DMA Form 1

DEFENSE MINERALS ADMINISTRATION
Control Slip

CONTROLLED DOCUMENT

DMEAXXXX Docket No. 2361

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EXPLORATION PROJECT

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Routing Slip
copies to USGS, USBM, & REGION II

To: CODE 400 Rm. 3538 Date 2-4-52

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Wolcia - 2361
also filed in 2440

MINERALS ENGINEERING'S TUNGSTEN
PROPERTIES MAKE EXCELLENT RECORD - The Mining Record
page 6, October 4, 1956 issue.

Grand Junction, Colo. -- Minerals Engineering Co. reports net realized income of $466,251 for the first six months of 1956, equal to 61 cents a share on 765,951 shares outstanding. The firm's realized net for the 12 months ended December 31, 1955, was $918,424 or $1.20 a share.

R. G. Sullivan, vice president, said that following signature of the new tungsten purchase program by President Dwight D. Eisenhower, the firm has started delivery of 10,000 units monthly by each of its two mines.

Initial deliveries will be against July and August operating months , during which tungsten operation were curtailed and finally suspended because of the demise of the original strategic minerals program.

The ore in concentrates arrives for final processing at Salt Lake Tungsten Co. refinery in Salt Lake City. Minerals owns 50 per cent interest in this property with Sylvania Electric Products Corp.

Mr. Sullivan said that the initial 18½ million dollar appropriation for the tungsten program would be used up by the forepart of 1957 and supplemental funds are needed.

"Several of the western senators and congressmen already are laying plans for securing additional appropriations when the new Congress meets in January," Mr. Sullivan said.

Mr. Sullivan said Minerals recently acquired the Red Button tungsten claims 50 miles northwest of the firm's Glen, Mont., mill. "Their location, ease of open pit mining and grade of ore will permit us to increase deliveries to 10,000 units monthly."

Mr. Sullivan said that drilling of a small portion of the ore body to date showed "positive existence of 100,000 tons of 1.18 per cent (WO_3(tungsten). Such ore would produce a net operating profit before taxes of an estimated $4,100,000." he said.

Mr. Sullivan said that at the Sonora Province, Mexico, tungsten properties, equipment orders had been placed for construction of a 400 ton a day mill. Operations will start early next year and initial deliveries will be made to England, under previously announced credit arrangement with English financiers in March 1957.

"We believe that our Mexican properties have several times the value of the Brown's Lake (Glen, Mont.) property, which will pass the 10 million dollar production figure some time in September (1956)."

Meanwhile, drilling of reserves on the Carter iron ore properties

near Dillon, Mont., continue, disclosing a magnetite body of indicated 200 million tons of which 52 million tons has 30 percent iron content.

Mr. Sullivan said that milling potentials at this property have created serious interest from possible consumers and cost studies are going forward with eye to sales contracts being completed.

Mr. Robert E. Adams, DMEA
Attention: Docket Control
Iron and Ferro-Alloy Division, DMEA

July 11, 1952

Removal of exploration docket from active files of Division
Docket No. DMEA 2361 - Tungsten
Minerals Engineering Company
Greenstone Tungsten Deposit
Beaverhead County, Montana

Transmitted herewith is the above-captioned docket which has been removed from the active files of this Division in accordance with information received from the applicant.

By letter of July 8, 1952, Mr. Burwell indicates that if in future his company seeks exploration aid on the Greenstone property it will be after further work has been done to explore the outcrop of the ore body and more sampling and analytical work has been done. Since such a future exploration program, if decided upon by the Minerals Engineering Company, would be of a different scope, a new application would be required in seeking exploration aid from DMEA.

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

Attachment

LScott
7/11/52

CC: Docket
Admn. Reading File
Field Team, Region II
G. C. Selfridge
D. M. Lemmon, USGS
R. W. Geehan, USBM

EXPLORATION

400

Mr. Blair Burwell, President
Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Re: Docket No. DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Burwell:

During one of our conversations while you were here in Washington this Spring you requested that the subject application be held in abeyance until the question of assays had been definitely settled and possibly a revision of the application submitted.

It is our impression that everyone is now convinced that the average tungsten value of the Greenstone property is much lower than originally indicated by the Lewis and Walker assays. To date we have not had further word from you either submitting additional data supporting the request for the proposed exploration assistance or an alternative proposal.

If it is your intention not to proceed with the application, will you please so advise us and we can withdraw it from our active file and consider the matter closed.

Sincerely yours,

George C. Selfridge

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

GCSelfridge:ls 6/18/52

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

EXPLORATION

400

JUN 6 1952

Mr. A. E. Weissenborn
Executive Officer, DMEA Region II
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. DMEA 2361 - Tungsten
Minerals Engineering Company
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Weissenborn:

Will you please inform us whether or not Mr. Burwell intends to proceed with his application for exploration assistance on the Greenstone property?

During your last visit to Washington you intimated that Mr. Burwell probably was now convinced that the assays by Lewis and Walker were high. Since no drilling was provided for in the contract on the Lost Creek property, it will be impossible to drill one or two holes as previously suggested by the Field Team unless Mr. Burwell does it at his own expense. As you know, the only action that we can take with the present docket is to write a denial. Possibly Mr. Burwell will not want to proceed with the application since he has exploration at Lost Creek. If he does wish to proceed with the application, we would appreciate having him present an alternative program agreeable to the Field Team and ultimately to us.

Will you please give us your comments on the matter at your earliest convenience?

Sincerely yours,

C. O. Mittendorf

Acting Administrator
Defense Minerals Exploration
Administration

GCSelfridge:ls 6/5/52

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

400

~~FILE COPY~~

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

April 29, 1952

Memorandum

To: George C. Selfridge, DMEA

From: Robert W. Geehan, Bureau of Mines

Subject: Mineral Engineering Company DMEA-2361, Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Attached is a copy of the subject docket.

It is my understanding that the applicant is no longer interested in exploration of this deposit because of the low tungsten content of the check samples, and that exploration will be confined to the Lost Creek deposit. The latter, as you know, has been approved for exploration as DMEA-2440.

It is recommended that this application be placed in the inactive file and that the applicant be notified of this action.

Robert W. Geehan

Attachment

RWGeehan:lds
Copy to: Ferrous Metals
Mr. Geehan
~~Fi~~

Copy retained 400

Mr. A. M. Weissenborn
Executive Officer, Region II
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Weissenborn:

Mr. Blair Burwell of Minerals Engineering Company called us the afternoon of February 21 with regard to the Company's exploration application.

Mr. Burwell discussed at length the check work that the Company is doing with regard to tungsten assays. He informed us that the method used by Lewis and Walker was one given them which had been developed by Electro-Met, a subsidiary of Union Carbide. Seemingly, Mr. Burwell has checked the methods used by the Union Assay Company and the Bureau of Mines and believes that their assays are low because of the procedures used.

Apparently Mr. Burwell had discussed the analysis question by telephone with Mr. Volin, who in part at least had concurred with Mr. Burwell in his criticism of Myers' sampling. Mr. Burwell did not believe that chip samples could compare with the bulk samples taken by the Minerals Engineering Company. It is our understanding that Mr. Volin will accompany Mr. Burwell to the property when weather conditions warrant.

Mr. Burwell further stated that there is a possibility of a fair-sized molybdenum deposit along the hanging wall of the properties in which his Company is interested. This possibility should be investigated.

Mr. George Griswold is making beneficiation tests on the tactite in his laboratory in Butte, Montana. The material on which he is working assays approximately .3% WO_3. Checks on products obtained from the beneficiation seemingly confirm the .3% head assay. Possibly the field team could secure some of the samples from Mr. Griswold for check analysis.

In your letter of January 26, 1952, you make mention of sending duplicate pulps of Myers' samples 3 to 6 to Lewis and Walker for determination. Are these results now available?

GCSelfridge:ls
2/25/52

Sincerely yours,

C. O. Mittenderf

Acting Administrator
Defense Minerals Exploration
Administration

cc: Admn. Reading File
Docket
Field Team, Region 2
~~G. O.~~ Selfridge

cc: D. M. Lemmon, USGS
R. W. Geehan, USBM

IN REPLY REFER TO:

G-ID-DML

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

February 19, 1952

Memorandum

To: George B. Holderer, DMPA

Dmea-2292

From: D. M. Lemmon, USGS

Subject: Tungsten ore reserves
American Alloy Metals Co. and Minerals Engineering Co.
Beaverhead County, Montana

DMPA 2281 - Tungsten

Sufficient exploration has not been completed on these properties to prove any substantial ore reserves. Large tonnages of tactite containing some tungsten are partially exposed, but the content of WO_3 is unknown and can be determined only by extensive trenching and sampling.

Work underway at the Ivanhoe claim of American Alloy Metals Co. (DMEA docket No. 2292) is expected to determine the content of WO_3 and tonnage in about 1/3 of the inferred Ivanhoe ore zone. This project should be completed early in the summer of 1952. At present, our information about grade is limited to a single channel cut across the ore body, with an average assay of about 0.4 percent WO_3.

2292

Minerals Engineering Co. actively prospected the surface of the Greenstone and Lost Creek claims in 1951. An application made for an exploration loan on the Greenstone deposit (DMEA 2361) is held in abeyance until the Company can verify its assay data. The Field Team, Region II, in a memorandum dated January 26, points out that assays made by Lewis and Walker for Minerals Engineering are far higher than assays by Ledoux, Union Assay, or Bureau of Mines, and are consequently suspect. Assays by Lewis and Walker are 0.3 to 0.8 percent WO_3, compared with determinations of 0.01 to 0.17 percent made by the other assayors.

2361

The Field Team (memo of February 7 concerning an access road application) states that similar discrepancies in assays exist in connection with the Lost Creek deposits, which are possibly worth considering for an exploration loan if the assay discrepancies can be explained. No application has been made for an exploration loan on the Lost Creek claims.

In a memorandum by W. B. Myers of the Geological Survey (February 7, 1952), the following statements are made:

> "The Lost Creek tungsten prospects, as well as the Ivanhoe and the Greenstone tungsten prospects, several miles to the north and south respectively, are located in contact-metamorphosed calcareous Amsden sediments along the contact of a large granitic body. All three tungsten areas are characterized by the presence of molybdenum, both combined with tungsten as high-powellite scheelite, and as pure powellite (calcium molybdate) which at least in part occurs as an alteration product of molybdenite. The scheelite is typically fine grained. This characteristic in conjunction with the apparently variable percentage amount of powellite combined in the scheelite molecule, plus the masking effect of the secondary powellite, renders the ultraviolet lamp of dubious value in estimating tungsten content.
>
> "A variable but generally small amount of copper mineralization is present at all three areas; at the Ivanhoe and Greenstone prospects the relatively high-grade tungsten mineralization, insofar as it is known, occurs with copper mineralization.
>
> "Inasmuch as it is the opinion of the writer that neither tonnage nor grade can be even approximately determined at present, he believes that more exploration work will be necessary before realistic plans can be laid for efficient mining."

<u>Conclusion</u>

Inasmuch as the Beaverhead County tungsten deposits are still in the prospect stage, it appears that the proposal to convert the Butte mill to tungsten concentration is premature and should be held in abeyance until more exploration is completed at the deposits. Similarily, no immediate action is required on the application of Minerals Engineering for a purchase contract for 100,000 units of WO_3 in low-grade concentrates, at $49 per unit.

DMLemmon:gt

Copy to: Geo.C.Selfridge

February 11, 1952

Memorandum

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

From: Glenn O. Gentry

Subject: Docket No. DMEA 2361 - Tungsten
Greenstone Mine
Beaverhead County, Montana -- $115,595.42

Wide discrepancies between analysts of the tungsten content indicate that considerable additional sampling and analysis by different analysts would be advisable prior to evaluating this mining property. The mathematical average of the group of samples taken follows:

Union Assay Office	U.S. Bureau of Mines	Lewis and Walker
0.0249% WO_3	0.0297% WO_3	0.464% WO_3

Lewis and Walker, analysts for the applicant, should recheck their analysis. If sufficient pulp is available, it is suggested that the applicant have analyses made by:

Union Assay Office, Salt Lake City, Utah
Abbot A. Hanks, San Francisco, California
Twining Laboratories, Fresno, California

Applicant should furnish this office with comparison results. If the rejects were saved from the three samples, namely of 600 lbs., 2,000 lbs., and 2,000 lbs., suggest the applicant crush, mix and split another sample and have the WO_3 content determined by two of the above analysts.

If the applicant substantiates the results obtained by Lewis and Walker, then it might be advisable for the Field Team to take about 1,000 lbs. of sample, as a composite, as a check on the applicant's sampling job. Until reasonable accuracy is assured in the sampling and the WO_3 content, the application should be held in abeyance. The burden of proof is on the applicant.

GOGentry:ls

Glenn O. Gentry

Copy to: Admn. Reading File
Docket
Mr. George B. Holderer, DMPA, Room 7105, GSA Bldg.
Mr. G. G.Gentry

DMEA-2361
Revised

Comparison of Assays

Minerals Engineering Co.
Greenstone Mine - Montana

Feb. 11, 1958

	UNION ASSAY Co.	LISV	LISBM Lab.	Ledoux	Applicants Samples Lewis & Walker	Applicants Samples Lewis & Walker	Union Assay Co.	LISBM Lab.	Brown
Samples By USGS									
No. 1 - Chip Sample Above Cut No. 6	0.02% WO_3		—		0.39% WO_3				
2 - From Tactite in Same Area	0.04 "								
3 - Pile of Crushed Rock at Cut No. 6	0.03 "		0.05% WO_3				0.02% WO_3		
						0.43% WO_3	0.03 "	0.01% WO_3	
Average	0.03 "		0.017				0.025		
No. 4 - Cut 14 Ft. on F.W. Side (Cut No. 9)	0.015 "		0.04			54 ft. - 0.33 "			
5 - 42 " in Middle "	0.015 "		0.05			No Sample			
6 - 26 " on H.W. Side "	0.025 "		0.05			20 ft. - 0.44 "			
7 - 57 " Qtz. Monzonite - Cut No. 10	0.015 "								
8 - 67 " Tactite "	0.015 "								
Average	0.017		0.047			0.385 "			
Applicants Samples									
1987 S - Cut No. 5	AIE Method 0.11% "			0.03					Tr.
600 lb. Sample - Cut No. 6	0.04 & 0.03 "	0.16	0.04	0.04	0.39				
2000 lb. " "	0.03 & 0.02 "		0.01		0.43				
1000 lb. " "	0.03 & 0.03 "				0.46				
	0.033		0.025	0.03	0.44				
Wagon Drill - No. 1 - 0' - 5'				0.11	0.81				
5' - 10'				0.07	0.54				
10' - 35'					0.433 - Avg.				
Average				0.12	0.583				
" No. 2 - 0' - 15'					0.47 - Avg.				
" No. 3 - 0' - 20'					0.34 - Avg.				
" No. 4 - 0' - 25'	0.03 & 0.03 Avg.				0.42 - Avg.				
Average					0.41				
Cut No. 9 - H.W. 20' Surface Grab					0.44				
F.W. 50' "					0.39				
Average					0.415				
General Average	0.0249		0.0292	0.099	0.469		0.407		

FEB 1 3 1952

Mr. R. G. Sullivan, Vice President
Minerals Engineering Company
Post Office Box 957
Grand Junction, Colorado

Re: DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Sullivan:

Recently the above-referenced application was transmitted to us by Region II, along with assay data of samples taken last Summer and Fall by interested Government agencies.

We are deeply perturbed regarding the disparity of assays obtained by Lewis and Walker, the assayers of Butte, Montana, who assayed your samples for tungsten, and those obtained from other assay offices, including the Union Assay Company of Salt Lake City, Utah, the Bureau of Mines, and Ledoux and Company of New York City.

While the samples, with few exceptions, that were sent to the last three assay offices were not splits of those sent to Lewis and Walker, the assays were uniformly low, on the order of only one-twelfth of the value obtained by Lewis and Walker. A limited amount of cross checking on splits of the same samples has indicated the same low values.

If available, we suggest that you send splits of your large 600, 1000, and 2000 pound samples to other assay offices for checking. Abbot A. Hanks of San Francisco or Twining Laboratories of Fresno may be of aid.

Until all interested parties are confident of the order of magnitude of the tungsten content of the subject deposit, we believe it best that the application be held in abeyance.

May we hear from you at your earliest convenience.

Sincerely yours,

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

GCSelfridge:ls
2/11/52

Copy to: Admn. Reading File
Docket
Field Team, Region 2
R. W. Geehan, USBR
D. M. Lemmon, USGS
G. C. Selfridge

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : Mr. Robert E. Adams, DMEA
Attention: Docket Control

DATE: July 11, 1952

FROM : Iron and Ferro-Alloy Division, DMEA

SUBJECT: Removal of exploration docket from active files of Division
Docket No. DMEA 2361 - Tungsten
Minerals Engineering Company
Greenstone Tungsten Deposit
Beaverhead County, Montana

Transmitted herewith is the above-captioned docket which has been removed from the active files of this Division in accordance with information received from the applicant.

By letter of July 8, 1952, Mr. Burwell indicates that if in future his company seeks exploration aid on the Greenstone property it will be after further work has been done to explore the outcrop of the ore body and more sampling and analytical work has been done. Since such a future exploration program, if decided upon by the Minerals Engineering Company, would be of a different scope, a new application would be required in seeking exploration aid from DMEA.

G. C. Selfridge

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

Attachment

FILE COPY
SURNAME:

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

Mr. Robert E. Adams, DMEA
Attention: Docket Control
Iron and Ferro-Alloy Division, DMEA

July 11, 1952

Selfridge.

Removal of exploration docket from active files of Division
Docket No. DMEA 2361 - Tungsten
Minerals Engineering Company
Greenstone Tungsten Deposit
Beaverhead County, Montana

Transmitted herewith is the above-captioned docket which has been removed from the active files of this Division in accordance with information received from the applicant.

By letter of July 8, 1952, Mr. Burwell indicates that if in future his company seeks exploration aid on the Greenstone property it will be after further work has been done to explore the outcrop of the ore body and more sampling and analytical work has been done. Since such a future exploration program, if decided upon by the Minerals Engineering Company, would be of a different scope, a new application would be required in seeking exploration aid from DMEA.

SIGNED 7/11/52

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

Attachment

LScott
7/11/52

CC: Docket
Admn. Reading File
Field Team, Region II
G. C. Selfridge
D. M. Lemmon, USGS
R. W. Geehan, USBM

MINERALS ENGINEERING COMPANY

GRAND JUNCTION, COLORADO

P. O. BOX 957

July 8, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 10 1952

Mr. G. C. Selfridge, Chief
Iron and Ferro-Alloy Division
U. S. Department of the Interior
Defense Minerals Exploration Administration
Washington 25, D. C.

Re: Docket No. DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Selfridge:

Regarding the Greenstone Tungsten Deposit, we have done no work on this deposit since last Fall, and have no reason to believe that the property should not be developed further. However, it will be necessary to make a series of surface cuts to further explore the outcrop of the ore body and to engage in a special sampling and analytical analysis of the mine. To do this, we are installing a laboratory at our Lost Creek mines and as soon as these facilities are in service we will re-examine the Greenstone situation.

I do not believe that we will proceed with the application as filed, but may request a different scope of exploration after our contemplated work. Accordingly, I wish that you would withdraw the application from your active file until such a time as our plans are completed.

Yours very truly,

MINERALS ENGINEERING COMPANY

Blair Burwell

Blair Burwell
President

BB/rol

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FILE COPY
SURNAME:

Selfridge
Mitt

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

JUN 18 1952

Mr. Blair Burwell, President
Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Re: Docket No. DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Burwell:

During one of our conversations while you were here in Washington this Spring you requested that the subject application be held in abeyance until the question of assays had been definitely settled and possibly a revision of the application submitted.

It is our impression that everyone is now convinced that the average tungsten value of the Greenstone property is much lower than originally indicated by the Lewis and Walker assays. To date we have not had further word from you either submitting additional data supporting the request for the proposed exploration assistance or an alternative proposal.

If it is your intention not to proceed with the application, will you please so advise us and we can withdraw it from our active file and consider the matter closed.

Sincerely yours,

6/19/52

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

GCSelfridge:ls 6/18/52

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

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

June 11, 1952

2361
2440 - contract

Mr. C. O. Mittendorf
Acting Administrator
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D. C.

Dear Mr. Mittendorf:

This is in reply to your letter of June 6 inquiring as to whether Mr. Blair Burwell intends to proceed with his application for exploration assistance on the Greenstone property. As you know, although we saw possibilities of a low-grade tungsten deposit on the Lost Creek deposit, we have never regarded the Greenstone property with much favor, although we did agree to a limited amount of drilling on the property on the assumption that some drilling would be done on the Lost Creek contract. We cannot bring ourselves to go any further than this, and, inasmuch as the drilling has been eliminated for the present at least from the Lost Creek property, and because the amount of drilling provided for on the Greenstone property only is not sufficient to warrant a drilling contract, we had assumed the proposal would be considered dead.

Sincerely,

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 17 1952

400

FILE COPY
SURNAME:

Selfridge.

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

JUN 6 1952

Mr. A. N. Weissenborn
Executive Officer, DMEA Region II
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. DMEA 2361 - Tungsten
Minerals Engineering Company
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Weissenborn:

Will you please inform us whether or not Mr. Burwell intends to proceed with his application for exploration assistance on the Greenstone property?

During your last visit to Washington you intimated that Mr. Burwell probably was now convinced that the assays by Lewis and Walker were high. Since no drilling was provided for in the contract on the Lost Creek property, it will be impossible to drill one or two holes as previously suggested by the Field Team unless Mr. Burwell does it at his own expense. As you know, the only action that we can take with the present docket is to write a denial. Possibly Mr. Burwell will not want to proceed with the application since he has exploration at Lost Creek. If he does wish to proceed with the application, we would appreciate having him present an alternative program agreeable to the Field Team and ultimately to us.

Will you please give us your comments on the matter at your earliest convenience?

Sincerely yours,

C. O. Mittendorf (fw)
Acting Administrator
Defense Minerals Exploration
Administration

f.N. 6-6-52

GCSelfridge:ls 6/5/52

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

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

April 29, 1952

Memorandum

To: George C. Selfridge, DMEA

From: Robert W. Geehan, Bureau of Mines

Subject: Mineral Engineering Company DMEA-2361, Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Attached is a copy of the subject docket.

It is my understanding that the applicant is no longer interested in exploration of this deposit because of the low tungsten content of the check samples, and that exploration will be confined to the Lost Creek deposit. The latter, as you know, has been approved for exploration as DMEA-2440.

It is recommended that this application be placed in the inactive file and that the applicant be notified of this action.

Robert W. Geehan

Robert W. Geehan

Attachment

APR 30 1952
Copy retained 400

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

April 29, 1952

Memorandum

To: George C. Selfridge, DMEA

From: Robert W. Geehan, Bureau of Mines

Subject: Mineral Engineering Company DMEA-2361, Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

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It is my understanding that the applicant is no longer interested in exploration of this deposit because of the low tungsten content of the check samples, and that exploration will be confined to the Lost Creek deposit. The latter, as you know, has been approved for exploration as DMEA-2440.

It is recommended that this application be placed in the inactive file and that the applicant be notified of this action.

Robert W. Geehan

Attachment

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

So. 157 Howard Street
Spokane 4, Washington

March 6, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 11 1952

Mr. C. O. Mittendorf
Acting Administrator
Defense Minerals Exploration Administration
Washington 25, D. C.

Dear Mr. Mittendorf:

I have your letter of February 26 with respect to Mr. Blair Burwell of the Mineral Engineering Company, and the Greenstone tungsten deposit at Beaverhead County, Montana, (Docket DMA-2361).

The duplicate pulps of Myers' samples 3 to 6 have been sent to Lewis & Walker, but the results have not been received as yet. One of our representatives, Mr. Elton Youngberg, called on Lewis & Walker a few days ago and was informed that very careful tests are being made on these samples and that the results will be sent to us in a short time. Although these pulps were sent to Lewis & Walker without comment, the fact that they were pulps, rather than uncrushed samples, probably was indicative to Lewis & Walker that they were being used for purposes of checking and they are being especially careful. Incidentally, the Lewis & Walker representatives discussed the whole matter of the tungsten analyses of low-grade powellite samples with Mr. Youngberg, and advised him that they have met with considerable difficulty in getting reliable assays due to the fact that the molybdenum and part of the silica come down with the tungsten. This is a rather puzzling statement because it would indicate that unless special care is used, the tungsten assay should be high, whereas our trouble is that the Lewis & Walker assays are much higher than the assays made by other laboratories. It does not check with Mr. Burwell's statement that assays of the Union Assay Co. and the Bureau of Mines are low because of the procedures used. It would appear from this statement that the contrary would be expected. The whole matter of assaying of low-grade tungsten ores is an extremely important one, and it should be thoroughly investigated. I can assure you that our mind is open on this matter.

Yes?

Referring to the method of sampling, some of the samples taken by Myers were chip samples from the same trench walls sampled by Mr. Burwell's crew. Some of them were 15-pound grabs from the

3/13

Mr. M:

This came to Hazel's desk today. Have you seen it?

fw

pile of sample rejects cut by Mr. Burwell's crew. We make no claim that any of the samples taken by Myers should precisely check those taken by Mr. Burwell and his associates, but we do think that they should be of the same order of magnitude. Mr. Volin has by phone made an agreement with Mr. Burwell for additional sampling at the property and this meets with my complete approval. I think that the property should be visited jointly by Mr. Burwell, the Bureau of Mines, and the Geological Survey, and samples should be cut that will satisfy all concerned. These then can form the basis for further checks on the assaying. Incidentally, Mr. Bardill of the Bureau of Mines visited Butte recently and discussed the matter of the assaying problem with Lewis & Walker and with Mr. George Griswold. Mr. Bardill reports that Mr. Griswold informed him that he has himself had great difficulty in checking the assay results and has dropped all metallurgical tests until the assaying difficulties can be solved. A memo by Mr. Bardill on this matter is in preparation.

Mr. Volin has been in contact with Mr. Burwell on several occasions during my absence in Washington and New York and, as a result of these discussions, Mr. Burwell has agreed to come to Spokane, probably sometime during the week of March 10 for a complete discussion of the whole problem. We will keep you advised of the progress of these and other discussions.

Sincerely yours,

A. E. Weissenborn

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

cc: USBM-Spokane

DMEA-2361

Sample No. By-USGS	Union Assay Co.	Duplicate Pulps By USBM	Applicant's Sample #1987-S-By Lewis & Walker
1-Chip Sample above Cut #6.	0.02% WO_3	—	0.39% WO_3
2-from Tactite in Same Area	0.04 "	—	
3-Pile of Crushed Rock at Cut #6	0.03 "	0.05% WO_3	Applicant's Samples 0.02% WO_3 Union Assay Co. 0.43 " Lewis & Walker 0.03 " Union Assay Co. 0.01 " U.S.B.M. #3 Sample 0.03 - Union Assay Co. 0.46 - Lewis & Walker 0.02 - Union Assay Co.
4-Cut 9-14 ft on FW Side	0.015% WO_3	0.04% WO_3	54 ft. - 0.33% - Lewis & Walker
5- " 42" in middle	0.015 "	0.05 "	No Sample
6- " 26" on HW Side	0.025 "	0.05 "	20 ft. 0.44% "
7 " 57 " of gutenmonants-Cut #10	0.015 "		No Samples presented by Applicant.
8 " 67 " Tactite-Cut #10	0.015 "		

By Company	Union Assay Co.	Le Doux	Lewis & Walker	USV Bishop	Brown	Union M.E. Lab	USBM.
1987S - Cut #5	0.11% WO_3	0.03			Tr.		
1 - 600 Lb. Sample - Cut #6	0.03 "	0.04	0.39	0.16		0.04	0.04
2 - 1000 Lb. Sample	0.02 "		0.43			0.03	0.01
3 - 1000 Lb. "	0.03 "		0.46			0.03	
Wagon Drill No. 1 0'-5'		0.17	0.81	Avg. 35 Ft. 0.34			
5'-10'		0.07	0.54				
10'-35' Average			0.433				
" #2 - 0'-15' - Average			0.47				
" #3 - 0'-20' - Average			0.34				
" #4 - 0'-25' - Average	0.03		0.42			0.03	
Cut 9 - HW - 20' Surface Grab			0.44				
" FW - 54' " "			0.39				
Float along Road - Average	0.09						

Feb. 26-52

Memorandum to: Mr. G.C. Selfridge, Chief, Ironand Ferro-Alloy Division
From: Glenn G. Gerting.

Re: DMEA 2361-Tungsten
Burwell Letter of Feb. 21, 1952.

1) Analysts: From personal experience of this Writer, the following are the most Competent in the List Submitted:
Getchell Mines Co., inc.
U.S. Vanadium Corp.
Nevada-Massachusetts Co.

2) Grade of the WO_3 as judged by the Ultra Violet "Lamp" Will no doubt be Subject to Considerable error Caused by the fluorescent oxide from the MoO_3 Content. However, the Grade of the Ore would be established by the Analysts from Samples Submitted.

3) The main point of the Controversy Still Remains in doubt; namely, the manner in which the Samples Were taken, Whether or not the Samples are Representative of the deposit, and the Accuracy of the higher WO_3 Content as Stressed by the Applicants

4) it is Suggested that Check Samples to be taken by the Field Team, be thoroughly Crushed, mixed and Split, and Sent to Various USBM metallurgical Branches for analysis. Then each USBM Branch exchange pulps With the others for Check purposes.

400

FILE COPY
SURNAME:

Selfridge

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

FEB 26 1952

Mr. A. E. Weissenborn
Executive Officer, Region II
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Weissenborn:

Mr. Blair Burwell of Minerals Engineering Company called us the afternoon of February 21 with regard to the Company's exploration application.

Mr. Burwell discussed at length the check work that the Company is doing with regard to tungsten assays. He informed us that the method used by Lewis and Walker was one given them which had been developed by Electro-Met, a subsidiary of Union Carbide. Seemingly, Mr. Burwell has checked the methods used by the Union Assay Company and the Bureau of Mines and believes that their assays are low because of the procedures used.

Apparently Mr. Burwell had discussed the analysis question by telephone with Mr. Volin, who in part at least had concurred with Mr. Burwell in his criticism of Myers' sampling. Mr. Burwell did not believe that chip samples could compare with the bulk samples taken by the Minerals Engineering Company. It is our understanding that Mr. Volin will accompany Mr. Burwell to the property when weather conditions warrant.

Mr. Burwell further stated that there is a possibility of a fair-sized molybdenum deposit along the hanging wall of the properties in which his Company is interested. This possibility should be investigated.

Mr. George Griswold is making beneficiation tests on the tactite in his laboratory in Butte, Montana. The material on which he is working assays approximately .3% WO_3. Checks on products obtained from the beneficiation seemingly confirm the .3% head assay. Possibly the field team could secure some of the samples from Mr. Griswold for check analysis.

In your letter of January 26, 1952, you make mention of sending duplicate pulps of Myers' samples 3 to 6 to Lewis and Walker for determination. Are these results now available?

Sincerely yours,

C. O. Mittenderf (for) 2/26

Acting Administrator
Defense Minerals Exploration
Administration

GCSelfridge:ls
2/25/52

cc: Admn. Reading File
Docket
Field Team, Region 2
G. C. Selfridge

cc: D. M. Lemmon, USGS
R. W. Geehan, USBM

MINERALS ENGINEERING COMPANY

GRAND JUNCTION, COLORADO

P. O. BOX 957

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 25 1952

February 21, 1952

Mr. G. C. Selfridge, Acting Chief
Iron and Ferro Alloy Division
Defense Minerals Administration
Washington, D. C.

Re: DMEA-2361 Tungsten, Greenstone Tungsten Deposit, Beaverhead County, Montana.

Dear Mr. Selfridge:

Replying to your letter to Mr. Sullivan, and further in reference to our telephone conversation today, I am enclosing a map of the Greenstone tungsten deposit and the following information on sampling and analytical work on this deposit.

As shown on the map, the Greenstone deposit is a faulted tactite and silicified limestone zone outcropping over a distance of 1,600 feet, dipping east about 40 degrees with a surface exposure width of 200 feet between footwall and hanging wall at the center of the deposit and a true thickness of from 35 to possibly 65 feet. On the hanging wall there is a "greenstone" layer carrying significant tungsten values varying from .15% to .55% WO_3, followed by a garnet and granite intruded complex containing values from .02% to .04% WO_3.

The thickness of the "greenstone" layer is not accurately determined, but is indicated between 5 and 25 feet, varying along the surface outcrop. MoS_2 occurs unaltered in fresh surfaces below the altered zone. This has been altered to MoO_3 and the highly fluorescent oxide makes it extremely difficult to appraise the value by surface or "lamp" inspection. This is also true of the footwall position of the ore zone.

Initial samples were taken by Carl Martin, Mining Engineer, along the "greenstone" hanging wall surface outcrop. These were assayed by McCarty Laboratories in Butte, Montana. The indicated tungsten values along a glossy, green band of silicolous material exposed along the road in surface float, although the accuracy of the assays was not checked at that time.

Mr. A. F. Boyd then resampled the "greenstone" float material, collecting a large sample of the surface material, which was sent to Union Assay office and returned .45% WO_3. This covered a longitudinal outcrop of about 500 feet, North-South, and roughly checked to initial Carl Martin samples.

A series of cross samples was then taken East-West of large boulders and float material in order to evaluate the cross section of the deposit on the surface. This material was largely garnet with "greenstone" showing only on the eastern exposure. Sample No. 1 was taken for a surface width of 65 feet on an East-West line at co-ordinate 19,400, and gave an assay of .18% WO_3 at Union Assay. Sample No. 2 at co-ordinate 19,500 gave an assay of .02% WO_3 (Union) and No. 3, separated into three parts, A .12% WO_3, B .02% WO_3 and C .13% WO_3.

A further study of the occurrence indicated that the majority of the values were in the eastern portion of the outcrop. Union Assay reported difficulty with these samples, due to silica content, the initial results being approximately double of the following ones. At this time we began to check methods of analysis used by Union Assay and found that the procedure of eliminating SiO_2 and of correction for molybdenum content did not conform to the standard Electro Metallurgical method for analysis of material of this type. Therefore, Electro Metallurgical methods of tungsten analysis were furnished Lewis and Walker at Butte, Montana, and work was started there under the direction of Mr. George Griswold, Jr. to set up proper procedures. A series of checks of previous samples were sent to Union following this, which further confirmed the need of accurate methods.

Following this sampling, a bulldozer and drilling equipment was moved into the area and surface cuts started along the outcrop. It was found that extensive faulting had displaced the mineralized zone to the east. At the fault in the center of the map, co-ordinate 20,000, a weathered surface exposure was investigated. At this point it was found that the "greenstone" or hanging wall band was in the floor of the No. 6 Cut. A surface sample (G-1) was taken, crushed and duplicate pulps sent to U. S. Vanadium at Bishop (.16% WO_3), Lewis and Walker at Butte (.20% WO_3), Union Assay at Salt Lake (.03% WO_3), and the reject of the Union Assay pulp to Bureau of Mines, Salt Lake (.04% WO_3). It is considered possible that some error exists and that these samples were not duplicates.

Surface material in Cut 6A was sampled. Sample No. 2 gave: Lewis & Walker .35%, Union Assay .02%, and Sample No. 3 Lewis & Walker .36%, Union Assay .03% WO_3. Again some question of error in the split at the Montana School of Mines.

The next group of samples was taken by a wagon drill, with inclined holes at right angles to the ore bed from Cut 6 and Cut 9. It was observed that surface samples were somewhat questionable due to weathering. Drill Hole No. 1 was directly below and 10 feet under the surface below Greenstone surface sample 2 and 3. Duplicate pulps gave: U. S. Vanadium, Bishop .34%, Union Assay .03%, and Lewis & Walker .36%.

The detail of the drill samples (Lewis and Walker) are given on the map.

To check these, a composite sample (3.3 pounds) was treated chemically to extract the tungsten, using established plant procedure for this operation. This gave weighed content of .298% WO_3. The Lewis and Walker samples were then pulps of these drill holes, then repeated in triplicate using Electro Metallurgical analytical methods and the re-assays checked the chemical extraction test.

We have now prepared standard samples of known WO3 added as 92% refined WO_3, in which we included silica and MoO_3 in proportion to the silicious ore under study. This is to be sent to laboratories to check the accurany of their procedures on this type of material; and duplicates of the samples will go to Salt Lake and Spokane offices of the Bureau of Mines. Following the determination of procedure variables on the standard, the matter of checking on unknowns would follow after the correct procedure has been selected.

This will give you some detail on the amount of work we are undertaking to obtain accurate assay methods. At the Greenstone we estimate that ore containing .15% WO_3 can be mined and milled at a profit, using surface ores, and that the "break-even" point will be about .12% WO_3, if a mill near the deposit is built. Therefore, precision methods of low-grade analysis are necessary to evaluate our future work. For your information, milling costs at Nevada-Massachusetts Company in 1951 were $2.27, which included chemical treatment and recoveries of this material in preliminary tests are 85%.

Unless field engineers are aware of the structure and significance of samples taken, random chip samples of small size taken from altered and weathered surfaces do not mean much in the surface evaluation of such a deposit. This has been our experience at Biship where surface samples were quite misleading.

While on the subject of deposits in this region, I am also including the sample and map record of the Lost Creek deposit. Here we have spent about $30,000.00 in surface pits and large-scale sampling, after removing about 6 feet of weathered outcrop. The vein here, which is the same contact as the Greenstone, also carries a band of better ore on the hanging wall, followed by about 100 feet of low grade on the foot wall. MoS2 mineralization has been identified of an order of possibly .20 to 1.50% Mo, which may have some economic value.

Sincerely yours,

MINERALS ENGINEERING COMPANY

Blair Burwell

Blair Burwell, President

BB/rol

400

FILE COPY
SURNAME:

Wiitt

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

FEB 1 2 1952

Mr. R. G. Sullivan, Vice President
Minerals Engineering Company
Post Office Box 957
Grand Junction, Colorado

Re: DMEA 2361 - Tungsten
Greenstone Tungsten Deposit
Beaverhead County, Montana

Dear Mr. Sullivan:

Recently the above-referenced application was transmitted to us by Region II, along with assay data of samples taken last Summer and Fall by interested Government agencies.

We are deeply perturbed regarding the disparity of assays obtained by Lewis and Walker, the assayers of Butte, Montana, who assayed your samples for tungsten, and those obtained from other assay offices, including the Union Assay Company of Salt Lake City, Utah, the Bureau of Mines, and Ledoux and Company of New York City.

While the samples, with few exceptions, that were sent to the last three assay offices were not splits of those sent to Lewis and Walker, the assays were uniformly low, on the order of only one-twelfth of the value obtained by Lewis and Walker. A limited amount of cross checking on splits of the same samples has indicated the same low values.

If available, we suggest that you send splits of your large 600, 1000, and 2000 pound samples to other assay offices for checking. Abbot A. Hanks of San Francisco or Twining Laboratories of Fresno may be of aid.

Until all interested parties are confident of the order of magnitude of the tungsten content of the subject deposit, we believe it best that the application be held in abeyance.

May we hear from you at your earliest convenience?

Sincerely yours,

E.P.L. 2/12/52

George C. Selfridge

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

GCSelfridge:ls
2/11/52

Copy to: Admn. Reading File
Docket
Field Team, Region 2
R. W. Geehan, USBR
D. M. Lemmon, USGS
G. C. Selfridge

FILE COPY
SURNAME:

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

February 11, 1952

Memorandum

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

From: Glenn G. Gentry

Subject: Docket No. DMEA 2361 - Tungsten
Greenstone Mine
Beaverhead County, Montana -- $115,595.42

Wide discrepancies between analysts of the tungsten content indicate that considerable additional sampling and analysis by different analysts would be advisable prior to evaluating this mining property. The mathematical average of the group of samples taken follows:

Union Assay Office	U.S. Bureau of Mines	Lewis and Walker
0.0249% WO_3	0.0297% WO_3	0.464% WO_3

Lewis and Walker, analysts for the applicant, should recheck their analysis. If sufficient pulp is available, it is suggested that the applicant have analyses made by:

Union Assay Office, Salt Lake City, Utah
Abbot A. Hanks, San Francisco, California
Twining Laboratories, Fresno, California

Applicant should furnish this office with comparison results. If the rejects were saved from the three samples, namely of 600 lbs., 2,000 lbs., and 2,000 lbs., suggest the applicant crush, mix and split another sample and have the WO_3 content determined by two of the above analysts.

If the applicant substantiates the results obtained by Lewis and Walker, then it might be advisable for the Field Team to take about 1,000 lbs. of sample, as a composite, as a check on the applicant's sampling job. Until reasonable accuracy is assured in the sampling and the WO_3 content, the application should be held in abeyance. The burden of proof is on the applicant.

Glenn G. Gentry

GGGentry:ls

Copy to: Admn. Reading File
Docket
Mr. George B. Holderer, DMPA, Room 7105, GSA Bldg.

DMBA - 2361 - Revised

COMPARISON OF ASSAYS - MINERALS ENGINEERING COMPANY
GREENSTONE MINE, MONTANA

February 11, 1952

Samples by USGS	Union Assay Co.	USV	USBM Lab.	Ledoux	Applicant's Samples: Lewis & Walker	Applicant's Samples: Lewis & Walker	Union Assay Co.	USBM Lab.	Brown
#1 Chip sample above Cut # 6	0.02%WO_3				0.39%WO_3		0.02%WO_3		
2 From tactite, same area	0.04								
3 Pile crushed rock, Cut #6	0.03		0.05%WO			0.43%WO_3	0.03	0.01%WO_3	
Average - - - - - -	0.03		0.017				0.025		
#4 Cut 14ft. on F.W. side, Cut #9	0.015		0.04		54ft. 0.33				
5 42 " in Middle " "	0.015		0.05		No sample				
6 26 " on H.W. side, " "	0.025		0.05		20ft. 0.44				
7 57 " qtz. manganite, Cut #10	0.015								
8 67 " tactite " "	0.015								
Average - - - - - -	0.017		0.047			0.385			
Applicant's Samples	ME								
1987 S-Cut #5	Method& 0.11			0.03					Tr.
600 lb. sample, Cut #6	0.04 & 0.03	0.16	0.04	0.04	0.39				
2000 lb. " " "	0.03 & 0.02		0.01		0.43				
1000 lb. " " "	0.03 & 0.03	-			0.46				
Average - - -	0.033 0.0225		0.025	0.035	0.44				
Wagon Drill No.1-0'-5'				0.17	0.81				
5'-10'				0.07	0.54				
10'-35'					0.433-Avg.				
Average -				0.12	0.594				
" No.2-0'-15'					0.47-Avg.				
No.3-0'-20'					0.34-Avg.				
No.4-0'-25'	0.03 & 0.03 Avg.				0.42-Avg.				
Average -					0.41				
Cut #9-H.W.-20' Surface Grab					0.44				
F.W.-54' "					0.39				
Average -					0.415				
GENERAL AVERAGE - -	0.0249		0.0297	0.099	0.464	0.407			

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

February 11, 1952

Memorandum

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

From: Glenn G. Gentry

Subject: Docket No. DMEA 2361 - Tungsten
Greenstone Mine
Beaverhead County, Montana — $115,595.42

Wide discrepancies between analysts of the tungsten content indicate that considerable additional sampling and analysis by different analysts would be advisable prior to evaluating this mining property. The mathematical average of the group of samples taken follows:

Union Assay Office	U.S. Bureau of Mines	Lewis and Walker
0.0249% WO_3	0.0297% WO_3	0.464% WO_3

Lewis and Walker, analysts for the applicant, should recheck their analysis. If sufficient pulp is available, it is suggested that the applicant have analyses made by:

Union Assay Office, Salt Lake City, Utah
Abbot A. Hanks, San Francisco, California
Twining Laboratories, Fresno, California

Applicant should furnish this office with comparison results. If the rejects were saved from the three samples, namely of 600 lbs., 1,000 lbs., and 2,000 lbs., suggest the applicant crush, mix and split another sample and have the WO_3 content determined by two of the above analysts.

If the applicant substantiates the results obtained by Lewis and Walker, then it might be advisable for the Field Team to take about 1,000 lbs. of sample, as a composite, as a check on the applicant's sampling job. Until reasonable accuracy is assured in the sampling and the WO_3 content, the application should be held in abeyance. The burden of proof is on the applicant.

Glenn G. Gentry

DMEA - 2361 - Revised

COMPARISON OF ASSAYS - MINERALS ENGINEERING COMPANY
GREENSTONE MINE, MONTANA

February 11, 1952

Samples by USGS	Union Assay Co.	USV	USBM Lab.	Ledoux	Applicant's Samples: Lewis & Walker	Applicant's Samples: Lewis & Walker	Union Assay Co.	USBM Lab.	Brown
#1 Chip sample above Cut # 6	0.02%WO_3				0.39%WO_3				
2 From tactite, same area	0.04						0.02%WO_3		
3 Pile crushed rock, Cut #6	0.03		0.05%WO			0.43%WO_3	0.03	0.01%WO_3	
Average - - - - - -	0.03		0.017				0.025		
#4 Cut 14ft. on F.W. side, Cut #9	0.015		0.04		54ft.	0.33			
5 42 " in Middle " "	0.015		0.05		No sample				
6 26 " on H.W. side, " "	0.025		0.05		20ft.	0.44			
7 57 " qtz. manzanite, Cut #10	0.015								
8 67 " tactite " "	0.015								
Average - - - - - -	0.017		0.047			0.385			
Applicant's Samples — ME									
1987 S-Cut #5 — Method&	0.11			0.03					Tr.
600 lb. sample, Cut #6 — 0.04 &	0.03	0.16	0.04	0.04	0.39				
2000 lb. " " " — 0.03 &	0.02		0.01		0.43				
1000 lb. " " " — 0.03 &	0.03	—			0.46				
Average - - - 0.033	0.0225		0.025	0.035	0.44				
Wagon Drill No.1-0'-5'				0.17	0.81				
5'-10'				0.07	0.54				
10'-35'					0.433-Avg.				
Average -				0.12	0.594				
" No.2-0'-15'					0.47-Avg.				
No.3-0'-20'					0.34-Avg.				
No.4-0'-25' — 0.03 & 0.03 Avg.					0.42-Avg.				
Average -					0.41				
Cut #9-H.W.-20' Surface Grab					0.44				
F.W.-54' "					0.39				
Average -					0.415				
GENERAL AVERAGE - -	0.0249		0.0297	0.099	0.464	0.407			

EXPLORATION

Subject: DMEA-2361
Re: Exploration Loan
Greenstone Property
February 4, 1952

Mr. R. G. Sullivan, Vice President
Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

My dear Mr. Sullivan:

This will acknowledge receipt of your application dated January 23, 1952 for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMEA-2361 and referred to the Iron & Ferro-Alloys Division.

Kindly refer to DMEA-2361 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Acting Administrative Officer

7862

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
So. 157 Howard Street
Spokane 4, Washington

Docket Cy

February 1, 1952

MEMORANDUM

Refers to DME A-2361
Memo 1/26/52 to Pittsburgh from Region

TO : Chairman, Operating Committee, DMPA

FROM : Executive Officer, Field Team, Region II

SUBJECT: Greenstone Tungsten Deposit of the Mineral Engineering Co., Beaverhead County, Montana

I have learned informally that discussions are in progress regarding a tungsten mill in Beaverhead County, Montana, and it occurred to me that the enclosed memorandum concerning an exploration application for the Greenstone tungsten deposit of the Mineral Engineering Company may be of interest to you in this connection.

Further interesting information regarding the discrepancy in assay results is given in the application submitted by the above-mentioned company and should be available to you for inspection from the files of the DMEA.

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

Enclosure
Cpy memo dtd 1/26/52
Fld Team, Region II
to Chman, Op. Committee

cc: Chairman, Operating Committee, DMEA

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 5 1952

DMEA-2361

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 1 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

So. 157 Howard Street
Spokane 4, Washington

Renewal

January 26, 1952

MEMORANDUM

To: Mr. C. O. Mittendorf, Chairman, Operating Committee, DMEA

From: Field Team, Region II

Subject: Transmittal of application from Mineral Engineering Co., P. O. Box 957, Grand Junction, Colorado, for exploration of the Greenstone Tungsten deposit, Beaverhead Co., Montana.

Enclosed is an application for the exploration of the greenstone tungsten deposit in Beaverhead County, Montana. Popoff and McNabb of the Bureau of Mines have examined the deposit, and W. B. Myers of the Geological Survey has mapped it in some detail and has taken a number of samples. However, no report on the geology of the deposit or of the proposed plan of exploration is considered necessary at this time pending clarification of certain discrepancies in assay results that are apparent in the data submitted by the applicant.

It will be noted that the justification for the exploration of the deposit depends entirely upon assays made by Lewis and Walker of Butte. It will be noted further that according to data presented by the applicant, assays made by other assayers show values much lower than those obtained by Lewis and Walker; in most cases the other assays are only a tenth or less of the value reported by Lewis and Walker.

Under his reply to Item 2b on Form 103, the applicant states as follows: "the high silica content has caused variation in assays by different assay firms, in our opinion due to their failure to thoroughly extract the silica in a preliminary step which if not done results in a low tungsten assay," but he does not enlarge upon this very important point. In our opinion, this is the significant point of the whole application. If the Lewis and Walker assays can be substantiated, then the DMEA should push the exploration of the deposit to the utmost. If, on the other hand, the Lewis and Walker assays cannot be substantiated, then any exploration of the project is obviously futile. We have, therefore, held the application here until we could do some checking on samples taken by Myers.

Myers' samples, which were assayed by Union Assay Co. of Salt Lake City, gave uniformly low results and the application was held here further until some of these assays could be checked at the Bureau of Mines laboratory at Albany, Oregon. Comparison of these results is given below:

GREENSTONE DEPOSIT, BEAVERHEAD COUNTY, MONTANA
SAMPLES BY W. B. MYERS, USGS

NO.	DESCRIPTION	ASSAY by UNION ASSAY CO. Salt Lake City, Utah	ASSAY OF DUPLICATE PULP by USBM, Albany, Oregon	REMARKS
		WO_3 percent	WO_3 percent	
1	Chip sample of granitized quartz monzonite above Cut No. 6	0.02	--	Roughly equivalent to applicant's sample 1987-S, 0.39 percent WO_3 (Lewis and Walker)
2	Ditto from tactite in same area.	0.04	--	
3	From pile of crushed rock at Cut No. 6	0.03	0.05	Roughly equivalent to applicant's samples 2 and 3. Applicant's No. 2 assayed as follows: .02% WO_3 Union Assay; 0.43% WO_3 Lewis and Walker; 0.03 Union (M.E. Method); 0.01 USBM. His No. 3 assayed as follows: 0.03% WO_3 Union Assay; 0.46% WO_3 Lewis and Walker; 0.03% WO_3 Union (M.E. Method)
4	Cut 9 14' on FW side	0.015	0.04	These correspond to the last two samples on applicant's assay list showing 20' on HW side at 0.44% WO_3 and 54' in FW side at 0.33% WO_3 (Assays by Lewis and Walker)
5	" 42' in Middle	0.015	0.05	
6	" 26' on HW side	0.025	0.05	
7	57' sample of garnetized quartz monzonite from Cut No. 10	0.015		No samples presented by applicant.
8	67' sample of tactite from Cut No. 10	0.015		

As a further check, duplicate pulps of Myers' samples 3 to 6 are being sent to Lewis and Walker for determination. Results will be transmitted as soon as available.

Myers' samples, although they should not necessarily give the same results as those by the applicant, should approximately indicate the same order of magnitude. Since they do not, and since they agree with assay results submitted by the applicant from Union Assay, Ledoux, and others, and since independent checks by the Bureau of Mines indicate the same low values, it is difficult for the Field Team to accept the Lewis and Walker assays. It might further be added that at the Browns Lake deposit, very good checks were obtained on duplicate pulps between the Bureau of Mines Albany laboratory and Union Assay Co., with the Bureau of Mines being higher by a few hundredths.

Should the Lewis and Walker assays be correct, there is an important deposit of tungsten at the Greenstone deposit; but the Field Team regretfully recommends that on the basis of available information, the application be denied until and unless the applicant can demonstrate beyond reasonable doubt that the Lewis and Walker samples are correct and all the others are incorrect. The Field Team further feels that the work to date has cast serious doubt on the Lewis and Walker assays, and that further investigation should be initiated by the applicant.

The above conclusions refer only to the Greenstone Deposit. Myers' samples from the applicant's Lost Creek deposit, which is not a part of this application, show considerably higher assays, although the grade is still very low. Furthermore, the above facts have no bearing upon the Brown's Lake deposit of the American Alloy Metals Co., which is a few miles north of the Lost Creek and Greenstone deposits. Assays by the Union Assay Co. and the U. S. Bureau of Mines Albany laboratory of samples from this deposit are in essential agreement and indicate that at least part of this deposit may average between .35 and .4 WO_3 or higher.

By DMEA Field Team, Region II

A. E. Weissenborn
A. E. Weissenborn
Executive Officer (USGS)

Enclosures.

M E Volin
M. E. Volin
Member (USBM)

P. S. Since writing the above, a revised application has been received from the applicant. This is enclosed herewith without review pending clarification of the paramount problem of the analyses.

DMEA-2361

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 1 1952

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

No. 157 Mount Forest
Spokane 1, Washington

January 21, 1952

MEMORANDUM

To: F. J. W. Rittenhouse, Chairman, Operating Committee, DMEA

From: Ralph Lowe, Spokane 1

Subject: Transmittal of application from Mineral Engineering Co., P. O. Box 757, Grand Junction, Colorado, for exploration of the Greenstone Tungsten deposit, Beaverhead Co., Montana.

Enclosed is an application for the exploration of the Greenstone Tungsten deposit in Beaverhead County, Montana. Report and sketch of the Bureau of Mines have examined the deposit, and Mr. Myers of the Geological Survey has mapped it in some detail and has taken a number of samples. However, no report on the geology of the deposit or of the proposed plan of exploration is considered necessary at this time pending clarification of certain discrepancies in assay results that are apparent in the data submitted by the applicant.

It will be noted that the justification for the exploration of the deposit depends entirely upon assays made by Lewis and Walker of Butte. It will be noted further that according to data presented by the applicant, assays made by other assayers show values much lower than those obtained by Lewis and Walker; in most cases the other assays are only a tenth or less of the value reported by Lewis and Walker.

Under his reply to Item 28 on Form 1[illegible], the applicant states as follows: "The high silica content has caused variation in assays by different assay firms, in our opinion due to their failure to thoroughly extract the silica in a preliminary step which if not done results in a low tungsten assay," but he does not enlarge upon this very important point. In our opinion, this is the significant point of the whole application. If the Lewis and Walker assays can be substantiated, then the DMEA should push the exploration of the deposit to the utmost. If, on the other hand, the Lewis and Walker assays cannot be substantiated, then any exploration of the project is obviously futile. We have, therefore, held up the application here until we could do some checking on samples taken by Myers.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

[illegible] samples, which were assayed by Union Assay Co. of Salt Lake City, gave uniformly low results and the application was held here further until some of these assays could be checked at the Bureau of Mines laboratory at Albany, Oregon. Comparison of these results is given below:

THE [illegible] DEPOSIT, [illegible] COUNTY, MONTANA
SAMPLES BY W. D. MYERS, [illegible]

No.	DESCRIPTION	ASSAY by UNION ASSAY CO. Salt Lake City, Utah WO_3 percent	ASSAY by BUREAU OF MINES LABS. FILE by [illegible], Albany, Oregon WO_3 percent	REMARKS
1	Chip sample of granitized quartz monzonite above Cut No. 6	0.02	--	Roughly equivalent to applicant's sample 1967-[illegible], 0.39 percent WO_3 (Lewis and Walker)
2	Ditto from tactite in same area.	0.04	--	
3	From pile of crushed rock at Cut No. 6	0.03	0.05	Roughly equivalent to applicant's samples 2 and 3. Applicant's No. 2 assayed as follows: .02 WO_3 Union Assay 0.43 WO_3 Lewis and Walker 0.03 Union (U.S. Method) 0.01 [illegible] His No. 3 assayed as follows: 0.03 WO_3 Union Assay 0.45 WO_3 Lewis and Walker 0.03 WO_3 Union (U.S. Method)
4	Cut 9 14' on FW side	0.015	0.04	These correspond to the last two samples on applicant's assay list showing 20' on HW side at 0.44 WO_3 and 34' in FW side at 0.33 WO_3 (Assays by Lewis and Walker)
5	" 42' in middle	0.015	0.05	
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8	67' sample of tactite from Cut No. 10	0.015		

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

As a further check, duplicate pulps of Myers' samples 3 to 6 are being sent to Lewis and Walker for determination. Results will be transmitted as soon as available.

Myers' samples, although they should not necessarily give the same results as those by the applicant, should approximately indicate the same order of magnitude. Since they do not, and since they agree with assay results submitted by the applicant from Union Assay, Ledoux, and others, and since independent checks by the Bureau of Mines indicate the same low values, it is difficult for the Field Team to accept the Lewis and Walker assays. It might further be added that at the Browns Lake deposit, very good checks were obtained on duplicate pulps between the Bureau of Mines Albany laboratory and Union Assay Co., with the Bureau of Mines being higher by a few hundredths.

Should the Lewis and Walker assays be correct, there is an important deposit of tungsten at the Greenstone deposit; but the Field Team regretfully recommends that on the basis of available information, the application be denied until and unless the applicant can demonstrate beyond reasonable doubt that the Lewis and Walker samples are correct and all the others are incorrect. The Field Team further feels that the work to date has cast serious doubt on the Lewis and Walker assays, and that further investigation should be initiated by the applicant.

The above conclusions refer only to the Greenstone Deposit. Myers' samples from the applicant's Lost Creek Deposit, which is not a part of this application, show considerably higher assays, although the grade is still very low. Furthermore, the above facts have no bearing upon the Brown's Lake deposit of the American Alloy Metals Co., which is a few miles north of the Lost Creek and Greenstone deposits. Assays by the Union Assay Co. and the U. S. Bureau of Mines Albany laboratory of samples from this deposit are in essential agreement and indicate that at least part of this deposit may average between .35 and .4 WO_3 or higher.

By EMMA Field Team, Region II

A. H. Weissenborn
Executive Officer (EMMA)

Enclosures

F. L. Volin
Member (EMMA)

P. S. Since writing the above, a revised application has been received from the applicant. This is enclosed herewith without review pending clarification of the paramount problem of the analyses.

MINERALS ENGINEERING COMPANY

GRAND JUNCTION, COLORADO

P. O. BOX 957

January 23, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

FEB 1 1952

Defense Minerals Administration
South 157 Howard Street
Spokane, Washington

Gentlemen:

On a recent visit to Washington Mr. Blair Burwell discussed our "Application for Aid for an Exploration Project Pursuant to Mineral Order 5, Under-Defense Production Act of 1950", filed on December 27, 1951, for the exploration on the Greenstone property in Beaverhead County, Montana, with Mr. Selfridge of the Washington office. Mr. Selfridge was kind enough to go over a copy of the application and called his attention to certain revisions which might be made in order to confine the exploration to the type and size of work required for exploration purposes only. The principal error in our application apparently was in the size of the exploration tunnel, which we had planned of a size to use for later development and mining.

We have also revised the estimates for equipment and supervision to conform with the smaller tunnel size,and in view of the fact that this requires a fairly complete revision of our figures we are filing an amended or corrected application to take the place of the data originally submitted. Please advise if this procedure meets with the regulations of your department.

Yours very truly,

MINERALS ENGINEERING COMPANY

R G Sullivan

R. G. Sullivan
Vice-President

RGS/rol

Encl.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMeA-2361
Metal or Mineral
Date Received 2-1-52
Amount $
Participation (Government %)

Name and address of applicant

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Date December 27, 1951

see revised application

If you have already filed MF-100, give date filed November 12, 1951, type of assistance requested Access Roads,

DMA Docket Number (if available)

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Minerals Engineering Company
(Name of company)

By R B Sullivan
(Signature of authorized official)

Dec. 27-51
(Date)

Vice-President
(Title)

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

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

1. (a) Lode mining claims and property located in Beaverhead County, Montana, and designated as:

Greenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

Albatross Unpatented Lode Mining Claim, Recorded in Book 101, Page 360-2 of Public Records of Beaverhead County, Montana.

Jerricoe Unpatented Lode Mining Claim, Recorded in Book 101, Page 407 of Public Records of Beaverhead County, Montana.

Kenlyn Unpatented Lode Mining Claim, Recorded in Book 101, Page 408 of Public Records of Beaverhead County, Montana.

Fairview Unpatented Lode Mining Claim, Recorded in Book 101, Page 409 of Public Records of Beaverhead County, Montana.

Northern Star Unpatented Lode Mining Claim, Recorded in Book 101, Page 410 of Public Records of Beaverhead County, Montana.

Saddle Back Unpatented Lode Mining Claim, Recorded in Book 101, Page 411 of Public Records of Beaverhead County, Montana.

Timber Queen Unpatented Lode Mining Claim, Recorded in Book 101, Page 413 of Public Records of Beaverhead County, Montana.

Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, of Public Records of Beaverhead County, Montana.

The property is known as the Greenstone.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

1. (b) See attached Lease & Option Agreement and Assignment and Agreement.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

1. (c) Exploration to be conducted on claims listed in 1 (a).

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P. O. Box 957
Grand Junction, Colorado

2. (a) Tungsten, Molybdenum, Copper. Also the U. S. Bureau of Mines, Salt Lake City, Utah, have advised us of the presence of traces of Columbium and Tantalum in the ore.

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P. O. Box 957
Grand Junction, Colorado

2. (b) In September and October 1951, Minerals Engineering Company conducted a preliminary examination of the Greenstone property. The ore (Scheelite) outcrops for a distance of 300 feet as shown by Cut No. 6 on the map. Large scale samples were taken in No. 6A Cut which is a cut at right angle to the strike. The assays were .43% and .46% WO_3 as determined by Lewis and Walker, assayers in Butte, Montana.

Four Wagon Drill holes were drilled as shown on the map, WD Hole No. 1 to WD Hole No. 4, totalling 100 feet and assays from samples averaged .47% WO_3. Cut No. 9 to the North of the outcrop was made with a dozer through 6 feet of overburden, exposing the Scheelite ore. Two Wagon Drill holes were drilled in Cut No. 9, samples taken averaged .38% WO_3 as determined by Lewis and Walker, assayers. The ore is a garnetized type, high in silica, which prevents no metallurgical problems according to results obtained in mill tests at the Griswold laboratory at Butte, Montana. The high silica content has caused variations in assays by the different assay firms, in our opinion, due to their failure to thoroughly extract the silica in a preliminary step, which if not done results in a low tungsten assay.

The ore lies on a contact between a granite batholith on the West and limestone beds on the East. Approximate dip of the beds at Greenstone is 40°. Our preliminary examination shows the presence of certain faults, shown on accompanying map. Drill holes have been planned with the effect of these faults in mind.

Further exploration by diamond drill holes and a tunnel is necessary to determine widths and grade.

The property has been examined by Mr. Jack Harlan of the DMPA, Mr. C. C. Popoff and Mr. McNabb of the Bureau of Mines, who have expressed their opinion that a program of exploration be inaugurated at the Greenstone property. It is the opinion of our engineers that the property is a potential large producer of low-grade tungsten ore, which will have to be proved by exploration.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (a) Our program consists of approximately 8,765 feet of diamond drill holes as indicated on the accompanying map, and 1,100 feet of exploratory tunnel over 24 month period.

The estimated cost are:

Diamond Drilling 8,765' @ $5.50 Includes labor, supplies and supervision	$48,000.00
Tunnel 1,100' @ $48.00 Includes labor, supervision, blasting supplies, steel, ventilation, transportation and supplies excepting pipe.	52,800.00
Buildings (Question No. 6)	6,000.00
Operating Equipment (Question No. 7 (b) 24 Month period	19,592.00
Operating Equipment (Question No. 7 (c) 24 Month period	8,640.00
Accounting, Engineering, Sampling, Assaying and Water Hauling as per Question No. 9 24 Month period	44,440.00
TOTAL	$179,472.00

Vertical crosscut holes will be diamond drilled to explore the underground existence, location, length, depth, width and thickness of the outcropping ore lens, and to obtain samples by means of core extraction. The samples will be assayed for mineral content, principally tungsten, and recorded on engineering maps. After completion of the first four or five holes a more clear concept of the geologic structure will be had which may change the location of subsequent holes to conform to good engineering practice.

A 10' x 10' tunnel is proposed to be driven on the strike of the ore lens as will be determined by the first few holes drilled. The approximate length of the tunnel will be 1,100 feet. At intervals of 100', crosscut tunnels will be driven to determine the

3. (a) Continued

width of the ore shoot for tonnage and grade calculations.

The dip of the vein as indicated from the outcrop is approximately minus 40 degrees, therefore if the dip remains the same with depth the vertical diamond drill holes will crosscut the ore lens along the strike at depths of 100' to 200'.

Additional deep holes are proposed to explore at depths of approximately 1,000', which will prove enormous reserves of tungsten ore if the width and assay results are favorable for economic mining.

The approximate location of the holes and the tunnel are indicated on the attached maps.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (b) It will require three months to start the project and 21 months to complete it.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

4. See attached Map.

Maps do not have to be returned

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

5. We do not propose to use the buildings nor the vacilities already on the property, which consists of a shaft house, shaft and tool shed. The exploration work proposed does not require the use of the shaft, therefore excluded.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

6. The following buildings will be erected and equipped by Minerals Engineering Company with the estimated costs given:

One 14' x 20' prefabricated building or building erected on the ground for Compressor House - Approximate Cost	$ 1,200.00
One 14' x 20' Building for Office and Engineering personnel	1,200.00
One 14' x 20' Building for Mechanic Shop	1,200.00
One 14' x 20' Building for Warehouse	1,200.00
One 14' x 20' Bunk House for Watchman	1,200.00
TOTAL	$ 6,000.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

7. (a) None.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

7. (b)	One Gardner Denver WH 210 Compressor	$ 7,565.00
	One Air Receiver	650.00
	Four S48 Gardner Denver Machines	1,380.00
	Four Jacklegs	820.00
	1,500' 2" Black Pipe	507.00
	1,500' 1" Black Pipe	270.00
	One 2T Truck with water tank	2,700.00
	One 1,000 Gal. Water Storage Tank	500.00
	One Pickup Truck (1/2 T)	1,800.00
	One Jeep Station Wagon for transporting men	2,400.00
	One Transit, Chain and Stadia Rod	800.00
	Miscellaneous Tools	200.00
	Total	$19,592.00

7. (c)	1 - 210 Compressor (Monthly depreciation on 5 year basis) @ $85.00	$ 2,040.00
	1 - HD5 Front-end Loader (Monthly depreciation on 10 year basis) @ $75.00	1,800.00
	2 - Diamond Drill Rigs Complete (Monthly Depreciation on 5 year basis) @ $100.00	4,800.00
	TOTAL	$ 8,640.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

8. Labor Schedule:

2 Miners @ $2.00/hr. each 1 Miner Helper @ $1.50/hr. 1 Compressor Man @ $1.75/hr. 1 Mechanic @ $2.00/hr. 1 Truck Driver @ 1.50/hr.	Alternate Labor Contract @ $18.00/foot

1 Shovel Loader Operator @ $2.00-$2.25/hr.

2 Diamond Drillers @ $2.00-$2.25/hr. each

2 Diamond Drill Helpers @ $1.75-$2.00/hr. each

1 Superintendent @ $700.00/Month

1 Shift Boss @ $500.00/Month

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

9. (24 Month Period)

1 Engineer @ $500.00/month	$12,000.00
Sampling & Assaying (Approximately 10 samples per day) @ $3.50/sample	10,000.00
Accounting and Timekeeping 2 People @ $675.00/month	16,200.00
Water Hauling	6,240.00
TOTAL	$44,440.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

10. (a) $45,000.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

10. (b) Yes

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

11. It is our hope that a thorough exploration program to determine the commercial value of the deposit will take less than 24 months but on account of the Montana winters the work may be retarded. The elevation at the property is 7,000 feet, and the snowfall is light but the cold weather will tend to slow down diamond drilling work. The property is located 21 miles from Dillon, Montana, and the personnel will be transported daily to the operations, which will eliminate the housing and boarding of the men.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

January 23, 1952

Defense Minerals Administration
South 157 Howard Street
Spokane, Washington

Gentlemen:

On a recent visit to Washington Mr. Blair Burwell discussed our "Application for Aid for an Exploration Project Pursuant to Mineral Order 5, Under Defense Production Act of 1950", filed on December 27, 1951, for the exploration on the Greenstone property in Beaverhead County, Montana, with Mr. Selfridge of the Washington office. Mr. Selfridge was kind enough to go over a copy of the application and called his attention to certain revisions which might be made in order to confine the exploration to the type and size of work required for exploration purposes only. The principal error in our application apparently was in the size of the exploration tunnel, which we had planned of a size to use for later development and mining.

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Yours very truly,

MINERALS ENGINEERING COMPANY

R. G. Sullivan
Vice-President

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 1 1952

RGS/rol

Encl.

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2361
Metal or Mineral
Date Received 2-1-52
Amount $
Participation (Government %)

Name and address of applicant

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Date January 23, 1952

revised application

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

DMA Docket Number (if available) _____

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Minerals Engineering Company
(Name of company)

By R B Sullivan
(Signature of authorized official)

January 23, 1952
(Date)

Vice-President
(Title)

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

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

1. (a) Lode mining claims and property located in Beaverhead County, Montana, and designated as:

Greenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

Albatross Unpatented Lode Mining Claim, Recorded in Book 101, Page 360-2 of Public Records of Beaverhead County, Montana.

Jerricoe Unpatented Lode Mining Claim, Recorded in Book 101, Page 407 of Public Records of Beaverhead County, Montana.

Kenlyn Unpatented Lode Mining Claim, Recorded in Book 101, Page 408 of Public Records of Beaverhead County, Montana.

Fairview Unpatented Lode Mining Claim, Recorded in Book 101, Page 409 of Public Records of Beaverhead County, Montana.

Northern Star Unpatented Lode Mining Claim, Recorded in Book 101, Page 410 of Public Records of Beaverhead County, Montana.

Saddle Back Unpatented Lode Mining Claim, Recorded in Book 101, Page 411 of Public Records of Beaverhead County, Montana.

Timber Queen Unpatented Lode Mining Claim, Recorded in Book 101, Page 413 of Public Records of Beaverhead County, Montana.

Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, of Public Records of Beaverhead County, Montana.

The property is known as the Greenstone.

1. (b) See attached Lease & Option Agreement and Assignment and Agreement.

1. (c) Exploration to be conducted on claims listed in 1 (a).

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

2. (a) Tungsten, Molybdenum, Copper. Also the U. S. Bureau of Mines Salt Lake City, Utah, have advised us of the presence of traces of Columbium and Tantalum in the ore.

2. (b) In September and October 1951, Minerals Engineering Company conducted a preliminary examination of the Greenstone property. The ore (Scheelite) outcrops for a distance of 300 feet as shown by Cut No. 6 on the map. Large scale samples were taken in No. 6A Cut which is a cut at right angle to the strike. The assays were .43% and .46% WO_3 as determined by Lewis and Walker, assayers in Butte, Montana.

Four Wagon Drill holes were drilled as shown on the map, WD Hole No. 1 to WD Hole No. 4, totalling 100 feet and assays from samples averaged .47% WO_3. Cut No. 9 to the North of the outcrop was made with a dozer through 6 feet of overburden, exposing the Scheelite ore. Two Wagon Drill holes were drilled in Cut No. 9, samples taken averaged .38% WO_3 as determined by Lewis and Walker, assayers. The ore is a garnetized type, high in silica, which prevents no metallurgical problems according to results obtained in mill tests at the Grisweld laboratory at Butte, Montana. The high silica content has caused variations in assays by the different assay firm, in our opinion, due to their failure to thoroughly extract the silica in a preliminary step, which if not done results in a low tungsten assay.

The ore lies on a contact between a granite batholith on the West and limestone beds on the East. Approximate dip of the beds at Greenstone is 40°. Our preliminary examination shows the presence of certain faults, shown on accompanying map. Drill holes have been planned with the effect of these faults in mind.

Further exploration by diamond drill holes and a tunnel is necessary to determine widths and grade.

The property has been examined by Mr. Jack Harlan of the DMPA, Mr. C. C. Popoff and Mr. McWabb of the Bureau of Mines, who have expressed their opinion that a program of exploration be inaugurated at the Greenstone property. It is the opinion of our engineers that the property is a potential large producer of low-grade tungsten ore, which will have to be proved by exploration.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (a) Our program consists of approximately 4,765 feet of diamond drill holes as indicated on the accompanying map, and 1,100 feet of exploratory tunnel over a 24 month period.

The estimated costs are:

Diamond Drilling 4,765' @ $5.50/ft. (Contract price)	$ 26,207.50
Tunnel 1,100' @ $35.00/ft. Includes labor, supervision, blasting supplies, steel, ventilation, transportation and supplies excepting pipe.	38,500.00
Buildings (Question No. 6)	1,200.00
Operating Equipment (Question 7b) 24 Month period	8,327.00
Operating Equipment (Question 7c) 24 Month period	5,020.92
Accounting, Engineering, Sampling, Assaying and Water Hauling as per Question No. 9 24 Month period	36,340.00
TOTAL	$115,595.42

Vertical crosscut holes will be diamond drilled to explore the underground existence, location, length, depth, width and thickness of the outcropping ore lens, and to obtain samples by means of core extraction. The samples will be assayed for mineral content, principally tungsten, and recorded on engineering maps. After completion of the first four or five holes a more clear concept of the geologic structure will be had which may change the location of subsequent holes to conform to good engineering practice.

A 5' x 7-1/2' tunnel is proposed to be driven on the strike of the ore lens as will be determined by the first few holes drilled. The approximate length of the tunnel will be 1,100 feet. At intervals of 100 feet, crosscut tunnels will be driven to determine the width of the ore shoot for tonnage and grade calculations.

The dip of the vein, as indicated from the outcrop, is approximately 40 degrees, therefore if the dip remains the same with depth, the vertical diamond drill holes will crosscut the ore along the strike.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (b) It will require three months to start the project and 21 months to complete it.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

4. See attached Map.

(Maps do not have to be returned)

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

5. We do not propose to use the buildings nor the facilities already on the property, which consists of a shaft house, shaft and tool shed. The exploration work proposed does not require the use of the shaft, therefore excluded.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

6. One building 14' x 20' (prefabricated or erected on the ground) will be necessary for tool storage and mechanic shop $ 1,200.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

7. (a) None.

7. (b)

One	Air Receiver	$ 650.00
Two	S48 Gardner-Denver Machines	690.00
Two	Jacklegs	410.00
1500'	2" Black Pipe	507.00
1500'	1" Black Pipe	270.00
One	2T Truck with Water Tank	2,700.00
One	1000 Gal. Water Storage Tank	500.00
One	Jeep Station Wagon for transporting men	2,400.00
Miscellaneous Tools		200.00
	Total	$8,327.00

7. (c) 24 Month Period

One	Compressor (Cost 7565.00) Monthly depreciation 5 year basis @ 126.08	$3,025.92
One	HD5 Front-end Loader (Cost 9975.00) Monthly depreciation on 10 year basis @ $83.13	1,995.00
	Total	$5,020.92

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

8. 1 Miner @ $2.00-$2.25 per hour

1 Compressor Man and Mechanic @ 2.00 per hour

1 Truck Driver @ $1.50-$1.75 per hour

1 Shovel Loader Operator @ $2.00-$2.25 per hour

1 Superintendent @ $700.00 per month)
1 Shift Boss @ $500.00 per month) 1/2 time on Exploration

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

9. (24 month period)

1 Engineer @ $500.00 per month		$12,000.00
Sampling & Assaying (Approximately 10 samples per day, @ $3.50 per sample		10,000.00
Bookkeeping, Accounting & Timekeeping) 2 people @ $675.00 per month	) 1/2 time	8,100.00
Water Hauling		6,240.00
Total		$36,340.00

Note: Balance of time for accounting and timekeeping for account Minerals Engineering Company and not included in Exploration.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

10. (a) $29,000.00

10. (b) Yes

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

11. It is our hope that a thorough exploration program to determine the commercial value of the deposit will take less than 24 months but on account of the Montana winters the work may be retarded. The elevation at the property is 7,000 feet, and the snowfall is light but the cold weather will tend to slow down diamond drilling work. The property is located 21 miles from Dillon, Montana, and the personnel will be transported daily to the operations, which will eliminate the housing and boarding of the men.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2361
Metal or Mineral
Date Received 2-1-52
Amount $
Participation (Government %)

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Name and address of applicant

Date January 23, 1952

Revised

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

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

INSTRUCTIONS

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

Defense Minerals Administration
RECEIVED
FEB 1 1952

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Minerals Engineering Company
(Name of company)

By R B Sullivan
(Signature of authorized official)

January 23, 1952
(Date)

Vice-President
(Title)

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

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

1. (a) Lode mining claims and property located in Beaverhead County, Montana, and designated as:

Greenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

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Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, of Public Records of Beaverhead County, Montana.

The property is known as the Greenstone.

1. (b) See attached Lease & Option Agreement and Assignment and Agreement.

1. (c) Exploration to be conducted on claims listed in 1 (a).

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

2. (a) Tungsten, Molybdenum, Copper. Also the U. S. Bureau of Mines Salt Lake City, Utah, have advised us of the presence of traces of Columbium and Tantalum in the ore.

2. (b) In September and October 1951, Minerals Engineering Company conducted a preliminary examination of the Greenstone property. The ore (Scheelite) outcrops for a distance of 300 feet as shown by Cut No. 6 on the map. Large scale samples were taken in No. 6A Cut which is a cut at right angle to the strike. The assays were .43% and .46% WO_3 as determined by Lewis and Walker, assayers in Butte, Montana.

Four Wagon Drill holes were drilled as shown on the map, WD Hole No. 1 to WD Hole No. 4, totalling 100 feet and assays from samples averaged .47% WO_3. Cut No. 9 to the North of the outcrop was made with a dozer through 6 feet of overburden, exposing the Scheelite ore. Two Wagon Drill holes were drilled in Cut No. 9, samples taken averaged .38% WO_3 as determined by Lewis and Walker, assayers. The ore is a garnetized type, high in silica, which prevents no metallurgical problems according to results obtained in mill tests at the Griswold laboratory at Butte, Montana. The high silica content has caused variations in assays by the different assay firsm, in our opinion, due to their failure to thoroughly extract the silica in a preliminary step, which if not done results in a low tungsten assay.

The ore lies on a contact between a granite batholith on the West and limestone beds on the East. Approximate dip of the beds at Greenstone is 40°. Our preliminary examination shows the presence of certain faults, shown on accompanying map. Drill holes have been planned with the effect of these faults in mind.

Further exploration by diamond drill holes and a tunnel is necessary to determine widths and grade.

The property has been examined by Mr. Jack Harlan of the DMPA, Mr. C. C. Popoff and Mr. McNabb of the Bureau of Mines, who have expressed their opinion that a program of exploration be inaugurated at the Greenstone property. It is the opinion of our engineers that the property is a potential large producer of low-grade tungsten ore, which will have to be proved by exploration.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (a) Our program consists of approximately 4,765 feet of diamond drill holes as indicated on the accompanying map, and 1,100 feet of exploratory tunnel over a 24 month period.

The estimated costs are:

Diamond Drilling 4,765' @ $5.50/ft. (Contract price)	$ 26,207.50
Tunnel 1,100' @ $35.00/ft. Includes labor, supervision, blasting supplies, steel, ventilation, transportation and supplies excepting pipe.	38,500.00
Buildings (Question No. 6)	1,200.00
Operating Equipment (Question 7b) 24 Month period	8,327.00
Operating Equipment (Question 7c) 24 Month period	5,020.92
Accounting, Engineering, Sampling, Assaying and Water Hauling as per Question No. 9 24 Month period	36,340.00
TOTAL	$115,595.42

Vertical crosscut holes will be diamond drilled to explore the underground existence, location, length, depth, width and thickness of the outcropping ore lens, and to obtain samples by means of core extraction. The samples will be assayed for mineral content, principally tungsten, and recorded on engineering maps. After completion of the first four or five holes a more clear concept of the geologic structure will be had which may change the location of subsequent holes to conform to good engineering practice.

A 5' x 7-1/2' tunnel is proposed to be driven on the strike of the ore lens as will be determined by the first few holes drilled. The approximate length of the tunnel will be 1,100 feet. At intervals of 100 feet, crosscut tunnels will be driven to determine the width of the ore shoot for tonnage and grade calculations.

The dip of the vein, as indicated from the outcrop, is approximately 40 degrees, therefore if the dip remains the same with depth, the vertical diamond drill holes will crosscut the ore along the strike.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

3. (b) It will require three months to start the project and 21 months to complete it.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

4. See attached Map.

(Maps do not have to be returned)

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

5. We do not propose to use the buildings nor the facilities already on the property, which consists of a shaft house, shaft and tool shed. The exploration work proposed does not require the use of the shaft, therefore excluded.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

6.	One building 14' x 20' (prefabricated or erected on the ground) will be necessary for tool storage and mechanic shop	$ 1,200.00

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

7. (a) None.

7. (b)

One	Air Receiver	$ 650.00
Two	S48 Gardner-Denver Machines	690.00
Two	Jacklegs	410.00
1500'	2" Black Pipe	507.00
1500'	1" Black Pipe	270.00
One	2T Truck with Water Tank	2,700.00
One	1000 Gal. Water Storage Tank	500.00
One	Jeep Station Wagon for transporting men	2,400.00
Miscellaneous Tools		200.00
	Total	$8,327.00

7. (c) 24 Month Period

One	Compressor (Cost 7565.00) Monthly depreciation 5 year basis @ 126.08	$3,025.92
One	HD5 Front-end Loader (Cost 9975.00) Monthly depreciation on 10 year basis @ $83.13	1,995.00
	Total	$5,020.92

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

8. 1 Miner @ $2.00-$2.25 per hour

1 Compressor Man and Mechanic @ 2.00 per hour

1 Truck Driver @ $1.50-$1.75 per hour

1 Shovel Loader Operator @ $2.00-$2.25 per hour

1 Superintendent @ $700.00 per month)
) 1/2 time on Exploration
1 Shift Boss @ $500.00 per month)

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

9. (24 month period)

1 Engineer @ $500.00 per month		$12,000.00
Sampling & Assaying (Approximately 10 samples per day @ $3.50 per sample		10,000.00
Bookkeeping, Accounting & Timekeeping 2 people @ $675.00 per month	) 1/2 time	8,100.00
Water Hauling		6,240.00
Total		$36,340.00

Note: Balance of time for accounting and timekeeping for account Minerals Engineering Company and not included in Exploration.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

10. (a) $29,000.00

10. (b) Yes

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

11. It is our hope that a thorough exploration program to determine the commercial value of the deposit will take less than 24 months but on account of the Montana winters the work may be retarded. The elevation at the property is 7,000 feet, and the snowfall is light but the cold weather will tend to slow down diamond drilling work. The property is located 21 miles from Dillon, Montana, and the personnel will be transported daily to the operations, which will eliminate the housing and boarding of the men.

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

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

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

Not To Be Filled in by Applicant

Docket No. DMEA-2361
Metal or Mineral
Date Received 2-1-52
Amount $
Participation (Government %)

Minerals Engineering Company
P. O. Box 957
Grand Junction, Colorado

Name and address of applicant

Date

See Reverse

If you have already filed MF-100, give date filed November 12, 1951, type of assistance requested Access Roads,

DMA Docket Number (if available)

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
FEB 1 1952

INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

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

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

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

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

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

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

CERTIFICATION

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

Minerals Engineering Company
(Name of company)

By R B Sullivan
(Signature of authorized official)

Dec 27-51
(Date)

Vice-President
(Title)

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

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

1. (a) Lode mining claims and property located in Beaverhead County, Montana, and designated as:

Greenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

Albatross Unpatented Lode Mining Claim, Recorded in Book 101, Page 360-2 of Public Records of Beaverhead County, Montana.

Jerricoe Unpatented Lode Mining Claim, Recorded in Book 101, Page 407 of Public Records of Beaverhead County, Montana.

Kenlyn Unpatented Lode Mining Claim, Recorded in Book 101, Page 408 of Public Records of Beaverhead County, Montana.

Fairview Unpatented Lode Mining Claim, Recorded in Book 101, Page 409 of Public Records of Beaverhead County, Montana.

Northern Star Unpatented Lode Mining Claim, Recorded in Book 101, Page 410 of Public Records of Beaverhead County, Montana.

Saddle Back Unpatented Lode Mining Claim, Recorded in Book 101, Page 411 of Public Records of Beaverhead County, Montana.

Timber Queen Unpatented Lode Mining Claim, Recorded in Book 101, Page 413 of Public Records of Beaverhead County, Montana.

Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, of Public Records of Beaverhead County, Montana.

The property is known as the Greenstone.

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1. (b) See attached Lease & Option Agreement and Assignment and Agreement.

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1. (c) Exploration to be conducted on claims listed in 1 (a).

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2. (a) Tungsten, Molybdenum, Copper. Also the U. S. Bureau of Mines, Salt Lake City, Utah, have advised us of the presence of traces of Columbium and Tantalum in the ore.

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2. (b) In September and October 1951, Minerals Engineering Company conducted a preliminary examination of the Greenstone property. The ore (Scheelite) outcrops for a distance of 300 feet as shown by Cut No. 6 on the map. Large scale samples were taken in No. 6A Cut which is a cut at right angle to the strike. The assays were .43% and .46% WO_3 as determined by Lewis and Walker, assayers in Butte, Montana.

Four Wagon Drill holes were drilled as shown on the map, WD Hole No. 1 to WD Hole No. 4, totalling 100 feet and assays from samples averaged .47% WO_3. Cut No. 9 to the North of the outcrop was made with a dozer through 6 feet of overburden, exposing the Scheelite ore. Two Wagon Drill holes were drilled in Cut No. 9, samples taken averaged .38% WO_3 as determined by Lewis and Walker, assayers. The ore is a garnetized type, high in silica, which prevents no metallurgical problems according to results obtained in mill tests at the Griswold laboratory at Butte, Montana. The high silica content has caused variations in assays by the different assay firms, in our opinion, due to their failure to thoroughly extract the silica in a preliminary step, which if not done results in a low tungsten assay.

The ore lies on a contact between a granite batholith on the West and limestone beds on the East. Approximate dip of the beds at Greenstone is 40°. Our preliminary examination shows the presence of certain faults, shown on accompanying map. Drill holes have been planned with the effect of these faults in mind.

Further exploration by diamond drill holes and a tunnel is necessary to determine widths and grade.

The property has been examined by Mr. Jack Harlan of the DMPA, Mr. C. C. Popoff and Mr. McNabb of the Bureau of Mines, who have expressed their opinion that a program of exploration be inaugurated at the Greenstone property. It is the opinion of our engineers that the property is a potential large producer of low-grade tungsten ore, which will have to be proved by exploration.

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3. (a) Our program consists of approximately 8,765 feet of diamond drill holes as indicated on the accompanying map, and 1,100 feet of exploratory tunnel over 24 month period.

The estimated cost are:

Diamond Drilling 8,765' @ $5.50 Includes labor, supplies and supervision	$48,000.00
Tunnel 1,100' @ $48.00 Includes labor, supervision, blasting supplies, steel, ventilation, transportation and supplies excepting pipe.	52,800.00
Buildings (Question No. 6)	6,000.00
Operating Equipment (Question No, 7 (b) 24 Month period	19,592.00
Operating Equipment (Question No. 7 (c) 24 Month period	8,640.00
Accounting, Engineering, Sampling, Assaying and Water Hauling as per Question No. 9 24 Month period	44,440.00
TOTAL	$179,472.00

Vertical crosscut holes will be diamond drilled to explore the underground existence, location, length, depth, width and thickness of the outcropping ore lens, and to obtain samples by means of core extraction. The samples will be assayed for mineral content, principally tungsten, and recorded on engineering maps. After completion of the first four or five holes a more clear concept of the geologic structure will be had which may change the location of subsequent holes to conform to good engineering practice.

A 10' x 10' tunnel is proposed to be driven on the strike of the ore lens as will be determined by the first few holes drilled. The approximate length of the tunnel will be 1,100 feet. At intervals of 100', crosscut tunnels will be driven to determine the

3. (a) Continued

width of the ore shoot for tonnage and grade calculations.

The dip of the vein as indicated from the outcrop is approximately minus 40 degrees, therefore if the dip remains the same with depth the vertical diamond drill holes will crosscut the ore lens along the strike at depths of 100' to 200'.

Additional deep holes are proposed to explore at depths of approximately 1,000', which will prove enormous reserves of tungsten ore if the width and assay results are favorable for economic mining.

The approximate location of the holes and the tunnel are indicated on the attached maps.

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3. (b) It will require three months to start the project and 21 months to complete it.

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4. See attached Map.

Maps do not have to be returned

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5. We do not propose to use the buildings nor the vacilities already on the property, which consists of a shaft house, shaft and tool shed. The exploration work proposed does not require the use of the shaft, therefore excluded.

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6. The following buildings will be erected and equipped by Minerals Engineering Company with the estimated costs given:

One 14' x 20' prefabricated building or building erected on the ground for Compressor House - Approximate Cost	$ 1,200.00
One 14' x 20' Building for Office and Engineering personnel	1,200.00
One 14' x 20' Building for Mechanic Shop	1,200.00
One 14' x 20' Building for Warehouse	1,200.00
One 14' x 20' Bunk House for Watchman	1,200.00
TOTAL	$ 6,000.00

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7. (a) None.

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7. (b)	One Gardner Denver WH 210 Compressor	$ 7,565.00
	One Air Receiver	650.00
	Four 348 Gardner Denver Machines	1,380.00
	Four Jacklegs	820.00
	1,500' 2" Black Pipe	507.00
	1,500' 1" Black Pipe	270.00
	One 2T Truck with water tank	2,700.00
	One 1,000 Gal. Water Storage Tank	500.00
	One Pickup Truck (1/2 T)	1,800.00
	One Jeep Station Wagon for transporting men	2,400.00
	One Transit, Chain and Stadia Rod	800.00
	Miscellaneous Tools	200.00
	Total	$19,592.00

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7. (c)	1 - 210 Compressor (Monthly depreciation on 5 year basis) @ $85.00	$ 2,040.00
	1 - HD5 Front-end Loader (Monthly depreciation on 10 year basis) @ $75.00	1,800.00
	2 - Diamond Drill Rigs Complete (Monthly Depreciation on 5 year basis) @ $100.00	4,800.00
	TOTAL	$ 8,640.00

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8. Labor Schedule:

2 Miners @ $2.00/hr. each 1 Miner Helper @ $1.50/hr. 1 Compressor Man @ $1.75/hr. 1 Mechanic @ $2.00/hr. 1 Truck Driver @ 1.50/hr.	Alternate Labor Contract @ $18.00/foot

1 Shovel Loader Operator @ $2.00-$2.25/hr.

2 Diamond Drillers @ $2.00-$2.25/hr. each

2 Diamond Drill Helpers @ $1.75-$2.00/hr. each

1 Superintendent @ $700.00/Month

1 Shift Boss @ $500.00/Month

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9. (24 Month Period)

1 Engineer @ $500.00/month	$12,000.00
Sampling & Assaying (Approximately 10 samples per day) @ $3.50/sample	10,000.00
Accounting and Timekeeping 2 People @ $675.00/month	16,200.00
Water Hauling	6,240.00
TOTAL	$44,440.00

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10. (a) $45,000.00

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10. (b) Yes

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11. It is our hope that a thorough exploration program to determine the commercial value of the deposit will take less than 24 months but on account of the Montana winters the work may be retarded. The elevation at the property is 7,000 feet, and the snowfall is light but the cold weather will tend to slow down diamond drilling work. The property is located 21 miles from Dillon, Montana, and the personnel will be transported daily to the operations, which will eliminate the housing and boarding of the men.

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ASSIGNMENT AND AGREEMENT

THIS ASSIGNMENT AND AGREEMENT, Made and entered into this 18th day of October, 1951, by and between CARL C. MARTIN, whose post office address is Box 76, Butte, Montana, party of the first part (hereinafter called "Martin") and MINERALS ENGINEERING COMPANY, a Colorado Corporation, having an office in Dillon, Montana, party of the second part (hereinafter called "Minerals"):

W I T N E S S E T H:

For and in consideration of the payment this day made and for the payments to be made hereafter, as stated hereinafter, and of the covenants and conditions herein contained, it is hereby agreed as follows:

I.

Martin hereby and herewith assigns, transfers and sets over and by these presents does assign, transfer and set over to Minerals all of the right, title and interest of said Martin in, to and under that certain Lease and Option Agreement dated September 24, 1951 by and between George W. Farlin, a single man, Carl B. Kennedy and Pearl E. Kennedy, his wife, Grace Farlin Kennedy and Farlyn Kennedy Ubigau as Lessors and Carl C. Martin as Lessee, which Lease and Option Agreement is hereinafter called "Lease and Option".

II.

Minerals agrees to pay Martin the following sums of money:

(a) The sum of $1,000.00 upon the execution of this instrument, the receipt whereof by Martin is hereby acknowledged.

(b) The sum of $1,000.00 within a period of 30 days from the date of this instrument, provided however that Minerals

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shall not be required to pay said sum in the event that Minerals, without cost or expense to Martin, reassigns said Lease and Option to Martin within a period of 30 days from the date of this instrument.

III.

Minerals undertakes and agrees to be bound by and to assume all of the duties and obligations of every kind and character under and by reason of said Lease and Option and the operations conducted thereunder. Minerals further undertakes and agrees to perform all obligations and make all payments required under said Lease and Option.

Minerals further undertakes and agrees to keep said Lease and Option in full force and effect and agrees not to terminate its lease for any cause without giving not less than 30 days advance notice in writing to Martin. In case such notice of termination is given, Minerals agrees to reassign the lease to Martin at the time notice of termination is given.

Any reassignment of said lease and Option to Martin shall not operate to relieve Minerals of any duties or obligations incurred under said Lease and Option prior to the effective date of any such termination.

Any such reassignment shall be without cost or expense to Martin and all such costs or expenses shall be the obligation of Minerals.

In the event of any such reassignment, or of the termination of said Lease and Option for any cause, Minerals agrees not to conduct any mining operations, either directly or indirectly upon the premises described in said Lease and Option and not to deal with, contract with or otherwise acquire, either directly or indirectly any leasehold or other interest in said premises from the said Lessors or their heirs,

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administrators, executors and successors.

Minerals shall have the right to modify, amend or revise said lease and Option, provided however that no such modification, amendment or revision shall have the effect of or result in reducing any payments or royalties of Martin under this instrument without the written consent of Martin and further provided that no such modification, amendment or revision shall have the effect of or result in increasing any duty or obligation of Martin under such Lease and Option without the consent in writing of Martin.

Minerals shall have the right to assign this Assignment and Agreement provided that it guarantees performance of all obligations of Minerals under this Assignment and Agreement.

Minerals shall have no right to surrender said Lease and Option under Paragraph IX thereof or otherwise.

IV.

Minerals agrees to pay additionally to Martin an overiding royalty as follows:

(a) Two and one half percent (2-1/2%) of the "net returns", as hereinafter defined, until the royalties, or other payments, on the option price payable to or paid to the said Lessors in said Lease and Option have amounted to the option price of $150,000.

(b) Five percent (5%) of the "net returns", as hereinafter defined, after the date on which the royalties, or other payments, on the option price payable to or paid to the said Lessors in said Lease and Option have amounted to the option price of $150,000; provided however that said five percent (5%) of the "net returns" as aforesaid shall terminate at the end of ten (10) years of mining operations. It being understood that if the mining operations on the premises are interrupted for any cause that the period of such interruption shall be added to the ten (10) year period.

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V.

The term "net returns" shall be considered in the light of the following explanation and shall be defined as follows:

> It is understood that Minerals contemplates that initially ores from said premises will be sold to the United States of America or some agency thereof, or an independent third party. In such event the term "net returns" shall mean the net amount payable for said ores after deducting all charges for freight and hauling from the premises; provided that said freight charges shall not exceed the freight rate for like ores from the premises to Butte, Montana. In the event the United States of America or some agency thereof, or some independent third party, shall purchase said ore as aforesaid, and can and will make royalty payments to Martin, then this instrument shall constitute the instructions to make such royalty payment direct to Martin.
>
> In case Minerals should treat the ores from the premises in a concentrator or chemical plant or plants in which Minerals has an interest direct or otherwise, it is understood that the term "net returns" shall mean the gross returns received from the metals recovered and sold from the ores, less the cost of transportation, concentration and chemical treatment by Minerals.
>
> Minerals agrees to make available to Martin for his inspection its operating costs and sales prices for the aforesaid purpose.
>
> For any of the purposes set forth above Martin shall receive notice in writing from Minerals of the concentrator, chemical treating plant or purchaser to whom each shipment of ores or concentrates is sent and also copies of all assays and settlement statements. Upon demand in writing by Martin, he shall be entitled to receive from Minerals for each said shipment after the date of said demand duplicate pulps for assay purposes and in case of any disagreement on assays the Union Assay Office, Salt Lake, Utah, or such other assay company as the parties may mutually agree upon, shall act as the final arbiter for said assay purposes and the decision of said arbiter shall be binding upon the parties for assay purposes only.

VI.

Minerals shall have the right of immediate occupancy of the premises described in said Lease and Option. It is agreed that Martin has not and does not hereby make any representations of any matters connected

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with said Lease and Option.

Martin shall have the right to inspect said premises from time to time.

VII.

Time shall be of the essence of this Assignment and Agreement.

Any notices may be given to the parties at the addresses hereinbefore set forth or as subsequently changed in writing by either party.

This Assignment and Agreement shall enure to the benefit of the successors, assigns and/or heirs, administrators and executors of the parties hereto.

VIII.

IN WITNESS WHEREOF the party of the first part and the party of the second part, by its officers thereunto duly authorized, have set their hands the day and year first above written.

/s/ Carl C. Martin
CARL C. MARTIN

by /s/ Armor B. Martin
Armor B. Martin, his Attorney in Fact.

Party of the First Part

MINERALS ENGINEERING COMPANY

by /s/ Blair Burwell
its President

Witness

/s/ Kendrick Smith
Kendrick Smith

Attest

/s/ A. F. Boyd
its Secretary

(seal)

Copy/rol/12-5-51

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STATE OF MONTANA)
:-ss
County of Silver Bow)

On this 18th day of October, 1951, before me the undersigned Notary Public personally appeared ARMOR B. MARTIN known to me to be the person whose name is subscribed to the within instrument as the attorney in fact of Carl C. Martin, and acknowledged to me that he subscribed the name of Carl C. Martin thereto as principal, and his own name as attorney in fact.

/s/ Kendrick Smith
Notary Public for the State of Montana
Residing in Butte, Montana
My Commission Expires 11-30-52

(Seal)

STATE OF MONTANA)
:-ss
County of Silver Bow)

On this 18th day of October, 1951, before me the undersigned Notary Public personally appeared Blair Burwell, the President of the Corporation that executed the within instrument on behalf of the Corporation therein named and acknowledged to me that said Corporation executed the same.

/s/ Kendrick Smith
Notary Public for the State of Montana
Residing in Butte, Montana
My Commission Expires 11-30-52

(Seal)

STATE OF MONTANA)
: ss 81241 INDEXED
County of Beaverhead)

I hereby certify that the within instrument was filed in my office on the 18th day of Oct. A.D. 1951 at 31 min. past 1:00 o'clock, P. M. and recorded on page 270-4 of Book 117 of Miscellaneous Records of Beverhead County, Montana.

Attest my hand and seal.

/s/ Dora E. Schmittroth, County Recorder

Fees $4.50

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LEASE AND OPTION AGREEMENT

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THIS AGREEMENT, Made and entered into this 24 day of September, 1951, by and between GEORGE W. FARLIN, a single man, CARL B. KENNEDY and Pearl E. KENNEDY, his wife, GRACE FARLIN KENNEDY and FARLYN KENNEDY UBIGAU, whose post office address is 1914 Magnolia Blvd., Seattle, Washington, parties of the first part and Lessors, and CARL C. MARTIN, whose post office address is Box 76, Butte, Montana, as party of the second part and Lessee.

W I T N E S S E T H:

I.

That for and in consideration of the sum of One Dollar ($1.00) and the royalties hereinafter reserved and the covenants and agreements hereinafter set forth, the Lessors have devised, leased and let, and by these presents do hereby demise, lease and let, unto the said lessee, his heirs, successors and assigns, upon the terms and conditions hereinafter set forth, all of their right, title and interest in and to those certain lode mining claims and property known and designated as:

Creenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

Albatross Unpatented Lode Mining Claim, Recorded in Book 101, Page 360-2 of Public Records of Beaverhead County, Montana.

Jerricoe Unpatented Lode Mining Claim, Recorded in Book 10k, Page 407 of Public Records of Beaverhead County, Montana.

Kenlyn Unpatented Lode Mining Claim, Recorded in Book 101, Page 408 of Public Records of Beaverhead County, Montana.

Fairview Unpatented Lode Mining Claim, Recorded in Book 101, Page 409 of Public Records of Beaverhead County, Montana.

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Northern Star Unpatented Lode Mining Claim, Recorded in Book 101, Page 410 of Public Records of Beaverhead County, Montana.

Saddle Back Unpatented Lode Mining Claim, Recorded in Book 101, Page 411 of Public Records of Beaverhead County, Montana.

Timber Queen Unpatented Lode Mining Claim, Recorded in Book 101, Page 413 of Public Records of Beaverhead County, Montana.

Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, Page of Public Records of Beaverhead County, Montana.

II.

TO HAVE AND TO HOLD the said premises unto the said Lessee for the term of ten (10) years, commencing with the date of this agreement, unless sooner terminated as hereinafter provided.

III.

IT IS UNDERSTOOD that the Lessee shall be entitled, during the life of this lease and under the terms and conditions hereof, to go upon and use and take and have possession of said property hereby leased, to such an extent as he deems necessary for his operations, 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, dams, tunnels, ditches, pipe lines and power lines.

IV.

The Lessee agrees to pay to the Lessors certain royalties upon the net returns from all ores, concentrates or minerals extracted by him from the premises. The Lessee shall notify the Lessors, in writing, of the purchaser to whom each shipment of ores, concentrates or minerals is sold and said purchaser shall be directed to remit said royalties, together with a copy of

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the assays and settlement statement, to the State Bank and Trust Company, Dillon, Montana, for the credit and information of the Lessors. The wording "net returns", shall be interpreted to mean the net payment received for said ores, concentrates or minerals after deducting all charges for freight and hauling from the premises and smelter and/or custom mill treatment. It is understood that the cost of treating ores from the premises in a mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest shall not be recognized as a deduction for the determination "net returns" under this paragraph.

All royalties paid hereunder are to be applied on the purchase price of the Lessor's rights in the property as hereinafter set forth. Said royalties are to be paid as follows:

> Twelve and one-half per cent (12½%) of the net returns on all copper, lead, zinc, silver and gold in ores and concentrates extracted drom the premises.
>
> Ten per cent (10%) of the net returns on all tungsten and other metals or minerals, (excepting copper, lead, zinc, silver and gold), in ores and concentrates extracted from the premises and sold or disposed of prior to treatment in a mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest.
>
> Seven per cent (7%) of the net returns on all tungsten and other metals or minerals (excepting copper, lead, zinc, silver and gold) in ores and concentrates extracted from the premises if treated in a mill or concentrator owned or controlled by the Lessee or in whihh the Lessee has an interest. It being understood that the cost of treating ores from the premises in said mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest shall not be deducted from payments received for said ores or concentrates from the premises in determining the "net returns", as described in the first sub paragraph of this paragraph No. IV.

V.

In further consideration of the expenditure made above and the other covenants hereincontained, the Lessors hereby grant to the Lessee the sole and exclusive right and option during the term of this Agreement to

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purchase of and from said Lessors all of their interest in the above described lode mining claims for the sum of One Hundred Fifty Thousand Dollars ($150,000.00) payable to the credit of the Lessors at the State Bank and Trust Company, Dillon, Montana.

IT IS FURTHER AGREED that the Lessee shall have the right and privilege during the term hereof of paying, in addition to royalties, any amounts on the said purchase price which he may desire to pay, and the royalty payments herein provided for are to be applied on the purchase price aforementioned, and that, if at any time within the term of this Agreement, the total of the royalty payments plus other amounts, if any, paid to the first party amount to the sum of One Hundred Fifty Thousand Dollars ($150,000.00), title to the said property, as aforedescribed, will be conveyed to the said Lessee, his heirs, successors and assigns. In the event said payments do not toal One Hundred Fifty Thousand Dollars ($150,000.00) within said term, then this Option shall be of no force and effect, and Lessors may retain all payments theretofore made to them whether as royalties or otherwise as reasonable rental for the use of their property during said term.

VI.

IT IS FURTHER UNDERSTOOD that the Lessors are performing certain development and mining operations in the so called "Kenlyn Shaft" on the said Greenstone mining claim and that they shall have the right to continue such mining operations until January 1, 1953, unless the Lessee should desire to take over the "Kenlyn Shaft" operations at an early date, in which event the Lessee will so notify the Lessors, in writing, and pay to them the sum of Ten Thousand Dollars ($10,000.00) in settlement for the cost of development work done in said "Kenlyn Shaft". It is understood and agreed

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that the Lessors shall be entitled to all of the proceeds from ores extracted from the premises through the said "Kenlyn Shaft" prior to January 1, 1953 or the time Leesee takes over the "Kenlyn Shaft" operations as provided in this paragraph and pays to the Lessors the aforesaid Ten Thousand Dollars ($10,000.00). It is understood that the Lessee shall have the privilege at any time of operating and using the "Kenlyn Shaft" for development purposes but that he shall not have the right to dispose of ores therefrom as provided in Paragraphs III and IV hereof until he has made the Ten Thousand Dollar ($10,000.00) payment to Lessors as provided above in this paragraph. In event that the Lessee should use the "Kenlyn Shaft" and/or adjoining workings for development purposes during the same period of time that the Lessors also have the right to use said shaft and workings it is understood by both parties hereto that the Lessors will limit their operations to one eight hour working shift per 24 hours, to be chosen by them, and the Lessee will confine his work in said shaft and workings to the opposite shaft if necessary to prevent interference with the operations of yhr Lessors.

VII.

IT IS UNDERSTOOD AND AGREED by the parties hereto that the Lessors now have upon the property hereby leased certain supplies, equipment and machinery listed in Exhibit "A" attached hereto and made a part hereof, and used by them in their "Kenlyn Shaft" operations, and that the purchase price of One Hundred Fifty Thousand Dollars ($150,000.00) for the mining property, as set forth in Paragraph V above, does not include said supplies, equipment and machinery. It is further understood that the Lessors may continue the use of the said supplies, equipment and machinery until January 1, 1953, or until such time as the Lessee takes over the "Kenlyn Shaft" operation as

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provided in Paragraph VI hereof. Upon taking over the "Knelyn Shaft" operations as provided in Paragraph VI, the Lessee agrees to purchase said supplies, equipment and machinery, as listed and priced in said Exhibit "A", for the sum of Twenty Three Thousand Two Hundred Two Dollars and Eighty Six Cents ($23,202.86) on a monthly rental payment basis as follows: One Thousand Dollars ($1,000.00) down payment and Five Hundred Dollars ($500.00) per month thereafter until the total purchase price has been paid. All rental payments to apply on the purchase price and title to said machinery and equipment to pass to the Lessee whenever the total rentals have amounted to the purchase price. It is understood that the purchase price for the said machinery and equipment specified hereinabove shall be reduced by the price of any item or items not available for assignment to the Lessee in good working condition when the Lessee begins rental payments as provided herein.

In case the Lessee does not complete purchase of machinery and equipment and the same is turned back to the Lessors, then said machinery and equipment must be returned in a good condition as when received by Lessee, less reasonable wear and tear.

In the event the Lessee shall use one or more of the items of machinery and equipment listed in Exhibit "A" hereof prior to the time that the Lessee takes over the operation of the "Kenlyn Shaft" and initiates rental payments on all of the machinery and equipment listed in Exhibit "A" as provided herein, the Lessee shall pay a monthly rental for the first month equal to one-tenth (1/10) of the price listed after such items of machinery or equipment in Exhibit "A" and a monthly rental thereafter of one-twentieth (1/20) of the price listed after such items in the attached Exhibit "A". All such rentals to apply on the purchase price of said machinery and equipment.

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In the event no equipment or machinery as listed in Exhibit "A" is used by the Lessee on or before 90 days from the date of execution of this Lease and Option Agreement, then the Lessee shall pay a minimum monthly rental of Two Hundred Dollars ($200.00) per month thereafter until said machinery and equipment is paid for. Such minimum rental, however, to apply on the purchase price of said machinery and equipment as listed in Exhibit "A" hereof.

VIII.

IT IS UNDERSTOOD AND AGREED that the Lessee plans to do exploration work for the discovery of tungsten and other ores upon the premises and that he may make application for an exploration loan from the United States Government to explore for tungsten and other ores upon the premises leased hereunder. Lessors agree to subordinate their rights to the returns from ores discovered by the exploration work done with funds from said Government loan to the extent of permitting a payment of 5% royalty on said returns to repay said loan. It is specifically understood that the provisions of this paragraph as set forth above are to apply only to ores discovered as a result of work done by the use of funds provided by said Government loan and in no event to extend for a period longer than ten years.

It is hereby understood and agreed that the royalty payment to the United States Government as provided for in this paragraph, shall in no event reduce the royalty payment due the Lessors under Paragraph IV. of this Lease and Option Agreement. The Lessors shall receive their full royalty payment regardless of any payment due on any United States Government Loan, which payments are to be made by Lessee. Lessors will be furnished with copies of all papers given the United States Government on any loan requiring the signature or consent of Lessors, and whereby the United States Government would have a lien on Lessors' property.

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IX.

LESSEE AGREES to prosecute the exploration work, as set forth in Paragraph VIII above, with due diligence and to notify Lessors, in writing, within a reasonable time of any unfavorable development which, in the sole determination of the Lessee, will cause him to abandon operations on the premises.

The Lessee shall have the right, at any time upon the payment of One Dollar ($1.00), to surrender this Lease and Option Agreement and the premises and thereby be relieved from all further obligations hereunder. If the Lessee surrenders or forfeits his rights hereunder, he agrees to execute and deliver to said Lessors a suitable release of all rights in said premises together with a copy of all engineer's reports, assay records and maps concerning the premises that have been prepared by or for the Lessee.

LESSEE AGREES that within thirty (30) days after the date of execution of this Agreement he will enter upon the premises and begin active exploration and/or mining operations thereon and that he will continue either to work not less than forty (40) man days per month of said exploration and/or mining operations on the premises or in lieu thereof to pay a rental of One Hundred Dollars ($100.00) per month to the Lessors during the life of this agreement, unless sooner terminated as provided in Paragraph IX hereof.

Lessee further agrees to perform the annual assessment work required to validate the unpatented mining claims listed in Paragraph I hereof and to make proper filing of affidavits of said assessment work.

XI.

IT IS UNDERSTOOD AND AGREED that the Lessee shall pay all taxes on structures, improvements and machinery used by him in the operations conducted under and in accordance with this lease, other than taxes on royalties received by Lessors and production taxes, a part of which are chargeable to

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Lessors, as provided by law, which taxes shall be paid by the Lessors, and other than taxes on the land which shall be paid by Lessors until the Deed is delivered to Lessee, as herein provided.

XII.

IT IS UNDERSTOOD AND AGREED that a representative of the lessors may, at any time, go upon the premises hereby leased to examine said premises and to sample the surface and underground workings thereon, with the use of all passages, ropes, windlasses, ladderways, and all other means of ingress and egress. The Lessors shall have the right to examine the maps, drill cores, shipment and assay records concerning the operations of the Lessee on the premises. Lessee shall notify assayers to return sample pulps, not required for further testing by Lessee, to the Lessors upon their request.

Lessee shall prepare and deliver to Lessors a tabulation of the assay values and locations of samples taken by Lessee on the premises once each calendar month. Lessee will bring assay maps up to date at lease once each three months and furnish copies of said maps to Lessors.

XIII.

The Lessee undertakes and agrees at all times during the life of this lease to comply with the Workmen's Compensation Act of the State of Montana, and to comply with all Federal and State enactments in connection with the operations under this lease, and the said 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 hereunde, except such claim or demands as may be caused or occasioned by the negligence of the lessors, their agents or employees.

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XIV.

IT IS UNDERSTOOD AND AGREED that the Lessee shall, at any time during or within sixty (60) days after the termination of this lease, have the right to remove all structures, equipment, machinery, and other property placed upon the leased premises by him, provided there are no unfilled obligations of the Lessee hereunder at that time.

Lessee shall not remove from the premises any machinery or equipment mortgaged to secure any U. S. Government loans as provided in Paragraph VIII hereof without the consent of the proper United States Government Loaning authority and the Lessors.

XV.

Lessee agrees that all work done by him upon the said property shall be carefully performed in a good and workmanlike manner. Underground workings shall be timbered where required with timber heavy enough to conform with good mining practice,so as to facilitate future mine opeations.

XVI.

Lessors have executed a Grant Deed to the Lessee, covering their interest in the property described in Paragraph I of this Lease and Option Agreement, and the parties hereto agree that this Lease and Option Agreement and that the Grant Deed shall be delivered to and placed in escrow with the State Bank and Trust Company, Dillon, Montana and that said State Bank and Trust Company shall deliver the said Grant Deed to the Lessee if and when, at any time within the term of this Agreement, the payments of royalties plus payments of any other amounts on the purchase price made by the Lessee to the Lessors at said bank amount to the sum of $150,000.00. In the event that the payments made by the Lessee to the Lessors during the term of this Agreement do not amount to the sum of $150,000.00, the said bank shall

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at the expiration of the term of this Agreement, or sooner cancellation thereof, return the said Grant Deed to the Lessors.

XVII.

IT IS AGREED that all notices or communications to be given to the Lessors under the terms of this lease shall be addressed to said Lessors at 1914 Magnolia Blvd. Seattle, Washington, and that all communications or notices to be given to the Lessee under the terms of this lease shall be addressed to the Lessee at Box 76, Butte, Montana, and any notice shall be deemed given at the date of mailing, if that mailing occurs in the Cities of Butte, Montana, or Seattle, Washington. Either party may change its address, as contained in this paragraph, by giving the other party notice, in writing, of such change.

XVIII.

The provisions of this lease shall be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns. Lessee agrees to notify the Lessors, in writing, of any assignment of interest in this Lease and Option Agreement within ten (10) days of the effective date thereof, and to furnish them with a copy of the instrument of assignment.

XIX.

In the event of the failure of either party to keep, observe and perform any and all of the terms and conditions hereof, this lease shall be subject to cancellation and forfeiture by the other party, provided that the party claiming that there is a default shall give to the defaulting party notice in writing of any such default which notice shall state specifically what default or failure has been committed, and the defaulting party shall, within thirty (30) days after such notice, either make good

COPY

any such designated default or failure of which he is guilty, or this lease shall be cancelled and terminated.

XX.

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

/s/ Carl B. Kennedy

/s/ Grace Farlin Kennedy

/s/ George W. Farlin

/s/ Pearl E. Kennedy

/s/ Farlyn Kennedy Ubigau

/s/ Alfred R. Ubigan

Parties of the First Part - Lessors

/s/ Carl C. Martin

Party of the Second Part - Lessee

copy/rol/12-8-51/5 copies

COPY

STATE OF MONTANA)
: -ss
County of Beaverhead)

On this 25th day of September, 1951, before my, the undersigned, a Notary Public in and for the State of Montana, personally appeared GEORGE W, FARLIN, , and CARL B. KENNEDY AND PEARL E. KENNEDY, his wife, known to me to be 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 and affixed my Notarial seal the day and year in this certificate first above written.

/s/ Donald J. Smith
Notary Public for the State of Montana
Residing at Dillon, Montana
My Commission Expires January 10, 1952

(SEAL)

STATE OF MONTANA)
:-ss
County of Beaverhead)

On this 25th day of September, 1951, before me, the undersigned, a Notary Public in and for the State of Montana, personally appeared GRACE E. FARLIN KENNEDY, known to me to be the person whose name is subscribed to the within and foregoing instrument, and acknowledged to me that she executed the same.

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

Notary Public for the State of Montana
Residing at Dillon, Montana
My commission expires January 10, 1952

(SEAL)

COPY

STATE OF WASHINGTON)
:-ss
County of King)

On this 18th day of September, 1951, before me, the undersigned, a Notary Public in and for the State of Washington, personally appeared FARLYN KENNEDY UBIGAU, known to me to be the person whose name is subscribed to the within and foregoing instrument, and acknowledged to me that she executed the same.

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

/s/ Howard T. Lewis
Notary Public for the State of Washington
Residing at Seattle
My commission expires June 28, 1952

(SEAL)

STATE OF WASHINGTON)
:-ss
County of King)

On this 18th. day of September, A. D. 1951, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn personally appeared Alfred R. Ubigau to me known to be the individual described in and who executed the foregoing instrument, and acknowledged to me that he signed and sealed the said instrument as his free and voluntary act and deed for the uses and purposes therein mentioned.

WITNESS my hand and official seal hereto affixed the day and year in this certificate above written.

/s/ Howard T. Lewis
Notary Public in and for the State of Washington residing in Seattle.

COPY

EXHIBIT "A"

The following lists of items and their values consisting of supplies, equipment and machinery with a total value of Twenty Three Thousand Two Hundred Two Dollars and Eighty Six Cents ($23,202.86) is attached to and made a part of the foregoing Agreement dated entered into by and between GEORGE W. FARLIN, CARL B. KENNEDY, GRACE FARLIN KENNEDY and FARLYN KENNEDY UBIGAU all of 1914 Magnolia Blvd., Seattle, Washington, Lessors and CARL C. MARTIN of Box 76, Butte, Montana, Lessee and referred to as Exhibit "A" in Paragraph VII of said Agreement.

It is agreed that the first rent-purchase payments made under the terms of Paragraph VII of the Agreement amounting to a total of, but not exceeding One Thousand Dollars ($1,000.00) is for the purpose of covering the value of the supplies and miscellaneous equipment which may be consumed or unidentifiable in case the Lessee does not complete the purchase of the entire lists of supplies, equipment and machinery shown in this Exhibit "A" and said equipment and machinery is returned to Lessors as provided for in Paragraph VII of the Agreement. In case the supplies, equipment and machinery shown in this Exhibit "A" are returned to the Lessors because of the Lessee's failure to complete payments equal to the total value of the items listed then the accounting shall be made as though the first rental-purchase payments made under the terms of Paragraph VII of the Agreement amounting to not more than One Thousand Dollars ($1,000.00) had been made to purchase those items of supply and miscellaneous equipment which may have been consumed or may be impossible to identify in taking inventory of the supplies, equipment and machinery listed herein.

The Lessee agrees to purchase and carry public liability insur-

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ance covering items of surface rolling equipment (truck, caterpillar, army jeep, motor patrol) as soon as each of such items is taken over by the Lessee under the provisions of Paragraph VII of the Agreement.

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LEASE AND OPTION AGREEMENT

THIS AGREEMENT, Made and entered into this 24 day of September, 1951, by and between GEORGE W. FARLIN, a single man, CARL B. KENNEDY and Pearl E. KENNEDY, his wife, GRACE FARLIN KENNEDY and FARLYN KENNEDY UBIGAU, whose post office address is 1914 Magnolia Blvd., Seattle, Washington, parties of the first part and Lessors, and CARL C. MARTIN, whose post office address is Box 76, Butte, Montana, as party of the second part and Lessee.

W I T N E S S E T H:

I.

That for and in consideration of the sum of One Dollar ($1.00) and the royalties hereinafter reserved and the covenants and agreements hereinafter set forth, the Lessors have devised, leased and let, and by these presents do hereby demise, lease and let, unto the said lessee, his heirs, successors and assigns, upon the terms and conditions hereinafter set forth, all of their right, title and interest in and to those certain lode mining claims and property known and designated as:

Creenstone Patented Lode Mining Claim, Survey No. 2138.

Subvene Unpatented Lode Mining Claim, Recorded in Book 101, Page 412 of Public Records of Beaverhead County, Montana.

Albatross Unpatented Lode Mining Claim, Recorded in Book 101, Page 360-2 of Public Records of Beaverhead County, Montana.

Jerricoe Unpatented Lode Mining Claim, Recorded in Book 10k, Page 407 of Public Records of Beaverhead County, Montana.

Kenlyn Unpatented Lode Mining Claim, Recorded in Book 101, Page 408 of Public Records of Beaverhead County, Montana.

Fairview Unpatented Lode Mining Claim, Recorded in Book 101, Page 409 of Public Records of Beaverhead County, Montana.

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Northern Star Unpatented Lode Mining Claim, Recorded in Book 101, Page 410 of Public Records of Beaverhead County, Montana.

Saddle Back Unpatented Lode Mining Claim, Recorded in Book 101, Page 411 of Public Records of Beaverhead County, Montana.

Timber Queen Unpatented Lode Mining Claim, Recorded in Book 101, Page 413 of Public Records of Beaverhead County, Montana.

Paystreak Unpatented Lode Mining Claim, Recorded in Book 101, Page of Public Records of Beaverhead County, Montana.

II.

TO HAVE AND TO HOLD the said premises unto the said Lessee for the term of ten (10) years, commencing with the date of this agreement, unless sooner terminated as hereinafter provided.

III.

IT IS UNDERSTOOD that the Lessee shall be entitled, during the life of this lease and under the terms and conditions hereof, to go upon and use and take and have possession of said property hereby leased, to such an extent as he deems necessary for his operations, 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, dams, tunnels, ditches, pipe lines and power lines.

IV.

The Lessee agrees to pay to the Lessors certain royalties upon the net returns from all ores, concentrates or minerals extracted by him from the premises. The Lessee shall notify the Lessors, in writing, of the purchaser to whom each shipment of ores, concentrates or minerals is sold and said purchaser shall be directed to remit said royalties, together with a copy of

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the assays and settlement statement, to the State Bank and Trust Company, Dillon, Montana, for the credit and information of the Lessors. The wording "net returns", shall be interpreted to mean the net payment received for said ores, concentrates or minerals after deducting all charges for freight and hauling from the premises and smelter and/or custom mill treatment. It is understood that the cost of treating ores from the premises in a mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest shall not be recognized as a deduction for the determination "net returns" under this paragraph.

All royalties paid hereunder are to be applied on the purchase price of the Lessor's rights in the property as hereinafter set forth. Said royalties are to be paid as follows:

> Twelve and one-half per cent (12½%) of the net returns on all copper, lead, zinc, silver and gold in ores and concentrates extracted drom the premises.
>
> Ten per cent (10%) of the net returns on all tungsten and other metals or minerals, (excepting copper, lead, zinc, silver and gold), in ores and concentrates extracted from the premises and sold or disposed of prior to treatment in a mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest.
>
> Seven per cent (7%) of the net returns on all tungsten and other metals or minerals (excepting copper, lead, zinc, silver and gold) in ores and concentrates extracted from the premises if treated in a mill or concentrator owned or controlled by the Lessee or in whihh the Lessee has an interest. It being understood that the cost of treating ores from the premises in said mill or concentrator owned or controlled by the Lessee or in which the Lessee has an interest shall not be deducted from payments received for said ores or concentrates from the premises in determining the "net returns", as described in the first sub paragraph of this paragraph No. IV.

V.

In further consideration of the expenditure made above and the other covenants hereincontained, the Lessors hereby grant to the Lessee the sole and exclusive right and option during the term of this Agreement to

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purchase of and from said Lessors all of their interest in the above described lode mining claims for the sum of One Hundred Fifty Thousand Dollars ($150,000.00) payable to the credit of the Lessors at the State Bank and Trust Company, Dillon, Montana.

IT IS FURTHER AGREED that the Lessee shall have the right and privilege during the term hereof of paying, in addition to royalties, any amounts on the said purchase price which he may desire to pay, and the royalty payments herein provided for are to be applied on the purchase price aforementioned, and that, if at any time within the term of this Agreement, the total of the royalty payments plus other amounts, if any, paid to the first party amount to the sum of One Hundred Fifty Thousand Dollars ($150,000.00), title to the said property, as aforedescribed, will be conveyed to the said Lessee, his heirs, successors and assigns. In the event said payments do not toal One Hundred Fifty Thousand Dollars ($150,000.00) within said term, then this Option shall be of no force and effect, and Lessors may retain all payments theretofore made to them whether as royalties or otherwise as reasonable rental for the use of their property during said term.

VI.

IT IS FURTHER UNDERSTOOD that the Lessors are performing certain development and mining operations in the so called "Kenlyn Shaft" on the said Greenstone mining claim and that they shall have the right to continue such mining operations until January 1, 1953, unless the Lessee should desire to take over the "Kenlyn Shaft" operations at an early date, in which event the Lessee will so notify the Lessors, in writing, and pay to them the sum of Ten Thousand Dollars ($10,000.00) in settlement for the cost of development work done in said "Kenlyn Shaft". It is understood and agreed

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that the Lessors shall be entitled to all of the proceeds from ores extracted from the premises through the said "Kenlyn Shaft" prior to January 1, 1953 or the time Lessee takes over the "Kenlyn Shaft" operations as provided in this paragraph and pays to the Lessors the aforesaid Ten Thousand Dollars ($10,000.00). It is understood that the Lessee shall have the privilege at any time of operating and using the "Kenlyn Shaft" for development purposes but that he shall not have the right to dispose of ores therefrom as provided in Paragraphs III and IV hereof until he has made the Ten Thousand Dollar ($10,000.00) payment to Lessors as provided above in this paragraph. In event that the Lessee should use the "Kenlyn Shaft" and/or adjoining workings for development purposes during the same period of time that the Lessors also have the right to use said shaft and workings it is understood by both parties hereto that the Lessors will limit their operations to one eight hour working shift per 24 hours, to be chosen by them, and the Lessee will confine his work in said shaft and workings to the opposite shaft if necessary to prevent interference with the operations of yhr Lessors.

VII.

IT IS UNDERSTOOD AND AGREED by the parties hereto that the Lessors now have upon the property hereby leased certain supplies, equipment and machinery listed in Exhibit "A" attached hereto and made a part hereof, and used by them in their "Kenlyn Shaft" operations, and that the purchase price of One Hundred Fifty Thousand Dollars ($150,000.00) for the mining property, as set forth in Paragraph V above, does not include said supplies, equipment and machinery. It is further understood that the Lessors may continue the use of the said supplies, equipment and machinery until January 1, 1953, or until such time as the Lessee takes over the "Kenlyn Shaft" operation as

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provided in Paragraph VI hereof. Upon taking over the "Knelyn Shaft" operations as provided in Paragraph VI, the Lessee agrees to purchase said supplies, equipment and machinery, as listed and priced in said Exhibit "A", for the sum of Twenty Three Thousand Two Hundred Two Dollars and Eighty Six Cents ($23,202.86) on a monthly rental payment basis as follows: One Thousand Dollars ($1,000.00) down payment and Five Hundred Dollars ($500.00) per month thereafter until the total purchase price has been paid. All rental payments to apply on the purchase price and title to said machinery and equipment to pass to the Lessee whenever the total rentals have amounted to the purchase price. It is understood that the purchase price for the said machinery and equipment specified hereinabove shall be reduced by the price of any item or items not available for assignment to the Lessee in good working condition when the Lessee begins rental payments as provided herein.

In case the Lessee does not complete purchase of machinery and equipment and the same is turned back to the Lessors, then said machinery and equipment must be returned in a good condition as when received by Lessee, less reasonable wear and tear.

In the event the Lessee shall use oen or more of the items of machinery and equipment listed in Exhibit "A" hereof prior to the time that the Lessee takes over the operation of the "Kenlyn Shaft" and initiates rental payments on all of the machinery and equipment listed in Exhibit "A" as provided herein, the Lessee shall pay a monthly rental for the first month equal to one-tenth (1/10) of the price listed after such items of machinery or equipment in Exhibit "A" and a monthly rental thereafter of one-twentieth (1/20) of the price listed after such items in the attached Exhibit "A". All such rentals to apply on the purchase price of said machinery and equipment.

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In the event no equipment or machinery as listed in Exhibit "A" is used by the Lessee on or before 90 days from the date of execution of this Lease and Option Agreement, then the Lessee shall pay a minimum monthly rental of Two Hundred Dollars ($200.00) per month thereafter until said machinery and equipment is paid for. Such minimum rental, however, to apply on the purchase price of said machinery and equipment as listed in Exhibit "A" hereof.

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IT IS UNDERSTOOD AND AGREED that the Lessee plans to do exploration work for the discovery of tungsten and other ores upon the premises and that he may make application for an exploration loan from the United States Government to explore for tungsten and other ores upon the premises leased hereunder. Lessors agree to subordinate their rights to the returns from ores discovered by the exploration work done with funds from said Government loan to the extent of permitting a payment of 5% royalty on said returns to repay said loan. It is specifically understood that the provisions of this paragraph as set forth above are to apply only to ores discovered as a result of work done by the use of funds provided by said Government loan and in no event to extend for a period longer than ten years.

It is hereby understood and agreed that the royalty payment to the United States Government as provided for in this paragraph, shall in no event reduce the royalty payment due the Lessors under Paragraph IV. of this Lease and Option Agreement. The Lessors shall receive their full royalty payment regardless of any payment due on any United States Government Loan, which payments are to be made by Lessee. Lessors will be furnished with copies of all papers given the United States Government on any loan requiring the signature or consent of Lessors, and whereby the United States Government would have a lien on Lessors' property.

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LESSEE AGREES to prosecute the exploration work, as set forth in Paragraph VIII above, with due diligence and to notify Lessors, in writing, within a reasonable time of any unfavorable development which, in the sole determination of the Lessee, will cause him to abandon operations on the premises.

The Lessee shall have the right, at any time upon the payment of One Dollar ($1.00), to surrender this Lease and Option Agreement and the premises and thereby be relieved from all further obligations hereunder. If the Lessee surrenders or forfeits his rights hereunder, he agrees to execute and deliver to said Lessors a suitable release of all rights in said premises together with a copy of all engineer's reports, assay records and maps concerning the premises that have been prepared by or for the Lessee.

LESSEE AGREES that within thirty (30) days after the date of execution of this Agreement he will enter upon the premises and begin active exploration and/or mining operations thereon and that he will continue either to work not less than forty (40) man days per month of said exploration and/or mining operations on the premises or in lieu thereof to pay a rental of One Hundred Dollars ($100.00) per month to the Lessors during the life of this agreement, unless sooner terminated as provided in Paragraph IX hereof.

Lessee further agrees to perform the annual assessment work required to validate the unpatented mining claims listed in Paragraph I hereof and to make proper filing of affidavits of said assessment work.

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IT IS UNDERSTOOD AND AGREED that the Lessee shall pay all taxes on structures, improvements and machinery used by him in the operations conducted under and in accordance with this lease, other than taxes on royalties received by Lessors and production taxes, a part of which are chargeable to

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IT IS UNDERSTOOD AND AGREED that a representative of the lessors may, at any time, go upon the premises hereby leased to examine said premises and to sample the surface and underground workings thereon, with the use of all passages, ropes, windlasses, ladderways, and all other means of ingress and egress. The Lessors shall have the right to examine the maps, drill cores, shipment and assay records concerning the operations of the Lessee on the premises. Lessee shall notify assayers to return sample pulps, not required for further testing by Lessee, to the Lessors upon their request.

Lessee shall prepare and deliver to Lessors a tabulation of the assay values and locations of samples taken by Lessee on the premises once each calendar month. Lessee will bring assay maps up to date at least once each three months and furnish copies of said maps to Lessors.

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The Lessee undertakes and agrees at all times during the life of this lease to comply with the Workmen's Compensation Act of the State of Montana, and to comply with all Federal and State enactments in connection with the operations under this lease, and the said 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 hereunde, except such claim or demands as may be caused or occasioned by the negligence of the lessors, their agents or employees.

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IT IS UNDERSTOOD AND AGREED that the Lessee shall, at any time during or within sixty (60) days after the termination of this lease, have the right to remove all structures, equipment, machinery, and other property placed upon the leased premises by him, provided there are no unfilled obligations of the Lessee hereunder at that time.

Lessee shall not remove from the premises any machinery or equipment mortgaged to secure any U. S. Government loans as provided in Paragraph VIII hereof without the consent of the proper United States Government Loaning authority and the Lessors.

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Lessors have executed a Grant Deed to the Lessee, covering their interest in the property described in Paragraph I of this Lease and Option Agreement, and the parties hereto agree that this Lease and Option Agreement and that the Grant Deed shall be delivered to and placed in escrow with the State Bank and Trust Company, Dillon, Montana and that said State Bank and Trust Company shall deliver the said Grant Deed to the Lessee if and when, at any time within the term of this Agreement, the payments of royalties plus payments of any other amounts on the purchase price made by the Lessee to the Lessors at said bank amount to the sum of $150,000.00. In the event that the payments made by the Lessee to the Lessors during the term of this Agreement do not amount to the sum of $150,000.00, the said bank shall

at the expiration of the term of this Agreement, or sooner cancellation thereof, return the said Grant Deed to the Lessors.

XVII.

IT IS AGREED that all notices or communications to be given to the Lessors under the terms of this lease shall be addressed to said Lessors at 1914 Magnolia Blvd. Seattle, Washington, and that all communications or notices to be given to the Lessee under the terms of this lease shall be addressed to the Lessee at Box 76, Butte, Montana, and any notice shall be deemed given at the date of mailing, if that mailing occurs in the Cities of Butte, Montana, or Seattle, Washington. Either party may change its address, as contained in this paragraph, by giving the other party notice, in writing, of such change.

XVIII.

The provisions of this lease shall be binding upon the parties hereto, their heirs, executors, administrators, successors and assigns. Lessee agrees to notify the Lessors, in writing, of any assignment of interest in this Lease and Option Agreement within ten (10) days of the effective date thereof, and to furnish them with a copy of the instrument of assignment.

XIX.

In the event of the failure of either party to keep, observe and perform any and all of the terms and conditions hereof, this lease shall be subject to cancellation and forfeiture by the other party, provided that the party claiming that there is a default shall give to the defaulting party notice in writing of any such default which notice shall state specifically what default or failure has been committed, and the defaulting party shall, within thirty (30) days after such notice, either make good

COPY

any such designated default or failure of which he is guilty, or this lease shall be cancelled and terminated.

XX.

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

/s/ Carl B. Kennedy

/s/ Grace Farlin Kennedy

/s/ George W. Farlin

/s/ Paarl E. Kennedy

/s/ Farlyn Kennedy Ubigau

/s/ Alfred R. Ubigau

Parties of the First Part - Lessors

/s/ Carl C. Martin

Party of the Second Part - Lessee

copy/rol/12-8-51/5 copies

STATE OF MONTANA)
: -ss
County of Beaverhead)

On this 25th day of September, 1951, before my, the undersigned, a Notary Public in and for the State of Montana, personally appeared GEORGE W, FARLIN, , and CARL B. KENNEDY AND PEARL E. KENNEDY, his wife, known to me to be 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 and affixed my Notarial seal the day and year in this certificate first above written.

/s/ Donald J. Smith
Notary Public for the State of Montana
Residing at Dillon, Montana
My Commission Expires January 10, 1952

(SEAL)

STATE OF MONTANA)
:-ss
County of Beaverhead)

On this 25th day of September, 1951, before me, the undersigned, a Notary Public in and for the State of Montana, personally appeared GRACE E. FARLIN KENNEDY, known to me to be the person whose name is subscribed to the within and foregoing instrument, and acknowledged to me that she executed the same.

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

Notary Public for the State of Montana
Residing at Dillon, Montana
My commission expires January 10, 1952

(SEAL)

COPY

STATE OF WASHINGTON)
:-ss
County of King)

On this 18th day of September, 1951, before me, the undersigned, a Notary Public in and for the State of Washington, personally appeared FARLYN KENNEDY UBIGAU, known to me to be the person whose name is subscribed to the within and foregoing instrument, and acknowledged to me that she executed the same.

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

/s/ Howard T. Lewis
Notary Public for the State of Washington
Residing at Seattle
My commission expires June 28, 1952

(SEAL)

STATE OF WASHINGTON)
:-ss
County of King)

On this 18th. day of September, A. D. 1951, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn personally appeared Alfred R. Ubigau to me known to be the individual described in and who executed the foregoing instrument, and acknowledged to me that he signed and sealed the said instrument as his free and voluntary act and deed for the uses and purposes therein mentioned.

WITNESS my hand and official seal hereto affixed the day and year in this certificate above written.

/s/ Howard T. Lewis
Notary Public in and for the State of Washington residing in Seattle.

COPY

EXHIBIT "A"

The following lists of items and their values consisting of supplies, equipment and machinery with a total value of Twenty Three Thousand Two Hundred Two Dollars and Eighty Six Cents ($23,202.86) is attached to and made a part of the foregoing Agreement dated entered into by and between GEORGE W. FARLIN, CARL B. KENNEDY, GRACE FARLIN KENNEDY and FARLYN KENNEDY UBIGAU all of 1914 Magnolia Blvd., Seattle, Washington, Lessors and CARL C. MARTIN of Box 76, Butte, Montana, Lessee and referred to as Exhibit "A" in Paragraph VII of said Agreement.

It is agreed that the first rent-purchase payments made under the terms of Paragraph VII of the Agreement amounting to a total of, but not exceeding One Thousand Dollars ($1,000.00) is for the purpose of covering the value of the supplies and miscellaneous equipment which may be consumed or unidentifiable in case the Lessee does not complete the purchase of the entire lists of supplies, equipment and machinery shown in this Exhibit "A" and said equipment and machinery is returned to Lessors as provided for in Paragraph VII of the Agreement. In case the supplies, equipment and machinery shown in this Exhibit "A" are returned to the Lessors because of the Lessee's failure to complete payments equal to the total value of the items listed then the accounting shall be made as though the first rental-purchase payments made under the terms of Paragraph VII of the Agreement amounting to not more than One Thousand Dollars ($1,000.00) had been made to purchase those items of supply and miscellaneous equipment which may have been consumed or may be impossible to identify in taking inventory of the supplies, equipment and machinery listed herein.

The Lessee agrees to purchase and carry public liability insur-

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ance covering items of surface rolling equipment (truck, caterpillar, army jeep, motor patrol) as soon as each of such items is taken over by the Lessee under the provisions of Paragraph VII of the Agreement.

COPY

ASSIGNMENT AND AGREEMENT

THIS ASSIGNMENT AND AGREEMENT, Made and entered into this 18th day of October, 1951, by and between CARL C. MARTIN, whose post office address is Box 76, Butte, Montana, party of the first part (hereinafter called "Martin") and MINERALS ENGINEERING COMPANY, a Colorado Corporation, having an office in Dillon, Montana, party of the second part (hereinafter called "Minerals"):

W I T N E S S E T H:

For and in consideration of the payment this day made and for the payments to be made hereafter, as stated hereinafter, and of the covenants and conditions herein contained, it is hereby agreed as follows:

I.

Martin hereby and herewith assigns, transfers and sets over and by these presents does assign, transfer and set over to Minerals all of the right, title and interest of said Martin in, to and under that certain Lease and Option Agreement dated September 24, 1951 by and between George W. Farlin, a single man, Carl B. Kennedy and Pearl E. Kennedy, his wife, Grace Farlin Kennedy and Farlyn Kennedy Ubigau as Lessors and Carl C. Martin as Lessee, which Lease and Option Agreement is hereinafter called "Lease and Option".

II.

Minerals agrees to pay Martin the following sums of money:

(a) The sum of $1,000.00 upon the execution of this instrument, the receipt whereof by Martin is hereby acknowledged.

(b) The sum of $1,000.00 within a period of 30 days from the date of this instrument, provided however that Minerals

COPY

shall not be required to pay said sum in the event that Minerals, without cost or expense to Martin, reassigns said Lease and Option to Martin within a period of 30 days from the date of this instrument.

III.

Minerals undertakes and agrees to be bound by and to assume all of the duties and obligations of every kind and character under and by reason of said Lease and Option and the operations conducted thereunder. Minerals further undertakes and agrees to perform all obligations and make all payments required under said Lease and Option.

Minerals further undertakes and agrees to keep said Lease and Option in full force and effect and agrees not to terminate its lease for any cause without giving not less than 30 days advance notice in writing to Martin. In case such notice of termination is given, Minerals agrees to reassign the lease to Martin at the time notice of termination is given.

Any reassignment of said lease and Option to Martin shall not operate to relieve Minerals of any duties or obligations incurred under said Lease and Option prior to the effective date of any such termination.

Any such reassignment shall be without cost or expense to Martin and all such costs or expenses shall be the obligation of Minerals.

In the event of any such reassignment, or of the termination of said Lease and Option for any cause, Minerals agrees not to conduct any mining operations, either directly or indirectly upon the premises described in said Lease and Option and not to deal with, contract with or otherwise acquire, either directly or indirectly any leasehold or other interest in said premises from the said Lessors or their heirs,

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administrators, executors and successors.

Minerals shall have the right to modify, amend or revise said lease and Option, provided however that no such modification, amendment or revision shall have the effect of or result in reducing any payments or royalties of Martin under this instrument without the written consent of Martin and further provided that no such modification, amendment or revision shall have the effect of or result in increasing any duty or obligation of Martin under such Lease and Option without the consent in writing of Martin.

Minerals shall have the right to assign this Assignment and Agreement provided that it guarantees performance of all obligations of Minerals under this Assignment and Agreement.

Minerals shall have no right to surrender said Lease and Option under Paragraph IX thereof or otherwise.

IV.

Minerals agrees to pay additionally to Martin an overiding royalty as follows:

(a) Two and one half percent (2-1/2%) of the "net returns", as hereinafter defined, until the royalties, or other payments, on the option price payable to or paid to the said Lessors in said Lease and Option have amounted to the option price of $150,000.

(b) Five percent (5%) of the "net returns", as hereinafter defined, after the date on which the royalties, or other payments, on the option price payable to or paid to the said Lessors in said Lease and Option have amounted to the option price of $150,000; provided however that said five percent (5%) of the "net returns" as aforesaid shall terminate at the end of ten (10) years of mining operations. It being understood that if the mining operations on the premises are interrupted for any cause that the period of such interruption shall be added to the ten (10) year period.

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V.

The term "net returns" shall be considered in the light of the following explanation and shall be defined as follows:

> It is understood that Minerals contemplates that initially ores from said premises will be sold to the United States of America or some agency thereof, or an independent third party. In such event the term "net returns" shall mean the net amount payable for said ores after deducting all charges for freight and hauling from the premises; provided that said freight charges shall not exceed the freight rate for like ores from the premises to Butte, Montana. In the event the United States of America or some agency thereof, or some independent third party, shall purchase said ore as aforesaid, and can and will make royalty payments to Martin, then this instrument shall constitute the instructions to make such royalty payment direct to Martin.
>
> In case Minerals should treat the ores from the premises in a concentrator or chemical plant or plants in which Minerals has an interest direct or otherwise, it is understood that the term "net returns" shall mean the gross returns received from the metals recovered and sold from the ores, less the cost of transportation, concentration and chemical treatment by Minerals.
>
> Minerals agrees to make available to Martin for his inspection its operating costs and sales prices for the aforesaid purpose.
>
> For any of the purposes set forth above Martin shall receive notice in writing from Minerals of the concentrator, chemical treating plant or purchaser to whom each shipment of ores or concentrates is sent and also copies of all assays and settlement statements. Upon demand in writing by Martin, he shall be entitled to receive from Minerals for each said shipment after the date of said demand duplicate pulps for assay purposes and in case of any disagreement on assays the Union Assay Office, Salt Lake, Utah, or such other assay company as the parties may mutually agree upon, shall act as the final arbiter for said assay purposes and the decision of said arbiter shall be binding upon the parties for assay purposes only.

VI.

Minerals shall have the right of immediate occupancy of the premises described in said Lease and Option. It is agreed that Martin has not and does not hereby make any representations of any matters connected

COPY

with said Lease and Option.

Martin shall have the right to inspect said premises from time to time.

VII.

Time shall be of the essence of this Assignment and Agreement.

Any notices may be given to the parties at the addresses hereinbefore set forth or as subsequently changed in writing by either party.

This Assignment and Agreement shall enure to the benefit of the successors, assigns and/or heirs, administrators and executors of the parties hereto.

VIII.

IN WITNESS WHEREOF the party of the first part and the party of the second part, by its officers thereunto duly authorized, have set their hands the day and year first above written.

/s/ Carl C. Martin
CARL C. MARTIN

by /s/ Armor B. Martin
Armor B. Martin, his Attorney in Fact.

Party of the First Part

MINERALS ENGINEERING COMPANY

by /s/ Blair Burwell
its President

Witness

/s/ Kendrick Smith
Kendrick Smith

Attest

/s/ A. F. Boyd
its Secretary

(seal)

Copy/rol/12-5-51

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STATE OF MONTANA)
:-ss
County of Silver Bow)

On this 18th day of October, 1951, before me the undersigned Notary Public personally appeared ARMOR B. MARTIN known to me to be the person whose name is subscribed to the within instrument as the attorney in fact of Carl C. Martin, and acknowledged to me that he subscribed the name of Carl C. Martin thereto as principal, and his own name as attorney in fact.

/s/ Kendrick Smith
Notary Public for the State of Montana
Residing in Butte, Montana
My Commission Expires 11-30-52

(Seal)

STATE OF MONTANA)
:-ss
County of Silver Bow)

On this 18th day of October, 1951, before me the undersigned Notary Public personally appeared Blair Burwell, the President of the Corporation that executed the within instrument on behalf of the Corporation therein named and acknowledged to me that said Corporation executed the same.

/s/ Kendrick Smith
Notary Public for the State of Montana
Residing in Butte, Montana
My Commission Expires 11-30-52

(Seal)

STATE OF MONTANA)
: ss 81241 INDEXED
County of Beaverhead)

I hereby certify that the within instrument was filed in my office on the 18th day of Oct. A.D. 1951 at 31 min. past 1:00 o'clock, P. M. and recorded on page 270-4 of Book 117 of Miscellaneous Records of Beverhead County, Montana.

Attest my hand and seal.

/s/ Dora E. Schmittroth, County Recorder

Fees $4.50

DMEA-2361
MINERALS ENGINEERING CO.

COMPARISON OF METHODS OF TUNGSTEN ANALYSIS

	Cunningham (E.M.Co.)	U.S.V. - Bishop	Nevada-Mass.	Union Assay	Lewis & Walker	Getchell
Decomposition of sample	Digest with Warm HCl, add HNO_3 & $HClO_4$ Heat to fumes, dilute, add cinchonine, cool, add alpha benzoinoxime Filter burn paper & ppt in porcelain, transfer to platinum dish, add HNO_3 & HF and evaporate just to dryness. Take up in NaOH and repeat, Decomposition HCl + HNO_3 + $HClO_4$ + Cinch. + ABO Filter Ignite 500-600° Add HNO_3 + HF	Digest with HCl Conc. then add HF HNO_3 $HClO_3$ Boil to fumes add H_3BO_3 + HCl + HNO_3 Boil add cinchonine cool add alpha benzoinoxime Filter Dissolve ppt with NH_4OH Filter	Digest with HCl + NH_4FHF - 2 hrs. add HNO_3 + $HClO_4$ evaporate to dryness. Add HNO_3 + HCl Dilute Add 10 cc Nemadine Standover night Filter Dissolve ppt in KOH 10% Filter to Sol. acidify - add Nemadine Filter Ignite-Weigh	Digest with HCl + HNO_3 Boil Add Cinchonine Stand 12 hours Filter Repeat Decomposition	Digest with warm HNO_3 + HF until all solids decompose Clear solution Add $HClO_4$ + HNO_3 Take to fumes Dilute Add Cinchonine Cool. Add Alpha Benzoinoxime Filter Dissolve Solids in NaOH Filter	Digest with HCl Add HF + HNO_3 Take to fumes $HClO_4$ Add Cinchonine Filter Dissolve solids in NH_4OH Filter Acidify - Boil Add cinchonine
Tungsten Precipitation	Conchonine + Alpha Benzoinoxime					
Silica Removal	by HNO_3 + HF in platinum dish	HF + HNO_3 in decomposition NH_4OH extract of ppt.	1st by NH_4FHF in decomposition 2nd by HF on Ignition	by HF + H_2SO_4 in weigh crucible	Filtrate, Acidify Boil - $HClO_4$ Add Cinc + ABO Filter Silica Removal in Decomposition	1st by NH_4OH Extraction above 2nd by HF in weighing
Molybdenum removal	by separate analysis and deduction from weighed WO_3 + MoO_3 ppt.	by separate analysis and deduction	Nemadine stated to be selective	by Volitization no pyrometer	Mo determined colormetric & deducted from WO_3 - MO_3 ppt	Volitization from weighed sample Pyrometer

bb/rol/2-22-52

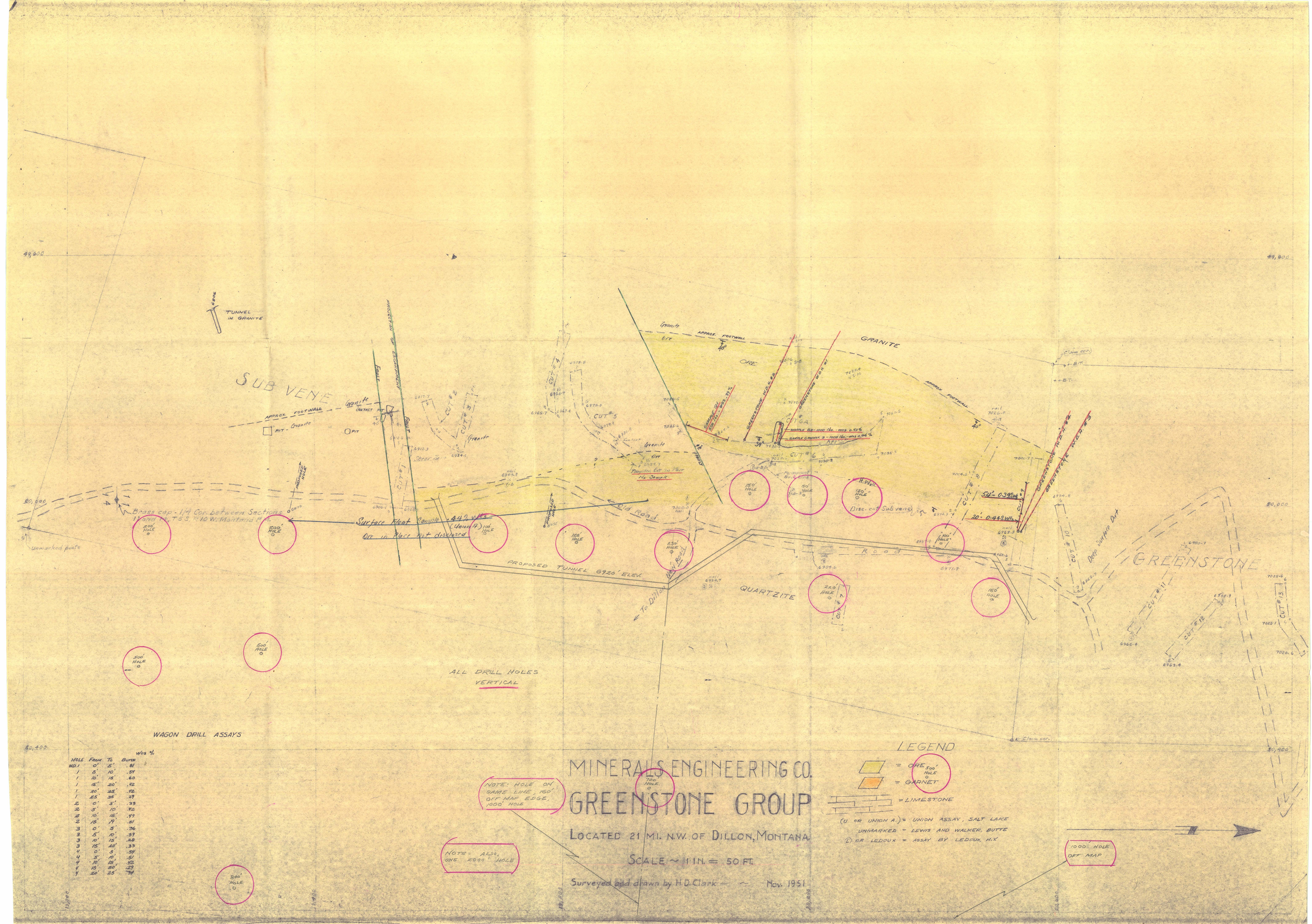
GREENSTONE

Date Assay Certif.	Sample Number	Location and Description	Union Assay	Ledoux	Lewis Walker	U.S.V. Bishop	Brown	Union M.E. Meth.	USBM
11-2-51	19873	Greenstone Surface, between Cut No. 5 and North end Cut No. 6, by A. Boyd	.11	.03			Trace		
11-16-51	1	600 Lbs. Sample Greenstone No. 1, in Cut 6, from Fault 65' North	.03	.04	.39	.16		.04	.04
11-16-51	2	1000 Lb. Sample, Greenstone No. 2, in Cut 6A, Top part of Cut	.02		.43			.03	.01
11-16-51	3	1000 Lb. Sample, Greenstone No. 3, in Cut 6A, Bottom part of Cut	.03		.46			.03	
11-16-51		Greenstone Wagon Drill Hole							
		No. 1 (Cut 6A) 0' - 5'		.17	.31	)			
11-16-51		No. 1 (Cut 6A) 5' - 10'		.07	.54	)			
11-16-51		No. 1 (Cut 6A) 10' - 15'			.60	)			
11-16-51		No. 1 (Cut 6A) 15' - 20'			.42	.34)			
11-16-51		No. 1 (Cut 6A) 20' - 25'			.42	)			
11-16-51		No. 1 (Cut 6A) 25' - 35'			.29	)			
11-16-51		Greenstone Wagon Drill Hole							
		No. 2 (Cut 6) 0' - 5'			.33				
11-16-51		No. 2 (Cut 6) 5' - 10'			.42				
11-16-51		No. 2 (Cut 6) 10' - 15'			.49				
11-16-51		Hole No. 2 (cut 6) 15' - 19'			.51				
11-16-51		Greenstone Wagon Drill Hole							
		No. 3 (Cut 9) 0' - 5'			.36				
11-16-51		No. 3 (Cut 9) 5' - 10'			.39				
11-16-51		No. 3 (Cut 9) 10' - 15'			.28				
11-16-51		No. 3 (Cut 9) 15' - 20'			.33				
11-16-51		Greenstone Wagon Drill Hole							
		No. 4 (Cut 9) 0' - 5'	)		.54			)	
11-16-51		No. 4 (Cut 9) 5' - 10'	)		.51			)	
11-16-51		No. 4 (Cut 9) 10' - 15'	.03)		.42			.03)	
11-16-51		No. 4 (Cut 9) 15' - 20'	)		.29			)	
11-16-51		No. 4 (Cut 9) 20' - 25'	)		.34			)	
11-16-51		Cut 9, Hanging Wall 20', Surface grab in Cut			.44				
11-16-51		Cut 9, Foot Wall 54', Surface grab in Cut			.39				

GREENSTONE (Continued)

Date Assay Certif.	Sample Number	Location and Description	Union Assay	Ledoux	Lewis Walker	U.S.V. Bishop	Brown	Union M.E. Meth.	USBM
10-20-51	3A	Greenstone, Float along road, High grade, taken by A. Boyd	.12						
10-20-51	3B	Greenstone, Float along road, Medium grade, taken by A. Boyd	.02						
10-20-51	3C	Greenstone, Float along road, Low grade, taken by A. Boyd	.13						

RAS/rol/12-27-51


MINERALS ENGINEERING CO.
GREENSTONE GROUP
LOCATED 21 MI. N.W. OF DILLON, MONTANA.
SCALE ~ 1 IN. = 50 FT.
Surveyed and drawn by H.D. Clark ~ Nov. 1951
LEGEND
= ORE
= GARNET
= LIMESTONE
(U OR UNION A.) = UNION ASSAY, SALT LAKE
UNMARKED = LEWIS AND WALKER, BUTTE
(L) OR LEDOUX = ASSAY BY LEDOUX, N.Y.
WAGON DRILL ASSAYS
HOLE NO. 1 FROM 0' TO 5' Wos % Burns .81
1 5' 10' .54
1 10' 15' .60
1 15' 20' .92
1 20' 25' .92
1 25 35' .27
2 0' 5' .33
2 5' 10' .92
2 10' 15' .49
2 15' 19' .51
3 0' 5' .36
3 5' 10' .37
3 10' 15' .28
3 15' 18' .33
4 0' 5' .54
4 5' 10' .51
4 10' 15' .92
4 15 20' .23
4 20' 25' .34
ALL DRILL HOLES VERTICAL
NOTE: HOLE ON SAME LINE, 160' OFF MAP EDGE, 1000' HOLE
NOTE: ALSO, ONE 2000' HOLE
1000' HOLE OFF MAP
SUBVENE
Granite
APPROX. FOOTWALL
CONTACT PIT
PIT - Granite
PIT
FAULT
PROJECTION OF ESCARPMENT
TUNNEL IN GRANITE
Brass cap - 1/4 Cor. between Sections 11 and 14, T.5 S., R.10 W. Montana P.M.
Unmarked posts
Surface Float Sample - 4.42 WOS (Union A) 100' HOLE
Ore in Place Not disclosed
Old Road
PROPOSED TUNNEL 6920' ELEV.
To Dillon
New Road
QUARTZITE
ORE
GRANITE
GREENSTONE WON #1
GREENSTONE WON #2
GREENSTONE WON #3
SAMPLE G2 - 1000 lbs - WOS 0.93%
SAMPLE G GRANIT. 3 - 1000 lbs - WOS 0.96%
CUT #6A
CUT #6
CUT #5
CUT #4
CUT #3
CUT #2
CUT #1
CUT #7
CUT #8
CUT #10
CUT #11
CUT #12
CUT #13
Disc. cut Subvene
54' - 0.39% WOS
20' - 0.44% WOS
Deep Surface Dirt
Claim corp.
500' HOLE
700' HOLE
800' HOLE
150' HOLE
50' HOLE
120' HOLE
100' HOLE
250' HOLE
220' HOLE
160' HOLE
120' HOLE
150' HOLE