. That the Lessee agrees that within forty-five days from the date of the consent of this lease and option agreement by the Farmers' Home Administration, he will enter upon said premises and begin geological

examination, prospecting, and/or active exploration thereon and that he will continue to expend not less than Four Hundred Dollars ($400.00) per year on the exploration and/or the mine production of said premises, for the first two years of the life of this agreement, and thereafter pay to said Lessors an annual rental of $80.00 for the remainder of the life of this agreement, but all royalties paid during any one year of the life of this agreement shall apply on said annual rental.

6. That the Lessee agrees to prosecute the exploration work with reasonable diligence and to notify the Lessors, in writing, within a reasonable time of any unfavorable developments or other reason, which in the sole discretion of the Lessee, will cause him to deem it advisable to abandon or cease his activities or work on the premises. In such case, the Lessee shall have the right, at any time, to surrender this Lease and Option Agreement to the Lessors, or one of them, together with a suitable and proper release of the same and all of his right s in said premises, and thereby be relieved and released from all further obligations hereunder.

7. That the Lessee agrees to pay when due and before delinquency the property tax, state and county, on all structures, improvements, machinery and equipment used by him in the operations contemplated under this agreement, and to pay when due and before delinquency all net proceeds tax or gross metals mine tax, if any, to become payable on all ores and proceeds from ores and minerals mined and treated under this agreement, and Lessee will not allow such taxes to go delinquent; that Lessors, for their part, will pay when due and before delinquency any and all royalty taxes levied against them on account of royalties paid to them under this agreement, and said Lessors will also pay such property taxes, state and county, as may be assessed against said lands, excluding the said structures, improvements, machinery, and other property and equipment that may be placed thereon by the Lessee, until the Lessee shall exercise his right of purchase under the option agreement hereinafter set forth and shall have received such deed or deeds as are agreed to be given thereunder.

8. That the Lessee undertakes and agrees to comply with the Workmen's Compensation Act of the State of Montana, and to comply with and abide by all of the laws of the United States and the State of Montana relative to mining

operations and work that may be done in connection with mining properties, and to adhere to the rules, regulations, and directions of the Inspector of Mines, acting under authority of law and the State Industrial Accident Board.

9. That the Lessee will so conduct the mining operations contemplated under this agreement so that undue hazards will not be created for others, and in this connection Lessee undertakes and agrees to indemnify and hold harmless the Lessors from and against the payment of any and all damages, claims, and demands of any kind or character whatsoever, resulting from the operations of the Lessee hereunder, except such claims and demands as may be caused or occasioned by the acts or negligence of the Lessors, their agents or employees.

10. That the Lessee will bear exclusively any and all expenses of mining operations carried on under this lease, and protect said property and the Lessors at all times from any and all claims and demands arising therefrom.

11. That the Lessee will cause all work done by him on the premises to be done in a good workman-like manner, with due regard to the safety, development and preservation of the premises as a workable mine.

12. That the Lessors or their agents may, at any and all reasonable times, go upon the premises hereby leased and examine and inspect the same and the underground workings, with the use of all means of ingress and egress.

13. That in the event of the failure of either party to this agreement to comply with or perform any one or more or all of the various terms, covenants, or conditions in this agreement contained, to be by such party complied with or performed as herein provided, then, in such event the other party may, at his or their option, declare this agreement at an end and forfeited by the other party, provided that the party claiming there is a default and forfeiture shall give the other party a notice in writing specifying the failure or default complained of, and the party so receiving such notice shall, within thirty (30) days after actual receipt of the notice, either make good any default of failure of which he is guilty, or this lease and agreement shall thereupon come to an end.

14. Upon the termination of this lease and agreement, whether by forfeiture or otherwise, the Lessee shall have the right to remove from the premises leased at any time within sixty (60) days from the date of such termination all structures

equipment, machinery, and other property placed thereon by the Lessee, provided there are no unfulfilled obligations of the Lessee due the Lessors at that time, and in their connection it is further understood the structures, equipment, machinery and other equipment mentioned in this paragraph may not be so removed until the Lessee has delivered to the Lessor evidence, acceptable to the Farmers Home Administration, that all property tax, state and county, on all structures, improvements, machinery and equipment used by lessor in the operations contemplated under this agreement and any other taxes and assessments constituting a lien on the land resulting from Lessor's operations, have been paid or sufficient funds deposited in escrow to assure their payment upon the amount thereof being ascertained.

15. That as a part and parcel of the foregoing lease and in consideration of the expenditures to be made thereunder by the Lessee and of his entering into said lease, the Lessors now give and grant to the Lessee the exclusive option to purchase at any time during the life of said lease for the sum of Fifteen Thousand Dollars ($15,000.00) from the Lessors all of Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights whatsoever in and to the above described premises, including the permanent right to occupy and use said three acres of surface area and said rights of way for roads, pipelines, and power lines, and telephone lines. In the exercise of this option to purchase, it is agreed that, as aforesaid, all royalties and rentals paid to the Lessors under the provisions of the foregoing lease shall apply on said purchase price of $15,000.00, and it is further agreed that the Lessee shall, in addition to said royalties, have the right to pay such further sums as he may desire to the Lessors on account of said purchase price, such additional payments, as well as said royalties, to be paid to The Whitehall State Bank, Whitehall, Montana, to the credit of said Lessors, and it is agreed that if at any time during the life of said lease the total of such additional payments, if any, and said royalty payments amounts to the sum of $15,000.00, the said Lessors will thereupon by good and sufficient deed convey to the Lessee, free from liens and encumbrances, all of Lessors' right, title, claim, interest, estate, and demand in and to all minerals, mineral rights, and mining rights whatsoever

in and to the above described premises, including the right to occupy permanently said three acres of surface area and said rights of way for roads, pipelines, and power lines, and telephone lines. The foregoing lease shall be considered a part and parcel of this option to purchase, and a forfeiture of termination of said lease for any reason shall be considered a forfeiture or termination of this option to purchase, and in the event the said payments on account of said purchase price do not total said $15,000.00 within the life of said lease, then this option to purchase shall forthwith come to an end and be no longer of any force or effect, and the Lessors may retain all payments theretofore made to them, whether as royalties or otherwise, as reasonable rental for the use of said mineral rights and premises during the term this agreement was in effect.

16. It is specifically understood and agreed that both said lease and said option to purchase are subject to the consent of the Farmers Home Administration of the Department of Agriculture of the United States of America, who at the present time holds a mortgage on the premises covered by this agreement.

17. This agreement is binding upon all of the parties hereto, their heirs, executors, administrators and assigns.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands the day and year in this agreement first above written.

/s/ Wilber H. Morgan

/s/ Mary Morgan
Parties of the First Part - Lessors.

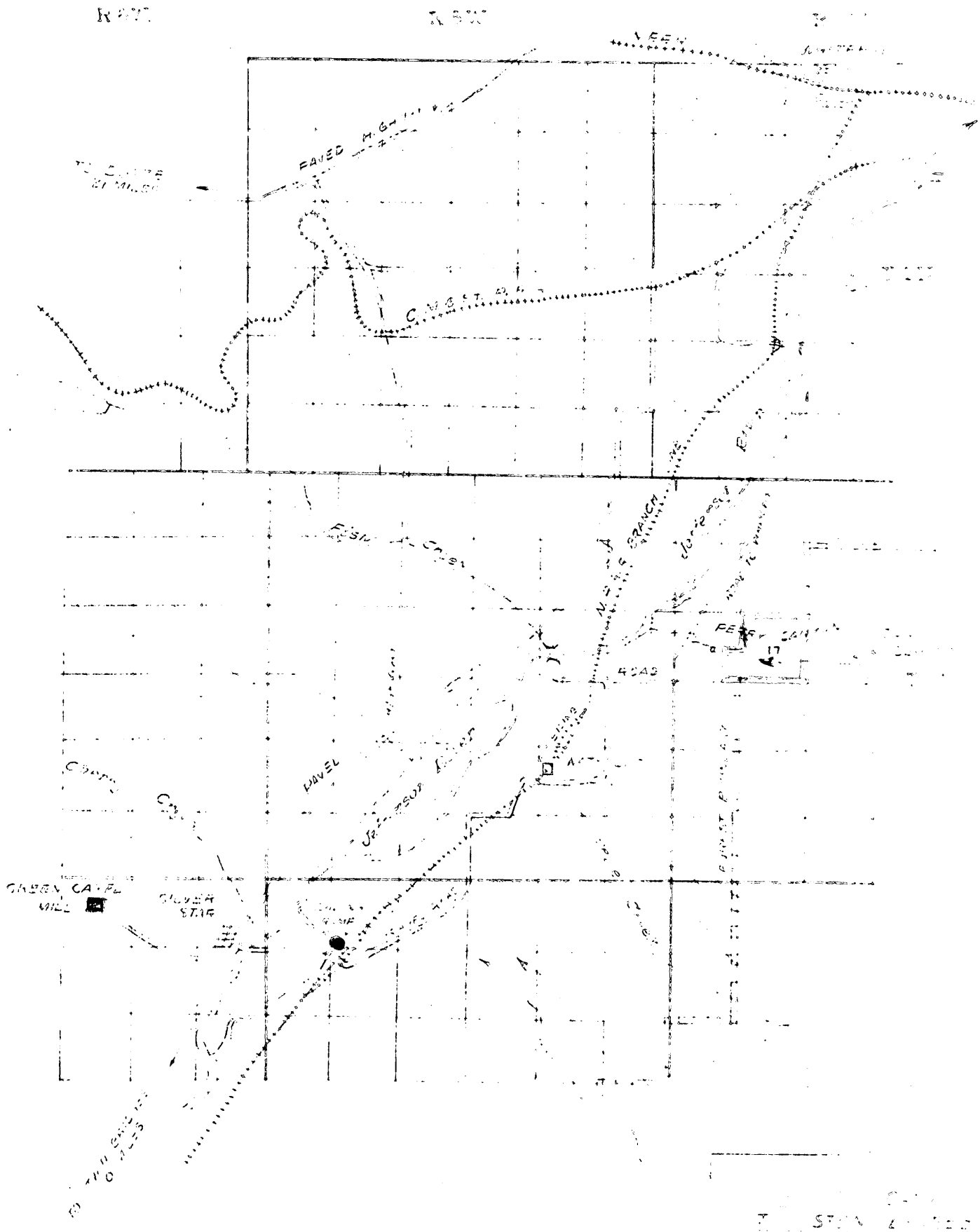
/s/ Carl C. Martin
Party of the Second Part - Lessee

STATE OF MONTANA,)
: ss.
County of Madison)

On this 24 day of April, in the year 1952, before me the undersigned Notary Public for the State of Montana, personally appeared Wilber H. Morgan and Mary Morgan, his wife, and Carl C. Martin known to me to be three of the persons whose names are subscribed to the within and foregoing instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand affixe my Notarial Seal the day and year in this certificate first above written.

/s/ Ben Krutzfeldt
Notary Public for the State of Mont. Residing at Waterloo, Mnt. Commission expires Oct.10, 1952


PAVED HIGHWAY
GRAVEL
CLOVER STAR

DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OFFICIAL BUSINESS

PAYMENT OF POSTAGE, $300
(PMGC)

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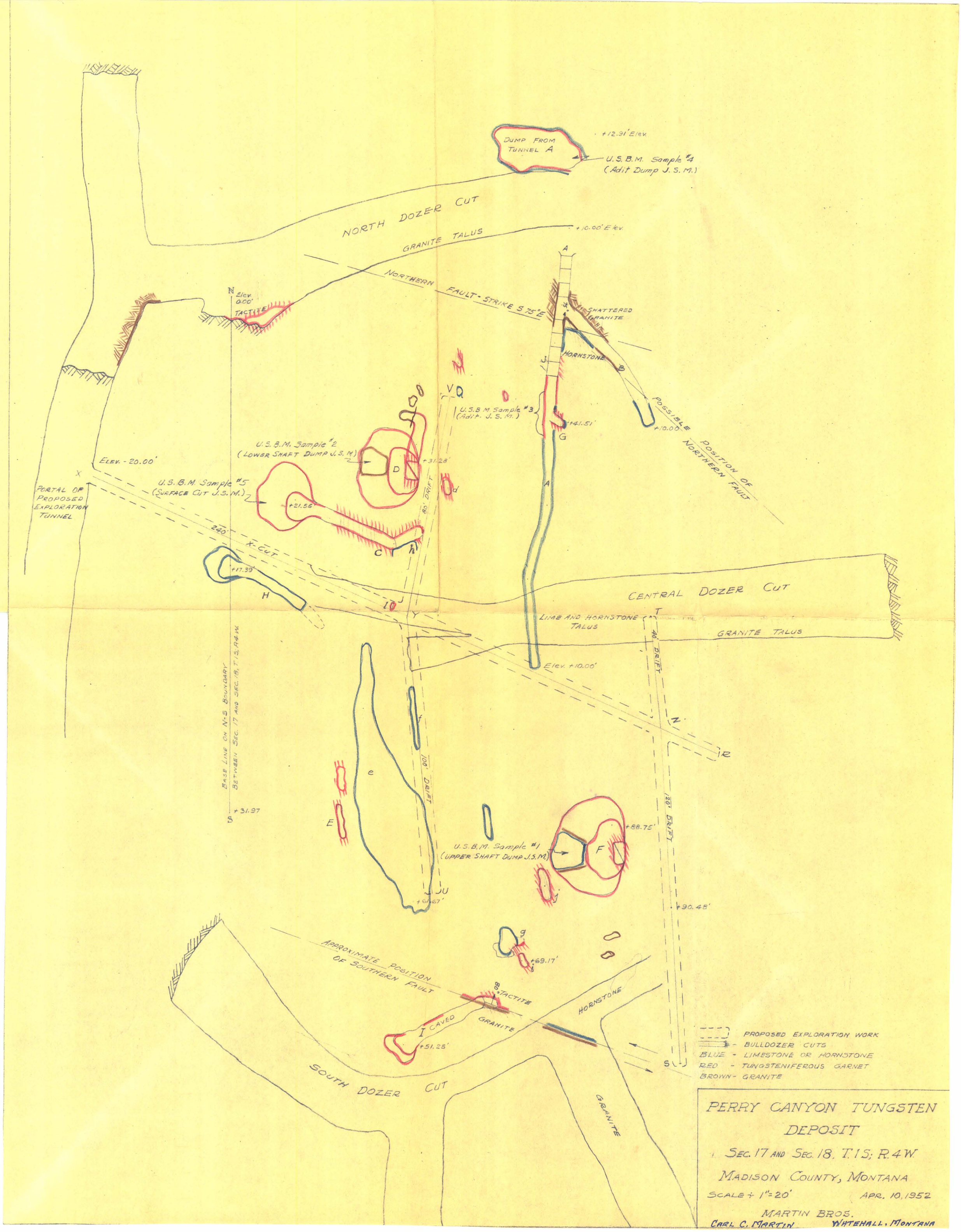
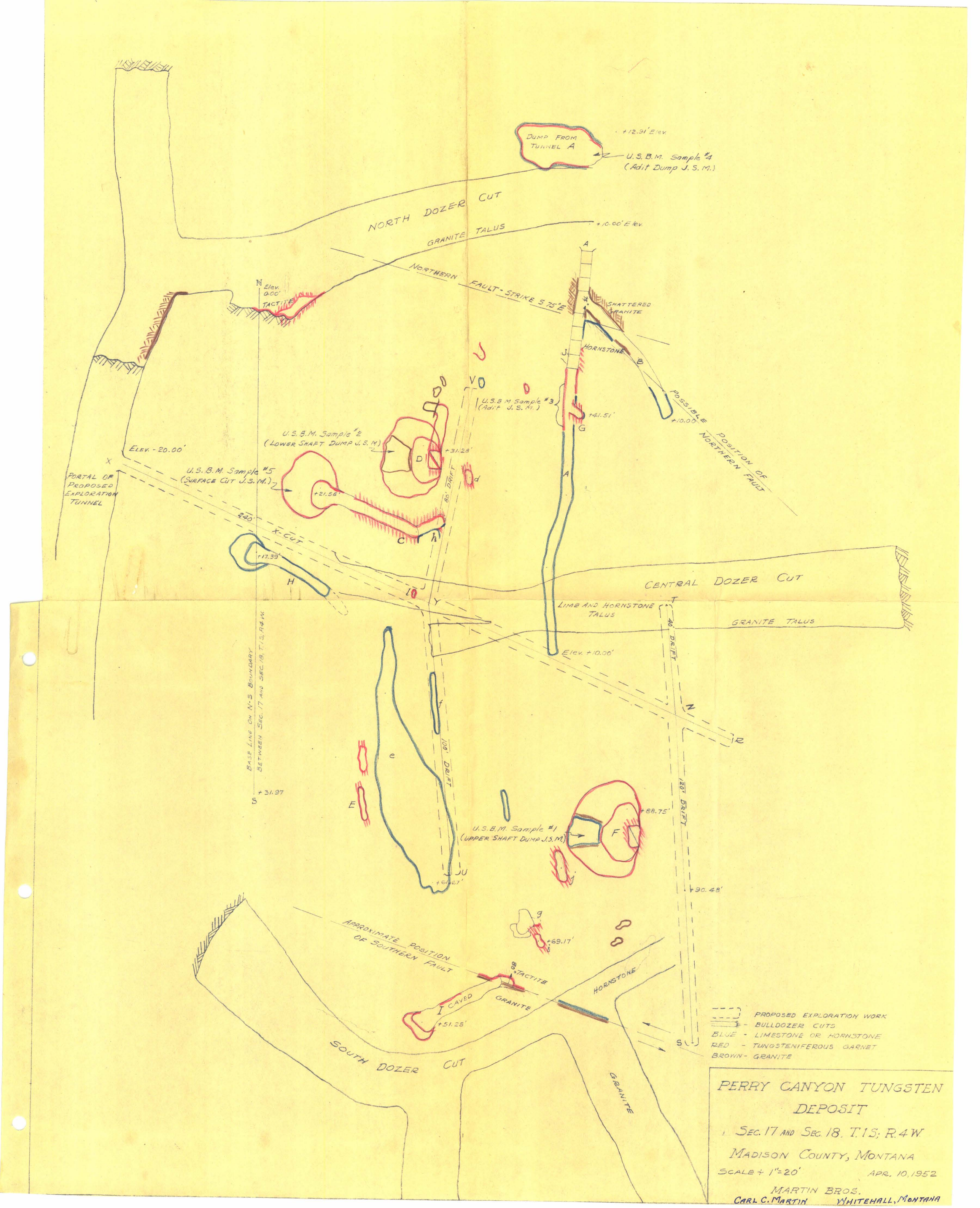
Operating Committee

Defense Minerals Exploration Administration

Department of the Interior

Washington 25, D. C.


DUMP FROM TUNNEL A
+12.91' Elev.
U.S.B.M. Sample #4 (Adit Dump J.S.M.)
NORTH DOZER CUT
GRANITE TALUS
+10.00' Elev.
NORTHERN FAULT - STRIKE S 75° E
N Elev. 0.00'
TACTITE
SHATTERED GRANITE
HORNSTONE
POSSIBLE POSITION OF NORTHERN FAULT
+10.00'
U.S.B.M. Sample #3 (Adit J.S.M.)
+41.51'
U.S.B.M. Sample #2 (LOWER SHAFT DUMP J.S.M.)
+31.28'
ELEV. - 20.00'
PORTAL OF PROPOSED EXPLORATION TUNNEL
U.S.B.M. Sample #5 (SURFACE CUT J.S.M.)
+21.56'
240' X-CUT
80' DRIFT
+17.39'
CENTRAL DOZER CUT
LIME AND HORNSTONE TALUS
GRANITE TALUS
40' DRIFT
Elev. +10.00'
BASE LINE ON N-S BOUNDARY BETWEEN SEC. 17 AND SEC. 18, T.1S., R.4W.
+31.97
100' DRIFT
+61.67'
U.S.B.M. Sample #1 (UPPER SHAFT DUMP J.S.M.)
+88.75'
120' DRIFT
+90.48'
APPROXIMATE POSITION OF SOUTHERN FAULT
TACTITE
CAVED
GRANITE
+51.25'
+69.17'
HORNSTONE
SOUTH DOZER CUT
GRANITE
PROPOSED EXPLORATION WORK
BULLDOZER CUTS
BLUE - LIMESTONE OR HORNSTONE
RED - TUNGSTENIFEROUS GARNET
BROWN - GRANITE
PERRY CANYON TUNGSTEN DEPOSIT
SEC. 17 AND SEC. 18, T.1S; R.4W.
MADISON COUNTY, MONTANA
SCALE 1" = 20'
APR. 10, 1952
MARTIN BROS.
CARL C. MARTIN
WHITEHALL, MONTANA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