DMEA Form 9
Rev. 6/57

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE — Idm-E NO. 489 — DMEA NO. 2612

Application
- [ ] Denied
- [ ] Withdrawn

Contract
- [ ] Terminated - Not Certified
- [ ] Terminated - Certified
- [ ] Cancelled
- [ ] Royalty Agreement

The records contained in this file are marked (x) and arranged in this order:

Folder No. 1:

Left Side

- [ ] Royalty Audits
- [x] Certification of Discovery 3-26-56
- [x] Closing Letter
- [x] Cost Audits
- [ ] Termination Notice or Agreement
- [ ] Recision Notice
- [x] Assignment of Contract 5-9-55
- [x] Contract Amendments
- [x] Contract with all exhibits and annexes
- [x] Owner's Consent to Lien and Subordination Agreement
- [ ] Application and attachments

Right Side

- [x] Project summary (final) 6-17-58
- [x] Work Completed analysis (final)
- All other material filed in chronological order including the following reports if checked:
- [ ] Field Team Semi-Annual Report for Certified Project
- [x] Final Field Team Report (Tab) 4-30-57
- [x] Operator's Final Report (Tab) 11-8-55
- [ ] Interim Field Team Reports
- [x] Operator's monthly reports and all attachments
- [x] On-site Exam Report (Tab) 9-29-52
- [ ] Settlement Sheets
- [ ] Drill Logs

Additional Folders:

Left Side

Folders No. 2.: Reports
- [x] Analysis of Semi-Annual Inspection Reports
- [ ] Project Summary (Interim) by DMEA Engineers

Right Side

- [x] Field Team Semi-Annual Report for Certified Project
- [x] Field Team Interim Reports
- [x] Operator's Monthly Reports with transmittal, narrative and maps.

Folders No. 3.: Maps (Use pocket folder or envelope)

Folders No. _____: Settlement Sheets

Folders No. _____: Drill Logs

Folders No. _____: Royalty material

Reported Inactive 12/28/59

17963

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
3/23	Murphy	120M
	Selbridge	120
3/23	Shum	110
	[illegible]	100
		220

MAR 2 4 1965

Grumore Company
1511 Norton Building
Seattle, Washington

Re: MUEA-2412 (Copper)
Grumore Co., Assignee
Sunset Mine
Snohomish County, Washington
Amended Contract Ldm-2489

Gentlemen:

By the terms of the subject Amended Exploration Project Contract, as amended, and the certification of discovery or development dated March 26, 1956, all minerals mined or produced from February 20, 1953, to February 20, 1963, were subject to the Government's royalty as set forth in said amended contract.

As the period during which production was subject to royalty has now expired, the Government according to its present records retains no claim or lien against the property subject to the amended contract or any future production therefrom. We, therefore, are closing our books and records on this amended contract. Your attention, however, is called to the provisions of the amended contract which require the Operator to keep and preserve certain records for the periods indicated.

Sincerely yours,

George Fumich, Jr.

Acting Director

MMerrithew/mm (3/23/65)
cc: Director's Reading File
Region I w/cy of incoming 63 from Index Mining Co. dated 3/4/65
CA&A Division
Docket
Code 120M
Earl Smith, Trustee, Index, Wash.
Index Mining Co., 2430 Monte Vista Place W., Seattle, Wash.,98199

23263

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Washington office pertaining to Amended Contract Idm-E489, Docket DMEA-2612 (copper), dated as of February 20, 1953, with

Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington
and its assignee
Granera Company
1511 Norton Building
Seattle, Washington

for the purpose of determining the amount of royalty payable to the U. S. Government on sales of minerals from property referred to as the Sunset (Index) Mine located in Snohomish County, Washington, during the period September 9, 1959, through August 28, 1962.

A certification of discovery or development was issued on March 26, 1956, and, in accordance with Articles 7 and 11 of the Amended Contract, royalty is payable on all minerals produced from the land described in Article 2 of the contract for a period of 12 years from the date of the contract or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. A Report of Review dated December 6, 1955, indicated accepted costs under the exploration contract amounting to $114,840.00 with the Government's contribution on a 50 percent basis being $57,420.00.

The status of the project, the scope of review, and the reasons therefor are stated on page 2.

This review established no sales subject to the Government's royalty subsequent to the period covered by a prior Report of Royalty Review, which also found no sales subject to the Government's royalty through September 8, 1959. Accordingly, as of August 28, 1962, the royalty account of this project was found to be:

Total Royalty Payable	$ -0-
Total Royalty Paid	-0-
Balance of Royalty Due	$ -0-

September 11, 1962

E. D. Talbert, OME Auditor

Idm-E489 Granore Company, Assignee DMEA-2612

STATUS OF PROJECT, SCOPE OF REVIEW
AND REASONS THEREFOR

This contract provides that the Operator, as principal if the producer or as surety if not the producer, shall pay to the Government a percentage royalty on all minerals produced from the land thereunder. The land under the contract consists of the N½ of sec. 1 and the NE¼ of sec. 2, T. 27 N., R. 10 E., W.M., plus the whole or portions of 10 patented and 2 unpatented claims not included in the N½ of sec. 1, Index Mining District. The contract recites that the Operator is the owner of the entire interest in all the land under the contract; however, the NE¼ of sec. 2 actually was held under a purchase contract with Earl Smith, Index, Washington, a trustee for judgment creditors. In consideration of the contract, Mr. Smith subsequently, on May 9, 1955, executed a subordination agreement.

On March 23, 1955, the Operator leased the property to the Granore Company and thereafter assigned the contract to the lessee. The Government consented to the assignment on May 3, 1955, without releasing the Operator-Assignor from any of the provisions of the contract.

Exploration work under the contract was completed during October 1955. There was no production during the exploration period by either the Operator-Assigner or the Operator-Assignee. Subsequent examinations of the property and inquiries by DMEA and OME regional representatives disclosed that the property remained inactive from the conclusion of the exploration work through September 8, 1959, and that the Operator-Assignee relinquished its lease during the first part of 1956.

In an August 28, 1962, reply to a MME Form 63 inquiry, the Operator-Assignee's vice president (Robert M. MacRae) advised that neither production nor change in property status has occurred since September 8, 1959.

This review was made in lieu of an on-site audit of the Operator's accounts and records for the following reasons:

(1) The files indicate that no minerals have been produced from the land under the contract; and

(2) The administrative cost to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

(4) Mailo + Files
Code 225

OFFICE OF MINERALS EXPLORATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

REPORT OF ROYALTY REVIEW

I have reviewed the files of the Office of Minerals Exploration, Washington, D. C., pertaining to Amended Contract No. Idm-E489, Docket No. DMEA-2612 (Copper), dated as of February 20, 1953, with

Granore Company
1640 Exchange Building
Seattle, Washington
Assignee of
Index Mining Company

for the purpose of determining the amount of royalty due the U. S. Government on sales of minerals from property referred to as Sunset Mine located in Snohomish County, Washington, during the period February 20, 1953, through September 8, 1959.

A certification of discovery or development was issued on March 26, 1956, and, in accordance with Articles 7 and 11 of the contract royalty is payable on all minerals mined or produced from the land described in Article 2 of the contract for a period of 12 years from the date of the contract or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. A Report of Review in lieu of final cost audit dated December 6, 1955, indicated accepted costs under the exploration contract amounting to $114,840.00 with the Government's contribution, on a 50 percent basis, being $57,420.00.

This review was made in lieu of an on-site audit of the Operator's accounts and records for the following reasons:

(1) The mine has not been operated since completion of the exploration;
(2) Semi-annual reports by representatives of the Field Team, Region I, and other documents in the files do not disclose any production or sales of minerals from this property subject to Government royalty during the exploration period or subsequent thereto; and
(3) The administrative cost to the Government of an on-site royalty audit at this time would be excessive in relation to the amount of possible royalty which might be disclosed.

The review indicated that there has not been any production or sales of minerals from the land described in Article 2 of the amended contract since February 20, 1953, and no royalty is due the Government.

C. E. Fisher

October 12, 1959

C. E. Fisher, OME Auditor

MME Form 22
April 59

DEPARTMENT OF THE INTERIOR
Office of Minerals Exploration

CHECK SHEET OF EXAMINING ENGINEER

Operator's Name Granore Company (assignee of Index Mining Co.)

Address 1640 Exchange Building

Seattle 4, Washington

Exploration Contract No. Idm-E489 Docket No. DMEA-2612

		Check One Yes	Check One No.
1.	(a) Does the Operator stockpile ore subject to royalty repayment?		X
	(b) If so, is segregation and identification procedure adequate?		
2.	(a) Does Operator commingle production subject to DMEA or OME royalties with exempt production?		X
	(b) If so, do you consider the allocation of the commingled production equitable?		
3.	(a) Does the Operator stockpile mine or mill rejects (low grade ore, tailing, middlings, etc.) that may have potential value within the royalty payment period?		X
	(b) If so, are adequate records maintained on such material to protect the Government's interest?		
4.	Do you consider the assay controls in effect are adequate?	X	
5.	Do you consider that the manner of disposing of production gives the Government its fair royalty returns?	X	
6.	Do your periodic examinations of operations indicate the Operator is properly reporting his production of ores subject to DMEA or OME royalties?	X	
7.	Does the Operator buy from or sell to other Operators?		X
8.	Comment on any item 2 (b) to 6 if answer is No.		

Property inactive.

September 8, 1959
Date

S. W. Zoldok
Mining Engineer
S. W. Zoldok

53362

File Copy
Surname
Klugescheid
Griswold
Burton
Dwyer
"Appd Sol. Off."
Crossman
Selfridge
Johnson

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

CERTIFICATION BY THE UNITED STATES OF AMERICA OF A DISCOVERY OR DEVELOPMENT WHERE AN EXPLORATION PROJECT CONTRACT

To: Mr. Robert M. MacRae, Vice President
Granore Company
1649 Exchange Building
Seattle 4, Washington

Pursuant to the provisions of Amended Exploration Project Contract No. Idm-2489, dated February 20, 1953, Docket No. DMEA-2612, hereinafter called the "contract", between the Granore Company, a corporation, and the United States of America, hereinafter called the "Government"; to establish and fix the Government's percentage royalty on production and its lien thereon and on the land described in the contract, the Government considers and therefore certifies that discovery or development from which production may be made has resulted from the exploration work.

The nature of said discovery or development is described broadly or indicated as follows: Diamond drilling from the surface and from the No. 2 Level of the mine has shown the existence of copper ores occurring in fracture zones in granodiorite.

Dated MAR 2 6 1956

THE UNITED STATES OF AMERICA

By C. F. Mathews
Administrator, Defense Minerals Exploration Administration

WPKlugescheid/er 3/19/56
Copy to:
Docket
Mr. C. F. Fredell, Dr.,MB,EPS
Mr. Geehan, USBM
Mr. Kiilsgaard, USGS
Admr R File
Op. Committee
Cont. Adm & Audit Div
Finance Office
Base Metals
Region I, NW. Dist.(2)
F. E. Johnson
W. R. Griswold
Chron.

DEFENSE MINERALS EXPLORATION ADMINISTRATION
CONTRACT ADMINISTRATION AND AUDIT DIVISION

Kbu[illegible]
Berry

REPORT OF REVIEW

I have reviewed the Monthly Reports of:

Granore Company, Assignee
1640 Exchange Building
Seattle 4, Washington
and
Index Mining Co., Assignor
2430 Monte Vista Place
Seattle 99, Washington

RECEIVED
DEC - 9 1955

pertaining to Exploration Project Contract No. Idm-E489, Docket No. DMEA 2612, dated February 20, 1953, including Amendment No. 1 which is superseded in all respects by the Amended Exploration Project Contract No. Idm-E489, Docket No. DMEA 2612, dated as of February 20, 1953, without amendment, for the period of February 20, 1953 to October 20, 1955, covering a project for the exploration of copper on property known as the Sunset Mine, located in Snohomish County, State of Washington.

My review included an examination of the Monthly Reports (Forms MF-104) and supporting documents attached thereto, comparison of the costs claimed with the contract and pertinent schedules, consultation with the Government representative who visited and examined the project, and a determination of the reasonableness and propriety of the costs.

This review was made in lieu of a final audit of the Operator's accounts and records for the following reason:

All of the costs incurred were under a contract provision for payment by the Government on the basis of fixed unit costs of work actually performed.

The review disclosed the following facts in regard to the amount paid or to be paid the contractor:

Total Cost as billed by Contractor	$120,459.60
Exceptions (Schedule attached)	5,619.60
Total Accepted Cost	$114,840.00

The contract calls for a 50 percent participation of exploration expenses by the United States Government. Therefore, payment to the Contractor by the Government in the amount of Fifty seven thousand four hundred and twenty and 00/100 Dollars

--$57,420.00--

is considered valid and proper, provided that the Regional Executive Officer, the Administrator, or other competent official has accepted or will accept the project as having otherwise met the terms of the contract.

C. A. Turner, Auditor

December 6, 1955

RECEIVED
DEC - 9 1955

SCHEDULE OF EXCEPTIONS

Granore Company DMEA-2612 Idm-E489

Claimed on Final MF-104 dated October 1955

Geophysical Survey		$ 3,000.00	
Trenching		1,500.00	
Diamond Drilling	16,472.8 ft. @ $7.00	115,309.60	
Chemical Analyses	325 @ $2.00 each	650.00	
			$120,459.60

Work Authorized by Contract

Geophysical Survey		$ 3,000.00	
Trenching		1,500.00	
Diamond Drilling	15,670 ft. @ $7.00	109,690.00	
Chemical Analyses	325 @ $2.00 each	650.00	
			114,840.00

Disallowed by Audit

Diamond Drilling in excess of the maximum provided by the contract	802.8 ft. @ $7.00	$ 5,619.60

C. A. Turner, Auditor

December 6, 1955

Docket copy

ASSIGNMENT OF CONTRACT

WHEREAS, Index Mining Company, a Washington corporation (hereinafter called the "Assignor"), entered into Amended Exploration Project Contract Idm-2489 (Docket No. DMEA-2612), executed January 27, 1955, and effective February 20, 1953 (hereinafter called the "Contract"); and

WHEREAS, Granore Company, a Washington corporation, whose address is 1640 Exchange Building, Seattle, Washington (hereinafter called the "Assignee"), has acquired the Assignor's interest in the land which is the subject of the Contract and the Assignee desires to complete the work under the Contract;

NOW THEREFORE, the Assignor, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration received from the Assignee does hereby assign, transfer, and convey to the Assignee all of its right, title, and interest in the Contract: Provided, that the Government shall make payment to the Assignor for all work performed prior to January 1, 1955, and upon payment thereof the Government shall be and is hereby released by the Assignor from all claims under the Contract.

The Assignor consents to all future amendments and assignments of the Contract and waives notice thereof.

This Assignment is subject to the execution by the Assignee of the acceptance form set forth below and to the written consent of the Government.

Dated this 9 day of May, 1955.

INDEX MINING COMPANY

By A. Brennan

I, A. J. Brennan, certify that I am the Secretary of the corporation named herein; that C. V. Brennan who signed this instrument on behalf of the corporation, was then President of said corporation;

that said instrument was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

A. J. Brennan /Corporate Seal/

ASSIGNEE'S ACCEPTANCE

The Assignee, Granore Company, hereby accepts the above Assignment and agrees to be bound by the terms, provisions, and conditions of the Contract.

Dated this 9th day of May, 1955.

GRANORE COMPANY

By Robert M. MacRae

I, Elizabeth Barnes, certify that I am the _____ secretary of the corporation named herein; that Robert M. MacRae who signed this instrument on behalf of the corporation, was then Vice President of said corporation; that said instrument was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Elizabeth Barnes /Corporate Seal/

GOVERNMENT'S CONSENT

The Government, this 3rd day of May, 1955, hereby consents to the above Assignment without

releasing the Assignor, Index Mining Company, from any of the terms, provisions, and conditions of the Contract.

THE UNITED STATES OF AMERICA

By C O Mutherdy
Administrator, Defense
Minerals Exploration
Administration

Rubin
H F Flood
Hugoschard
Chandler
Martin
H Johnson

MF-203
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator Index Mining Company
Docket No. DMEA- 2612
Amended Contract No. Idm-E 459
Executed ~~Contract Date~~ January 27, 1955.

OF THE INTERIOR
Minerals Administration
RECEIVED
MAY 20 1955

CONSENT TO LIEN

To the United States of America:

Referring to that certain land in the County of Snohomish, State of Washington, described as follows:1/

See ANNEX 1 to this Consent to Lien

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Undertakes and agrees that property in which the Government may acquire an interest or equity under the contract may be dismantled, severed from the land, and removed, as may be provided in the contract; and the Government's interest and equity in such property shall be prior and superior to any adverse right or claim of the undersigned;

2. Grants to the Government a lien upon all of the undersigned's right, title, and interest in the land and upon any production of minerals therefrom to secure the payment to the Government of a percentage royalty on production as may be provided for by the contract;2/ and represents and undertakes that there are no claims, liens, or encumbrances upon the undersigned's right, title, or interest in the land prior to that hereby granted to the Government other than the following:3/

NONE

3. Undertakes and agrees neither to commit any act nor assert any claim in conflict with the provisions of this Consent to Lien; and to give advance notice of the Government's rights under this Consent to Lien to any subsequent transferee, mortgagee, encumbrancer, or lessee of any of the undersigned's right, title, or interest in the land; and

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

3/ Write "none" if that is the case. Do not leave lines blank.

4. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Consent to Lien shall extend and apply thereto.

5. Added provision: NONE

Dated this 9 day of May, 1955.

INDEX MINING COMPANY

By C. Brennan [Seal]

Pres.

[Seal]

[Seal]

I, R. J. Brennan certify that I am the _____ (Secretary, etc.) of the corporation named herein; that C. U. Brennan who signed this agreement was then President (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

R. J. Brennan.

[Corporate Seal]

AMENDED EXPLORATION CONTRACT
INDEX MINING COMPANY
DOCKET NO. EMEA-2612

ANNEX 1 to "OWNER'S CONSENT TO LIEN"
Executed by Index Mining Company

not covered/included under Index Contract

The North 1/2 of Section 1 and the Northeast 1/4 of Section 2, Township 27 North, Range 10 East, W.M.; and the following mining claims:

Star and Black Bear (both covered by patent #488234), Black Bear Extension, W.H.B., Boundary, Hazel C., Ivy R., Mountain Side, Ravine, Mono (all covered by patent #886270), and those portions of the Mabel Lode and Lloyd B. Lode not included in North 1/2 of Section 1. The land is shown, in part, on the map, "Figure 2 Index Mining Company Patented Claims," attached to the Original Contract and made a part hereof.

MAY 20 1955

MF-201
Revised March 24, 1955

For Government's Use Only
EXPLORATION PROJECT CONTRACT
Operator Index Mining Company
Docket No. DMEA- 2612
Contract No. Idm-B 169
Contract Date January 27, 1955

Awarded
Executed

SUBORDINATION AGREEMENT

To the United States of America:

Referring to that certain land in the County of Snohomish, State of Washington, described as follows:1/

The Northeast 1/4 of Section 2, Township 27 North, Range 10 East, W.M.

which is the subject of a proposed exploration project contract, hereinafter called the "contract," with the United States of America, hereinafter called the "Government;" in consideration of the contract and as an inducement to the Government to enter into it, the undersigned hereby--

1. Subordinates whatever right, claim, lien or encumbrance the undersigned may have in or against the land to whatever interests, equities, and rights the Government may acquire under the contract (a) with respect to purchased property in or upon the land to the cost of which it has contributed, including the right to dismantle, sever, and remove it from the land; and (b) with respect to a percentage royalty on production from the land and a lien to secure the payment thereof; and

2. Undertakes and agrees (a) neither to commit any act nor assert any claim in conflict with the provisions of this Subordination Agreement; and (b) to give advance notice of this Subordination Agreement to any transferee of the right, claim, lien, or encumbrance hereby subordinated; and

3. Consents to all amendments and assignments of the contract without notice thereof, and agrees that this Subordination Agreement shall extend and apply thereto.

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

(OVER)

Dated this 9 day of May, 1955.

_____ [Seal]

Earl Smith, Trustee

Earl Smith Trustee [Seal]

_____ [Seal]

I, _____, certify that I am the _____ _____, (Secretary, etc.) of the corporation named herein; that _____ _____ who signed this agreement was then _____ (President or Vice-President, etc.) of said corporation; that said agreement was duly signed for and in behalf of said corporation by authority of its governing body, and was within the scope of its corporate powers.

_____

[Corporate Seal]

Government's copy

AMENDED EXPLORATION PROJECT CONTRACT
GRANORE COMPANY, Assignee
DOCKET NO. DMEA-2612

AMENDMENT NO. 1

It is agreed this _____ day of _____, 1955, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Granore Company, assignee, that Amended Exploration Project Contract Idm-E489 (Docket No. DMEA-2612), executed January 27, 1955, effective as of February 20, 1953, is amended effective February 20, 1953, as follows:

> With respect to the Northeast $\frac{1}{4}$ of Section 2, Township 27 North, Range 10 East, W.M., set forth in Annex I to the Amended Contract, the representation and undertaking in Article 2(b) of the contract form that the Operator is the "owner" is hereby changed to read that the Operator is the "lessee," and the Consent to Lien of the holder of the legal title required by Article 2(c) of the contract form is attached hereto.

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute, nor the amount of any item designated as "maximum."

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By_____
Administrator, Defense
Minerals Exploration
Administration

GRANORE COMPANY, Assignee

By_____

_____

Docket Copy

MF-200A
(Revised June 1954)

Docket No. DMEA 2612

Commodity Copper

Contract No. Idm-E 439

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
EXPLORATION PROJECT CONTRACT[1]
(Short Form)

Amended

It is agreed this 2nd day of February, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Index Mining Company, a State of Washington Corporation, whose mailing address is 2633 Monte Vista Place, Seattle 99, Washington, hereinafter called the "Operator," as follows:

ARTICLE 1. *This contract* is entered into under the authority of the Defense Production Act of 1950, as amended. It consists of this form (MF-200A), the attached Exhibit "A," Annex I, and Amer II.

The Operator shall not transfer or assign this contract or any right thereunder without the written consent of the Government.

ARTICLE 2. *Operator's property rights.*—(a) The land which is the subject of this contract (hereinafter called "the land") is in the State of Washington, County of Snohomish, and is described in Annex I.[3]

(b) The Operator represents and undertakes that:

(1) The Operator is the [4] Owner of [5] the entire interest in the land, in possession and entitled to possession for all of the purposes of this contract, under and by virtue of a [6] ____, [7] ____ recorded in Book ____, page ____, official records of said County; and

(2) The Operator's right, title, or interest (whether as owner, lessee, or otherwise) is subject only to the following claims, liens, or encumbrances: None

(c) The Subordination Agreement of the holder of any claim, lien, or encumbrance listed above, and (if the Operator does not hold the legal title) the Consent to Lien of any holder of the legal title of the land (lessor, seller, optionor, etc.), are attached, as follows: None

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] Insert name, and if an organization, its nature (corporation and place of incorporation, partnership with names of partners, etc.).
[3] State on a separate sheet marked "Annex I" the legal description or enough to identify the property, particularly excluding any areas from which the production is not to be subject to the Government's percentage royalty.
[4] Insert "owner," "lessee," "contract purchaser," "locator," etc.
[5] Insert "the entire interest," "the mineral rights," "an undivided one-third," etc.
[6] Insert "deed," "lease," "contract," "location notice," "patent," etc.
[7] If not recorded, so indicate by inserting "un."

(d) The Operator shall preserve and maintain his right, title, and interest in the land and his right to the possession thereof for the purposes of this contract, and shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of this contract. Until the lapse of the time within which the Government may make a certification of discovery or development without any such certification having been made, and after any such certification has been made, the Operator shall neither transfer, convey, nor surrender the land nor any right, title, or interest therein, nor permit nor suffer any claim, lien, or encumbrance thereon, without expressly referring to and providing in the instrument of conveyance, lien, or encumbrance for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof. If the Government makes no certification of discovery or development within the time limited in Article 7, it shall thereafter have no claim against the land or any production therefrom except for any production referred to in Article 7(b)(1).

ARTICLE 3. *The exploration project.*—The project is a search for indicated or undeveloped deposits of .....Copper..... The work to be performed is described in Exhibit "A." The Operator on or before ...April 20, 1953..... shall commence the work, and on or before ...February 20, 1956.... (unless the Operator's obligation to complete the work is terminated—see Article 8) shall complete the work.

ARTICLE 4. *Performance of the work.*—(a) *Operator's responsibility.*—The work shall be performed with reasonable diligence, efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for liability insurance covering employment; and with suitable and adequate equipment, facilities, materials, supplies, and labor, to bring it to completion within the time fixed.

(b) *Government may inspect.*—The Operator shall consult with and inform the Government on all phases of the work as it progresses. The Government may enter at all reasonable times to inspect the work under the contract, and also after a certification of discovery or development to inspect production operations and underground workings. The operator shall provide the Government with all reasonable means of access for such inspections.

ARTICLE 5. *Contribution by the Government.*—A fixed cost for each unit of work to be performed (per foot of drifting, per foot of drilling, per hour of operations, etc.) is hereby agreed upon, and is set forth in Exhibit "A" in connection with the estimated total cost of the project in the sum of $115,000.00..... The Government will contribute 50.. percent of the fixed unit costs as work is performed, in a total sum not in excess of $57,500.00.....: *Provided,* That until the Operator has rendered to the Government his final report, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last voucher or vouchers such sums as it sees fit not in excess of 10 percent of the estimated total cost of the work. The Government will make its contribution on the basis of the monthly vouchers referred to in Article 6(b), but all payments by the Government are provisional only, subject to audit, until the account between the Operator and the Government is finally audited and settled. To the extent that excesses over fixed unit costs or any excess over the estimated total cost may be necessary for the performance of the work, the Operator shall incur and pay such excesses for his own account without contribution by the Government. The Government may make payments directly to independent contractors and suppliers for the account of the Operator rather than to the Operator.

ARTICLE 6. *Reports, accounts, audits.*—(a) *Operator's records.*—The Operator shall keep suitable records and accounts of the units of work performed and of any production in which the Government may have an interest; and shall preserve those with respect to work performed for at least three years after final payment by the Government, and those with respect to production for at least three years after any obligation to pay royalties to the Government has terminated. The Government may inspect and audit said records and accounts at any time, either by itself or by a certified public accountant. The Comptroller General of the United States or his representative, until the expiration of said three-year periods, shall have access to and the right to examine any pertinent books, documents, papers, and records of the Operator. All of the Operator's vouchers and records and accounts relating thereto and the Government's payments thereof remain subject to adjustment until final audit by the Government.

(b) *Progress reports and vouchers.*—The Operator shall provide the Government with five copies of monthly progress reports in three sections as follows: (1) Operator's Monthly Report and Voucher showing a detailed statement of units of work performed during the reporting period; (2) Operator's Unit Cost and Progress Report showing the various types of work performed during the reporting period and the fixed unit costs incurred for each type of work; and (3) a Narrative Report of the work

performed during the reporting period including adequate engineering-geological maps or sketches, drill hole logs and locations, and assay reports on samples taken concurrently with advance in mineralized ground. (Forms for reporting under (1) and (2) above will be provided by the Government.)

(c) *Final report.*—Upon completion of the work or termination of the Government's obligation to contribute to costs, the Operator shall furnish the Government with five copies of a final report (in addition to the final progress report and voucher). This final report shall include a geological and engineering evaluation of the results of the work performed under the contract with an estimate of the ore reserves resulting from such work, complete assay data, adequate geological and engineering maps or sketches, and a summary of the work performed and the unit costs thereof.

(d) *Report of sales.*—The Operator shall provide the Government with suitable accounting and documentary evidence covering all production to which the Government's percentage royalty relates, such as copies of smelter or concentrator settlement sheets, and certified accounts of production and sale or other disposition of production.

(e) *Compliance with requirements.*—If in the opinion of the Government any of the Operator's reports, records, or accounts are insufficient or incomplete, or if the Operator fails to make them, the Government may procure the making or completion of such with suitable attachments as an expense of the work to which the Operator shall contribute. The Government may withhold approval and payment of any vouchers relating to insufficient or incomplete reports, records or accounts.

ARTICLE 7. *Repayment by Operator.*—(a) *Certification.*—If the Government considers that a discovery or development from which production may be made has resulted from the work, the Government, at any time not later than six months after a sufficient final report and final account (see Article 6) has been rendered, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

(b) *Royalty on production.*—The Operator, as principal if the Operator is the producer, or as surety if the Operator is not the producer, shall pay to the Government a royalty on all minerals mined or produced from the land, as follows: (1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first; or (2) if the Government makes a certification of discovery or development, within a period of ten years from the date of the contract, or until the total net amount contributed by the Government without interest is fully repaid, whichever occurs first. See Article 11

(c) *Basis for computation.*—The Government's royalty shall be a percentage of the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent), at the point of delivery (the f. o. b. point); *except,* that charges of *the buyer* arising in the regular course of business, and shown as deductions on the buyer's settlement sheets, on account of the cost of treatment processes performed by *the buyer,* sampling and assaying to determine the value of the production sold, and freight paid by *the buyer* to a carrier (not the Operator), shall be allowed as deductions in arriving at the "gross proceeds" as that term is used herein. Any costs of treatment processes, sampling or assaying, or transportation, performed or paid by the Operator or by anyone other than the buyer, are not deductible in arriving at the "gross proceeds" as that term is here used. The term "treatment processes," as here used, means those processes (such as milling, concentrating, smelting, refining, or equivalent) applied to the crude ore or other production after it is extracted from the ground, to put it into a commercially marketable form; excluding fabricating or manufacturing.

(d) *Unsold production.*—If any production (ore, concentrates, metal, or equivalent), after the lapse of six months from the date the ore was extracted from the ground, remains neither sold nor used by the Operator in integrated manufacturing or fabricating operations (for instance, if it is stockpiled), the Government, at its option, as long as it so remains, may require the computation and payment of its royalty on the value of such production in the form (ore, concentrates, metal, or equivalent) it is in when the Government elects to require computation and payment. If any production is used by the Operator in integrated manufacturing or fabricating operations before the Government makes its election, the Government's royalty on such production shall be computed on the value thereof in the form in which and at the time when it is so used. "Value" as here used means what is or would be gross income from mining operations for percentage depletion purposes in Federal income tax determination, or the market value, whichever is greater.

(e) *Percentages of royalty.*—The percentages of the Government's royalty shall be as follows:

One and one-half (1½) percent of amounts ("gross proceeds" or "value") not in excess of eight dollars ($8.00) per ton of production in the form in which sold, held, or used, plus one-half (½) percent for each additional full fifty cents ($0.50) by which such amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such amounts.

(For instance: the royalty on an amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on an amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(f) *Time for computation and payment.*—The Government's royalty shall be computed and paid currently upon each lot sold, held, or used in integrated operations, as the case may be, as above provided in this article.

(g) *Lien for payment.*—To secure the payment of its percentage royalty, there is hereby granted to the Government a lien upon the land or the Operator's interest in the land and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(h) *Notice to purchasers.*—The Operator shall give notice of the Government's claim for royalty to any purchaser of the production, and shall authorize and direct such purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets. If the records of any production and sales or other disposition of production, whether the production is by the Operator or by others, are not made available to the Government, the amount of the royalty may be estimated by the Administrator, Defense Minerals Exploration Administration, or his successor, and his estimate thereof shall be final and binding upon the Operator.

(i) *No obligation to produce.*—Nothing in this contract is to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any production operations.

(j) *Government not obligated to buy.*—Nothing in this contract shall be construed as imposing any obligation on the Government to purchase any minerals mined or produced from the land.

ARTICLE 8. *Termination of the Government's obligations.*—(a) If in the opinion of the Government operations at any time have failed to achieve anticipated results that indicate the probability of making a worthwhile discovery, and in the opinion of the Government further operations are not justified, the Government may give the Operator written notice thereof, and thereupon the Government shall be free of all obligation to pay on account of units of work not then performed, and the Operator shall be free of all further obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting.

(b) If in the opinion of the Government the Operator is in any manner in default under the terms of the contract, the Government may give the Operator written notice of such default with a specification of reasonable time within which the default must be cured; and if the Operator fails to cure such default as required, thereupon the Government shall be relieved of all obligation to pay on account of units of work not performed when the notice was given, and the Operator shall be free of all obligation to prosecute the work other than such as may be necessary and incidental to winding up, reporting, and accounting. The remedy provided for the Government in this paragraph "(b)" is in addition to any other remedy provided in this contract, and in addition to any other remedy the law may provide for breach of contract.

(c) The giving of any notice by the Government under the provisions of this Article 8 shall not affect the Government's rights as provided for in the contract with respect to a percentage royalty, and such rights shall be fully preserved.

ARTICLE 9. *Notices to be given by the Government* may be delivered to the Operator, or may be sent by registered mail addressed to the Operator at his mailing address stated in this contract. If mailed, notices are deemed to have been delivered five days after the date of mailing.

ARTICLE 10. *Officials not to benefit.*—No member of or delegate to Congress or resident commissioner shall be admitted to any share or part of this contract or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

ARTICLE 11. *Changes and added provisions.*—

In Article 7(b) the words "twelve years from the date of the Original Contract," are substituted for the words "ten years from the date of the Contract."

Executed in sextuplicate the [redacted] day of January 27 1955.

[redacted]
(Operator)

By C. Brennan
President

THE UNITED STATES OF AMERICA

By O. Mittendorf
[redacted]

Ching
Ellis

"Appd. Sol. Off."
Talbert
Selfridge
[illegible]

I, A. J. Brennan, certify that I am the secretary of the corporation named as Operator herein; that C. V. Brennan who signed this contract on behalf of the Operator, was then President of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Index Mining Co.
by A. J. Brennan
Sect. Treas.

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—70618-1

Lewis Lewis's Attorney
Received
MAR 4 1955

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

ANNEX I

The North ½ of Section 1 and the Northeast ¼ of Section 2, Township 27 North, Range 10 East, W. M.; and the following mining claims:

Star and Black Bear (both covered by patent #488234), Black Bear Extension, W. M. B., Boundary, Hazel C., Ivy R., Mountain Side, Ravine, Mona (all covered by patent #886270), and those portions of the Mabel Lode and Lloyd B. Lode not included in the North ½ of Section 1. The land is shown, in part, on the map, "Figure 2 Index Mining Co. Patented Claims," attached to the Original Contract and made a part hereof.

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

ANNEX II

WITNESSETH:

The parties to this Amended Exploration Project Contract, hereinafter called the "Contract," are also parties to Contract Idm-E489 (Docket No. DMEA-2612), dated February 20, 1953, as amended, executed on form MF-200 (June 1951), in this Contract called the "Original Contract." Only a small part of the work described in the Original Contract (some geophysical surveying and bulldozing) has been performed, and the parties desire to redescribe the work, to change the basis of payment for the work, to add land to the project, and to restate their agreement on form MF-200A (Revised June 1954).

NOW, THEREFORE, It is agreed that:

1. Effective February 20, 1953, the Original Contract is superseded in all respects by this Contract, which shall control the Government's claim and lien for percentage royalty, and in which all the rights and obligations of the parties are fully merged.

2. The Operator releases and agrees to save the Government harmless from all claims and demands arising out of the Original Contract.

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

EXHIBIT "A"

Description of the Work

The work consists of the geophysical surveying and trenching performed under the Original Contract, and the following:

1. Drill an aggregate of 7,225 feet of diamond drill hole (minimum size AX) in approximately 16 holes from underground locations on the No. 2 level of the Sunset Mine, as tentatively indicated on the map entitled "Figure 7, Sunset Mine, Proposed Underground Drill Plan," attached hereto and made a part hereof.

2. Drill an aggregate of 8,445 feet of diamond drill hole (minimum size AX) in approximately 25 holes from surface locations, as tentatively indicated on the map entitled, "Figure 8, Sunset Mine, Proposed Surface Drilling," attached hereto and made a part hereof, exclusive of Group 5.

All diamond drill core shall be stored in core boxes and shall be made available to the Government for inspection. The Government, if it so elects, may also require splits of core for its own use. All holes drilled shall be logged geologically, and a detailed record of such logging shall be submitted to the Government with the Operator's monthly progress report and voucher. A summary of the logging record also shall be submitted as a part of the Operator's final engineering and geologic report.

The Operator shall select representative samples for chemical analysis from drill core and cuttings, and shall have these samples analyzed.

The location, inclination, direction, and extent of all work, including the quantity and method of sampling and analysis, are subject to the approval of the Government.

Estimated Cost of the Project

Fixed Unit Costs

Work Performed Under Original Contract

Geophysical survey 1/	$ 3,000.00	
Trenching 1/	1,500.00	$ 4,500.00

Work To Be Performed Under This Contract

15,670 feet diamond drilling @ $7.00/ft.	$109,690.00	
405 chemical analyses @ $2.00/each	810.00	$110,500.00
Estimated Total cost of project		$115,000.00
Government participation @ 50%		$ 57,500.00

1/ This work, completed under the Original Contract, constitutes a unit for the purpose of payment under this Contract.

Docket copy

30 1954

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

AMENDMENT NO. 1

It is agreed this 17th day of March, 1954, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, and Index Mining Company, that Contract Idm-2489 (Docket No. DMEA-2612), dated February 20, 1953, is amended, effective December 1, 1953, as follows:

1. a. Work under the contract shall be suspended during the period beginning December 1, 1953, and ending not later than June 1, 1954.

b. No costs incurred by the Operator during the period of suspension shall be allowable for contribution by the Government.

c. The Operator, at his own cost and expense, without contribution by the Government, during the period of suspension shall preserve the project work and any property in which the Government has an interest.

d. The Government shall not contribute to any costs of rehabilitation or repair which in its opinion would not have occurred if there had been no suspension of work.

2. The provisions of Annex III, attached hereto and made a part hereof, are substituted for the provisions of Article 9 of the contract form.

3. It is of the essence of this contract that work be resumed on or before June 1, 1954; and if the work is not resumed within the time limited, in a manner required to bring the project to completion as required:

a. All obligation of the Government to contribute to costs not incurred before December 1, 1953, shall be and is hereby terminated, except for necessary and reasonable costs and expenses incurred in--

(1) preserving and disposing of property to the cost of which the Government has contributed, and

(2) making and rendering reports, accounts, and winding-up and settlement actions provided for in the contract.

b. The Operator shall promptly perform all winding-up and settlement actions provided for in the contract, including the disposal of any facilities, buildings, fixtures, equipment, or other items to the cost of which the Government has contributed; and shall promptly render to the Government a final report and a final accounting.

c. The provisions of Annex III to this Amendment No. 1, as amended hereafter, shall remain in full force and effect. That part of paragraph "b" of Annex III which precedes the first colon is amended to read as follows:

"The Operator, regardless of any certification of discovery or development, and regardless of whether the Operator is the producer or has any interest in the land or the production therefrom, shall pay to the Government a royalty on all minerals mined or produced from the land described in the contract for a period of ten years from the date of the contract, or until the total amount contributed by the Government, without interest, is fully repaid, whichever occurs first. Said royalty shall be a percentage of the net smelter returns, the net concentrator returns, or other amounts realized from the sale or other disposition of any such production (including any bonuses, premiums, allowances, or other benefits), in whatever form disposed of, including ore, concentrates, or metal, as follows:"

This amendment shall not be construed to increase the estimated total cost of the project, the aggregate total amount which the Government may be required to contribute,

the amount of any item designated as "allowable maximum," or the agreed unit cost of any item of work.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By C P Mittendorf
Administrator, Defense Minerals
Exploration Administration

Robin Hoffhood
Chamberlin

INDEX MINING COMPANY

By C J Brennan

ANNEX III

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 30 1954

The following provisions are in lieu of Article 9

Repayment by Operator.--a. Certification.--If at any time the Government considers that a discovery or development from which production may be made has resulted from the exploration work, the Government, at any time not later than six months after the Operator has rendered the final report and final account, may so certify in writing to the Operator. Such certification shall describe broadly or indicate the nature of the discovery or development.

b. Percentage royalty.--The Operator, or his successor in interest, shall pay to the Government a royalty on all minerals mined or produced from the land described in Article 2,--(1) regardless of any certification of discovery or development, from the date of the contract until the lapse of the time within which the Government may make such certification of discovery or development, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first, unless the Government waives its right to a royalty; or (2) if the Government makes a certification of discovery or development, for a period of ten years (or other period fixed by this contract) from the date of the contract, or until the total net amount contributed by the Government, without interest, is fully repaid, whichever occurs first. Said royalty shall be a percentage of the net smelter returns, the net concentrator returns, or other amounts realized from the sale or other disposition of any such production (including any bonuses, premiums, allowances, or other benefits), in whatever form disposed of, including ore, concentrates, or metal, as follows:

(a) One and one-half ($1\frac{1}{2}$) percent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(b) One and one-half ($1\frac{1}{2}$) percent of any such net amounts, plus one-half ($\frac{1}{2}$) percent of such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such net amounts.

(For instance: the percentage royalty on a net amount of five dollars ($5.00) per ton, would be one and one-half ($1\frac{1}{2}$) percent; on a net amount of ten dollars ($10.00) per ton, three and one-half ($3\frac{1}{2}$) percent.)

c. Definitions.--As here used, "net smelter returns", "net concentrator returns", and "other amounts realized from the sale or other disposition", mean gross revenue from sales; or if not sold, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income tax determination.

d. Lien for Payment.--To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

e. Notice to Purchasers.--The Operator shall notify any purchaser of the production of the Government's royalty interest, and shall authorize and direct the purchaser to pay the royalty directly to the Government and to furnish the Government with copies of the settlement sheets; but failure or refusal by the purchaser to comply shall not relieve the Operator of liability to pay any royalty falling due.

f. No Obligation to Produce.--This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

MF-200
(June 1951)
(Revised Feb. 1952)

DOCKET NO. DMEA 2612

COMMODITY Copper

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Docket Copy
IDM-E 489

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 20 1953

EXPLORATION PROJECT CONTRACT [1]

IT IS AGREED this 20th day of February, 1953, between the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration, hereinafter called the "Government," and [2] Index Mining Company, a corporation duly organized and existing under and by virtue of the laws of the State of Washington, 2430 Monte Vista Place, Seattle 99, Washington

hereinafter called the "Operator," as follows: and as provided in Annex I, attached hereto.

ARTICLE 1. *Authority for contract.*—This agreement is entered into under the authority of the Defense Production Act of 1950, as amended, pursuant to DMEA Order 1 entitled "Government Aid in Defense Exploration Projects."

ARTICLE 2. *Operator's property rights.*—With respect to that certain land situated in the State of Washington, County of Snohomish, described as follows: [3] As set forth in Annex II

the Operator represents and undertakes: [4]

(*a*) That the Operator is the owner, in possession and entitled to possession, and that the property is subject only to the following claims, liens, or encumbrances as to each of which the subordination agreement of the holder is attached: None

(*b*) ~~That the Operator is a lessee in possession and entitled to possession, and the Owner's Consent to Lien is attached.~~

The Operator shall devote the land and all existing improvements, facilities, buildings, installations, and appurtenances to the purposes of the exploration project without any allowance for the use, rental value, depreciation, depletion, or other cost of acquiring, owning, or holding possession thereof.

ARTICLE 3. *Exploration project.*—The Operator, within 60 days from the date of this contract shall commence work on a project of exploration for [5] Copper

in or upon the described land; and shall bring the project to completion within a period of 2 years from the date of this contract. The work to be performed is more fully described in Exhibit "A" attached hereto, which, with any maps or drawings thereto attached, are made a part of this contract. The Government will contribute to the cost of this work as hereafter provided.

ARTICLE 4. *Performance of the work.*—(*a*) *Operator's responsibility.* The work shall be performed efficiently, expertly, in a workmanlike manner, in accordance with good mining standards and State regulations for health and safety and for workmens' compensation and employers' liability insurance, with suitable and adequate equipment, materials, and labor, to bring the project to completion within the time fixed. To the extent specified in Exhibit "A," attached hereto, the work may be performed by independent contractor or contractors; and work not specified in Exhibit "A" for performance by independent contractor may nevertheless be so performed upon amendment of Exhibit "A," as agreed to by the parties, to state the work to be so performed and the estimated unit costs thereof, as provided hereafter.

(*b*) *Independent contracts.*—Any independent contract for the performance of work shall be on a unit-price basis (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved), or on some basis that will indicate the amount due for work performed at any stage of the work to be performed under such independent contract. The Government shall not be nor be considered to be a party to any such independent contract, and the Government's right to terminate the exploration project contract under any of its provisions shall not in any manner be affected by reason of any such independent contract. If the reference in Exhibit "A" to any such independent contract states that the Government's approval thereof is required, the Government may refuse to participate in the cost thereof unless and until it has given its written approval of the independent contract.

(*c*) *Government may inspect.*—The Government shall have the right to enter and observe and inspect the work at all reasonable times, and the Operator shall provide the Government with all available means for doing so. The Government may consult with and advise the Operator on all phases of the work.

ARTICLE 5. *Estimated costs of the project.*—A statement of the estimated cost of the project is set forth in Exhibit "A," attached hereto. Except insofar as any item of requirement or the estimated cost thereof set forth in Exhibit "A" is there or elsewhere designated as an "allowable maximum," such items of requirement and of related cost are estimates only, and may be exceeded to the extent that the Government may from time to time approve for the most economic and beneficial performance of the work within the limitation of the total aggregate estimate of costs. The Government's approval of any such excess over the estimate for an item of requirement or related cost will be signified by its approval and payment of any invoice or voucher for payment which expressly calls attention to such excess. Items expressly designated in Exhibit "A" or elsewhere as "allowable maximum," and the total aggregate estimated cost are limitations, and any excess therein will be for the sole account of the Operator in which the Government will not participate.

ARTICLE 6. *Allowable costs of the project.*—(*a*) The costs of the project in which the Government will participate are limited to the following: and also the costs referred to in Article 13.

(1) *Independent contracts.*—Payments to independent contractors under independent contracts listed in Exhibit "A." The estimated cost of any work to be performed under an independent contract is or shall be included in the estimate of costs in Exhibit "A" in terms of the estimated numbers of units of work to be performed, the estimated amount to be paid per unit, and the estimated total amount to be paid to the independent contractor, and such estimates shall be allowable maximums above which the Government will not contribute. Regardless of the provisions of any such independent contract, the Government will participate in the payments to the independent contractor only on account of work actually performed and that conforms with the provisions of the exploration project contract, and only to the extent that the Government deems the unit prices for the work under the independent contract to be reasonable and necessary. No such independent contract shall have the effect of increasing the estimated total cost of the exploration project contract nor the maximum amount which the Government will pay as provided in the exploration project contract.

(2) *Labor, supervision, consultants.*—Labor, supervision and technical services (including engineering and geological consultants), a schedule of which is included in the estimate of costs set forth in Exhibit "A." The requirements and related estimated costs for supervision and technical services are allowable maximums.

(3) *Operating materials and supplies.*—Necessary materials and supplies including items of equipment costing less than $50.00 each, and power, water, and fuel, a schedule of which is included in the estimate of costs in Exhibit "A."

(4) *Operating equipment.*—Any operating equipment to be rented or purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or the allowable depreciation, as the case may be, a schedule of which is included in Exhibit "A." Any items listed as owned and to be furnished by the Operator, and related ~~initial~~ allowable depreciation, are allowable maximums.

(5) *Rehabilitation and repairs.*—Any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and to be devoted to the purposes of the exploration contract, a schedule of which is included in the estimate of costs set forth in Exhibit "A." These items are allowable maximums.

(6) *New buildings, improvements, installations.*—Any necessary buildings, fixed improvements, or installations to be purchased, installed, or constructed for the purposes of the exploration work, with the estimated cost of each, a schedule of which is included in the estimate of costs in Exhibit "A." All of these items are allowable maximums.

(7) *Miscellaneous.*—Repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance and payroll taxes.

(8) *Contingencies.*—Such other necessary, reasonable direct costs of performing the exploration work, within the limit of the total aggregate estimate of costs, whether or not included in any schedule of costs in Exhibit "A," as may be approved by the Government in the course of the work, as indicated by its approval and payment of invoices and vouchers.

[1] If sufficient space is not provided in any blank, use an extra sheet of paper and refer to it in the blank.
[2] State name, address, and nature of organization if any.
[3] Give legal description or enough to identify the property, particularly excluding any land or interest therein to which the Government's lien is not to attach or the production from which is not to be subject to the Government's percentage royalty.
[4] Strike out the provision not applicable.
[5] Name of mineral or minerals.

(*b*) The Government's payments in [illegible] cases will be based on actual, necessary co[illegible] (including contract unit prices) incurred not in excess of any "allowable maximum," and not in excess of the fixed percentage of the total aggregate estimated cost. Costs will be considered to be incurred only as they are or become due and payable.

(*c*) No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes) or any other indirect costs, or work performed or costs incurred before the date of this contract, shall be allowed as costs of the project in which the Government will participate.

ARTICLE 7. *Reports, accounts, audits.*—(*a*) *Progress reports.* The Operators shall provide the Government with monthly reports of work performed and costs (including contract unit prices) incurred under the contract, in quintuplicate (five copies), upon forms provided by the Government. These progress reports shall be certified by the Operator, and shall constitute both the Operator's invoice of costs incurred on the project during the period covered by the report and his voucher for repayment by the Government, unless the Government requires the use of a standard voucher form with invoice attached. Progress reports shall include surface and/or underground engineering-geological maps or sketches showing the progress of the exploration, with assay-reports on samples taken concurrently with the advance in mineralized ground.

(*b*) *Final report.*—Upon completion of the exploration work or termination of the contract the Operator shall provide the Government with an adequate geological and engineering report, in quintuplicate (five copies), including an estimate of ore reserves resulting from the exploration work.

(*c*) Compliance with requirements.—If, in the opinion of the Government, any of the Operator's reports are insufficient or incomplete, the Government may procure the making or completion of such reports and attachments as an expense of the exploration work; and the Government may withhold approval and payment of any vouchers depending upon insufficient or incomplete reports.

(*d*) *Accounts and audits.*—The Operator shall keep suitable records and accounts of operations, which the Government may inspect and audit at any time. The Government may at any time require an audit of the Operator's records and accounts by a certified public accountant, the cost thereof to be treated as a cost of the project. The Operator shall keep and preserve said records and accounts for at least 3 years after the completion of the project or the termination of this contract. Upon the completion of the project or termination of the contract the Operator shall render a final account as provided in Article 12.

ARTICLE 8. *Payments by the Government.*—(*a*) The Government will pay 50 percent of the allowable costs incurred, as they accrue, in an aggregate total amount not in excess of $ 57,500.00, which is 50 percent of $ 115,000.00, the agreed, estimated total cost of the project in which the Government will participate; *Provided,* that until the Operator's final report and final accounting have been rendered to the Government, and any final auditing required by the Government has been made, and a final settlement of the contract has been made, the Government may withhold from the last voucher or vouchers such sums as it sees fit not in excess of ten (10) percent of the maximum total which the Government might have been called upon to pay under the terms of the contract.

(*b*) The Government may make any payment or payments direct to independent contractors and to suppliers, for the account of the Operator, rather than to the Operator.

ARTICLE 9. *Repayment by Operator.*—(*a*) If, at any time, the Government considers that a discovery or a development from which production may be made has resulted from the exploration work, the Government, at any time not later than 6 months after the Operator has rendered the required final report and final account, may so certify in writing to the Operator. The certification shall describe broadly or indicate the nature of the discovery or development. In the event of such certification, any minerals mined or produced from the land described in Article 2 within 10 years from the date of this contract, including any mined or produced before the certification, shall be subject to a percentage royalty which the Operator or his successor in interest shall pay to the Government, upon the net smelter returns, the net concentrator returns, or other net amounts realized from the sale or other disposition of any such production, in whatever form disposed of, including ore, concentrates, or metal, until the total amount contributed by the Government, without interest, is fully repaid, or said 10 years have elapsed, whichever occurs first, as follows:

(1) One and one-half (1½) percent of any such net amounts not in excess of eight dollars ($8.00) per ton.

(2) One and one-half (1½) percent of any such net amounts, plus one-half (½) percent of such net amounts for each additional full fifty cents ($0.50) by which such net amounts exceed eight dollars ($8.00) per ton, but not in excess of five (5) percent of such net amounts.

(For instance: The percentage royalty on a net amount of five dollars ($5.00) per ton would be one and one-half (1½) percent; on a net amount of ten dollars ($10.00) per ton, three and one-half (3½) percent.)

(*b*) As here used, "net smelter returns," "net concentrator returns," and "other net amounts realized from the sale or other disposition," mean gross revenue from sales; or if not sold, the market value of the material after it is mined in the form in which and the place where it is held. In the case of integrated operations in which the material is not disposed of as such, these terms mean what is or would be gross income from mining operations for percentage depletion purposes in income-tax determination.

(*c*) To secure the payment of its percentage royalty, the Government shall have and is hereby granted a lien upon the land described in Article 2 and upon any production of minerals therefrom, until the royalty claim is extinguished by lapse of time or is fully paid.

(*d*) This article is not to be construed as imposing any obligation on the Operator or the Operator's successor in interest to engage in any mining or production operations.

ARTICLE 10. *Assignment, transfer, or loss of Operator's interest.*—Without the written consent of the Government, the Operator shall not assign or otherwise transfer or hypothecate this contract or any rights thereunder. The Operator shall not make any voluntary nor permit any involuntary transfer or conveyance of the Operator's rights in the land described in Article 2, without making suitable provision for the preservation of the Government's right to a percentage royalty on production and lien for the payment thereof; *Provided,* that mere failure by the Operator to maintain the Operator's rights in the land, without any consideration running to the Operator other than relief from the cost of maintaining such rights (as by surrender of a leasehold, failure to perform assessment work, or failure to exercise an option), coupled with complete abandonment by the Operator of all interest in or operations on the land for a period of 10 years from the date of this contract, shall not constitute such a transfer or conveyance. Should the Operator make or permit any transfer or conveyance in violation of this provision, the Operator shall be and remain liable for payment to the Government of the same amounts, at the same times, as would have been paid under the terms of the percentage royalty on production. If for any reason the net smelter returns, net concentrator returns, or other net amounts realized from the sale or other disposition of such production are not available as a means of measuring the amount of the Operator's liability, the amount thereof shall be estimated as well as may be, and in the event of dispute as to such estimates, the determination thereof by the Administrator of Defense Minerals Exploration Administration or by his successor shall be final and binding upon the Operator.

ARTICLE 11. *Title to and disposition of property.*—All facilities, buildings, fixtures, equipment, or other items costing more than $50.00 each, paid for or purchased with funds contributed jointly by the Operator and the Government, although title may be taken in the name of the Operator, shall belong to the Operator and the Government jointly, in proportion to their respective contributions, and upon the completion of the work or the termination of the contract shall be disposed of promptly by the Operator for the joint account of the Government and the Operator, either by return to the vendor, by sale to others, or purchase by the Operator at a price at least as high as could otherwise be obtained, as may appear to be for the best interest of the Government, unless the Government, in writing, waives its interest in any such item. If necessary to accomplish such disposition, the Operator shall dismantle, sever from the land, and remove any such item, the cost thereof to be for the joint account of the parties in proportion to their respective interests. If the Operator, within 90 days after the receipt of written notice from the Government, fails, neglects, or refuses to dispose of such property, the Government may itself enter upon the land, take possession of, and remove and dispose of any such property as above provided.

ARTICLE 12. *Termination and completion.*—The Government may, at any time, by written notice to the Operator, terminate this contract: (*a*) If the Operator fails to provide his share of the money necessary to prosecute operations pursuant to the terms of the contract; (*b*) if the Operator, in the opinion of the Government, fails to prosecute operations pursuant to the terms of the contract; or (*c*) if in the opinion of the Government, operations up to the time of the notice have not indicated the probability of making any worth while discovery and in the opinion of the Government further operations are not justified. Upon the completion of the project or any termination of the contract the Operator shall dispose of any remaining materials, supplies, facilities, buildings, fixtures, and equipment in which the Government has an interest, for the joint account of the Operator and the Government in the proportion of their respective interests; shall render to the Government a full and final accounting of his operations under the contract and his expenditures of money; and shall pay to the Government its pro rata share of any money remaining.

ARTICLE 13. *Changes and added provisions.* To the extent that costs are set forth in Exhibit "A" as "Agreed Unit Costs" they are in lieu of the actual costs that would otherwise be allowable costs of the project as provided in Article 6(a) of the contract form.

Executed in sextuplicate the day and year first above written.

THE UNITED STATES OF AMERICA

By O. Mitterdorf
Administrator, Defense Minerals Exploration Administration

Index Mining Company
(Operator)

By C. Brennan
President

I, A. G. Brennan, certify that I am the Secretary of the corporation named as Operator herein; that C. V. Brennan, President, who signed this contract on behalf of the Operator, was then of said corporation; that said contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Index Mining Co. A. G. Brennan, Secy.

[CORPORATE SEAL]

U. S. GOVERNMENT PRINTING OFFICE 16—66328-1

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

ANNEX I

Materials and Supplies: For the purpose of determining the Government's interest in materials or supplies remaining upon any termination of the work, they shall be considered in groups or categories (such as pipe, or explosives, or rails, or drill steel), and if the original cost of the remaining unexpended portion of any such group or category exceeded $50, the Government shall have an interest therein as provided in Article 11 of the contract form.

Equities in Equipment: Unless expressly permitted by provisions in Exhibit "A", the operator shall not procure equipment or any other item under a rental-purchase agreement, an installment-purchase agreement, any agreement which creates or builds up an equity or interest in the thing procured which can be converted to legal title only by further payment or some other consideration, or any agreement other than for straight rental or cash purchase and delivery.

Preservation of Property: Until the final disposal of any equipment or other property in which the Government has an interest or equity, the operator shall preserve and protect same for the mutual best interests of the parties, any reasonable and necessary cost thereof to be treated as an allowable cost of the exploration work to which the Government will contribute.

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

ANNEX II

North 1/2 of Section 1 Township 27 N. R. 10 E. W. M.; and the following patented mining claims: Star and Black Bear, (both covered by patent #488234); Black Bear Extension, W. H. B., Boundary, Hazel C., Ivy R., Mountain Side, Ravine and Mono (all covered by patent #886270) shown on the two maps attached hereto and made a part hereof entitled "Figure 2 Index Mining Co. Patented Claims" and "Figure 3 Sunset Mine Area, Snohomish County, Washington" but excluding that part of the Sunset Mine below the No. 2 Level at elevation 1420 feet indicated on map attached hereto and made a part hereof entitled "Fig. 6 -- Longitudinal section of the Sunset mine, Snohomish County, Washington."

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

EXHIBIT "A"

Description of the work

The object of this work is to explore for copper ore in the area indicated on the map entitled "Figure 3 -- Sunset mine area, Snohomish County, Washington . The proposed work indicated on the said map is as follows:

1. Construct a road 600 feet long from the "logging railroad grade" to the portal site of the proposed "Bureau" (of Mines) crosscut which is at an elevation of 1550 feet, and prepare said site.

2. Crosscut 600 feet to intersect the "Bureau" vein at a depth of approximately 270 feet below the outcrop and then drift 300 feet on the vein.

3. Conduct a geophysical survey in an area located roughly between the "Bureau" ore body and the Sunset vein, and also in the area east of the present Sunset Mine workings.

4. If the geophysical survey indicates the advisability of so doing, dig trenches to the necessary depth and length on any favorable indications found by the geophysical survey.

5. Construct a road approximately 1000 feet long from a point near diamond drill hole No. 3 on the branch road from Trout Creek Road, to the portal of a proposed Harrington crosscut at 1600 feet elevation.

6. Crosscut from the portal of the proposed Harrington crosscut approximately 150 feet to the Harrington vein, and then drift easterly on the Harrington vein 750 feet.

7. Diamond drill three holes to a total length of 1000 feet from the "Bureau" crosscut to intersect the "Bureau" vein at a depth of approximately 150 feet below the crosscut or approximately 420 feet below the outcrop.

All the drifts and crosscuts are to be timbered where necessary and shall be at least 5 feet x 7 feet in the clear. It is estimated that about 525 feet of drifts and crosscuts will require timbering.

The diamond drill holes must be of a size necessary to obtain the required geological information.

The location, direction and extent of all work is subject to the approval of the Government engineers.

AGREED UNIT COSTS

Construct 2400 ft. of roads @ $2.20/ft.	$ 5,280.00	
Crosscut and drift 1800 ft. @ $36.17/ft.	65,106.00	
Timber 525 feet of drifts and/or crosscuts @ $8.39/ft.	4,405.00	
Diamond drill 1000 feet @ $7.00/ft.	7,000.00	$81,791.00

The Government will contribute to the costs of the road construction, drifting, crosscutting, timbering and diamond drilling on the basis of these agreed unit costs per foot, as they accrue, for units of work actually performed, in lieu of actual costs. The agreed unit costs include all costs of the work except Operating Equipment and Assaying estimated under Items (4) and (7) below. The rest of the described work estimated in Items (5),(6) and (8) below, and those items of cost which are excluded from the unit costs will be contributed to by the Government on the basis of the actual costs.

Estimated Actual Costs
(*Indicates allowable maximum)

Geophysical survey 1/	$ 3,000.00*
Trenching on favorable geophysical showings 1/	1,500.00*

(4) Operating Equipment

To be Purchased

1 Air compressor 315 cfm diesel	$10,000.00
1 Loader, Eimco 12 B or equivalent	3,100.00
1 Air Trammer	2,100.00

1/ With respect to this item of work, all schedules are waived. The sum allowed includes all costs including that of necessary technicians, labor, supervision, equipment, materials and supplies.

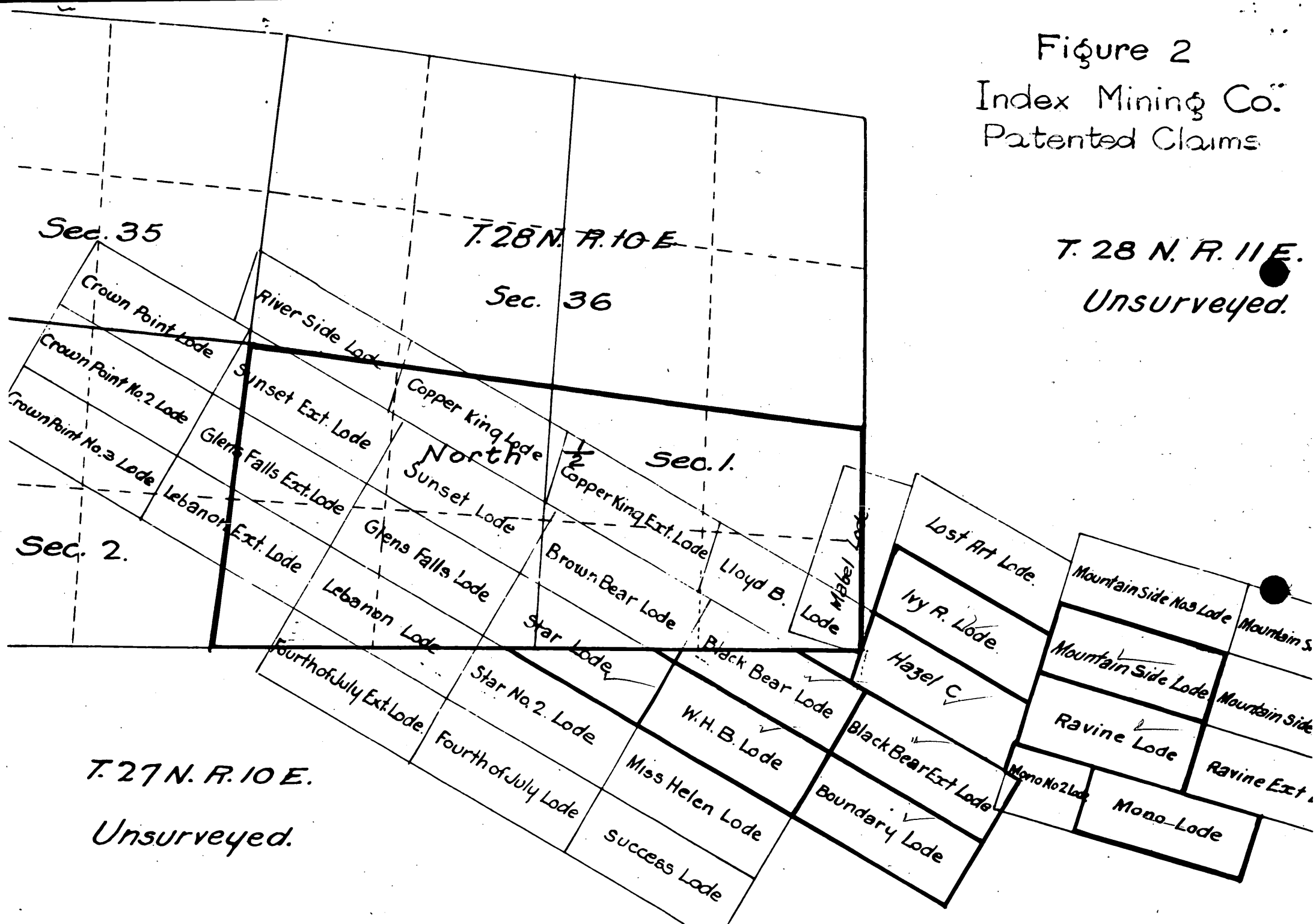
4 Mine cars @ $300	$ 1,200.00	
3 Drills with air leg @ $650/ea.	1,950.00	
1 Truck pickup	2,275.00	
1 Grinder air driven	200.00	
1 Ventilating fan gas engine driven	350.00	
1000 feet Vent tube @ $1.00/ft.	1,000.00	
250 ft. Air hose, 1 inch	245.00	
150 ft. Water hose 3/4 inch	135.00	
1 Saw air driven, hand	250.00	
1 Air receiver tank 36 inch x 8 ft.	400.00	$23,205.00
(5) **Rehabilitation and Repairs**		
Blacksmith Shop, Office and Dry 2/	990.00*	990.00*
(6) **New Buildings, Improvements, Installations** 2/		
1 Shed for compressor and tools at "Bureau" Adit 2/	500.00	
1 Shed for compressor and tools at 1600 level Adit 2/	500.00	1,000.00*
(7) **Miscellaneous**		
Assaying 2/	600.00	600.00
(8) **Contingencies**		2,914.00*
		$33,209.00*

S U M M A R Y

Agreed Unit Costs	$81,791.00	
Estimated Actual Costs	33,209.00*	
Estimated Total Cost of Project		**$115,000.00***
Government Participation @ 50%		**$ 57,500.00***

2/ See footnote 1.

Figure 2
Index Mining Co.
Patented Claims



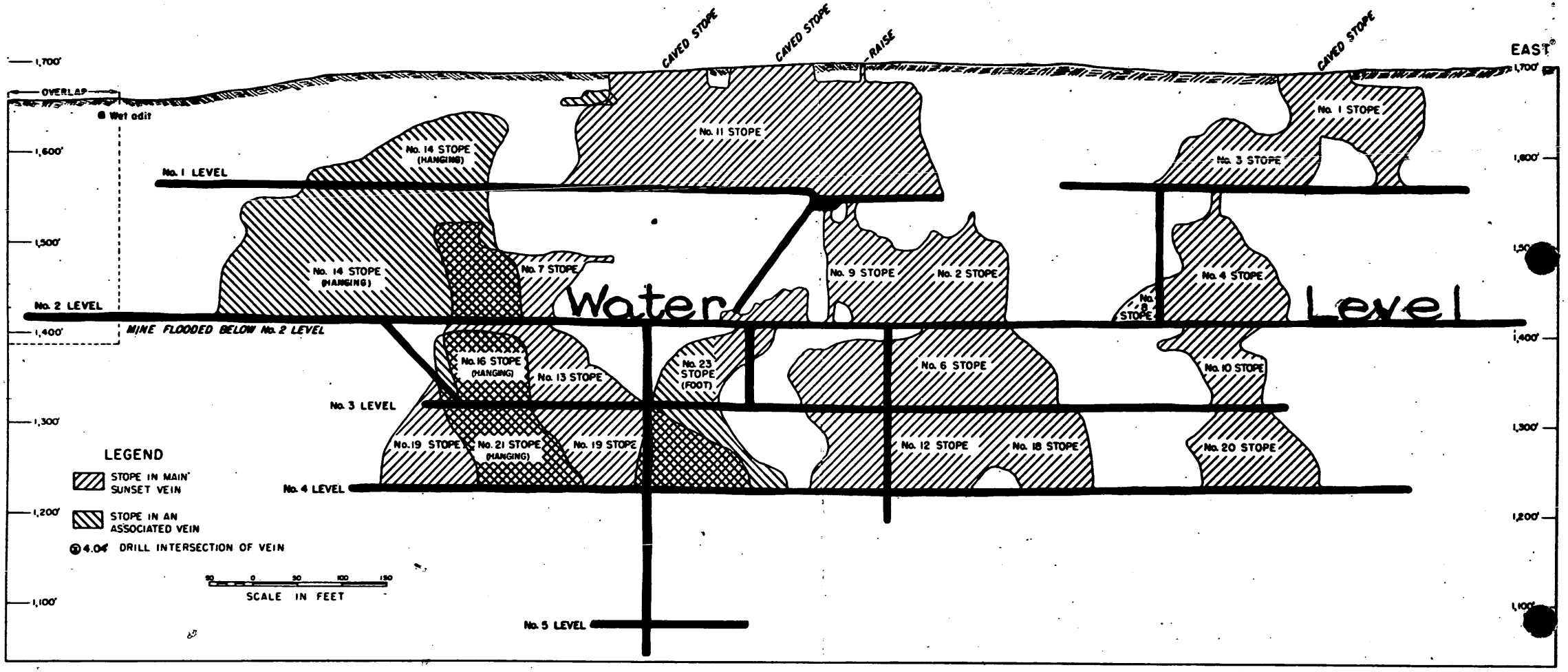


Figure 6.—Longitudinal section of the Sunset mine, Snohomish County, Washington.

DMEA- 2612

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

July 8, 1952

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

Dear Sir:

Enclosed are three copies of an application for DMEA exploration assistance submitted by the Index Mining Company, 2430 Monte Vista Place, Seattle 99, Washington. The application concerns the Sunset mine, Snohomish County, Washington. One copy of the application has been retained at this office to facilitate field examination.

We have considerable information on the Sunset mine at this office and it is entirely possible that no further field examination will be needed. We will, however, be glad to schedule a field examination on advice from the Operating Committee.

Sincerely yours,

Thor H. Kiilsgaard

Thor H. Kiilsgaard
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosures

cc: USBM

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUL 11 1952

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

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

Not to be filled in by applicant

Docket No. DMEA-2612
Metal or Mineral
Date Received 7-11-52
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: INDEX MINING COMPANY, a Washington Corporation
2430 Monte Vista Place,
Seattle 99, Washington.
C.V.Brennan, President and A.G.Brennan, Secretary-Treasurer, Same address.

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

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

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract N½, Sec 1, Township 27N, Range 10E W.M. & the Star, BlackBear, Black Bear Ext, WHB, Boundary, Hazel C, Ivy R, Mountain Side, Ravine and Mona patented mining claims, excluding that part of the Sunset mine at present under water

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

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

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

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

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

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

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

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

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

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

Defense Minerals Administration
16—66551-1
JUL 11 1952

5. *The exploration project.*—(*a*) St[illegible]he mineral or minerals for which you wish t[illegible]plore copper

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

(*c*) The work will start ~~within~~ as soon as equipment can be obtained ~~days~~ and be completed within 24 ~~months from~~ the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

☐ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated June 1, 195[illegible]

[illegible] (Applicant)

By [illegible] President.

[illegible] Brennan

[illegible] Secretary-

[illegible] Brennan Treasurer.

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

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

INDEX MINING COMPANY
2430 Monte Vista Place
Seattle 99, Washington

4. (a) The Sunset Mine with 13,450 feet of underground workings was the largest producer of copper in Washington prior to 1930. Since 1930 production has been very low. The mine is flooded below No.2 Level which is at elevation 1400 feet above sea level. No work is now being done. There are no serviceable production facilities apart from office, dry and blacksmith shop buildings and three houses all in need of repairs and some equipment chiefly for the mill. Index Mining Company owns the mine. Most of the mine workings, above No.2 Level, are accessible. From No.2 to No.5 Level is flooded.

(b) There is no current production. The Bureau of Mines and the old Company records both show a production of 250,000 + tons of ore averaging 2.5% copper with small gold and silver values. Ore reserves, all in the flooded area or at the new western section are estimated at 135,000 tons averaging 2.6% copper.

(c) The Sunset ore bodies occupy fracture zones in a granite country rock. Chalcopyrite and bornite are the chief copper minerals associated with low gold and silver values. Pyrite is very scarce. The fracture zones are quite long and vary in width from a narrow break to as much as a 30' width of crushed, seritized and mineralized material. One series, including the Sunset vein, strikes N70W, while another including the Harrington vein, strikes almost E.W. Dips vary from 75° to 90° to the north. The proposed crosscut to the new Bureau of Mines ore showing would open up for further exploration 1000' laterally of promising ground where the vein structure has been indicated by some diamond drilling.
The old Sunset Mine is flooded below the No.2 Level. There are substantial ore reserves between the No.2 and No.5 Levels but no work is contemplated there under the present plan.
Leaser have worked for years in the dry part of the mine above No.2 Level but the management feels confident that judicious exploratory work above the old workings will find ore in the Copper King vein, in the western end of the Sunset vein, above the No.2 Level stope on the Harrington vein, and above the +200' level of the Little Copper King stope. The distance between these two latter stopes has never been prospected on any level and on the proposed new 1500' Level this area represents a very promising exploratory risk- See maps (1) and (2).

(d) The Tacoma Smelter is 96 miles from the mine of which 90 miles is 1st class pavement, 5 miles good gravel country road, and 1¼ miles good mine road. Index, on the Great Northern Railroad is 6 miles by road from the mine, Everett 45 miles, Seattle 65 miles and Tacoma 95 miles away, are all important supply points There are three small towns within 6 to 20 miles of the property.

(e) Manpower, materials, supplies, and equipment are as available as anywhere in the country. Trout Creek passes 150' from the mine portal and could develop up to 2000 H.P.

INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.

5.(b) EXPLORATION PROGRAM

The proposed exploration is set up to explore the "Bureau of Mines" ore body, the Harrington, Sunset, Red Devil and Little Copper King and to prospect indications of any new veins found in a geological and gepphysical survey in that area.

PROPOSED WORK

1. Construction of a road 600' long to the proposed"Bureau" crosscut and preparation of a portal site (see attached maps)

2. Crosscut to Bureau of Mines vein 600 feet and drift a minimum of 300 feet on the vein.

In 1950 the U. S. Bureau of Mines did some diamond drilling on the property. They indicated the "Bureau" ore-body by 4 holes the deepest of which cut the ore about 180' vertically below the outcrop. This proposed crosscut will intersect the vein 270' below the outcrop and open up a new zone for exploration.

3. Geophysical survey of the area between the Bureau of Mines ore body and the Sunset vein and the extension of the mineralized area eastward.

The work would be carried out by one of the electrical methods perhaps also using the self potential method. Dr. A. R. Clark, a well known geophysicist has already done some geophysical surveying on the property and this type of work has been quite successful in the area.

6. 4. Surface pitting and trenching on any favorable indications.

5. Construction of a road 1800' long to the proposed "1600 Level" crosscut.

6. At elevation 1600' crosscut 150' to the Harrington vein where it is expected to find ore. On the way in one would cut the western extension of the Sunset Vein west of the stoped area. It is then planned to drift east on the Harrington Vein 750' to explore the virgin ground there and this would also explore for the upward extension of the Red Devil vein and connect with the top of the old Little Copper King stope.

INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.

5. (b) EXPLORATION PROGRAM continued

7. Diamond drill 3 holes from the "Bureau" crosscut to explore the Bureau Vein 150' below the crosscut. These would be fanned out from the crosscut, which is located 270' below the outcrop, and would intersect the ore zone 420' below the outcrop.

(c) The work will start as soon as equipment can be placed on the ground and will be completed within 24 months.

(d) C. V. Brennan, of Seattle Washington who will be advisor for the job, has, since graduation, done everything from mucking to supervising large crews in mining operations.

R. J. Craig, with a B. S. degree in mining has, since graduation, had sixteen years experience in mining and worked underground for several years befpre graduation.

R. T. Curtiss who has been mining for 30 years will be in charge of the detailed underground work.

INDEX MINING COMPANY
2430 Monte Vista Place ,
Seattle 99, Washington.

6. Estimate of Costs.

1. Geological Survey) 2. Geophysical Survey)	3,000
3. Surface trenching	1,500
4. Crosscut a total of 750' @ 54.47 per foot	40,855
5. Drift a total of 1050' @ 54.47 " "	57,195
6. Diamond drilling 1000' @ 7.00	7,000
7. Rehabilitation and repairs	990
8. Roads 2400' @ $2.20 per foot	5,280
9. Analytical work	600
10. Two small buildings at new portals 550 each	1,100
Total	117,520

Basis of costs is a heading with minumum dimensions of 5½'X 7' in the clear, untimbered, and with a good ditch. Anticipated average advance would be 4' per shift, two shifts per day, 5 days per week.

All items of expense including transportation etc have to be charged against one working face.

It is requested that a short term form of contract be entered into with a fixed per foot cost being allowed for drifting, crosscutting, diamond drilling, and road work.

INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.

6. (b) Labor and Supervision.

	cost per day
4 Miners at 17.50 including taxes	70.00
2 Trammer operators at 17.50 including taxes	35.00
2 Surface at 15.50 " "	31.00
1 Foreman " "	18.50
1 Accountant part time	5.00
1 Engineer " "	7.00
Supervision, consultants, etc.	25.00
	191.50

191.50 8' per day = cost per foot $23.94

	cost per foot	
(c) Powder 18# per foot @ 22.5¢ per pound	4.05	
Caps, electric, 20 per rd., @ 16¢ ÷ 4	.80	
Steel and bits	3.25	
Pipe 2" and 1" (36¢ and 18¢ + fittings)	.65	
Rail and ties	1.46	
Power	3.25	
Maintance and repairs	3.50	
Small tools and miscellaneous	.80	17.76
		41.70
Contingencies 10%		4.17
	Total	45.87
Purchase of equipment or rental equivalent carried forward from 6. (d)		8.60
		54.47

Total cost per foot carried to page 6.

INDEX MINING COMPANY
430 Monte Vista Place
Seattle 99, Washington.

6 (d) Equipment.	cost	estimated salvage value aft. 2 years.	monthly rental
Total footage 1800. Estimate per month 176'			
3 drills with pusher leg $650. each	1,950	300	150
1 Grinding machine	200	100	15
1 Air compressor diesel 315 cfm	10,000	5000	400
1 Eimco 12 B loader or equivalent	3,100	1500	300
1 Eimco air trammer " "	2,100	1000	200
4 mine cars	1,200	600	100
1 Fan, air, gas driven	350	100	30
800 feet vent tube @ $1.00 per foot	800	--	80
1 ½ ton pick up or equivalent	2,000	1000	100
	21,700		1375
10% contingency	2,170		137
	23,870	9600	1512
Cost per foot of tunnel	13.33	5.33	8.60

Under present conditions it is hard to estimate delays on account of man power and strikes or climatic conditions. Winter conditions might make it advisable to shut down from December to April 1st.

A rental charge of $1512 per month against an advance of 176' = 8.60 per foot. This assumes that there will be no lost time.

Rentals on a 2 shift per day basis are usually increased by 50% but this has not been done in this case.

6 (e) Rehabilitation and repairs

3 cabins at $100 each	$300	
1 Blacksmith shop	200	
1 Office	150	
1 Dry	250	
Total		$900
10% contingency		90
		990

INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.

6. (f) New buildings, Improvements, Installations

Compressor & tool shed at Portal of "Bureau" Adit	500
Compressor & tool shed at Portal of "1600Level"Adit	500
Road to "Bureau" Adit 600 feet	1200
Road to "1600" Level" Adit 1800 feet	3600
	5800
10% contingency	580
Total	6380

6. (g) Maintance of operating equipment see per foot costs

Analytical work 200 samples @ $3.00 each	600
Accounting 24 months @ $100. per month see per foot costs	
Workmans compensation etc see per foot costs	
Transportation	

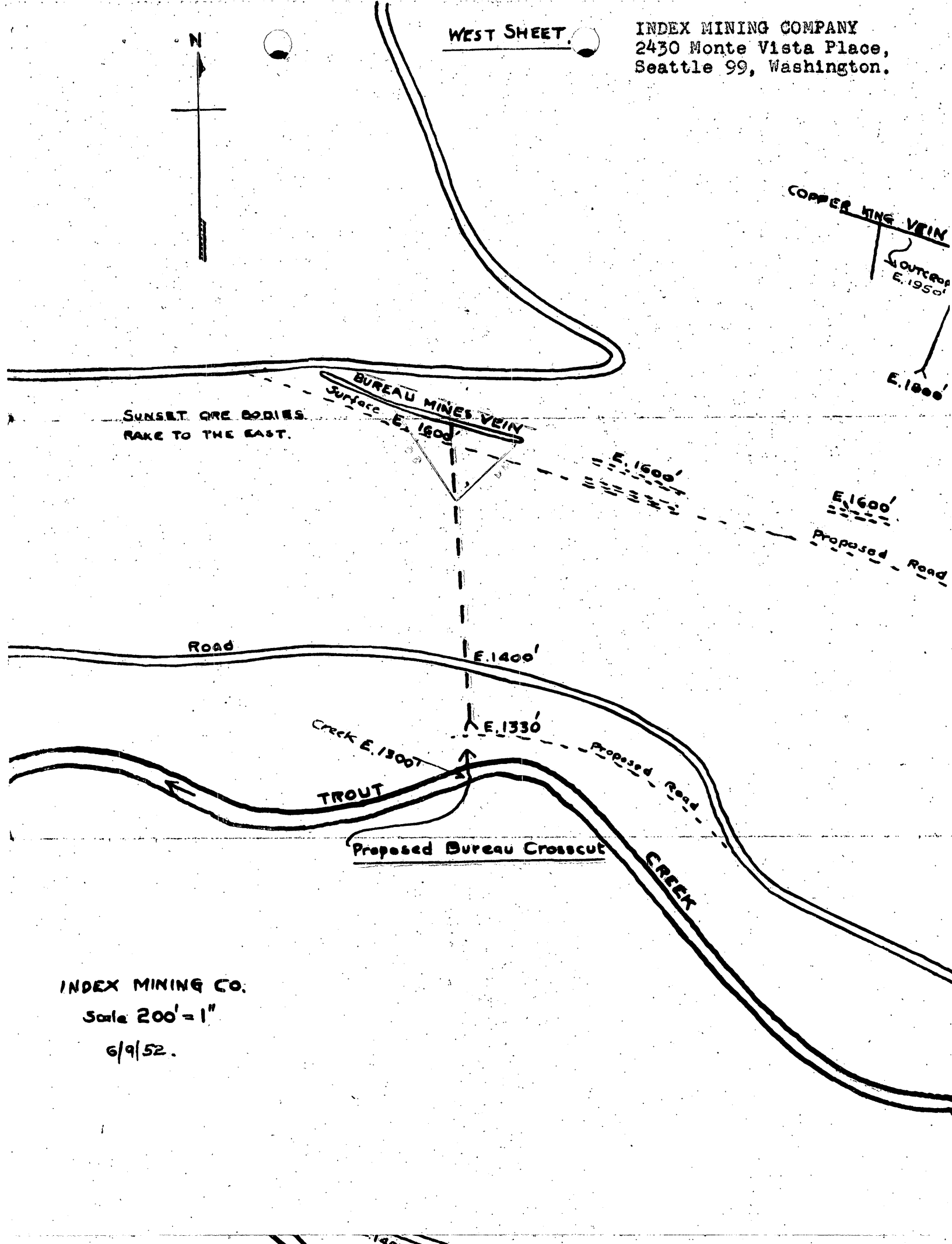
6. (h) Contingencies

A 10% contingency item has been figured under separate headings where necessary.

Note:
The Head of the Snoqualime National Forest in the area estimates road construction at a minimum of $300 per station. The State Highway Department estimate on mine to market roads is very much higher. In the above $200. only is allowed, gravelling etc. would be omitted for the time being.

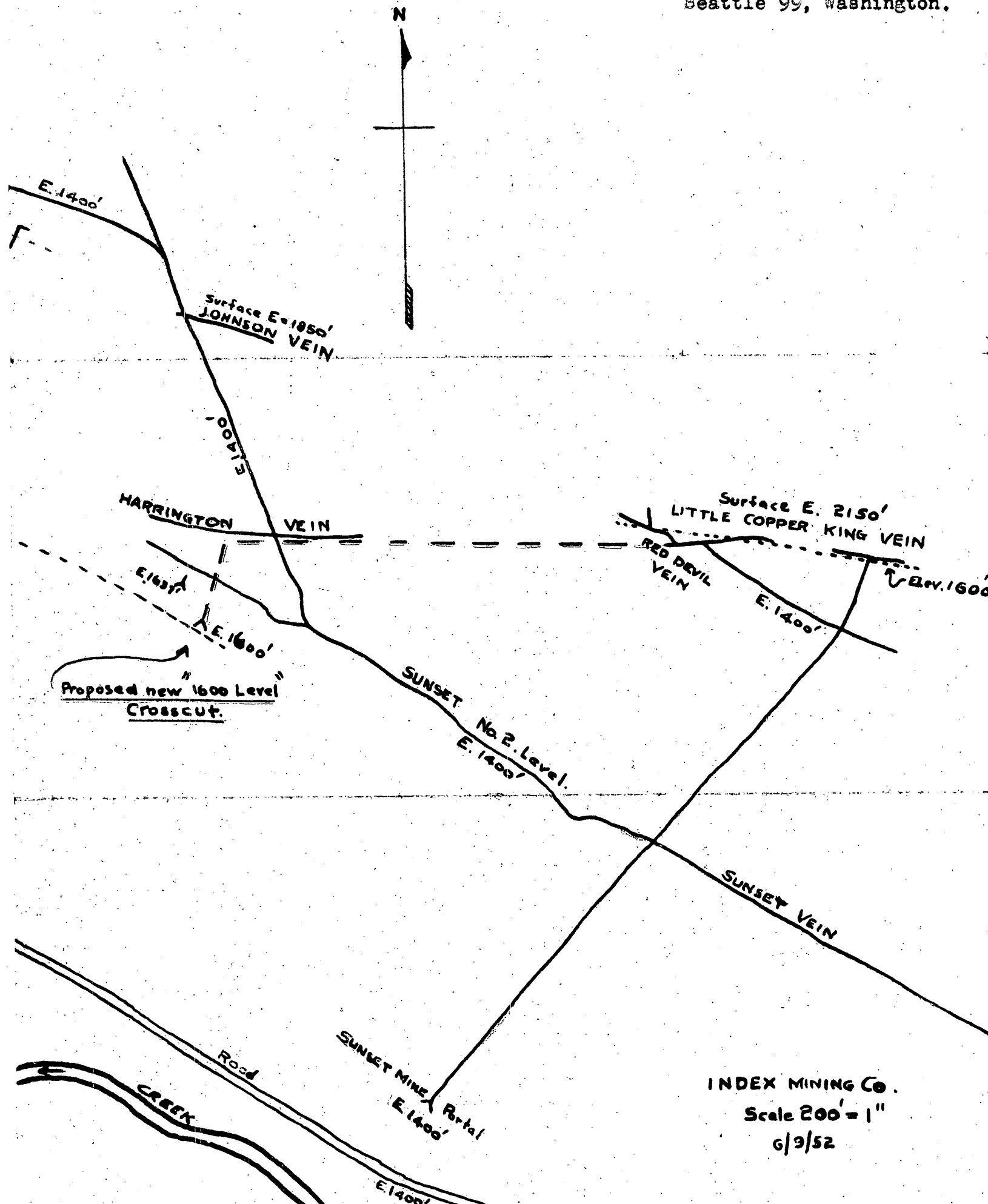
7 (a) Yes

(b) Our share of the cost will be provided by supplying technical advice, by buying or renting the necessary equipment, and by paying the expense over and above that which the Government may agree to pay as per the estimates set out under clause 6 herewith.


WEST SHEET.
INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.
N
COPPER KING VEIN
OUTCROP
E.1950'
E.1800'
BUREAU MINES VEIN
Surface
E.1600'
SUNSET ORE BODIES
RAKE TO THE EAST.
E.1600'
E.1600'
Proposed Road
Road
E.1400'
E.1330'
Creek E.1300'
TROUT
Proposed Road
Proposed Bureau Crosscut
CREEK
INDEX MINING CO.
Scale 200' = 1"
6/9/52.

EAST SHE

INDEX MINING COMPANY
2430 Monte Vista Place,
Seattle 99, Washington.



OFFICIAL BUSINESS

Code - 700

U S DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
MINOR & RARE METALS BRANCH 102
WASHINGTON 25, D C
ATTN WESTON BOURRET 2

Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code

PROJECT SUMMARY REPORT

By: J. W. Alt June 17, 1958

1. Docket No. DMEA-2612 (Copper)
Contract No. Idm-E489
Property: Sunset Mine
Snohomish County, Washington

Operator: Index Mining Company
2430 Monte Vista
Seattle 99, Washington

Operator's Property Rights: Owner
Assignment of Contract dated May 9, 1955
to Granore Company
1640 Exchange Building
Seattle, Washington

Consent to Lien dated May 9, 1955
Subordination Agreement dated May 9, 1955

2. Contract dated February 20, 1953. To complete - 2 years.

Work Authorized

1. Construct a road 600 feet long.

2. Crosscut 600 feet to intersect the "Bureau" vein at a depth of approximately 270 feet below the outcrop and drift 300 feet on the vein.

3. Conduct a geophysical survey.

4. If geophysical indicates the advisability of so doing, dig trenches to the necessary depth and length.

5. Construct a road approximately 1,800 feet long.

8623

6. Crosscut from the portal of the proposed Harrington crosscut approximately 150 to the Harrington vein and drift easterly on the Harrington vein 750 feet.

7. Diamond drill three holes to a total length of 1,000 feet from the "Bureau" crosscut to intersect the "Bureau" vein.

Agreed Unit Costs

Construct 2,400 feet of roads @ $2.20/ft.	$ 5,280.00
Crosscut and drift 1,800 feet @ $36.17/ft.	65,106.00
Timber 525 feet of drifts and/or crosscuts @ $8.39/ft.	4,405.00
Diamond drill 1,000 feet @ $7.00/ft.	7,000.00
Total Agreed Unit Cost	$81,791.00

Estimated Actual Costs

Geophysical survey	$ 3,000.00
Trenching on favorable geophysical showing	1,500.00
Operating equipment to be purchased	23,205.00
Rehabilitation and repairs	990.00
New buildings, improvements, installations	1,000.00
Miscellaneous	600.00
Contingencies	2,914.00
Total Estimated Actual costs	$33,209.00

SUMMARY

Total Agreed Unit Costs	$81,791.00
Total Estimated Actual Costs	$33,209.00
Total Estimated Cost of the Project	$115,000.00
Government's participation, 50%	$ 57,500.00

Amendments

No. 1 Effective December 1, 1953.

Suspends work from December 1, 1953 to June 1, 1954. Contains a Pseudo-Certification.

Amended Project Contract (Short-Form)

Dated February 20, 1953. To complete - February 20, 1956

The work consists of the geophysical surveying and trenching performed under the original contract and the following:

1. Drill 7,225 feet of diamond drill hole in approximately 16 holes from underground locations on the No. 2 level of the Sunset mine.
2. Drill 8,445 feet of diamond drill hole in approximately 25 holes from surface locations.

Estimated Cost of the Project

Fixed Unit Costs

Work Performed Under Original Contract		$ 4,500.00
Work to be performed under this contract		
15,670 feet of diamond drilling @ $7.00/ft.	$109,690.00	
405 chemical analyses @ $2.00/each	810.00	
	$110,500.00	
Estimated Total Cost of the Project		$115,000.00
Government Participation, @ 50%		57,500.00

Work Completed

Geophysical Survey	$ 3,000.00
Trenching	1,500.00
Diamond drilling, 15,670 feet, @ $7.00/ft.	109,690.00
Chemical assay, 325 @ $2.00/each	650.00
Total cost of the project	$114,840.00
Government's participation, 50%	$ 57,420.00

Work on the project was started in March 1953.
The work of the project was completed on October 5, 1955.

3. Audit - Report of Review dated December 6, 1955.

Total costs as billed by contractor	$120,459.60
Exceptions	5,619.60
Total accepted costs	$114,840.00
Government's participation, 50%	$ 57,420.00

Operator's final report; dated November 8, 1955
Field Team's final report dated April 1957

Royalty ends Feb. 20, 1965

4. Certification of Discovery or Development dated March 26, 1956

The discovery consists of copper ores occurring in fracture zones in granodiorite. Estimated indicated ore reserves were 24,400 tons averaging 7.22 per cent copper. Inferred ore reserves are in three blocks: (1) Harrington-Westward extension containing 44 tons of rock per vertical foot and averaging 4.25 per cent copper; (2) Harrington-Eastward extension containing 255 tons of rock per vertical foot and averaging 4.20 per cent; and (3) Johnson and Red Devil containing 180 tons of rock per vertical foot and averaging 2.32 per cent copper. The vertical extent of the inferred ore is unknown.

5. Comments

The contract work was carried out by two different Operators. The Index Mining Company carried out the geophysical survey and bulldozer trenching. The Granore Company carried out the diamond drill program.

The geophysical survey and bulldozer trenching were very slow in being completed.

The Granore Company entered into a lease with the Index Mining Company and was assigned the Amended Contract on May 9, 1955. By October 5, 1955, it had completed 16,472.8 feet of diamond drilling which was 802.8 feet more than was called for under the exploration contract. The diamond drilling was carried out rapidly and efficiently. The location of the holes was based upon the anomalies found by the geophysical survey along with the drilling of the extensions of known veins. The drill holes covering the anomalies failed to indicate any ore. It might have been advisable after several of the anomalies had given negative results to have transferred some of the footage from hole locations based on geophysical anomalies to holes based on geologic evidence.

The Granore Company advised the Field Team Executive Officer on April 3, 1956, that it had decided to drop all interest in the property and had notified the Index Mining Company of this decision.

The most promising geologic target remaining relatively unexplored at the Sunset mine is the structure beneath Trout Creek. One hole drilled beneath the creek indicated that one and possibly two veins lie beneath the creek. Unfortunately, where intersected, they were not mineralized sufficiently to be considered as ore. These structures beneath Trout Creek definitely warrant further exploration.

The Field Team recommends that serious consideration be given to any work that would further explore the veins beneath Front Creek.

J. W. Alt

J. W. Alt

JWAlt/er 6/18/58
Copy to: Docket
Mr. Johnson
Chron.

DMEA Form 17
Feb. 58

DEFENSE MINERALS EXPLORATION ADMINISTRATION

WORK COMPLETED ANALYSIS

After final audit or review report is received, prepare original only and file in official docket

Operator: Granore Company (Assignee of Index Mng Co.)		Actual Cost	
State: Washington		Agreed Unit Cost	x
Final Report of Audit		Commodity: Copper	Docket No. DMEA-2612
Final Report of Review	X		Contract No. Idm-E489

Operation	Authorized by Contract and Amendments		Completed		Net cost after sale of Government Property
	Units	Cost	Units	Cost	
Drifting & Crosscutting					
Raising					
Diamond drilling ~~Shafts~~ (surface -AX)	8,445' @ $7.00	$ 59,115.00	7,357.7'	$ 51,503.90	
Diamond drilling ~~Winzes~~ (underground-AX)	7,225' @ $7.00	50,575.00	8,312.3'	58,186.10	
Drilling Diamond AX (Specify) Total	15,670' @ $ 7.00	109,690.00	15,670'	109,690.00	$109,690.00
Surface Excavation Trenching		1,500.00		1,500.00	1,500.00
Underground Excavation					
~~Roads and Trails~~ Assays -405 @ $2.00/ea		810.00	325@$2.00	650.00	650.00
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) Geophysical Survey		3,000.00		3,000.00	3,000.00
Totals		$ 115,000.00		$ 114,840.00	* $ 114,840.00

* Net cost total must agree with final report of audit or review.

Prepared by W. P. Klugescheid/er Date 4/1/58

31398

☒ Audited ☒ Certified 3/27/56.

WORK ANALYSIS SHEET - DMEA PROJECT

☐ Actual Cost

☒ Agreed Unit Costs

Analysis as of Dec. 30, 1955
Incl. Voucher for October 1955

Name GRANORE COMPANY (Assignee of INDEX MINING COMPANY).

Docket No. 2,612

State WASHINGTON

Commodity COPPER

Idm-E No. 489

OPERATION	AUTHORIZED Units	AUTHORIZED Cost	COMPLETED Units (Amended (work))	COMPLETED Cost	NET COST
Drifting & Crosscutting					
Raising					
~~Shafts~~ Diamond Drilling (Surface) (AX)	8,445' @ 7.00	$59,115.00	7,357.7'	$51,503.90	
~~Winzes~~ Diamond Drilling (Underground) (AX)	7,225' @ 7.00	50,575.00	8,312.3'	58,186.10	
Drilling (Specify) Total Diamond (AX)	15,670' @ 7.00	$109,690.00	15,670.0'	$109,690.00	$109,690.00
Surface Excavation Trenching		1,500.00		1,500.00	1,500.00
Underground Excavation					
~~Roads and Trails~~ Assays	405 @ 2.00	810.00	325 @ 2.00	650.00	650.00
Operating Equipment Purchased					
Surface Rehabilitation & Repairs					
Underground Rehabilitation					
New Building, Improvements, etc.					
Other (Specify) Geophysical Survey		3,000.00		3,000.00	3,000.00
Totals		$115,000.00		$114,840.00	$114,840.00

Checked Audit

~~Completed Sept 1955.~~ 12/31/56. Inactive.

Certification recommended.
Operator's final report in - Rec'd 12/5/55. F.T. Report? Project Summary
Work completed during Oct. 1955

Ore Reserves:
Indicated: 24,400 tons @ 7.22% Cu.
Inferred: Harrington-Westward Extension 44 tons/vert. foot @ 4.25% Cu.
Harrington - Eastward " 255 " " " " 4.20 " "
Johnson + Red Devil 180 " " " " 2.32 " "

Prepared by W. P. Klugescheid.

No Production - no Royalties. Lease reverted to Index

71626

~~September~~ Oct.

~~July~~ ~~August~~

~~Start June 1955.~~	15,670.00'	$109,690.00
	~~13,730.8'~~	~~96,110.60~~
	~~8,812.8'~~	~~61,689.60~~
Diamond Drilling	~~7,853.8'~~ @ 7.00	~~55,976.60~~
Trenching		1,500.00
Assays. ~~225~~ 325 ~~120~~ @ 2.00		~~450.00~~ 650.00 ~~240.00~~
Geophysical Survey		3,000.00
Total		114,840.00
		~~101,265.60~~
		~~66,639.60~~
		~~58,116.60~~

~~Septem~~ Oct.

~~July~~ ~~August~~

Start June 1955.	15,670.00'	$109,690.00
	~~13,730.8'~~	~~96,110.60~~
	~~8,813.8'~~	~~61,689.60~~
Diamond Drilling	~~4,853.8'~~ @ 7.00	~~33,976.60~~
Trenching		1,500.00
Assays. ~~285~~ 325 ~~720~~ @ 2.00		~~450.00~~ 650.00 ~~240.00~~
Geophysical Survey		3,000.00
		114,840.00
		~~101,265.60~~
		~~66,639.60~~
Total		~~38,716.60~~

Diamond Drill Hole Record.

Holes No.	S = Surface Number = Drill Hole Number	Angle	Length.	Assay Results.
(P) 2-1	Underground	0°	456.8'	N.G.
(O) 2-2	"	0°	552.0'	1' @ 1.79% Cu.
(E) 2-3	"	0°	376.0'	N.G
(J) 2-4	"	0°	546.0'	6.4' @ 5.96% Cu. 1.3' @ 1.12% " 1.5' @ 2.91% " 1.0' @ 2.36% "
(N) 2-5	"	0°	151.5'	Low grade
(M) 2-6	"	0°	455.0'	1.1' @ 11.38% Cu 1.2' @ 1.14% " 1.0' @ 11.30% " 2.7' @ 4.25% " 5.2' @ 1.09% "
(K) 2-7	"	0°	547'	2.2' @ 2.25% "
(L) 2-8	"	0°	403'	5.7' @ 2.19% "
(I) 2-9.	"	0°	418'	N. G.
2-10	"	0°	358'	N. G.
2-11	"	0°	424'	N. G.
S-3	Surface	-30°	403'	N.G.
S-2	"	-30°	250.5'	N.G.
S-3	"	-30°	254'	~~Large amount of sulphides~~ N.G.
S-4	"	-30°	401'	N.G.
S-5	"	-30°	396'	N.G.
S-6	"	-30°	278'	N.G.
S-7	"	-30°	255'	N.G.

Hole No.	S = Surface number - from mining Report	Angle	Length	Assay Results
2-12	Underground	0°	506'	N.G.
2-13	"	-30°	765'	N.G.
2-14	"	-30°	606'	N.G.
2-15	"	0°	502'	N.G.
2-17	"	0°	357.3'	2' @ 2.67% Cu
2-16	"	0°	884'	0.7' @ 2.00% Cu
5-8	Surface	-30°	306'	1.0' @ 13.2% Cu 3.0' @ 14.2% Cu 1.5' @ 20.3% Cu
5-9	"	-30°	366'	N.G.
5-10	"	-30°	297'	2.6' @ 8.32% Cu 1.5' @ 7.14% Cu
5-11	"	-30°	325'	N.G.
5-12	"	-30°	747'	N.G.
5-13	"	-30° ±	777'	1.0' @ 3.20% Cu
5-14	"	-30°	436'	N.G.
5-15	"	-45°	84'	Overburden
5-16	"	-30° ±	407'	1.5' @ 2.30% Cu
5-17	"	-30°	765'	N.G.
5-18	"	-30°	477'	N.G.

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
3/23	[illegible]	120 M
	[illegible]	120
3/23	[illegible]	110
[illegible]	[illegible]	100
		220

MAR 2 4 1965

Index Mining Company
2430 Monte Vista Place W.
Seattle, Washington 98199

Re: DMEA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Washington
Amended Contract Idm-2489

Gentlemen:

Enclosed is a copy of a self-explanatory letter of today to the Granore Company.

This correspondence relates to the contract dated February 20, 1953, executed by you under the Defense Minerals Exploration Administration program.

Sincerely yours,

George Fumich, Jr.

Acting Director

Enclosure

MMerrithew/mm (3/23/65)
cc: Director's Reading File
Region I
Docket
120M

23263

MME Form 7
(2/63)

OFFICIAL FILE COPY

Date	Surname	Code
3/23	Murphy	120M
	Selfridge	120
3/23	Johnson	110
		100
		920

MAR 2 4 1965

Mr. Earl Smith
Trustee
Index, Washington

Re: DMRA-2612 (Copper)
Gremore Co., Assignee
Sunset Mine
Snohomish County, Washington
Amended Contract Idm-2489

Dear Mr. Smith:

Enclosed is a copy of a self-explanatory letter of today to the Gremore Company.

This correspondence relates to the Subordination Agreement dated May 9, 1955, executed by you under the Defense Minerals Exploration Administration program.

Sincerely yours,

George Fumich, Jr.

Acting Director

Enclosure

MMerrithew/mm
3/23/65
cc: Director's Reading File
Region I
Docket
120M

23263

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

March 4, 1965

Index Mining Company
2430 Monte Vista Place N.
Seattle, Washington 98199

Re: DMEA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract Idm-E489

Gentlemen:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely yours,

George C. Selfridge

George C. Selfridge, Chief
Division of Exploration Operations

OFFICIAL COPY
O. M. E.
RECEIVED
MAR 19 1965

INITIALS	CODE
ama	800
	120
	120
3/19	120
	120

MME Form 63
Revised 3-62

DMEA-2612
Idm-E489

REQUEST FOR INFORMATION ON CERTIFIED PROJECT AND PROJECT UNDER ROYALTY AGREEMENT

From November 1964 to February 20, 1965

1. [redacted], has there been a change in ownership, lease, or sublease? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before. Yes ☐ No ☒

From November 1964 to February 20, 1965

2. [redacted], has there been any production from the land subject to the contract? Yes ☐ No ☒

A. If so and it was shipped, give quantity, value, and name and address of purchaser.

	Quantity	Value

B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity	Estimated Grade	Location
Ore	Tons		
Concentrates	Tons		
Other	Tons		

3. Since , has any production been transported through workings (see of contract)? Yes ☐ No ☒

A. If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name R. G. Brennan Title Secretary Treasurer

Address 2430 Monte Vista Pl. W. Seattle, Wash. 98199 Date March 15 - 1965

4511

W MEA
2612

INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ Deliver *ONLY* to addressee

☒ Show address where delivered

(Additional charges required for these services)

RECEIPT

Received the numbered article described on other side.

SIGNATURE OR NAME OF ADDRESSEE *(must always be filled in)*

Indep Manning Co.

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

A.G. [illegible]

DATE DELIVERED

NOV 23 1964

SHOW WHERE DELIVERED *(only if requested)*

2430 Monte Vista Pl
Seattle WN

C55—16—71543-5—F GPO

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

November 17, 1964

REGISTERED MAIL
RETURN RECEIPT REQUESTED

Re: DMEA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract Idm-E489

Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Gentlemen:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely yours,

George C. Selfridge

George C. Selfridge, Chief
Division of Exploration Operations

OFFICIAL FILE COPY
O. M. E.
RECEIVED NOV 30 1964

DATE	INITIALS	CODE
11/30	GEF	800
		~~100~~
11/30	FEJ	~~110~~
		~~120~~
12/1	mm	120
12/1	[illegible]	120 m

MME Form 63
Revised 3-62

DMEA-2612
Idm-E489

REQUEST FOR INFORMATION ON CERTIFIED PROJECT AND PROJECT UNDER ROYALTY AGREEMENT

1. Since June 1956, has there been a change in ownership, lease, or sublease? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before. Yes ☐ No ☒

2. Since June 1956, has there been any production from the land subject to the contract? Yes ☐ No ☒

   A. If so and it was shipped, give quantity, value, and name and address of purchaser.

	Quantity	Value

   B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity		Estimated Grade	Location
Ore		Tons		
Concentrates		Tons		
Other		Tons		

3. Since , has any production been transported through workings (see of contract)? Yes ☐ No ☒

   A. If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name R. G. Brennan Title Secretary-Treasurer

Address 2430 Monte Vista Pl. N. Seattle, Washington 98199 Date November 23-1964

MME Form 63
Revised 3-62

REQUEST FOR INFORMATION ON CERTIFIED PROJECT AND PROJECT UNDER ROYALTY AGREEMENT

1. Since August 8, 1962, has there been a change in ownership, lease, or sublease? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before. Yes ☐ No ☐

2. Since August 8, 1962, has there been any production from the land subject to the contract? Yes ☐ No ☐

   A. If so and it was shipped, give quantity, value, and name and address of purchaser.

	Quantity	Value

   B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity		Estimated Grade	Location
Ore		Tons		
Concentrates		Tons		
Other		Tons		

3. Since [redacted], has any production been transported through [redacted] workings (see [redacted] of contract)? Yes ☐ No ☐

   A. If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name [redacted] Title [redacted]

Address [redacted] Date [redacted]

Region I

If you know the name of this building please advise Washington office. 4511

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

October 16, 1963

Re: [illegible]-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract I4n-[illegible]

Granore Company
1640 Exchange Bldg.
Seattle 4, Washington

Gentlemen:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely yours,

F. M. Murphy, Acting Chief
Division of Minerals

MME FORM 6 REFERENCE SLIP
REV. 2-59 OFFICE OF MINERALS EXPLORATION

TO:		DATE	INITIALS
1.	Chief, Divn. of Field Operations	11/ 1/63	
2.			
3.			
4.			
5.	D. R. MacLaren		

FROM: Acting Field Officer, Region I

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O. M. E.
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D R MacLaren Murphy
220

FOR: Check items for action desired

____	Action	____	Reply for signature of		
____	Approval	____	Investigate	____	Surname
____	Comment	____	Recommendations		Signature
____	Conference	____	Rewrite	____	File
____	Instructions	X	Your information		

REMARKS: DMEA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract Idm-E489

Transmittal of Thermo-Fax Copy of MME Form 63 showing address of Mr. MacRae as requested in your penciled notation.

INT.-DUP. SEC., WASH., D.C. M56300-62

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

October 16, 1963

Re: DMEA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract Idm-E489

Granore Company
1640 Exchange Bldg.
Seattle 4, Washington

Gentlemen:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely yours,

s/F. M. Murphy

F. M. Murphy, Acting Chief
Division of Minerals

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MME Form 63
Revised 3-62

REQUEST FOR INFORMATION ON CERTIFIED PROJECT AND PROJECT UNDER ROYALTY AGREEMENT

1. Since August 8, 1962, has there been a change in ownership, lease, or sublease? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before. Yes ☐ No ☑

2. Since August 8, 1962, has there been any production from the land subject to the contract? Yes ☐ No ☑

   A. If so and it was shipped, give quantity, value, and name and address of purchaser.

	Quantity	Value

   B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity	Estimated Grade	Location
Ore	Tons		
Concentrates	Tons		
Other	Tons		

3. Since , has any production been transported through workings (see of contract)? Yes ☐ No ☑

   A. If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name Robert M. MacRae Title Vice pres.

Address 1511 Mntn. Bldg Date 10/21/63

Seattle

4511

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

August 24, 1962

Re: DMRA-2612 (Copper)
Granore Co., Assignee
Sunset Mine
Snohomish County, Wash.
Amended Contract Idm-E489

Granore Company
1640 Exchange Building
Seattle 4, Washington

Gentlemen:

After the completion of the approved exploration work under the contract identified above, we asked to be informed about changes in the status of the property and production from it during the period of royalty obligation.

To assist you to furnish this information and to assure the accuracy of our records, please answer the questions on the back of this letter and return two copies to this office with copies of any pertinent documents.

Sincerely yours,

W. R. Griswold

W. R. Griswold, Chief
Division of Minerals

MME Form 63
Revised 3-62

DMBA-2612
Idm-8489

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DATE	INITIALS	CODE
9/5	[illegible]	100
9-8	[illegible]	100
	on leave	110
	[illegible]	500
	Yes ☐	No ☒
		220

REQUEST FOR INFORMATION ON CERTIFIED PROJECT AND PROJECT UNDER ROYALTY AGREEMENT

1. Since September 8, 1959, has there been a change in ownership, lease, or sublease? If yes, please state details of the transaction below and provide a true or signed copy of the pertinent documents, unless they have been provided before.

2. Since September 8, 1959, has there been any production from the land subject to the contract? Yes ☐ No ☒

   A. If so and it was shipped, give quantity, value, and name and address of purchaser.

	Quantity	Value

   B. If stockpiled awaiting sale, state quantity, grade, and location.

Type	Quantity	Estimated Grade	Location
Ore	Tons		
Concentrates	Tons		
Other	Tons		

3. Since , has any production been transported through workings (see of contract)? Yes ☐ No ☐

   A. If so, state quantity, value, and disposition of material.

Disposition of Material	Quantity	Value

Submitted by:

Name Robert M. MacRae Title Vice President

Address 1511 Norton Building Date 8/28/62

Seattle, Washington

(Please note address change)

4511

MME Form 7
(10-58)

OFFICIAL FILE COPY

Date	Surname	Code
		220

September 11, 1962

Memorandum

To: Acting Field Officer, Region I

From: E. D. Talbert, Chief (Signed) E. D. Talbert
Contract Administration and Audit Division

Subject: DMEA-2612 (Copper)
Granore Company, Assignee
Sunset (Index) Mine
Snohomish County, Washington
Amended Contract Idm-8489

The original and one copy of a Report of Royalty Review covering the subject contract are enclosed. If you concur in the facts stated therein, please make the following distribution:

(a) Original to the Fiscal Section, Division of Administrative Services, Office of the Secretary, Department of the Interior, Washington 25, D. C.; and

(b) One copy for your files.

This Report of Royalty Review is made for record purposes only; therefore, no copy for the Operator is provided.

As evidence of your concurrence, a copy of your memorandum transmitting the original report to the Fiscal Section should be furnished this Division. If for any reason you do not concur, both copies of the report should be returned to this Division with your comments.

Enclosures

EDTalbert/ama 9-11-62

cc:
Docket
Director's Reading File
CA & A Division
Fiscal Section

43683

IN REPLY REFER TO:

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 14 1957

DATE	INITIALS	CODE
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		500

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

May 13, 1957

Re: DMEA 2612 Idm-E-489
Index Mining Co.,
Sunset Mine
Snohomish Co., Washington
Copper

Memorandum

To: ~~W. R. Griswold~~, Defense Minerals Exploration Administration

From: N. E. Nelson, U. S. Geological Survey

Subject: Review of Field Team Final Report.

The contract was awarded in 1953 and work continued until October 1955, $114,840 having been spent. ~~Accrued royalty~~ Govt. contribution amounts to $57,420. The project was certified Mar. 26, 1956.

As a result of the work done, under the contract and previously, the ore reserves are estimated as:

Ore Reserves

	Before Contract			After contract		
Indicated	138,500	tons @	3.64%	146,500	tons @	4.19%
Inferred	240,500	"	3.05%	387,700	"	3.56%
Totals	379,000	"	3.27%	534,200	"	3.73%

Increase 155,200 tons @ 4.88% Cu.

The mine is credited with the production of 263,416 tons since 1902 of ore assaying:

Copper	2.45%
Silver	0.59 oz. per ton
Gold	0.0057 oz. per ton

In the opinion of the examiners, a possible structure beneath Trout Creek warrants further drilling as does the probable downward extension of the Bureau of Mines orebody.

N. E. Nelson

N. E. Nelson

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

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		130
		220

April 30, 1957

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (Copper)
Granore Company, assignee of
Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-E489

Dear Mr. Selfridge:

Enclosed are four copies of a Field Team final report by E. A. Magill, Mining Engineer, Bureau of Mines, and Donald F. Kellum, Geologist, Geological Survey, on the above-referenced project.

Project work began in the spring of 1953 with a geophysical survey of the mine area, which was followed by an unsuccessful attempt to explore the anomalies by bulldozing two trenches. The overburden was too deep and bedrock was not reached. The contract was amended and in May 1955 diamond drilling was started. The work was completed by October 1955 after spending $114,840, of which the Government contributed 50 percent, or $57,420.

A Certification of Discovery or Development was issued March 26, 1956. As a result of this project, indicated reserves were increased from 138,500 tons containing 3.64 percent copper to 146,500 tons containing 4.19 percent copper, and the inferred reserves were increased from 240,500 tons containing 3.05 percent copper to 387,700 tons containing 3.56 percent copper.

Should further Government assistance be requested to explore the veins beneath Trout Creek, it is recommended that the request be given consideration.

Reviewed by
DMEA OPERATING COMMITTEE
5/10/57
(date)

Enclosures

cc: USBM (2)
USGS (SRO)
Kellum

By Field Team, Region I, NW Dist.

A. E. Weissenborn
A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew
Wing G. Agnew, Member
U. S. Bureau of Mines

Final Field Report.

DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS EXPLORATION ADMINISTRATION

FIELD TEAM, REGION I
Northwest District

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 6 1957

DATE	INITIALS	CODE

FINAL REPORT

Amended Contract Idm-E489

by

E. A. Magill
Mining Engineer
U. S. Bureau of Mines

Donald F. Kellum
Geologist
U. S. Geological Survey

GRANORE COMPANY
(Assignee of Index Mining Company)
1640 Exchange Building
Seattle 4, Washington

Docket No.:	DMEA-2612
Commodity:	Copper
Original Contract date:	February 20, 1953
Amended Contract executed:	January 27, 1955
Completion date:	October 5, 1955

Reviewed by
DMEA OPERATING COMMITTEE
5/10/57
(date)

SUNSET MINE
Index Mining District
Snohomish County, Washington

Spokane, Washington

April 1957

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APPENDICES

I - Operator's drill logs and assays of mineralized sections — In pocket

II - Results of check assays — Page i

III - Spectrographic analyses — Page ii

ILLUSTRATIONS
(In pocket)

Plate 1 - Surface Resistivity Anomalies, Sunset Mine Area, Snohomish County, Washington (Jan. 1957). Scale 1" = 200'

Plate 2 - Geology of No. 2 Level, Sunset Mine, Snohomish County, Washington. Scale 1" = 100'

Plate 3 - Diamond Drilling - No. 2 Level, Sunset Mine, Snohomish County, Washington (Jan. 1957). Scale 1" = 100'

Plate 4 - Surface Diamond Drilling, Sunset Mine, Snohomish County, Washington (Jan. 1957) (Northwest Sheet). Scale 1" = 100'

Plate 5 - Surface Diamond Drilling, Sunset Mine, Snohomish County, Washington (Jan. 1957) (Central Sheet). Scale 1" = 100'

Plate 6 - Surface Diamond Drilling, Sunset Mine, Snohomish County, Washington (Jan. 1957) (Southeast Sheet). Scale 1" = 100'

Plate 7 - Longitudinal Section - "Bureau of Mines" Orebody, Radiore "B", Sunset Mine, Snohomish County, Washington. Scale 1" = 40'

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 6 1957

DATE	INITIALS	CODE

FINAL REPORT

GRANORE COMPANY
(Assignee of Index Mining Company)
Sunset Mine
Index Mining District
Snohomish County, Washington

Amended Contract Idm-E489

* * * * * *

INTRODUCTION

This report describes a project conducted jointly by the Defense Minerals Exploration Administration and the Granore Company (Assignee of Index Mining Company) to explore for copper ores at the Sunset mine, Snohomish County, Washington.

Summary

Exploration carried out at the Sunset mine under the exploration project contract consisted of:

1. A resistivity survey to search for veins that do not outcrop.

2. Two bulldozer trenches.

3. Diamond drilling for a total of 16,472 feet to check the anomalies found by the resistivity survey and to check vein extensions underground.

No new ore bodies were discovered by the diamond drilling or surface trenching although essentially all the anomalies indicated by the geophysical survey were tested.

Diamond drilling extended the lower limits of the "Bureau of Mines" ore body. One underground drill hole indicated a possible new ore shoot on the Harrington vein; however, another intersection 180 feet beneath this hole was barren.

The area most promising for the discovery of new ore bodies would appear to be beneath Trout Creek where two structures which had all the characteristics of the productive veins in the area were intersected. Unfortunately, at the point of intersection their copper content was low.

Recommendation

A Certification of Discovery or Development was issued on March 26, 1956. The diamond drilling carried out under the exploration project contract appears to have adequately tested the anomalies indicated by the geophysical survey. Further drilling is recommended to test the two structures discovered by drilling beneath Trout Creek. No other exploration is warranted unless new geologic targets are discovered.

LOCATION AND ACCESSIBILITY

The Sunset mine is in secs. 1 and 2, T. 27 N., R. 10 E. W.M., Index Mining District, Snohomish County, Washington. Index, Washington, which is on the main line of the Great Northern Railroad, is 7 miles by graveled road from the mine. The property is 74 miles from Seattle.

Because of the relatively low altitude of the mine workings (1,400 feet), snow is not a serious detriment to year-round operation.

PROPERTY

The land that was the subject of the exploration project contract is the N½ sec. 1 and NE¼ sec. 2, T. 27 N., R. 10 E. W.M. and the following patented mining claims in the Index Mining District, Snohomish County, Washington:

Name	Patent number
Star	488234
Black Bear	do
Black Bear Extension	386270
W. H. B.	do
Boundary	do
Hazel C.	do
Ivy R.	do
Mountain Side	do
Ravine	do
Mono	do

and those portions of the Mabel Lode and Lloyd B. Lode not included in the N½ sec. 1.

The property is owned by the Index Mining Company, 2430 Monte Vista Place, Seattle 99, Washington. The company also owns other mining claims and property in the area, but the above-listed property is all that was subject to the exploration contract.

The main adit, No. 2 level of the Sunset mine (pl. 2), is at an altitude of 1,399 feet above sea level. The mine workings consist of 6,400 feet of drifts and crosscuts on the main or No. 2 level, 1,200 feet on Level No. 3, 2,250 feet on Level No. 4, and 300 feet on Level No. 5. Level No. 1 with 1,550 feet of workings has been abandoned and is partially caved. A two-compartment winze 365 feet deep extends from the No. 2 level to the lower levels. Level No. 3 is 92 feet below, Level No. 4 is 185 feet below, and Level No. 5 is 335 feet below the main level. Workings below No. 2 level are flooded. The workings on No. 2 level are practically all accessible as are some of the stopes above the level.

Workings away from the veins stand very well without support although workings in the veins generally require support.

The mine makes several hundred gallons of water per minute. However, this is largely surface water which comes down through the open stopes on the Sunset vein. It is not believed that water would offer any serious pumping problems at depth.

The property was equipped in the 1920's with a 200-ton-per-day flotation mill driven by water power, along with a complete camp, sawmill, repair shop and assay office. This equipment has been allowed to deteriorate to the point that if the property is again placed in production it would have to be completely replaced. None of the buildings can be considered usable without extensive repairs.

Production from the property from 1902 to date has been 263,416 tons of ore with an average recovered content as follows:

Copper	-	2.45 percent
Silver	-	0.59 ounce per ton
Gold	-	0.0057 ounce per ton

GEOLOGY

The geology of the Index Mining District has been described by Weaver (Weaver, C. E., Geology and Ore Deposits of the Index Mining District: Wash. Geol. Survey, Bull. No. 7, 1912) and by Toepfer (Toepfer, P. H., Investigation of the Sunset Copper mine, Snohomish County, Washington: U. S. Bur. of Mines, Report of Investigations 4989, 1953).

The following paragraphs are quoted from Toepfer's report (p. 5-7):

"The Index mining district is within the southern boundary of the Index batholith. The ore deposits in this district are found near its margins. Some deposits, among them the Sunset, are in the granite of the batholith, whereas others are in the highly metamorphosed bordering sedimentaries.

"The earliest rock known in this district is the Gunn Peak formation, composed of quartzites, slates, crystalline limestone, cherts, and schists, with interbedded igneous flows. This formation has been subjected to intense metamorphism, strong folding, and faulting, which make stratigraphic interpretation difficult. A large part of the series is believed to be Carboniferous. The metamorphism and folding are assumed to have taken place during intrusion of the Index batholith, which is composed of Jurassic granodiorite that forms the base of the Cascade Range in this area. Remnants of extrusive andesite and arkose sandstone are found overlying the Gunn Peak formation and the Index granodiorite.

"Geology of Sunset Mine

"The Sunset deposit is entirely within the Index granodiorite, a homogeneous mass intruded by scattered aplite and basic dikes. These dikes are generally narrow, erratic, and discontinuous.

"The vein structure of the Sunset mine comprises two sets of parallel fissures, intercepting without crossing to form an oblique grid pattern. One set of fissures strikes N. 60° W. and the other due west. The dip of both sets varies between 75° N. and vertical.

"The Sunset vein is the most prominent; its zone of fracturing averages about 7 feet in width and attains locally a maximum of 15 feet. Other productive veins are smaller; the Little Copper King vein averages only 2 feet in width. Slight movement accompanied the fracturing, and relatively small amounts of fault gouge were formed.

"Chloritic alteration of widely varying intensity has acted within these fracture zones. Sericitic alteration appears to be intimately associated with the copper mineralization. Some sericitization always accompanies the ore, although the converse does not hold true. The sericitic alteration is fairly well confined within the fracture zones and does not penetrate the wall rock as the chloritic alteration often does.

"Little or no postmineral faulting has occurred. The veins are nowhere offset by unmineralized faults.

"Ore Shoots

"The ore shoots occur at irregular intervals within the linked vein system of the Sunset deposit. Ore-shoot boundaries are generally gradational to barren vein material. Within the ore shoots the grade of ore is variable, necessitating close sampling.

"The ore is confined within good walls; mineralization, however, is not uniform between them. In places good ore is found along one wall, and the remainder of the vein is submarginal.

"The following table, based upon Sunset Mining Co. surveys and sampling, shows the size and grade of the known ore shoots on the levels from which further development can be expected:

"Sunset-mine ore shoots

"Location	Average width, feet	Stope length, feet	Average grade, percent Cu
Sunset Vein:			
East stope, level 4	6.3	162	2.1
Central stope, level 4..	7.1	265	2.6
West stope, level 4	6.8	422	3.3
Footwall stope, level 4.	7.0	133	3.9
Hanging Wall stope, level 4	6.5	122	2.6
Harrington vein, level 4	6.1	432	3.5
Johnstone stope, level 2	4.7	90	2.3
Red Devil stope, level 2	4.0	40	1/2.0
Little Copper King stope, head of stope	2.0	645	2/4.5

1/ Denotes estimates of former company engineer.
2/ Denotes estimate based upon grade of ore milled."

THE PROJECT

The Sunset mine has produced some 263,400 tons of ore averaging 2.45 percent copper. Production has been intermittent since 1930 because of copper prices, litigation, and the rather low grade of known ore reserves. In 1930 a geophysical survey was carried out by C. N. Disney of the Radiore Company. This survey indicated an anomaly 2,500 feet to the west of the mine workings. No work was done at that time to determine the cause of the anomaly. In 1950 the Bureau of Mines drilled the anomaly and discovered the Radiore "B" or "Bureau of Mines" ore shoot.

On February 20, 1953, an exploration project contract in the amount of $115,000 (Government's share, $57,500, or 50 percent) was entered into with the Index Mining Company to:

1. Conduct a geophysical survey of the mine area.

2. Crosscut 600 feet to the "Bureau" vein and drift 300 feet along it.

3. Diamond drill three holes so as to intersect the "Bureau" ore body 150 feet below the crosscut.

4. Drive a crosscut to the Harrington vein at an elevation of 1,800 feet and drift easterly on the vein 750 feet.

During the summers of 1953 and 1954 a resistivity survey was carried out by Dr. A. R. Clarke of Vancouver, British Columbia. It indicated a number of anomalies in the areas to the west and to the east of the Sunset workings (pl. 1). Two bulldozer trenches were cut in an attempt to determine the cause of one of the anomalies to the west of the "Bureau" vein. Unfortunately, the overburden was too deep and bedrock was not reached.

Late in 1954 the Granore Company, a subsidiary of the Granby Consolidated Mining, Smelting and Power Company, Ltd. of British Columbia became interested in the property and obtained a lease on it from the Index Mining Company on March 23, 1955. An Amended Contract was executed on January 27, 1955 and effective February 20, 1953, which changed the work to be done under the contract to:

1. Geophysical survey and trenching (already completed).

2. Diamond drilling 15,670 feet to check the anomalies disclosed by the geophysical survey and to test the extensions of the known veins.

The contract was assigned to the Granore Company on May 9, 1955, who then became the Operator under the Amended Contract.

Diamond drilling was commenced late in May 1955 under contract to Lynch Bros. of Seattle, Washington. A maximum of two surface drills and three underground drills were operated two shifts per day, 6 days per week (pls. 3, 4, 5, and 6). Diamond drilling was terminated on October 5, 1955, after 16,472.8 feet of diamond drilling had been completed. A complete series of maps showing the location of the holes accompanies the Operator's final report. Detailed logs accompanied his monthly reports. Copies of these maps (pls. 1, 3, 4, 5, and 6) and logs (Appendix I) accompany this report.

Drilling of the anomalies failed to disclose any ore bodies or the reason for the anomalies. Holes beneath the "Bureau" ore shoot indicated that it continued to a depth of at least 250 feet below the outcrop. A drillhole intersection on the Harrington vein disclosed 6.2 feet of 5.96 percent copper. Another hole, cutting the vein 180 feet below this intersection, was barren. Hole 2-13 drilled from the No. 2 level crosscut intersected two favorable structures beneath Trout Creek. The best assay was only 0.96 percent copper across 3.3 feet. An attempt to test these structures further was unsuccessful when a surface hole was drilled to a depth of 84 feet in overburden without penetrating bedrock and had to be abandoned.

The Operator's drill logs and assays are included with this report as Appendix I. Appendix II is a compilation of check assays made of part of the mineralized sections in the drill holes. Appendix III contains additional spectrographic analyses which were made from four of the samples selected for check assaying.

On April 3, 1956, Robert M. MacRae, vice-president of Granore Company, wrote to the Executive Officer of the Field Team stating that Granore had elected to drop all interest in this property and that Index Mining Company had been notified of this decision.

Ore Reserves

"Bureau of Mines" ore body:--The "Bureau of Mines" or Radiore "B" ore body was further tested by five holes (pl. 7). Two holes intersected the ore shoot 260 feet below the surface. Two holes to the west and one to the east outlined its lateral extent reasonably well.

The Operator estimates the inferred ore reserves in this ore shoot, to a depth of 50 feet beneath the lowest drill hole, to be 24,400 tons with an average grade of 7.22 percent copper. The ore intersection in USBM No. 4 drill hole was not taken into consideration in these reserve estimates. By including this hole

which intersected 3.9 feet of 4.95 percent copper, the grade is decreased slightly but the tonnage is increased. Computing the ore body on the basis of five drill hole intersections and assuming that the ore shoot extends for 50 feet outside the drill holes, the following estimate is obtained:

Hole No.	True width (feet)	Assay %	Width x assay
USBM 4	3.9	4.95	19.30
USBM 3	5.8	5.10	29.58
S-8	4.4	11.30	49.72
USBM 7	5.1	5.67	28.92
S-10	3.5	7.88	27.58
Total	22.7		155.10
Average	4.5	6.83	

The area (longitudinal section, pl. 7) of the ore body is increased by 11,787 square feet when hole 4 is included in the estimates. This gives indicated ore:

$$\frac{68915 \times 4.5'}{11} = 28,200 \text{ tons} - 6.83\% \text{ copper}$$

Harrington vein west extension:--One drill hole intersection (hole 2-6) on the Harrington vein assayed 4.25 percent copper over a true width of 2.6 feet. Assuming an area from the face of the present workings to 75 feet beyond the drill hole intersection, the Operator estimates that the reserve indicated by this hole is 44 tons per vertical foot averaging 4.25 percent copper. This is assuming that the ore shoot has a length of 185 feet. Taking half the length below and half the length above the level gives a block of inferred ore:

$$\frac{185' \times 185' \times 2.6'}{11 \text{ cu.ft./ton}} = 8,100 \text{ tons} - 4.25\% \text{ copper}$$

Harrington vein east extension:--The Operator in his final report estimates that the eastward extension of the Harrington vein will average 225 tons of ore per vertical foot, assaying 4.20 percent copper. This figure is based on assays from two drill hole intersections (2-7, 2-4) and on the assumption that the entire

distance between the two workings is of the same grade as indicated by the drill holes. From an examination of the two headings it is believed that this is slightly on the optimistic side. Assuming that the ore shoot extends only 50 feet on either side of the drill holes, we arrive at a strike length of 240 feet rather than 520 feet. This would give:

$$\frac{240 \times 5.4}{11} = 118 \text{ tons per vertical foot} - 4.20\% \text{ copper}$$

Assuming that the ore extends half the strike length above and below, it gives us an inferred reserve of:

$$118 \times 240 = 28{,}320 \text{ tons} - 4.20\% \text{ copper}$$

Even this figure may be on the optimistic side inasmuch as a drill hole intersection 180 feet below the better of the two holes upon which the estimate is made was barren.

Johnson-Red Devil veins:--The Johnson and Red Devil veins are assumed to be the same. At the present time the headings are 660 feet apart. Three drill holes (2-8, 2-7, and 2-4) intersected the vein at the No. 2 level elevation.

Hole No.	True width (feet)	Assay %	Width x assay
2-8	5.4	2.19	11.83
2-7	2.1	2.25	4.72
2-4	1.5	2.91	4.37
Total	9.0		20.92
Average	3.0	2.32	

The Operator estimates the vein to contain 180 tons per vertical foot. Assuming the ore body extends half the strike length above and below:

$$660 \times 180 = 118{,}800 \text{ tons} - 2.32\% \text{ copper}$$

Little Copper King vein:--Two drill holes (2-17, 2-16) intersected the eastward extension of the Little Copper King vein. The first intersection, 160 feet east from the mined section, assayed 2.67 percent over 0.8-foot true width. The second intersection, 340 feet east from the mined section, assayed 1.20 percent copper over 0.6-foot true width. No ore estimate is made on this section of vein.

Blank vein:--One drill hole (2-16) intersected the vein 130 feet east of the present heading. It assayed 2.0 percent copper over 0.6-foot true width. No ore estimate is made on this vein.

Sunset vein:--Although three holes (2-1, 2-2, and 2-6) were placed so as to cut the westward extension of the Sunset vein, the best intersection was only 0.94 percent copper over 10.0 feet. No drilling was done to test the vein beneath the existing workings; consequently, the ore reserve estimates made by Toepfer (Confidential Section, 1953) remain unchanged by the recent work. Toepfer's estimates are as follows:

Location	Width (feet)	Indicated ore (tons)	Grade % Cu	Inferred ore (tons)
Sunset vein east ore body Below No. 4 level	6.30	3,500	2.10	7,000
Central ore body Below No. 4 level	7.09	10,500	2.61	21,000
West ore body Below No. 4 level	6.85	25,500	3.33	51,000
Footwall ore body Below No. 4 level	7.00	2,500	3.89	5,000
Hanging Wall ore body Below No. 4 level	6.50	2,000	2.65	4,000
Total		44,000		88,000
Average			3.06	

Summary of Ore Reserves

According to available figures in the Bureau of Mines files at Spokane, Washington, total reserves prior to the start of the DMEA project were estimated to be about 138,500 tons of indicated ore averaging 3.64 percent copper and about 240,500 tons of inferred ore averaging 3.05 percent copper. Inferred reserves, with the exception of the "Bureau of Mines" ore body, the Johnson vein, and the Little Copper King vein were taken between the No. 4 level at an altitude of about 1,200 feet and a proposed service level which was to be driven at an altitude of about 925 feet from a portal site near the Skykomish River. In the "Bureau of Mines" ore body inferred reserves were taken between the No. 2 level at an altitude of about 1,400 feet and the altitude of the proposed service

level; on the Johnson vein inferred reserves were taken between the surface and the altitude of the proposed service level; and on the Little Copper King vein inferred reserves were taken above as well as below the No. 4 level, to the altitude of the proposed service level. In all cases indicated reserves were taken no lower than the No. 4 level.

Following the DMEA project, the total ore estimates are about 146,500 tons of indicated ore averaging 4.19 percent copper and about 387,700 tons of inferred ore averaging 3.56 percent copper. These estimates have been revised from the Bureau of Mines figures as follows:

Sunset vein:--No revision. Drilling on the lateral extensions was unsuccessful. Original estimates were 44,000 tons of indicated ore averaging 3.06 percent copper and 88,000 tons of inferred ore averaging 3.06 percent copper.

Harrington vein:--Additional reserves of 36,420 tons averaging 4.21 percent copper were inferred by drilling on the lateral extensions of known reserves originally estimated as 60,818 tons of indicated ore averaging 3.73 percent copper and 25,969 tons of inferred ore averaging 3.51 percent copper.

Johnson-Red Devil veins.--Additional reserves of 118,800 tons of inferred ore averaging 2.32 percent copper are estimated to be present. In the original estimates it was presumed that there were two separate veins and no reserves were assigned to the Red Devil vein; original estimates of reserves on the Johnson vein were 27,122 tons of inferred ore averaging 2.35 percent copper.

Little Copper King vein.--No revision. Drilling on lateral extensions was unsuccessful. Original estimates were 13,517 tons of indicated ore averaging 4.42 percent copper and 40,668 tons of inferred ore averaging 4.42 percent copper.

"Bureau of Mines" ore body.--Original estimates based on Bureau of Mines diamond drilling were 20,172 tons of indicated ore averaging 4.09 percent copper and 58,739 tons of inferred ore averaging 3.59 percent copper. Deeper diamond drilling on the DMEA project did not warrant changing the estimated total tonnage but did indicate that ore previously classed as inferred between 1,300 feet and 1,400 feet elevation could be reclassified as indicated ore of higher grade (pl. 7). The revised estimates are: 28,200 tons of indicated ore having an average grade of 6.83 percent copper and 50,711 tons of inferred ore to which have been assigned an average grade of 6.83 percent copper.

Summary of Factual Data

Work Item	No. units allowable and completed under contract	Unit cost	Total cost
Geophysical Survey	1 unit	$3,000.00	$ 3,000.00
Trenching	1 unit	1,500.00	1,500.00
Diamond drilling	15,670 feet 1/	7.00/ft.	109,690.00
Chemical assays	325 each	2.00 ea.	650.00
Total cost			$114,840.00

1/ Operator completed 16,472.8 feet.

Total amount of contract	$115,000.00
Government's share at 50 percent	57,500.00
Total amount expended	$114,840.00
Government's participation	57,420.00
Total amount unexpended	$ 160.00
Government's share unexpended	80.00
Royalty payments received	none

There was no equipment purchased under the exploration project contract.

The geophysical survey was made by Dr. A. R. Clarke of Vancouver, B. C.

The diamond drilling was let on contract to Lynch Bros., diamond drill contractors of Seattle, Washington. The drilling was carried out on a double shift, 6 days a week, with a maximum of two surface and two underground drills operating.

Discussion of Conclusions

The contract work was carried out by two different Operators. The Index Mining Company carried out the geophysical survey and bulldozer trenching. The Granore Company carried out the diamond drill program.

The geophysical survey and bulldozer trenching were very slow in being completed. This was largely because C. V. Brennan of the Index Mining Company suffered a heart attack a short time before the contract was granted and he was unable to direct or supervise the work personally.

The Granore Company entered into a lease with the Index Mining Company and was assigned the Amended Contract on May 9, 1955. By October 5, 1955, it had completed 16,472.8 feet of diamond drilling which was 802.8 feet more than was called for under the exploration contract. The diamond drilling was carried out rapidly and efficiently. The location of the holes was based upon the anomalies found by the geophysical survey along with the drilling of the extensions of known veins. The drill holes covering the anomalies failed to indicate any ore. It might have been advisable after several of the anomalies had given negative results to have transferred some of the footage from hole locations based on geophysical anomalies to holes based on geologic evidence.

The Granore Company advised the Field Team Executive Officer on April 3, 1956, that it had decided to drop all interest in the property and had notified the Index Mining Company of this decision.

The most promising geologic target remaining relatively unexplored at the Sunset mine is the structure beneath Trout Creek. One hole (2-13) drilled beneath the creek indicated that one and possibly two veins lie beneath the creek. Unfortunately, where intersected, they were not mineralized sufficiently to be considered as ore. These structures beneath Trout Creek definitely warrant further exploration.

It is recommended that serious consideration be given to any work that would further explore the veins beneath Trout Creek.

There is apparently little chance for a strike extension of the "Bureau of Mines" ore body; the downward extension, however, below the 1,300-foot elevation is worth additional work. The grade of the ore intersected in holes S-8 and S-10 is significantly higher than the shallower holes drilled prior to the program. If this grade were consistent, there are good possibilities for the production of direct shipping ore.

Attachments
Distribution:
DMEA(4)
USBM(5)
USGS(SRO)
Docket
Kellum

APPENDIX II

Results of check assays

Sample No.	Hole No.	Footage From	Footage To	Type	Peter Mack Wallace, Idaho Cu	Peter Mack Au	Peter Mack Ag	Willis Ott Seattle, Wash. Cu	Willis Ott Au	Willis Ott Ag	U.S.B.M. Albany, Oregon Cu	U.S.B.M. Au	U.S.B.M. Ag
W-230	S-13	303.7	309.0	core	0.05						0.23	Tr	0.10
231	S-13	309.0	310.0	core	3.20			3.26	nil	nil			
55*	2-4	307.3	313.7	core	5.96	0.01	0.20				6.13	0.01	0.30
73*	2-4	424.8	426.3	core	2.91						2.99	0.005	0.10
74*	2-4	431.3	432.3	core	2.36						2.49	0.005	0.10
64	2-6	2.4	3.5	core	1.38			1.37	Tr	0.16			
84	2-6	345.0	347.7	core	4.25	Tr	0.30				4.50	0.01	0.30
111	2-7	230.5	235.2	core	1.82						1.97	Tr	0.20
123	2-7	427.3	429.5	core	2.25						2.10	Tr	0.10
110*	2-8	290.0	300.0	sludge	5.44						5.68	0.005	0.40
145	2-13	103.2	105.3	core	1.21						1.27	Tr	0.20
152	2-13	260.4	264.5	core	Tr			nil	nil	nil			
166	2-14	133.1	136.8	core	0.96						1.10	Tr	0.20
224	2-17	289.0	291.0	core	2.67						2.90	0.01	0.50
229	2-17	290.0	300.0	sludge	0.77			0.82	nil	nil			
225	2-17	331.6	333.2	core	0.46						0.52	Tr	0.10

*See Appendix III for spectrographic analyses.

APPENDIX III

Spectrographic analyses
(See Appendix II for description of samples and chemical analyses)

Sample No.	Ag	Al	As	Au	B	Ba	Be
W-55	F	A	D	-	E	E	-
W-73	F	A	D or E	-	-	-	-
W-74	F	A or B	D or E	-	-	-	-
W-110	F	A	D or E	-	-	-	F

	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Ge
W-55	-	C	-	E	E or F	B	A	-	-
W-73	-	C	-	F	-	B	A or B	-	-
W-74	-	C or D	-	F	-	C	A	-	-
W-110	-	C or D	-	E	-	B	A	-	-

	Hg	In	K	Li	Mg	Mn	Mo	Na
W-55	-	-	A or B	-	C or D	D	E	D
W-73	-	-	-	-	C	D	B or C	C or D
W-74	-	-	-	-	C	D	D	D or E
W-110	-	-	-	-	C	D	D	C or D

	Nb	Ni	P	Pb	Pd	Pt	Sb	Si	Sn	Sr
W-55	-	D or E	-	D	-	-	-	A	E	-
W-73	-	E	-	D or E	-	-	-	A	E	-
W-74	-	E	-	-	-	-	-	A	E	-
W-110	-	E	-	-	-	-	-	A	E	-

APPENDIX III (Continued)

Spectrographic analyses

Sample No.	Ta	Te	Ti	V	W	Zn	Zr	Th
W-55	-	-	D	D	-	-	E	-
W-73	-	-	D	D	-	-	E	-
W-74	-	-	D	E	-	-	E	-
W-110	-	-	D	E	-	-	E	-

Letters in the above table signify the following:

A, over 10 percent
B, 5 to 10 percent
C, 1 to 5 percent
D, 0.1 to 1 percent
E, 0.01 to 0.1 percent
F, 0.001 to 0.01 percent
G, under 0.001 percent

The symbol "-" denotes "not detected"

COPY

So. 157 Howard Street
Spokane 4, Washington

COPY

March 21, 1957

Betty

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Final Field Team Reports for
DMEA Dockets
Docket Nos. DMEA-2341, DMEA-2612,
DMEA-2907 and DMEA-3394

Dear Mr. Selfridge:

This is in reply to your letter of December 12, 1956, which was inadvertently filed without first being answered.

Docket DMEA-2341 - Western States Corporation. Our final report is in the final stages of preparation and should be completed within a week. The Operator's monthly reports and our own examinations contain all the pertinent information and it is doubtful that the Operator's final report would be of any particular value and we, therefore, recommend that the requirement be waived.

Docket DMEA-2612 - Granore Company. Our final report is being typed and should be mailed within the next day or so.

Docket DMEA-2907 - Norman Boe and Kenneth Curtiss. Our final report was mailed January 23, 1957.

Docket DMEA-3394 - Triumph Mining Company. Our final report will be completed within the next three weeks.

All other final reports now due are in various stages of preparation.

By Field Team, Region I, NW Dist.

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: USBM(2)

File Copy
Surname

Initialed
/s/ Selfridge (SHB)
F. G. Brown

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

500

DEC 12 1956

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Re: Final Field Team Reports for
DMEA Dockets
Docket Nos. DMEA-2341, DMEA-2612,
DMEA-2907 and DMEA-3394

Dear Mr. Weissenborn:

The following projects have been concluded or terminated for a considerable period of time and we have received no final Field Team reports covering project results. In certain instances, as noted below, the final Operator's report is also lacking.

It may be that in certain cases final Field Team reports have been delayed pending property settlements and final audits. However, we can see no reason for such delay; actually the final report from the Field Team is not considered as being an exact financial statement. We must depend upon our Contract Administration and Audit Division for our final and precise data on expenditures.

In cases where final precise figures are not available, it would be sufficient if it was so noted in your final report, with an additional notation that such unit and over-all costs which you might have quoted were subject to minor revisions, depending upon matters of final settlement.

Transmitted

DMEA-2341 - Western States Copper Corporation
(Final Operator's Report also due)
Termination November 18, 1955.

DMEA-2612 - Granere Company
Concluded October, 1955.

DMEA-2907 - Norman Bee and Kenneth Curtis
Concluded July, 1955.

DMEA-3394 - Triumph Mining Company
Termination May 7, 1956.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (JHB)

APPROVED

Frank D. Lamb (JHB)
Member, Bureau of Mines

Thor H. Kiilsgaard (JHB)
Member, Geological Survey

WRGriswold/er 12/10/56
Copy to: Docket (Q)
Admr R File
Op. Committee
Base Metals
Mr. Bishop, USBM
Mr. Kiilsgaard, USGS
Chron.

File Copy
Surname
Klugescheid.
Mingwed
Selfridge
Yopes

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

500

MAR 27 1956

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Re: Docket No. DMEA-2612 (Copper)
Gramore Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-Kh89

Dear Mr. Weissenborn:

While we were processing the Certification of Discovery for the cited contract, the legal division stated that it would be necessary to send a copy thereof and also of the letter of transmittal to Mr. Earl Smith, who signed the Subordination Agreement for the group which still holds royalty rights to a part of the property.

We are enclosing these papers as well as a letter of transmittal to Mr. Smith, as we are not sure of the latter's address. Will you kindly forward all of the above to Mr. Smith.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (WB)

Enclosure

WPKlugescheid/er 3/20/56
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Pennington, USBM
Mr. Kiilsgaard, USGS
Chron.

APPROVED:

P. F. Yopes (WB)
Member, Bureau of Mines

N. E. Nelson (WB)
Member, Geological Survey

File Copy
Surname
Klugescheid, Russwurm, Nelson, Selfridge, Yoder, Johnson

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

MAR 2 7 1956

Mr. Karl Smith, Trustee

Index, Washington

Re: Docket No. DMEA-2612 (Copper)
Granore Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-2489

Dear Mr. Smith:

For your information, we are enclosing a copy of a Certification of Discovery or Development covering the cited property, which has been sent to the Granore Company. We are also enclosing a copy of our letter of transmittal of this certification.

The above are in connection with the Subordination Agreement signed by you on May 9, 1955.

Sincerely yours,

C. O. Mittendorf

Administrator

WPKlugescheid/er 3/20/56

Enclosures

Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. Pennington, USBM
Mr. Kiilsgaard, USGS
Region I, NW, Dist. (2)
Chron.

R.G.B.

File Copy
Surname
Klugescheid
Griswold
Nelson
Yoyo
Selfridge
Hofstman

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

MAR 27 1956

Mr. C. W. Brennan, President
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMEA-2612 (Copper)
Granore Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-4489

Dear Mr. Brennan:

For your information, we are enclosing a copy of a Certification of Discovery or Development covering the cited property, which has been sent to the Granore Company. We are also enclosing a copy of our letter of transmittal of this certification.

The above are in connection with the Assignment of Contract signed by you on May 9, 1955.

Sincerely yours,

C. O. Mitterdorf

Administrator

Enclosures

WPKlugescheid/er 3/20/56
Copy to: Docket
Admr R. File
Op. Committee
Base Metals
Mr. Pennington, USBM
Mr. Kiilsgaard, USGS
Region I, NW, Dist. (2)
Chron.

R.G.H.

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Nelson
Johnson

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

MAR 2 7 1956

Mr. Clarence A. Fredell, Acting Director
Materials Division
Emergency Procurement Service
General Services Administration
Washington 25, D. C.

Re: Docket No. DMEA-2612 (Copper)
Cramore Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-2489

Dear Mr. Fredell:

Enclosed is a copy of a certification of discovery or development related to Amended Exploration Project Contract No. Idm-2489.

The contract was dated February 20, 1953, with the Government participating to the extent of 50 per cent in an exploration project estimated to cost $115,000.00. Actual expenditures were $114,840.00, with the Government's share being half of such amount, or $57,420.00.

The total amount of work provided for under the contract consisted of a geophysical survey, trenching, and 15,670 feet of diamond drilling. All work specified in the contract was actually completed.

The discovery consists of copper ores occurring in fracture zones in granodiorite. Estimated indicated ore reserves were 24,400 tons averaging 7.22 per cent copper. Inferred ore reserves are in three blocks: (1) Harrington-Westward extension containing 44 tons of rock per vertical foot and averaging 4.25 per cent copper; (2) Harrington-Eastward extension containing 255 tons of rock per vertical foot and averaging 4.20 per cent copper; and (3) Johnson and Red Devil containing 180 tons of rock per vertical foot and averaging 2.32 per cent copper. The vertical extent of the inferred ore is unknown.

Sincerely yours,

E. O. Mittendorf

Administrator

Enclosure

WPKlugescheid/er 3/19/56
Copy to: Docket
Mr. Geehan, USBM
Mr. Kiilsgaard, USGS
Admr R File
Op. Committee
Cont.Admr & Audit File
Base Metals
F. E. Johnson
W. R. Griswold
Chron.
Region I (2) NW, Dist.

R.C.4

File Copy
Surname
Klugescheid
Griswold
Rubin
Chambers
Nelson
Yost
Selfridge
Johnson

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

MAR 2 7 1956

Mr. Robert M. MacRae, Vice President
Grancre Company
1640 Exchange Building
Seattle 3, Washington

Re: Docket No. DMEA-2612 (Copper)
Grancre Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-2489

Dear Mr. MacRae:

Transmitted herewith is a certification of discovery or development related to the Amended Exploration Project Contract No. Idm-2489, dated February 20, 1953, on the lands described in the contract.

By the terms of the Amended Exploration Project Contract and of the Certification, all production from the land described in the contract from February 20, 1953, the date of the contract, is subject to the Government's percentage royalty as set forth in the said contract until the sum of $57,020.00, which the Government has advanced as its participating interest is repaid, or until February 20, 1965, whichever occurs first.

Payments should be made to Mr. A. E. Weissenborn, Executive Officer, DMEA Field Team, Region I, South 157 Howard Street, Spokane 4, Washington. Checks should be drawn in favor of the Defense Minerals Exploration Administration. The purchaser should be advised to deduct royalties from the amount due on each shipment and forward the checks to the Executive Officer.

Royalty payments to the Government should be accompanied by suitable evidence, such as copies of the settlement sheets, showing quantity and grade of the products sold, the name of the purchaser, and the price and charges, certified to be correct by the purchaser.

You are requested to notify Mr. Weissenborn of any changes in ownership and production rights that might affect the Government's right to its percentage royalty. Also, if production ceases at any time for an extended period please notify Mr. Weissenborn at six-month intervals that such is the case.

Sincerely yours,

C. O. Mitterdorf

Administrator

Enclosure

Region I, N.W. Dist. (2)
Mr. F. E. Johnson
W. R. Griswold
Chron.

Admr R File
Op. Committee
Cont. Adm & Audit. Div.
Finance Office
Base Metals

WPKlugescheid/er 3/19/56
Copy to: Docket
Mr. C. A. Fredell, Dr.,MD,EPS
Mr. Geehan, USBM
Mr. Killsgard, USGS

XXXXXXXXXXXXXXXXX
1201 N. Division Street
Spokane 2, Washington
December 12, 1955

RECEIVED
DEC 10 1955

Betty

Mrs. Myrtle Purdy, Certifying Officer
DMEA Field Team, Region I
1201 N. Division Street
Spokane 2, Washington

Re: Docket No. DMEA-2612
Granore Company
Snohomish County, Washington
Contract No. Idm-2489

Dear Mrs. Purdy:

Work under the subject contract has been completed to the satisfaction of the Government. A final report evaluating the results of the exploration program has been presented by the Operator and accepted by the Executive Officer.

The Government has no equity in equipment or supplies used at the project.

A Certification of Discovery or Development covering this project has been recommended by the Field Team.

A final Report of Review dated December 6, 1955 has been issued by C. A. Turner, DMEA Auditor.

As all contract requirements have been met, it is requested that final settlement of our account with the Operator be made.

Sincerely yours,

cc: DMEA (2)
USGS (2)

A. E. Weissenborn, Exec. Officer
DMEA Field Team, Region I
Northwest District

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

DEC - 9 1955

Mr. Charles A. Turner
DMEA Auditor
1201 North Division Street
Spokane 2, Washington

Re: Report of Review
Idm-2489, DMEA-2612
Granore Company, Assignee
Index Mining Co., Assignor

Dear Charlie:

Receipt is acknowledged of the Washington copies of your Report of Review covering the referenced contract.

The regional copies of the report undoubtedly have been distributed; however, you should arrange to make the following corrections on all the copies:

(1) Delete the word "The" in the title of the Assignor; and

(2) Add the words "as of" after the word "dated" in the third line immediately following the title of the exploration project contract.

The Washington copies have been corrected.

Sincerely yours,

(Signed) J. L. Chambers

Jay L. Chambers, Chief
Contract Administration
and Audit Division

WBorovies/wb
December 9, 1955

Copy to: Docket
Admr. Reading File
Mr. Chambers

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

RECEIVED
DEC - 5 1955

November 29, 1955

Mr. Robert MacRae, Vice-President
Granore Company
1640 Exchange Building
Seattle 4, Washington

Re: Docket No. DME1-2612 (copper)
Granore Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. MacRae:

Thank you for your final report on the exploration of the Sunset mine. Mr. Stitt did a nice job on it.

An audit of your contract will be made just as soon as our auditor's work load permits, and then the money being withheld (see our letter dated October 25) can be released.

By Field Team, Region I, NW Dist.

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: [illegible] (2)
[illegible] ( )
[illegible] ( )
[illegible]

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

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DEC - 5 1955

November 29, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (copper)
Granore Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

Exploration of the Sunset mine by the Granore Company has been completed and the Operator's final report, received November 21, 1955, is acceptable to the Field Team. The original and two copies are enclosed.

On the basis of the Operator's reserve calculations, summarized below, we recommend that a Certification of Discovery be issued.

Indicated ore reserves are in a mineralized zone, Radiore "B" ore body, previously located by the Bureau of Mines. Assuming no dilution this ore body contains 24,400 tons of ore averaging 7.22 percent copper. Inferred ore reserves are in three blocks: (1) Harrington-Westward extension that contains 44 tons of rock per vertical foot and averages 4.25 percent copper; (2) Harrington-Eastward extension that contains 255 tons of rock per vertical foot and averages 4.20 percent copper; and (3) Johnson and Red Devil that contains 180 tons of rock and averages 2.32 percent copper.

By Field Team, Region I, NW Dist.

A. E. Weissenborn

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew

Wing G. Agnew, Member
U. S. Bureau of Mines

NOTE:
See attached envelope for maps.

cc: USBM (2)
USBM (AD)
Kellum

ELLIOTT 5133

U. S. BUREAU OF MINES
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SPOKANE, WASHINGTON

GRANORE COMPANY
1640 EXCHANGE BUILDING
SEATTLE 4, WASHINGTON

November 8, 1955

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OPERATOR'S FINAL REPORT.

The United States Department of the Interior
Defense Minerals Exploration Administration
Federal Office Building
Seattle 4, Washington, U.S.A.

Re: Docket No. DMEA-2612
Contract No. Idm-E489

Gentlemen:

Submitted herewith is the final report as required under Article 6 (c) of Form MF-200A (Revised June 1954), an Exploration Project Contract agreed to by the United States of America, acting through the Department of the Interior, Defense Minerals Exploration Administration and Index Mining Company.

Photostated copies of all the diamond drill corelogs have been submitted previously, with the monthly reports.

Respectfully submitted,

J.M. Stitt

J.M. Stitt
Resident Engineer

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FINAL REPORT

to the

UNITED STATES of AMERICA

acting through the

DEPARTMENT of the INTERIOR

DEFENCE MINERALS EXPLORATION ADMINISTRATION

Docket No. DMEA-2612

Commodity - Copper

Contract No. Idm-E489

The 1955 Diamond Drill

Exploration Program

at the

Index Mine

Index, Washington

U.S.A.

November 8, 1955

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LOCATION and ACCESS

The Index Mine is located in Snohomish County in the northwest part of the State of Washington. The nearest town, Index, is about 40 miles east of Everett by excellent paved highway. From Index the mine can be reached by six miles of good gravelled county road up the north fork of the Skykomish River to Trout Creek and then by about one mile of truck road.

The mine is owed by the Index Mining Company, and was formerly known as the Sunset Mine.

PREVIOUS WORK

The mine has been operated at various times up to 1946. After the underground mining was stopped the U.S. Bureau of Mines conducted a Radiore survey over the area. Later, 14 diamond drill holes, with a total footage of 3,655 feet, were drilled. In 1953 Dr. Clark, professor of Geophysics at the University of British Columbia, outlined some geophysical anomalies by a resistivity survey.

1955 PROGRAM

The program for 1955 was to core approximately 16,000 feet of diamond drill hole to test the ground below the anomalies and to check the possible extension of the known underground veins.

The work was done under the direction of Granore Company, a wholly-owned subsiduary of Granby Consolidated Mining, Smelting and Power Company, Limited.

PERSONNEL

The original layout of diamond drill holes was done by Dr. B.S.W. Buffam, consulting geologist for Granby Cons. M.S. and P. Co. Ltd. Changes in the layout were made in consultation with Dr. Buffam and Mr. L.T. Postle, president of Granby, The major portion of the engineering was done by Mr. J.H. Parliament, P.Eng., Chief Engineer of Granby.

Assistance to the project was rendered by the officers of the U.S. Bureau of Mines, and the co-operation and advice of Mr. E.A. Magill was especially valuable.

Mr. W. Puffett and Mr. D. Kellum of the U,S. Geological Survey made several visits to the property and were very helpful.

Mr. C.V. Brennan, president of the Index Mining Company, assisted the work greatly by providing information on the previous operation and the location of surface outcrops.

CONTRACTORS

H.M. & H. Logging Co. of Index cleared the roads of snow and built the new roads that were required. The excellent job of diamond drilling was done by Lynch Bros., Diamond Drill Contractors, of Seattle.

A maximum of four drills were used - two on the surface and two underground. Compressed air was supplied to the underground drills by a 600 c.f.m. compressor. The surface drills were gasoline-engine powered. The work was done on two shifts a day.

PERFORMANCE

The average footage drilled per shift underground was 32.0'. The average on surface, exclusive of overburden, was 31.6' per shift.

Of the surface holes, five were collared in bedrock and one remained in overburden for the total length. The average footage drilled in overburden on the remainder was 20 feet. Some difficulty was encountered in a few of the holes due to the low angle of 30 degrees from the horizontal at which they were drilled.

The overall core recovery was 90.3% in the underground holes and 83.5% in the surface holes. Core recovery in the mineralized sections was generally very good.

SUMMARY of the WORK PERFORMED

	No. of Holes drilled	Footage	Dip Tests	Assays
Surface	20	8,165.5	16	99
Underground	17	8,307.3	5	226
Total	37	16,472.8	21	325

SUMMARY of UNIT COSTS

Units	Unit Cost	Total Cost
16,472.8 ft. core drilling	$7.00	$115,309.60
325 chemical analyses	2.00	650.00
TOTAL		$115,959.60
Bulldozing		1,500.00
Geophysical Survey		3,000.00
TOTAL		$120,459.60

SURVEYING

A complete double-angle, transit-and-chain survey was made of all the underground workings on 2-level. Stainless steel spads were placed in the back for all stations and were plainly marked with yellow paint. The collars of all diamond drill holes were also marked with yellow paint.

On the surface, three balanced, inter-connecting loops were run by transit and chain. The collars of all surface diamond drill holes and all roads were thus tied in to the underground workings. A post placed at the collar of each diamond drill hole was marked with the appropriate number.

A small part of the surface area was contoured and the north edge of Trout Creek was surveyed for the distance it passes near the portal.

The underground survey was started from two old survey stations, re-numbered B-1 and B-2. The co-ordinates for these stations were scaled from an old map. As a result, the co/ordinates of the drill hole collars are fairly close to, but not exactly the same as, the co-ordinates on old maps.

Hydroflouric acid etch tests were made in all important inclined holes.

PLANS AND SECTIONS

A surface map on the scale of 1"=200' was made from old maps. Four surface maps on the scale of 1"=100' were made using the results of the new surveys. A small map on the scale of 1"=40' was

made for the high-grade lens area.

A plan of the underground workings and drill holes, based on new surveys, was made on the scale of 1"=100'. Five plans on the scale of 1"=40' were made of the same area, showing the location of all assays.

Vertical sections on the scale of 1"=40' were made for all inclined holes. One longtitudinal section on the same scale was made for the high-grade lens area.

DIAMOND DRILL CORE

The diamond drill core was geologically logged and the actual core recovered for every drill run was measured. Mineralized sections of the core were split and one half was sent to Peter Mack of Wallace, Idaho for assaying. Several of the reject pulps were sent to the U.S. Bureau of Mines for check assaying. A comparison of the results appears as Appendix 2.

Some of the core was stripped by removing sections of normal, unaltered granodiorite. Every box was marked with the hole number and the footage. At the conclusion of the job the core was given to the U.S. Bureau of Mines.

The reject pulps from the assays and the etched glass tubes were given to the owner.

OUTSIDE EXPLORATION

During the summer the Non-Pareil tunnel and the Copper King tunnel were investigated. The Copper King tunnel was mapped and sampled. Several pits and cuts on the surface were sampled and some reported outcrops were investigated.

CONCLUSIONS REACHED FROM THE DRILLING PROGRAM

A. UNDERGROUND

Unless otherwise mentioned in the following report all holes were drilled in the horizontal plane. Assays are given as per cent copper over the length of sample at the distance from the collar of the hole of the beginning of the sample.

WEST END OF UNDERGROUND WORKINGS

Holes 2-1, 2-2 and 2-6 were drilled to explore the possible westward extension of the Sunset and Harrington veins. Hole 2-6, (4.25% over 2.7' at 345'), indicated an extension of the Harrington vein or Sunset vein for approximately 120', but Holes 2-2 and 2-1 indicated that the extension did not continue farther.

Hole 2-6, (11.30% over 1.0' at 259'), indicated mineralization but this could not be related to any of the mine workings and was not located in the other holes.

The three holes mentioned above, plus Hole 2-5, also explored the possible westward extension of the Johnson vein. Some mineralization in Hole 2-2, (1.79% over 0.8' at 161'), is possibly related to the Johnson vein but this mineralization was not located by holes on either side approximately 150' distant.

CENTRAL SECTION OF UNDERGROUND WORKINGS

Holes 2-7 and 2-4 were drilled to explore the eastward extension of the Harrington vein. Both indicated an extension; 2-7 (1.82% over 4.7' at 230') and 2-4 (5.96% over 6.4' at 307'). Hole

2-14 was drilled at -30° directly below Hole 2-4 to check the possible downward extension of the mineralization found in Hole 2-4. A bleached and altered zone, similar to the one which contained the mineralization in Hole 2-4, was found, but it was barren.

Hole 2-8, plus the three holes mentioned above also checked the possible eastward extension of the Johnson vein, or the possible westward extension of the Red Devil vein. The three flat holes indicated that the vein did continue. Assays were: 2-8, (2.19% over 5.7' at 318'); 2-7, (2.25% over 2.2' at 427') and 2-4, (1.12% over 1.5' at 413', 2.91% over 1.5' at 425' and 2.36% over 1.0' at 431'). An andesite dyke was found adjacent to the mineralized zone in Holes 2-7 and 2-4. A similar dyke was found in Hole 2-14 but there was very little mineralization.

NORTH SIDE OF UNDERGROUND WORKINGS

Hole 2-12 was drilled from the western end of 2-level to investigate the possible occurrence of veins parallel to the Copper King, Johnson and Sunset veins. In 506' the only mineralization was 0.12% over 2.6' at 191'.

Similarly, Hole 2-15 was drilled from the eastern end of the mine. A little mineralization was found near the collar, (0.31% over 2.8' at 14'), but nothing more of any consequence to the end of the hole at 502'.

EAST END OF UNDERGROUND WORKINGS.

Hole 2-16 was drilled to explore the possible eastward extension of the Blank vein. Mineralization indicated the vein

extends for 130', (2.00% over 0.7' at 534').

Hole 2-17 and 2-16 explored the possible eastward extension of the Little Copper King vein. Mineralization in both holes indicated this extension; 2-17, (2.67% over 2.0' at 289') and 2-16, (1.20% over 1.0' at 830').

SOUTH SIDE OF UNDERGROUND WORKINGS

Four holes were drilled southward from the Sunset vein to investigate the possibility of veins parallel to those found in the mine. Very little mineralization was found in any of the holes, the highest assay being 0.66% over 5.0' at 342' in Hole 2-3.

Hole 2-13 was drilled southward from the main adit. Mineralization was encountered in several places, notably 1.21% over 2.1' at 103', 0.96% over 3.3' at 572' and 0.67% over 4.4' at 719'. The last two intersections are approximately vertically below Trout Creek.

Two holes from surface were planned to explore a possible extension of the mineralization found in Hole 2-13, but it was found to be impossible to drill them. Hole S-15 was driven for 84' in overburden and did not reach bedrock. An examination of the surrounding area was made to attempt to locate a better place to collar a hole but none was found.

B. SURFACE

Unless otherwise stated, all holes were drilled at -30°. Assays are given as per cent copper over the length of sample at the distance from the collar of the beginning of the sample.

GROUP 9

Holes S-1 and S-2 were drilled to test the most westerly anomaly. Except where they cut narrow dykes, these holes were entirely in granodiorite.

GROUP 7

Holes S-3, S-4 and S-5 were drilled under the next anomaly to the east. Slight mineralization was encountered in S-3, (0.06% over 2.5' at 242'). The remainder of the hole and the other two holes were barren except for rare fractures up to 1/8" wide containing copper mineralization.

GROUP 8

Holes S-6 and S-7 were drilled to test the most northerly anomaly at the eastern end of the mine. Both holes were barren.

At this point the drilling program was changed. Three anomalies had been tested with negative results. Therefore it was decided to reduce the amount of surface drilling and increase the amount of underground drilling. The pattern of the surface holes was also altered so that several holes were drilled in the same vertical plane to give a continuous cross-section across the vein area, instead of several parallel holes in the same anomaly.

GROUP 5

Holes S-8, S-9, S-10, S-11 and S-12 were designed to test and possibly extend the mineralized area known as the U.S. Bureau of Mines Radiore body. Holes S-8 and S-10 were each drilled below a

hole drilled by the U.S. Bureau of Mines which intersected a heavily mineralized zone, and each hole indicated the downward extension of the zone. Assays were; S-8, (13.2% Cu, 0.17 oz. Au, 0.54 oz. Ag over 1.0' at 282'; 14.2% Cu, 0.19 oz. Au, 0.60 oz. Ag over 3.0' at 285' - The 1.8' between the two assays is andesite dyke), S-10, (8.32% Cu, 0.04 oz. Au, 0.65 oz. Ag over 2.6' at 270.3'; 7.14% Cu, 0.02 oz. Au, 0.60 oz. Ag over 1.3' at 272.9').

Holes S-9 and S-11, drilled 100' and 200' westerly from hole S-8 encountered practically no mineralization. Hole S-12, drilled 100' easterly from Hole S-10 assayed 0.33% over 1.0' at 275'.

GROUP 6

Hole S-12 was extended to a length of 747' and Hole S-14 collared in the same vertical plane, A mineralized zone was intersected by Hole S-12 which appears to be the westward extension of the Sunset vein but the best assay was 0.11% over 5.0' at 569'. Hole S-14 intersected a mineralized zone shich appears to be the westward extension of the Copper King vein. The best assay was 0.62% over 1.0' at 390'. Adjacent to this mineralized zone was an andesite dyke, similar to those found in or near the Copper King vein underground.

GROUP 4

Hole S-15 was drilled approximately 200' easterly from the portal and directed towards Trout Creek at -45°. It was designed to intersect a possible extension of the mineralized zone found in Hole 2-13. At 84' the hole was still in overburden and it was impossible to proceed farther so the hole was abandoned.

GROUP 2

Hole S-13 was designed to locate a possible eastward extension of the Sunset vein. A mineralized section assaying 3.20% over 1.5' at 309' was located. Hole S-16 was collared 200' westerly (towards the underground workings) and a similar zone was found which assayed 2.30% over 1.5' at 256'. Hole S-18 was collared 200' easterly and a mineralized zone was located but the best assay was 0.22% over 10.5' at 400'.

GROUP 3

Hole S-13 was extended to 777' and Holes S-17 and S-19 were drilled in the same vertical plane to give continuous cross-section. No further mineralization was found in Hole S-13, Hole S-19 was barren and Hole S-17 was nearly so.

GROUP 1

Hole S-20 was the only hole in this group. It was designed to test the most easterly anomaly and also to test the ground under a surface outcrop showing slight mineralization. No mineralization was intersected by the hole.

ESTIMATE OF ORE RESERVES

1. HIGH GRADE LENS

The mineralized zone which was located by the U.S. Bureau of Mines, known as the Radiore "B" Orebody, was further tested by five

holes. Two holes intersected the zone approximately 260' below the suface. Two holes to the west and one to the east indicated there was no further lateral extent. Assuming the zone extends for 50' on all sides of the four holes the tonnage is 24,400 tons averaging 7.22% copper. No dilution is included.

Dimensions

The length along the strike is 240' at the longest point. Height is approximately 300' and width is 4.7'. The lowest ore intersections occur 260' below the surface. Overburden is assumed to be 17'. The area of the ore body, measured along the strike and down the dip is 57,128 square feet.

Specific Gravity

The ore is assumed to contain 20% chalcopyrite and 20% granite.

$$\text{Specific gravity} = \frac{20 \times 4.1 + 80 \times 2.6}{100} = 2.9$$

Volume

$$\frac{2000}{2.9 \times 62.5} = 11 \text{ Cubic feet per ton.}$$

Tonnage

$$\frac{57,128 \times 4.7}{11} = 24,400 \text{ tons.}$$

The above results are based on four drill holes, two of which were drilled by Granore (S-8 and S-10) and two of which were drilled by the U.S. Bureau of Mines (USBM #3 and USBM #7.).

The four intersections in the ore body are as follows:

	True Width	Assay	Width x Assay
USBM #3	5.8'	5.10%	29.58
S-8	4.4'	11.30%	49.72
USBM #7	5.1'	5.67%	28.92
S-10	3.5'	7.88%	27.58
TOTAL	18.8'		135.80
AVERAGE	4.7'	7.22%	

GENERAL CONDITIONS

The mineralized sections of the core contain a high per centage of sericite. When first drilled the material cored well but as soon as the drill disturbed it on the second time through, the hole caved completely. This would indicate that mining would be expensive and probably square-setting would be required.

2. HARRINGTON VEIN

Westward Extension

One drill hole intersection 112' westward from the mined section assayed 4.25% over a true width of 2.6'. The next intersection, 150' farther west, assayed 0.94% over 10.0'. Another intersection, approximately 300' west from the last intersection, on the probable extension of the vein, assayed only traces of copper. Assuming the assay in the first hole can be applied to the vein for the area from the present workings to 75' beyond the intersection the inferred ore reserve is

$$\frac{185 \times 2.6}{11} = 44 \text{ tons per vertical foot assaying } 4.25\%.$$

Eastward Extension

The Little Copper King and the Harrington are probably the same vein. The two workings are 520' apart and there are two intersections in this area. The first, 120' from the mined section of the Harrington vein assayed 1.82% over 4.6' true width. The second, 260' from the mined section of the Harrington assayed 5.96% over 6.2' true width. Assuming the vein is continuous between the two mined sections, and assuming the average of the two assays represents the average of the entire vein the inferred ore reserve is

$$\frac{520 \times 5.4}{11} = 255 \text{ tons per vertical foot assaying } 4.20\%.$$

Depth

A hole was drilled at -30° below the hole containing the best assay. This Hole, 2-14, passed through a zone similar to the one above carrying the mineralization, but the zone was barren. This zone was intersected 180' below the upper intersection and indicates that the mineralization did not continue down to that depth.

3. JOHNSON AND RED DEVIL VEINS

The distance between these two veins is 660' and the area is cut by three holes at the 2-level elevation. The intersections are:

Hole No.	True Width	Assay	Width x Assay
2-8	5.4'	2.19%	11.83
2-7	2.1'	2.25%	4.72

2-4	1.5'	2.91%	4.37
TOTAL	9.0'		20.92
AVERAGE	3.0'	2.32%	

The inferred ore reserve is

$\frac{660 \times 3.0}{11}$ = 180 tons per vertical foot assaying 2.32%

Depth

Hole 2-14, mentioned above, also intersected the ground below the Johnson and Red Devil veins. An andesite dyke, similar to that found near the mineralization in the upper hole, was encountered but the area near it was almost barren.

4. LITTLE COPPER KING VEIN

Two drill holes intersect the probable eastward extension of the Little Copper King vein. The first, 160' from the mined section assayed 2.67% over 0.8' true width. The second, 180' farther east, assayed 1.20% over 0.7' true width.

5. BLANK VEIN

One drill hole intersects the probable eastward extension of the Blank vein at 130' from the mined section. The assay was 2.00% over 0.6' true width.

SUMMARY OF ORE RESERVES

Indicated Ore

High-grade lens 24,400 tons @ 7.22% Cu.

Inferred Ore

	Tons per Vertical Foot	Assay	Tons x Assay
Harrington-Westward extension	44	4.25%	187
Harrington-Eastward extension	255	4.20%	1071
Johnson and Red Devil	180	2.32%	418
TOTAL	479	3.50%	1676

Sunset Vein

In previous reports the major portion of the ore reserve has been attributed to the Sunset vein near 4-level or 5-level. This area is now under water and no holes were drilled through it. Therefore, nothing further can be said about these reserves.

CONCLUSIONS

1. The results of the drilling indicate that the value of the anomalies is doubtful. Nothing was found in the core to account for them.

2. The possibility of eastward or westward extensions of the known veins at the 2-level elevation is not good.

3. There are no indications of similar veins to the north of the present workings.

4. Mineralization was found in the one hole that was drilled southward from the present workings.

5. The possibility of eastward or westward extensions of the Radiore "B" orebody is doubtful. However, there is nothing to indicate that

the lower limit has been reached, and the assay values of the two lower holes were considerably higher than those in the upper holes.

6. The possibility of the downward extension of the Sunset vein was not explored. This possible downward extension, plus the possible downward extension of the Radiore "B" orebody are the two best places to conduct further exploration.

LIST OF PLANS AND SECTIONS

Plan - 1"=200' Prposed Underground Drill Program	
Plan of No. 2-level 1"=100'	
Plan of No. 2-level 1"-40'	L14-D 12
Plan of No. 2-level 1"=40'	L14-D 13
Plan of No. 2-level 1"=40'	L13-D 12
Plan of No. 2-level 1"=40'	L13-D 13
Plan of No. 2-level 1"=40'	L12-D 12-13
Vertical Section	DDH's 2-4 and 2-14
Vertical Section 2-13	
Surface Plan 1"=200'	Proposed Surface Drilling
Surface Plan 1"=100'	West Sheet
Surface Plan 1"=100'	Center Sheet
Surface Plan 1"=100'	East Sheet
Surface Plan 1"=100'	North-East Sheet
Vertical Section	DDH S-1
Vertical Section	DDH S-2
Vertical Section	DDH S-3
Vertical Section	DDH S-4
Vertical Section	DDH S-5
Vertical Section	DDH S-6
Vertical Section	DDH S-7
Vertical Section	DDH's S-8 and USBM #3
Vertical Section	DDH's S-9, USBM #4 and #6
Vertical Section	DDH's S-10 and USBM #7

Vertical Section	DDH's S-11 and USBM #12
Vertical Section	DDH'S S-12, S-14 and USBM #8
Vertical Section	DDH's S-13, S-17, S-19 and USBM #5
Vertical Section	DDH' S-15
Vertical Section	DDH's S-16 and USBM #9
Vertical Section	DDH S-18
Vertical Section	DDH S-20

Plan - High-Grade Lens Area

Longtitudinal Section - High-Grade Lens Area.

APPENDIX 1

SUMMARY OF THE LOGGING RECORD

Unless otherwise stated the core may be assumed to be granodiorite. The term "lightly mineralized" refers to assays between 0.20 and 0.50% copper, "mineralized" 0.50 to 4.0% copper and "heavily mineralized" over 4.0% copper.

SURFACE

S - 1	85.7	-	86	Fine-grained grey speckled dyke.
	92	-	92.5	Fine-grained grey speckled dyke.
	239	-	239.5	Aplite dyke.
		-	254	End of hole.
S - 2	117	-	118	Basic dyke.
		-	250.5	End of hole.
S - 3	70	-	71	Dark grey speckled dyke.
	71	-	88	Aplite dyke.
	149	-	152.2	Aplite dyke.
	180.5	-	188	Basic dyke.
	201	-	201.2	Basic dyke.
	332	-	346	Aplite dyke.
		-	403	End of hole.
S - 4	0	-	23	Overburden.
	77	-	81	Basic dyke.
	134	-	139	Aplite dyke.
	180	-	187.4	Basic dyke.
	286	-	287	Aplite dyke.
		-	401	End of hole.
S - 5	0	-	14	Overburden.
	123.5	-	133	Basic dyke.
	159	-	175.2	Aplite dyke.
	361.5	-	380.5	Aplite dyke.
		-	396	End of hole.
S - 6	93	-	167	Aplite dyke.
		-	278	End of hole.
S - 7	0	-	28	Overburden.
		-	255	End of hole.
S - 8	0	-	20	Overburden.
	232	-	233	Aplite dyke.
	282	-	283	Heavily mineralized zone.
	283	-	284.8	Andesite dyke.

S - 8 con't.

	284.8	-	287.8	Heavily mineralized zone.
		-	306	End of hole.
S - 9	0	-	18	Overburden.
	279	-	280	Aplite dyke.
		-	366	End of hole.
S - 10	0	-	18	Overburden.
	270.3	-	274.4	Heavily mineralized zone.
		-	297	End of hole.
S - 11	0	-	17	Overburden.
		-	325	End of hole.
S - 12	0	-	20	Overburden.
	276	-	276.3	Lightly mineralized zone.
		-	747	End of hole.
S - 13	0	-	26	Overburden.
	219	-	221	Light grey, green dyke.
	309	-	310	Mineralized zone.
	336.5	-	339.5	Basic dyke.
		-	777	End of hole.
S - 14	30.6	-	31.3	Basic dyke.
	107	-	107.3	Basic dyke.
	389.6	-	390.4	Basic dyke.
	390.4	-	391.4	Mineralized zone.
		-	436	End of hole.
S - 15	0	-	84	Overburden.
		-	84	End of hole.
S - 16	0	-	17	Overburden.
	256	-	257.5	Mineralized zone.
		-	407	End of hole.
S - 17	0	-	13	Overburden.
	254	-	254.5	Aplite dyke.
	304.6	-	309.5	Andesite dyke.
	466.7	-	472	Mineralized zone.
		-	765	End of hole.
S - 18	0	-	26	Overburden.
		-	477	End of hole.
S - 19	0	-	30	Overburden.
	297	-	297.2	Felsite dyke.
		-	350	End of hole.

S - 20	0	-	10	Overburden.
	116	-	118	Aplite dyke.
		-	591	End of hole.

UNDERGROUND

2 - 1	456.8			End of hole.
2 - 2	160.8	-	161.6	Mineralized zone.
		-	552	End of hole.
2 - 3	199	-	199.5	Aplite dyke.
	200.5	-	201.5	Aplite dyke.
	314	-	315	Aplite dyke.
	341.9	-	346.9	Mineralized zone.
		-	376	End of hole.
2 - 4	307.3	-	313.7	Heavily mineralized zone.
	413.4	-	414.7	Mineralized zone.
	426.3	-	431.3	Andesite dyke.
	431.3	-	432.3	Mineralized zone.
		-	546	End of hole.
2 - 5	11.4	-	12.4	Mineralized zone.
		-	151.5	End of hole.
2 - 6	2.4	-	3.5	Mineralized zone.
	18.3	-	21.7	Mineralized zone.
	43.7	-	44.8	Mineralized zone.
	72.6	-	74.5	Lightly mineralized zone.
	118.9	-	121.3	Andesite dyke.
	211.5	-	212.7	Mineralized zone.
	259.2	-	260.2	Heavily mineralized zone.
	345	-	347.7	Heavily mineralized zone.
	432.6	-	437.6	Aplite dyke (?)
	448.3	-	453.5	Mineralized zone.
2 - 7	230.5	-	235.2	Mineralized zone.
	249	-	250.2	Dark grey speckled dyke.
	364.3	-	368	Basic dyke.
	408	-	408.3	Basic dyke.
	417.6	-	426.3	Mineralized zone.
	426.3	-	427.3	Andesite dyke.
	427.3	-	440.5	Mineralized zone.
		-	547	End of hole.

2 - 8	41.8	-	52.8	Aplite dyke.
	163	-	166.3	Andesite dyke.
	177.3	-	178.4	Andesite dyke.
	184	-	185	Aplite dyke.
	317.8	-	323.5	Mineralized zone.
	326.2	-	328.9	Mineralized zone.
	335.7	-	336.7	Mineralized zone.
		-	403	End of hole.
2 - 9	55.0	-	60.2	Lightly mineralized zone.
	143.5	-	157.4	Lightly mineralized zone.
	401	-	414	Basic dyke.
		-	418	End of hole.
2 - 10	23.8	-	26.3	Lightly mineralized zone.
	304	-	304.5	Aplite dyke.
	348	-	350	Andesite dyke.
		-	358	End of hole.
2 - 11	189	-	189.5	Aplite dyke.
		-	424	End of hole.
2 - 12	18	-	19	Aplite dyke.
	351	-	352	Aplite dyke.
		-	506	End of hole.
2 - 13	103.2	-	105.3	Mineralized zone.
	116.4	-	117.3	Mineralized zone.
	124	-	125	Aplite dyke.
	378.6	-	379.6	Andesite dyke.
	379.6	-	382.2	Lightly mineralized zone.
	555	-	560	Andesite dyke.
	565	-	571.5	Andesite dyke.
	571.5	-	574.8	Mineralized zone.
	718.5	-	722.9	Mineralized zone.
	722.9	-	725.1	Andesite dyke.
	749	-	750	Aplite dyke.
		-	765	End of hole.
2 - 14	133.1	-	136.8	Mineralized zone.
	457	-	464.6	Andesite dyke.
	512.5	-	515.2	Mineralized zone.
	575	-	576	Aplite dyke.
		-	606	End of hole.
2 - 15	149.7	-	158.5	Andesite dyke.
	160.3	-	161.5	Andesite dyke.
		-	502	End of hole.

2 - 16	512.6 - 513	Basic dyke.
	534 - 534.7	Mineralized zone.
	577.4 - 578.2	Aplite dyke.
	830 - 831	Mineralized zone.
	- 884	End of hole.
2 - 17	289 - 291	Mineralized zone.
	331.6 - 333.2	Lightly mineralized zone.
	- 357.3	End of hole.

APPENDIX 2

RESULTS OF THE CHECK ASSAYS

Sample No.	Hole No.	Footage	Type	Peter Mack Cu	Peter Mack Au	Peter Mack Ag	U.S.B.M. Cu	U.S.B.M. Au	U.S.B.M. Ag
W152	2-13	260.4-264.5	Core	Tr.			Nil	Nil	Nil
230	S-13	303.7-309	Core	0.15					
225	2-17	331.6-333.2	Core	0.46					
229	2-17	290- -300	Sludge	0.77			0.82	Nil	Nil
166	2-14	133.1-136.8	Core	0.96					
145	2-13	103.2-105.3	Core	1.21					
64	2-6	2.4- 3.5	Core	1.38			1.37	Tr.	0.16
111	2-7	230.5-235.2	Core	1.82					
123	2-7	427.3-429.5	Core	2.25					
74	2-4	431.3-432.3	Core	2.36			2.49	.005	.10
224	2-17	289 -291	Core	2.67					
73	2-4	424.8-426.3	Core	2.91			2.99	.005	.10
231	S-13	309 -310	Core	3.20			3.26	Nil	Nil
84	2-6	345 -347.7	Core	4.25	Tr.	0.30			
110	2-8	290 -300	Sludge	5.44			5.68	.005	.40
55	2-4	307.3-313.7	Core	5.96	.01	0.20	6.13	.01	.30

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

RECEIVED
DEC - 5 1955

November 29, 1955

Hugesebard
Betty

Mr. George C. Selfridge, Chairman
Operating Committee, DME
Department of the Interior
Washington 25, D. C.

Re: Docket No. 1[illegible]-2612 (copper)
Granore Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-[illegible]

Dear Mr. Selfridge:

Exploration of the Sunset mine by the Granore Company has been completed and the Operator's final report, received November 21, 1955, is acceptable to the Field Team. The original and two copies are enclosed.

On the basis of the Operator's reserve calculations, summarized below, we recommend that a Certification of Discovery be issued.

Indicated ore reserves are in a mineralized zone. Ladiere "B" ore body, previously located by the Bureau of Mines. Assuming no dilution this ore body contains 24,400 tons of ore averaging 7.22 percent copper. Inferred ore reserves are in three blocks: (1) Harrington-Westward extension that contains 44 tons of rock per vertical foot and averages 4.25 percent copper; (2) Harrington-Eastward extension that contains 255 tons of rock per vertical foot and averages 4.20 percent copper; and (3) Johnson and Red Devil that contains 120 tons of rock and averages 2.32 percent copper.

By Field Team, Region 1, NW Dist.

[illegible] Weissenborn, Exec. Officer
U. S. Geological Survey

[illegible] Wing G. [illegible], Member
U. S. Bureau of Mines

cc: DEM (2)
DEM (2)
Keller

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

1201 N. Division St.
Spokane 2, Washington
October 25, 1955

MEMORANDUM

To: DMEA Field Team, Region I, Northwest District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Diamond drill core, Sunset Mine, Granore Company, Snohomish County, Washington, Docket No. DMEA 2612 (copper, Contract No. Idm-E489

The diamond drill core from the subject project has been stripped and shipped to the USBM diamond drill core library at Albany, Oregon. The total footage drilled amounted to 16472.8 feet. This was stripped to 192 boxes (25 ft. of core per box). Stripping was carried out by the Bureau of Mines and by Granore Company, the Operators.

In stripping the core, all split core was retained, as was any core showing alteration, evidence of faulting, dikes or minute amounts of copper mineralization. In other words, only unaltered granodiorite was discarded. Even in granodiorite at least one piece was retained from each run.

E. A. Magill

Orig. & 3 cys - Wash.
USGS (2)
DMEA
M/D
AD
EAM/he

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane, Washington

September 28, 1955

Mr. J. H. Parliament
Granore Company
1640 Exchange Building
Seattle 4, Washington

Re: Docket No. DMEA-2612 (copper)
Granore Company
(assignee of Index Mining Company)
Snohomish County, Washington
Contract No. Idm-5489

Dear Mr. Parliament:

This is to confirm your request for extension of DDH No. 2, Group 2, and the DDH of Group 3 to 700 feet, each as requested by your letter of August 23, 1955.

Regarding your request to drill two -45° holes under Trout Creek, it is our understanding that after discussing the situation with our field men this drilling will not be undertaken.

By Field Team, Region I, NW Dist.

R. E. Weissenborn, Executive Officer
U. S. Geological Survey

Stephen W. Zoldok, Acting Member
U. S. Bureau of Mines

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D.C.~~
1201 N. Division St.
Spokane 2, Washington
August 29, 1955

MEMORANDUM

To: DMEA Field Team, Region I, Northwest District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Proposed drill hole changes, Docket No. DMEA 2612 (copper), Granore Company, assignee of Index Mining Co., Snohomish County, Washington, Contract No. Idm-E489

Attached is a letter from Granore Company, requesting several changes in their drilling program.

The Operator had previously requested permission to drill holes "U" and "V"; however, permission was never granted by the Field Team and consequently no action is necessary in connection with these two holes.

The Operator has requested permission to lengthen DDH #2, Group 2 (Map 50-28-0 Rev.) and the DDH in Group 3 to 700 feet each. I believe that permission should be granted for this as these holes will then give a complete cross section east of the mine workings.

Permission has been requested for two minus 45° holes about 200 feet on either side of DDH 2-13. These holes are to be about 400 feet in length to test the mineralization found under Trout Creek by DDH 2-13. I believe that holes under Trout Creek are very definitely called for; however, I would like to see shorter holes and if the first two are encouraging, possibly a series of holes farther up and down the creek. I would think that minus 30° 250-foot holes would be a little better initially than 400-foot holes. I do not believe it is necessary for the first holes to test the structure at too great a depth below the creek bottom. Of course, there is always the possibility that the copper may have leached out some distance below the creek. It is also reported that good copper mineralization has been observed in the bottom of the creek near the bridge at the west end of the camp. Consequently, I believe that permission should be granted for three holes about 250 feet in length to test for mineralization under Trout Creek. If these holes are encouraging, they should be followed by a series of holes along the creek.

E. A. Magill

Orig. & 3 cys - Wash.
USGS (2)
DMEA
AD
eam/he

Elliott 5133

GRANORE COMPANY
1640 Exchange Building
Seattle 4, Washington

RECEIVED
OCT 6 - 1955

August 23, 1955

Mr. E. A. Magill
The United States Department of the Interior
Federal Office Building
Seattle 4, Washington

Re: Docket No. DMEA-2612
Contract No. Idm-E489

Dear Mr. Magill:

I am sorry I was not able to see you when I was in Seattle today. We phoned you several times from Mr. MacRae's office but apparently missed you.

Last Thursday we had a conference with Mr. Postle and Dr. Buffam. It was decided not to drill holes "U" and "V" which were designed to test the Sunset vein at depth. From the results of our other drilling we feel that these holes are too long and expensive for the information we would obtain.

Regarding surface drilling we would like to lengthen D.D.H. #2, Group 2 (Map 50-28-0 Rev.) and the D.D.H. in Group 3 to 700 feet each. As we agreed during your last visit to Index, these holes together with D.D.H. #4, Group 4, would give a very desirable continuous section across the structure East of the mine workings.

Also we would like to drill two -45° holes, each approximately 400 feet long, to the Southwest under Trout Creek. These holes would be collared about 200 feet on each side of D.D.H. 2-13 and drilled parallel to it. They are designed to further test the mineralization found under Trout Creek by D.D.H. 2-13.

We would appreciate it if you would discuss these proposals with your colleagues and let us know if we may proceed with these changes.

Yours very truly,

J. H. Parliament /s/

J. H. Parliament
Chief Engineer

C O P Y

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

RECEIVED
JUL 26 1955

1201 N. Division St.
Spokane 2, Washington
July 21, 1955

MEMORANDUM

To: DMEA Field Team, Region I, Northwest District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Docket No. DMEA 2612 (copper)
Granore Company, assignee of Index Mining Co.,
Sunset Mine, Snohomish County, Washington
Contract No. Idm-E489

Mr. Robert MacRae of Granore Company has requested that all correspondence regarding the subject contract be forwarded to:

Granore Company
1640 Exchange Building
Seattle 4, Washington

DMEA (2)
USGS (2)
USBM (AD)

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

RECEIVED
AUG - 1 1955

July 26, 1955

Mr. J. H. Parliament
Granore Company
Index, Washington

Re: Docket No. DMEA-2612 (copper)
Granore Company
(Assignee of Index Mining Co.)
Sunset mine
Snohomish County, Washington
Contract Idm-E489

Dear Mr. Parliament:

This is your authorization to drill underground diamond drill holes "Q" and "R" totaling 1,000 feet, as requested in your letter of July 8, 1955.

We have also received your proposal of July 22, 1955, in which you state further desired changes to be made in the drilling on the surface and underground. Inasmuch as surface drilling of geophysical anomalies in groups 7 and 8 indicates no ore in holes presently completed, omission of the remaining hole in group 7, and the remaining 3 holes in group 8, as indicated on your map 50-28-0, is authorized. On the same map, in groups 5 and 6, the proposed lengthening of one hole of each group to 700 feet, in order to provide a continuous diamond drill section of the westward projection of the mine structures, is authorized. Omission of any drill holes in either of groups 5 or 6, however, will depend on results of previous drilling.

Underground drilling changes, as proposed in your letter of July 22, are approved in part. Omission of DDH's "G" and "C" is authorized inasmuch as the four holes already testing portions of this area do not indicate minerals of ore grade. Proposed DDH's "S", "T", "U", "V", "W", and extension of "D" (alternate) will be discussed with you before a decision is made; also, their approval requires amending the contract in order to transfer drilling footage from surface to underground.

By Field Team, Region I
Northwest District

Wing G. Agnew, Acting Exec. Officer
U. S. Bureau of Mines

cc: Granore Company
Seattle, Washington
DMEA (2) w/copies incoming & Magill's memo dated 7/20/55
USBM (2)
USBM (AD)
Kellum

Verne C. Fryklund, Jr., Acting Member
U. S. Geological Survey

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

RECEIVED
AUG - 1 1955

1201 N. Division St.
Spokane 2, Washington
July 20, 1955

MEMORANDUM

To: DMEA Field Team, Region I, Northwest District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Proposed amendment, Docket No. DMEA 2612 (copper), Granore Company, assignee of Index Mining Company, Sunset Mine, Snohomish County, Washington, Contract No. Idm-E489 (copper)

Attached is a letter from the Granore Company, requesting a change in the location of some of the proposed diamond drill holes at the subject property. Also attached is a map showing the proposed location of the drill holes.

They would like to drill two additional 500-foot holes underground as shown on the map, the footage from these holes to be taken from the surface drilling. These two additional holes will probe for parallel veins to the north of the presently known veins. The existence of such veins is known from surface outcrops. No attempt has been made to explore these veins on the surface because of the steep cliffs and overburden.

It would appear to me that these two holes would have just as good or better chance of finding mineralization as some of the proposed surface holes. Therefore, it is suggested that a Field Team letter be written to the Operator, authorizing the drilling of holes "Q" and "R" as shown on the map attached to their request.

Orig. & 3 cys - Wash.
USGS (2)
DMEA
AD
EAM/he

E. A. Magill

For Mgr. See Map Folder
Map # 50-40-1- 8/1/55 (Paid)

GRANORE COMPANY

INDEX, WASHINGTON

P.O.Box 256

RECEIVED
AUG - 1 1955

July 8,1955

Mr.A.E.Weissenborn
Executive Officer
U.S,G.S.
So. 157 Howard St.
Spokane,Wash.

Re: Docket No.D.M.E.A. 2612 (copper)
Amended Cont.No.Idm.E.489

Dear Mr. Weissenborn:

To date our drilling of the geophysical anomalies from surface ,west of the Sunset Mine workings,has given negative results.After a conference yesterday with Mr.Magill, Mr. Kellum, and Mr. Postle, our president, we feel that part of the proposed surface drilling could be done more advantageously elsewhere. We propose drilling only a part of each group of holes on the anomalies until we see what further results are obtained.

In place of part of this drilling we propose drilling two holes each 500 ft. long from underground,as shown on the accompanying map. These holes would explore for veins parallel to the Sunset Mine structure.

Although the Copper King vein has arelatively good surface outcrop, it is very weak on #2 Level,and the area south of it is practically barren. It therefore seems possible that the real Copper King vein could lie north of the #2 Level drift. It also seems possible that veins similar to the Red Devil and Little Copper King could exist in the unexplored ground north of them.

We will continue our underground drilling program as previously outlined. If the two new proposed holes seem reasonable to you, and we obtain your permission, we would drill them after the holes already authorized.

Yours very truly,

J.H.Parliament

Chief Engineer

c.c.E.A.Magill

RECEIVED
AUG - 1 1955

GRANORE COMPANY

INDEX, WASHINGTON

Don K. F.T. Letter file 7/25
Derse

July 22, 1955.

Mr. A.E. Weissenborn,
Executive Officer,
U.S.G.S.,
So. 157 Howard St.,
Spokane, Wash.

USBM

Re: Docket No. D.M.E.A. 2612 (copper)
Amended Cont. No. Idm. E. 489

Dear Mr. Weissenborn:

During Mr. Postle's last visit to Index we again discussed the drilling program at the Sunset Mine in the light of the latest information. We consequently have several changes and new proposals for your consideration and approval.

DMEA

UNDERGROUND DRILLING

D.D.H.s 2-9, 2-10, 2-11 and 2-3, drilled to the south-west of the Sunset vein, proved practically barren. We therefore wish to omit proposed drill holes "C" and "G" which would further explore this area.

In addition to holes "Q" and "R", proposed in my letter of July 8th, we wish to drill the following holes:

1. A plus 30° hole and a minus 30° hole in the same vertical plane as D.D.H. 2-4 to test the vertical continuity of the vein structure intersected in D.D.H.s 2-4, 2-7, and 2-8. As there is no information from surface outcrop or mine workings above or below No. 2 Level in this immediate area, we regard these holes as purely exploratory. (Proposed holes "S" and "T" on accompanying map)
2. Two minus 45° holes to explore the main Sunset vein at depth ("U" and "V" on map).
3. A short hole "W" and lengthening of hole "D" to explore for an eastward continuation of the Little Copper King vein.

GRANORE COMPANY

INDEX, WASHINGTON

SURFACE DRILLING

On surface D.D.H.s S-6 and S-7 were barren of mineralization or interesting structure. We therefore wish to omit the remaining holes of Group 8 (on surface map 50 - 28 - 0).

We wish to extend both proposed hole 3 in Group 5 and proposed hole 2 in Group 6 to 700 feet. This will complete a section across the westward projection of the entire mine structure. I f hole 3, Group 6, proved barren, the remaining two holes of the group would be omitted.

We hope these proposed changes appear reasonable to you and that you will give us permission to procede with them.

Will you please direct correspondence regarding this program to the Granore Company at our Index address or to the main office of the Company at 1640 Exchange Building, Seattle 4, Wash.?

Yours very truly,

J.H. Parliament
Chief Engineer.

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

So. 157 Howard Street
Spokane 4, Washington

June 20, 1955

Mr. J. H. Parliament
P. O. Box 256
Index, Washington

Re: Docket No. DMEA-2612 (copper)
Grancore Company
Assignee of Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-8489

Dear Mr. Parliament:

Our field examiners report that you desire to keep only a skeleton portion of the diamond drill core which you are recovering under the current DMEA exploration program. They state that you desire to keep only a small portion of the core in an effort to conserve your limited supply of core boxes. Inasmuch as the geology of the mine is relatively simple and apparently the ore zones are definitely related to the somewhat altered portions of the grano-diorite, there seems to be no reason why it should be necessary for you to keep a great amount of the core that has been recovered in the unaltered rock.

Therefore, after our representatives have completed their examination of the core it will be acceptable to us if you retain only that portion of the core which shows definite evidence of alteration or mineralization which may be of interest in later study. Our examiners report that you are doing a very competent job of supervision of the project and they believe that you can use your own discretion as to which parts of the core should be kept. If you have any further questions either contact us at this office or Mr. Magill in Seattle.

By Field Team, Region I, NW District

R. E. Weissenborn, Executive Officer
U. S. Geological Survey

cc: DMEA (2)
USBM (2)
Kellum

King G. Agnew, Member
U. S. Bureau of Mines

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

May 18, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-E489

Dear Mr. Selfridge:

Enclosed are the Government, Docket, and Division copies of Assignment of Contract executed by Index Mining Company and Granore Company, Consent to Lien executed by Index Mining Company, and Subordination Agreement executed by Mr. Earl Smith.

Distribution of these documents is being made in the usual manner.

Sincerely yours,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District

Attachments 3 (in trip.)
cc: Finance Office w/encls.
USBM (2)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

[redacted]
No. 157 Howard Street
Spokane 4, Washington

May 5, 1955

Special Delivery

Bobby

Mr. J. H. Parliament
P. O. Box 256
Index, Washington

Re: Contract No. DMEA-6612 (copper)
Index Mining Company
Bennett Mine
Snohomish County, Washington
Amended Contract No. 16m-1489

Dear Mr. Parliament:

Please refer to previous correspondence and our telephone conversations regarding the assignment of the above-cited contract from Index Mining Company to Gruners Company. Enclosed are the following documents for approval and signature of the parties concerned:

(1) The original and six copies of an assignment which must be executed by Index Mining Company, assignor, and Gruners Company, assignee. This assignment replaces the previously executed assignment containing a clause to which our Legal Division objected. After signing by both parties, retain the assignor and assignee copies and return the rest to us.

(2) The original and five copies of a Consent to Lien, on the new form, replacing the one previously executed and submitted by Index Mining Company. After signing by Index Mining Company retain one copy which is to be attached to the Operator's Copy of the contract, and return the rest to us.

(3) The original and five copies of a Subordination Agreement, to be submitted to Mr. Earl Smith for signature. Our Legal Division requests this as the property in question is still subject to royalty payments by the Index Mining Company to the Smith Group. This instrument merely gives Mr. Smith's consent to the payment of royalty to the Defense Minerals Exploration Administration ahead of payment to him. Actually, both royalty payments will probably be made at the same time. One copy of this is to be attached to the Operator's Copy of the contract, returning the rest to us.

We are sending along a sample of extra copies of the Consent to Lien and Subordination Agreement forms in the event you wish to prepare copies for anyone.

Sincerely,

A. E. Weissenborn
Executive Officer, DMA.
Field Team, Region 2
Northwest District

Enclosures as indicated

cc: Granby Cons. Mining Smelting
and Power Company, Ltd.
675 West Hastings Street
Vancouver, B. C., Canada

G. T. Evanson, President
Index Mining Company
2340 Main Vista Place
Seattle 99, Washington

Eagle, Eagle, & Gates
(Attorneys for Index)
6th Floor Central Building
Seattle 4, Washington
Attn: Donald E. Leland

DMEA (2)
USBM (2)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

May 4, 1955

Memorandum for the File

From: W. P. Klugescheid, Base Metals Division

Subject: Index Mining Company, Sunset Mine, Snohomish County, Washington, Docket No. DMEA-2612

On this date I phoned A. E. Weissenborn, Executive Officer, Region I, Northwest District to give him the latest information regarding papers concerning this project.

I told him that all the legal papers (Assignment, Consent to Lien, and Subordination Agreement) had gone through the Operating Committee the previous day and were being sent to him by airmail.

I explained that the delay was not of our doing and that with these papers there should not be any further hitch to the carrying on of the work by the Granore people.

The papers had been delayed after the Committee meeting as Mr. Mittendorf could not sign the Assignment until the legal division waived a condition they had in the letter accompanying the legal papers. This was obtained and the Assignment was executed here.

W. P. Klugescheid

W. P. Klugescheid

WPR/er 5/11/55

Copy to: Docket
Base Metals
Chron.

File Copy
Surname
Klugescheid
Weissenborn
Chronister
Martin
Fe Johnson
Weissendorf
Corbin
Hoffland

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

MAY - 4 1955

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-2489

Dear Mr. Weissenborn:

With reference to your teletype of April 25, the letter to you dated April 20 from the Operator's attorneys, and our teletype of April 27, we are enclosing the following papers:

(1) The original and six copies of an assignment which must be executed and which replace the previously executed assignment containing a clause to which the legal division objected. Kindly present it to the Index Mining Company and the Gramore Company for their approval and signatures.

(2) The original and five copies of a Consent to Lien, on the new form, replacing the ones you recently submitted, but which were not acceptable to the legal division. These should be presented to the Index Mining Company for signature.

(3) The original and five copies of a Subordination Agreement, to be submitted to Mr. Earl Smith for signature, were requested by our legal division insofar as the property in question is still subject to royalty payments by the Index Mining Company to the Smith Group.

When the above documents have been completed, please distribute the copies in the usual manner.

Sincerely yours,

W. S. Martin
ACTING Chairman, Operating Committee (2/6)

Enclosures

APPROVED:

M. E. Volin (2/6)
Member, Bureau of Mines

/s/ R. D. Trace (2/6)
Member, Geological Survey

Mr. Volin, USBM
Mr. Kiilsgaard, USGS
Chron.

WPKlugescheid/er 4/28/55
Copy to: Docket
Admr. R. File
Op. Committee
Base Metals

R.C.G.

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

April 27, 1955

Memorandum for the File

From: W. P. Klugescheid, Base Metals Division

Subject: Index Mining Company, Sunset Mine, Snohomish County, Washington, Docket No. DMEA-2612

On this date Mr. J. Alt phoned A. E. Weissenborn, Executive Officer, Region I, Northwest District and at the end of their conversation, Weissenborn wished to speak to me.

Mr. Weissenborn wished to know the status of the Index Mining Company's contract as far as Washington is concerned.

I told him that the Assignment had been drawn up by the legal division and that it was being presented to the Operating Committee. I also told him that all other papers such as the Consent to Lien and the Subordination Agreement were also to go to the Committee and that everything should be in his hands in a few days.

He said that the Granore people were bothering him all the time and that they were very anxious to go to work on the contract. He wondered if it would not be safe to tell them that they could go ahead but, I told him that as most of the matters pending were all legal and depended on acceptance by both sides, that I thought it would be better to wait. He agreed that I was probably right and said that he would tell the Granore group that everything should be in his hands for them to sign sometime next week and then they would be able to proceed without any fear of complications.

W. P. Klugescheid

W. P. Klugescheid

WPKlugescheid/er 5/2/55

Copy to: Docket
Base Metals
Chron.

File Copy
Surname
Klugescheid
Quinnel
Selfridge
Johnson
Wallendorf

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

APR 27 1955

WPKlugescheid/er Rm. 4442, Ext. 3669

Base Metals Div. DMEA, Interior

14X4401(01) Revolving Fund,
Defense Production Act, Interior (allocated
Working Fund to Office of the Secy.)

TELETYPE

Date:

To: A. E. Weissenborn, Executive Officer, DMEA Field Team, Region I, Northwest District, Spokane, Washington

Reurtt April 25, Docket DMEA-2611, Index Mining Company, Contract Idm-2489. Assignment being presented to Operating Committee April 27. Will be forwarded to you immediately thereafter. We will also require subordination agreement from Smith and OCL from Index on new forms. Both will be prepared here and sent with assignment.

George C. Selfridge
by ESF
Chairman, Operating Committee

(written 2/27/55)

Copy to: Docket
Admr. R. File
Op. Committee
Base Metals
Mr. Bishop
Mr. Kiilsgaard
Chron.

R.S.F.

Minerals Administration
RECEIVED
APR 26 1955

RECEIVED
APR 25 7 20 PM '55
COMMUNICATIONS

AXXXXXXX-062K

AXXXXXXX-063K

AXXXXXXX-064K

XDXXXXXX-065K

YWB046 WAF SP 32 I- GS-G

SPOKANE WN 4-25-55 1150A

GEORGE D SELFRIDGE CHAIRMAN OPEERATING COMM DMEA

WA

RE DOCKET # DMEA-2612 INDEX MINING COMPANY. ON APRIL 22 WE AIRMAILED COPIES OF LETTER RECEIVED FROM COMPANY STATING THEY NOW HAVE TITLE TO NORTH EAST QUARTER OF SECTION TWO. IS THIS SATISFACTORY? PLEASE WIRE WHEN ASSIGNMENT IS MAILED. GRANORE READY TO BEGIN DRILLING AND IS PRESSING US. WITH REFERENCE TO HOFFLUND'S MEMORANDUM OF APRIL 8 ATTACHED TO YOUR LETTER OF APRIL 21 RECEIVED THIS MORNING, WE BELIEVE ANY CHANGES IN 4TH PARAGRAPH OF ASSIGNMENT THAT LEGAL DEEMS EXPEDIENT WILL BE ACCEPTABLETO THE OPERATOR.

A E WEISSENBORN DMEA REGION 1 NORTHWEST DISTRICT

DMEA 2612 22 8 21 4TH

MAH 1153A

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

APR 22 1955.

Memorandum

To: The Administrator, DMEA
Attention: W. R. Griswold

From: Acting Assistant Solicitor, Defense Minerals

Subject: Docket No. DMEA-1612, Contract Idm-2489, Index Mining Company (Copper)

As requested in Mr. Griswold's two memoranda of April 18, we have prepared an assignment of the Amended Contract, and an Amendment No. 1 to the Amended Contract, to carry out the recommendations set forth in our memorandum dated April 8 to the Administrator.

It will be noted that Amendment No. 1 has been prepared for the signature of Granore Company, and should be executed by that Company after execution of the Assignment and the Government's consent thereto have been completed.

The Consent to Lien of the Lessor of the land which is the subject of Amendment No. 1 should be obtained, as well as a copy of the lease, prior to the Government consenting to the assignment.

J. L. Hofflund

J. L. Hofflund
Acting Assistant Solicitor

Attachments

HCRubin/emd
Copy to: Solicitor's Docket
√DMEA Docket
W. R. Griswold (2)
J. L. Hofflund
H. C. Rubin
chron.

NOTE: Amendment No. 1 was not used as the Index Mining Company completed its purchase of the land in question, and is now subject to a royalty on this land up to $10,000 in the event of production from this area. A Subordination Agreement, signed by Earl Smith, is being obtained to cover this.

Klugescheid

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

April 22, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

Enclosed are two copies of a letter dated April 20, 1955, from the attorneys for the Index Mining Company relative to the property in the NE$\frac{1}{4}$ of section 2 which you referred to in your teletype of April 18, 1955. According to this letter, the property is now in the possession of the Index Mining Company by virtue of a purchase contract and deed.

Will you please advise whether the attorneys are correct in stating that under these circumstances a Consent to Lien from Earl Smith, Trustee, will not be required.

Sincerely,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District

Enclosure 1 (in dupl.)

cc: USBM (2)
Puffett

W. H. BOGLE-1927
WARREN BROWN, JR.-1941
RAY DUMETT-1947

LAWRENCE BOGLE
CASSIUS E. GATES
EDWARD G. DOBRIN
CLAUDE E. WAKEFIELD
STANLEY B. LONG
GEORGE F. KACHLEIN, JR.
FRANK L. MEYCHEM
DONALD E. LELAND
ROBERT W. GRAHAM
CHARLES T. OSBORN
EDW. S. FRANKLIN
TOM M. ALDERSON
THOMAS L. MORROW
ORLO B. KELLOGG

LAW OFFICES OF
BOGLE, BOGLE & GATES
6TH FLOOR CENTRAL BUILDING
SEATTLE 4
CABLE ADDRESS BOGLE SEATTLE
MUTUAL 5151

MAX KAMINOFF
ARTHUR B. GRUNKE
ROBERT W. HOLLAND
J. TYLER HULL
H. BAYARD CRUTCHER
EDWARD C. BIELE
WALTER B. WILLIAMS
J. KENNETH BRODY
C. CALVERT KNUDSEN
RUSSELL A. POTTER
GEORGE N. PRINCE
ROBERT A. STEWART
PAUL A. WALLACE, JR.

April 20, 1955

REFER TO	ACTION	NOTED	DATE
[illegible]			
[illegible]			
ANSWERED			

Mr. A. E. Weissenborn
United States Department of Interior
Defense Minerals Exploration Administration
South 157 Howard Street
Spokane, Washington

Re: Docket No. DMEA-2612 (Copper)
Sunset Mine - Snohomish County,
Washington; Contract No. Idm-5489

Dear Mr. Weissenborn:

With reference to the wire from Mr. George C. Selfridge to Mr. A. E. Weissenborn under date April 18, 1955, on the subject of the above contract, we have the following to report:

The real property described as the Northeast one-quarter of Section 2, Township 27 North, Range 10 E.W.M. Snohomish County, State of Washington, was being purchased from Earl Smith, Trustee, of Index, Washington, under the usual form of real estate contract. Since the contract had but six additional monthly instalments remaining to be paid before the deed was available to the purchaser, the Index Mining Company elected at this time to pay off the balance of the contract and take title to the property forthwith. This has been completed and title is presently in Index Mining Company, free and clear except for a 3% royalty provision, which is applicable in favor of the seller, Earl Smith, Trustee, in accordance with the provision in the contract and in the deed which reads as follows:

"The grantee covenants and agrees to pay to the grantor a royalty of 3% of the net smelter returns (after payment of all transportation and freight charges and all treatment and reduction charges in connection with the smelting, refining or processing of the ore) on any ore or minerals which shall be taken from the property conveyed hereunder, until the total amount so paid to grantor is $10,000.00. Any amount owing

RECEIVED
airmail
APR 21 1955
U. S. G. S.
SPOKANE, WASH.

File Copy
Surname
Klugescheid
Selfridge
Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

APR 21 1955

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-E489

Dear Mr. Weissenborn:

We refer to our teletype of April 18, in answer to your telephone call of April 15.

We are enclosing two copies of the memorandum from the Acting Assistant Solicitor, Defense Minerals, to the Administrator, which refers, in paragraph 1, to the land for which a Consent to Lien must be obtained and concerning which our legal division has been asked to prepare an amendment.

The legal division has also been requested to prepare an assignment to replace the one to which they objected and would not approve.

We will forward these various papers to you are soon as we receive them.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (24B)

Enclosures

APPROVED:

J. H. Hedges (24B)
Member, Bureau of Mines

Thor H. Kiilsgaard (24B)
Member, Geological Survey

WPKlugescheid/er 5/18/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. M. Volin, USBM
Mr. Kiilsgaard, USGS
Chron.

R.C.B.

> on account of such royalties shall be a lien upon the land hereby conveyed, which may be enforced in the same manner as a mortgage lien. This covenant shall be binding upon and enure to the benefit of the successors in interest of the grantee and the grantor, respectively, and shall run with the land."

It will be noted that the 3% royalty payment would not in any respect interfere with the payment of the Government's royalty, which it would be entitled to under the Amended Exploration Project Contract. Both royalties would, of course, be paid from the first 8% of any net returns.

In view of the foregoing, it would appear to us that it should not be necessary to obtain any consent to lien on the part of Earl Smith, Trustee, inasmuch as Index Mining Company is fully entitled without any consent or subordination from Earl Smith, Trustee, to grant to the Government the right to a 5% royalty from any net proceeds from the property. The Index Mining Company have advised us of their complete willingness to enter into any amendment of the instant Exploration Project Contract which may be deemed necessary if a more complete disclosure as to the status of the title is deemed essential. We trust, however, that the developments referred to hereinabove will make this unnecessary since full legal title is presently in Index Mining Company, subject only to a royalty payment which does not in any manner conflict with the royalty rights granted to the Government in the instant Exploration Project Contract.

The wire from Mr. Selfridge also refers to the preparation of a new assignment form which would delete one paragraph which was included in the prior form of assignment. As soon as the new form has been received, we shall be pleased to have it executed by the parties and returned to you promptly.

Very truly yours,

BOGLE, BOGLE & GATES

By Donald E. Leland,
Attorneys for Index Mining Co.

File Copy
Surname
Klugescheid
Selfridge
Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

APR 21 1955

Mr. A. E. Weissenborn
Executive Officer
DMEA Field Team, Region I
Northwest District
South 157 Howard Street
Spokane 4, Washington

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Amended Contract No. Idm-E489

Dear Mr. Weissenborn:

We refer to our teletype of April 18, in answer to your telephone call of April 15.

We are enclosing two copies of the memorandum from the Acting Assistant Solicitor, Defense Minerals, to the Administrator, which refers, in paragraph 1, to the land for which a Consent to Lien must be obtained and concerning which our legal division has been asked to prepare an amendment.

The legal division has also been requested to prepare an assignment to replace the one to which they objected and would not approve.

We will forward these various papers to you are soon as we receive them.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (GCS)

Enclosures

APPROVED:

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

Thor H. Kiilsgaard (THK)
Member, Geological Survey

WPKlugescheid/er 5/18/55
Copy to: Docket
Admr R File
Op. Committee
Base Metals
Mr. M. Volin, USBM
Mr. Kiilsgaard, USGS
Chron.

R.C.S.

File Copy
Surname
Klugescheid.

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

April 18, 1955

Memorandum

To: Acting Assistant Solicitor, Defense Minerals

From: Chief, Base Metals Division

Subject: Preparation of Amendment No. 1 for Docket No. DMLA-2612, Amended Contract No. Idm-E189, Index Mining Co., Sunset Mine, Snohomish County, Washington, (Copper(

Will you please prepare Amendment No. 1 to the cited amended contract. This amendment will cover the land which the contract recites as being owned by the Index Mining Company, and is actually held under a purchase contract with Earl Smith, a trustee for judgment creditors.

Please refer to the memorandum dated April 8, from Acting Assistant Solicitor, Defense Minerals, paragraph 1, and to paragraph (b) of Exhibit "A" to Lease between Index Mining Co., and Granore Company.

W. R. Griswold

W. R. Griswold

WPKlugescheid/er

Copy to: Docket
Base Metals
Chron.

File Copy
Surname
Klugescheid

UNITED STATES
DEPARTMENT OF THE INTERIOR 500
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

April 18, 1955

Memorandum

To: Acting Assistant Solicitor, Defense Minerals

From: Chief, Base Metals Division

Subject: Preparation of Assignment for Docket No. DMEA-2612, Amended Contract No. Idm-E489, Index Mining Company, Sunset Mine, Snohomish County, Washington, Copper.

Will you please prepare an Assignment of Contract for the cited amended contract by the Index Mining Company, a Washington Corporation (Assignor) to the Granore Company, a Washington Corporation (Assignee).

Please refer to the memorandum dated April 8, from Acting Assistant Solicitor, Defense Minerals, and to the unaccepted assignment of contract.

W. R. Griswold

W. R. Griswold

WPKlugescheid/er

Copy to: Docket
Base Metals
Chron.

File Copy
Surname
W.P. Klugescheid
Mr Hendorf

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

APR 18 1955

WPKlugscheid/er, Rm. 4442, Ext.2690

Base Metals, DMEA, Interior

14X4401(01) Revolving Fund, Defense Production Act, Interior (allocated Working Fund to Office of Secy.)

T E L E T Y P E

Date:

To: Mr. A. A. Weissenborn, Executive Officer, DMEA Field Team, Region I, Northwest District, Spokane, Washington

Reurtel call to Mr. Selfridge April 15, Docket DMEA 2612, Index Mining Company, Contract Idm-2489. Article 2 of Contract must be amended to recite true fact as to NE¼ of Section 2. Amendment will be preparedhere. Proper Consent to Lien of Trustee must be obtained before any payment is made under the Amended Contract. Legal objects to 4th paragraph on Page 1 of the assignment which should be deleted. Washington will draw up assignment. Letter follows.

George C. Selfridge
Chairman, Operating Committee (245)

WPKlugescheid/er Written 4/15/55

Copy to: Docket
Admr R. File
Op. Committee
Base Metals
Mr. Kiilsgaard, USGS
Mr. Volin, USBM
Chron.

R. Lily

Rubin
J.T.H

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

APR - 8 1955.

Memorandum

To: The Administrator, DMEA
Attention: E. W. Ellis

From: Acting Assistant Solicitor, Defense Minerals

Subject: Docket No. DMEA-2612 (Copper), Index Mining Company, Sunset Mine, Snohomish County, Washington, Contract No. Idm-E489

With a reference slip dated March 30 Mr. Ching asked that we review a letter dated March 28 from Mr. Weissenborn to the Operating Committee and 6 attachments referred to therein, in connection with the assignment of the subject amended contract by the Operator, Index Mining Company, to Granore Company, a State of Washington corporation, which is a wholly owned subsidiary of Granby Consolidated Mining, Smelting and Power Company, Ltd., a company incorporated in British Columbia, Canada. In reviewing this matter we did not have the benefit of attachment (5), a letter dated March 3, 1955, from the President of the Operator.

1. The Amended Contract recites that the Operator is the owner of all the land described in Annex 1. Actually, the lease to Granore recites (in Exhibit "A" thereto) that the NE ¼ of Section 2, which is part of the land included in the Amended Contract, is held under a purchase contract with Earl Smith, a trustee for judgment creditors. Accordingly, Article 2 of the Contract should be amended to recite the true fact as to the NE ¼ of Section 2, and the Consent to Lien of the Trustee should be obtained before any payment is made under the Amended Contract.

2. As to the assignment of the Amended Contract, the combination form submitted follows our generally accepted form except that in the fourth paragraph on page 1 the assignor has limited its consent to amendments and assignments to such as are ". . . not inconsistent with the terms and provisions of its lease agreement with the Assignee, ..."

The lease agreement is a complex document, and without some acceptable definition of what is "inconsistent" with it we are unable to approve the assignment with this reservation in it.

In this regard, as the Operator does not waive its rights under the lease in executing the assignment of the exploration contract and as it is bound under the OCL as to any amendments, we do not understand why the limitation has been placed in the assignment. Accordingly, the limitation must be deleted from the assignment, or the word "inconsistent" acceptably defined before we would approve the assignment.

J. L. Hofflund

J. L. Hofflund
Acting Assistant Solicitor,
Defense Minerals

HCRubin:gjb
4/7/55

Copy to: DMEA Docket
Sol. Docket
E. W. Ellis
J. L. Hofflund
H. C. Rubin
Chron. File

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D. C.~~
So. 157 Howard Street
Spokane 4, Washington

April 1, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

Reference is made to your letter of January 11, 1955, the last paragraph of which suggested that some justification was needed for underground DDH No. A in that it appears to have no target.

Enclosed is a memorandum by E. A. Magill giving the reasons for the drilling of this hole.

Very truly yours,

John S. Vhay

John S. Vhay
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I
Northwest District

Enclosure
cc: USBM (2)
Puffett

xxxxxxxxxxxxxxxxxxxx

1201 N. Division St.
Spokane 2, Washington
February 4, 1955

MEMORANDUM

To: DMEA Field Team, Region I, NW District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Justification of drill hole "A", Docket No. DMEA 2612 (copper) Indax Mining Company, Sunset Mine, Snohomish County, Washington, Contract No. Idm-5489

Reference is made to Mr. Selfridge's letter of January 11, 1955, regarding justification for drill hole "A" under the subject contract.

Drill hole "A" is a minus 30° hole to be drilled from underground in line with the main crosscut adit. This hole has a double purpose. The first is to test a vein which is exposed at the end of the timbers at the portal. This vein was intersected only a few feet beneath the overburden. It does not outcrop on the surface. The vein, where intersected, is several feet in width and shows good copper mineralization. No development work was done previously because of its location, i.e., near the portal and with no backs. The second reason for the drill hole is the fact that Quartz Creek flows in exactly the same direction as the strike of the major veins in the area. There is the very definite possibility that Quartz Creek has incised itself along a vein.

At the time the Bureau of Mines was exploring the Sunset mine in 1950 a hole similar to hole "A" was very seriously considered. Limitations in funds was all that prevented it from being drilled at that time.

E. A. Magill

Orig. & 3 cys - Wash.
USGS (2)
DMEA
H/D
AD
EAM/he

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

Defense Minerals Administration
RECEIVED
MAR 30 1955

March 28, 1955

VIA AIR MAIL

Mr. George C. Selfridge
Chairman, Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA 2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Wash.
Contract No. Idm-E489

Dear Mr. Selfridge:

Reference is made to previous correspondence concerning the operation of this mine, particularly to our letter of March 7, 1955 to Granby Consolidated.

Inasmuch as Granby Consolidated Mining, Smelting and Power Company, Ltd., through its operating subsidiary, Granore Company, has taken over the operation of this mine, we think it would be highly desirable to formally assign the contract, which is still in the name of Index Mining Company, to the Granore Company. We have discussed this matter with Mr. C. V. Brennan, President of Index, and a representative of Granore Company, and they are willing to make this assignment. They have supplied the following documents to this end:

(1) Lease dated March 23, 1955, between Index Mining Company, and Granore Company and Granby Consolidated Mining, Smelting and Power Company, Ltd.

(2) Owner's Consent to Lien executed by C. V. Brennan for Index Mining Company. (New consent will have to be obtained for it has been executed without the added provision under item 4.)

(3) Original and 3 copies of Assignment of Contract dated March 11, 1955. (Two ozalid copies are enclosed in addition to make the required number of copies.)

Enclosed also for your information are the following:

(4) Two copies of a letter dated March 11, 1955, from Bogle, Bogle and Gates, attorney for Index.

(5) Two copies of a letter dated March 3, 1955, from Mr. C. V. Brennan, Index Mining Company president.

(6) Memorandum to the field team by E. A. Magill dated March 25, 1955.

We trust that with these above documents this assignment can be made. If there is any difficulty please wire or telephone us immediately as the Granore Company is anxious to begin work.

Very truly yours,

A. E. Weissenborn

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region I, NW Dist.

Enclosures
as above

cc: USBM (2)
USBM (AD)
Puffett

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

RECEIVED
MAR 30 1955

March 25, 1955

MEMORANDUM

To: DMEA Field Team, Region I, NW District

From: E. A. Magill, Mining Engineer, U. S. Bureau of Mines

Subject: Docket No. DMEA-2612 (copper), Assignment of contract, Index Mining Company, Snohomish County, Washington, Contract No. Idm-E489.

Attached is a signed copy of the lease between Granore Company and Granby Consolidated Mining Smelting and Power Company Limited and Index Mining Company.

Mr. Harvey Parliment, mining engineer for the Granore Company, is on the property preparatory to commencing diamond drilling. A diamond drill contract has been let to Lynch Bros., diamond drill contractors of Seattle, Washington.

The Granore Company is very desirous of having the DMEA contract assigned to them before actually commencing drilling; consequently, it would be appreciated by the company if every effort was made to expedite the assignment. Assignment of Contract and Owner's Consent to Lien forms were forwarded to you on March 15.

E. A. Magill

Attachments
Distribution:
Wash.,D.C.(Orig.&3)
USGS(2)
USBM(AD)
Eng.
DMEA

Encl. (6)

W. H. BOGLE - 1927
WARREN BROWN, JR. - 1941
RAY DUMETT - 1947

LAWRENCE BOGLE
CASSIUS E. GATES
EDWARD G. DOBRIN
CLAUDE E. WAKEFIELD
STANLEY B. LONG
GEORGE F. KACHLEIN, JR.
FRANK L. MECHEM
DONALD E. LELAND
ROBERT W. GRAHAM
CHARLES F. OSBORN
EDW. S. FRANKLIN
TOM M. ALDERSON
THOMAS L. MORROW
ORLO B. KELLOGG

LAW OFFICES OF
BOGLE, BOGLE & GATES
6TH FLOOR CENTRAL BUILDING
SEATTLE 4

CABLE ADDRESS: "BOGLE SEATTLE"
MUTUAL 5151

COPY

MAX KAMINOFF
ARTHUR G. GRUNKE
ROBERT V. HOLLAND
J. TYLER HULL
M. BAYARD CRUTCHER
EDWARD C. BIELE
WALTER B. WILLIAMS
J. KENNETH BRODY
C. CALVERT KNUDSEN
RUSSELL A. POTTER
RUSSELL N. PRINCE
ROBERT A. STEWART
PAUL A. WALLACE, JR.

March 11, 1955

The United States Department of the Interior
Defense Minerals Exploration Administration
Seattle,
Washington

Attention: Mr. McGill

Re: Docket No. DMEA-2612 (Copper)
Sunset Mine, Snohomish County,
Washington; Contract No. Ion-1489

Gentlemen:

Subsequent to the preparation of the letter of March 3, 1955, enclosed herewith, from Index Mining Company to your Department, which has attached the duly executed forms required in connection with obtaining an assignment of the above-entitled contract, we have been furnished with a copy of a letter dated March 7, 1955, addressed to Granby Consolidated Mining, Smelting and Power Company, Ltd., at Copper Mountain, B. C. on behalf of the Defense Minerals Exploration Department, Field Team, Region I, Northwest District, commenting upon the contract provisions relating to assignments.

In view of the statements contained in the above-mentioned letter of March 7, we have felt that it is desirable to furnish you with a copy of the arrangements which are to be entered into by and between Index Mining Company and the Granore Company, as lessee from Index Mining Company. For your information, the Granore Company is a Washington corporation in which all of the stock is owned by Granby Consolidated Mining, Smelting and Power Company, Ltd. Granby's operations in the State of Washington are conducted by and through this Washington corporation.

If it is felt after reviewing the lease agreement that an assignment of the contract to the lessee is either

Encl (4)

necessary or desirable, then we would request that the instant application for such assignment be processed as promptly as possible.

Very truly yours,

BOOLE, BOOLE & GATES

By Donald E. Leland

cc: C. V. Brennan
Index Mining Company

Mr. Lane (2)

Mr. MacRae

Encl. (2 cc's)

INDEX MINING COMPANY
2340 Monta Vista Place
Seattle 99, Washington

March 3, 1955

The United States Department of the Interior
Defense Minerals Exploration Administration
Seattle,
Washington

Attention: Mr. McGill

Re: Docket No. DMEA-2612 (Copper)
Sunset Mine, Snohomish County,
Washington; Contract No. Idm-E489

Gentlemen:

We are pleased to enclose herewith the following instruments:

(1) Duly executed form for assignment and acceptance of DMEA Contract from Index Mining Company, a Washington corporation, as Assignor, to Granore Company, a Washington corporation, as Assignee;

(2) Duly executed form of "Owner's Consent to Lien";

(3) Copy of Lease instrument to be executed by and between Index Mining Co., as Lessor, and the Granore Company, as Lessee.

The parties to the Lease have reached agreement on the terms thereof and it will be executed by the respective parties as soon as the documents are prepared and can be circularized for signatures.

We respectfully request that the enclosed Assignment be acted upon by the Government as promptly as possible in order that work may be commenced on the properties, inasmuch as all other preparations have now been completed. If any further information is required from us, we shall be pleased to respond.

Very truly yours,

INDEX MINING CO.

By _____
C. V. Brennan, President

GOVERNMENT COPY

DEPARTMENT OF ... Defense Minerals ... RECEIVED MAR 30 1955

ASSIGNMENT OF CONTRACT

WHEREAS, Index Mining Company, a Washington corporation, (hereinafter called the "Assignor"), entered into Exploration Project Contract Idm-E489 (Docket No. DMEA-2612), dated February 20, 1953, and amended the _____ day of _____, 1955(hereinafter called the "Contractor"): and

WHEREAS, Granore Company, a Washington corporation, (hereinafter called the "Assignee"), has acquired the Assignor's interest in the land which is the subject of the Contract, by and under an agreement of lease dated the _____ day of _____, 1955;

NOW, THEREFORE, the Assignor, in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration received from the Assignee, does hereby assign, transfer and convey to the Assignee all of its right, title, and interest in the Contract: Provided, That the Government shall make payment to the Assignor for all work performed prior to January 1, 1955, and upon payment thereof the Government shall be and is hereby released by the Assignor from all claims under the Contract.

The Assignor consents to all future amendments and assignments of the Contract not inconsistent with the terms and provisions of its lease agreement with the Assignee, reference to which is made hereinabove and Assignor does hereby waive notice of all such future amendments.

This Assignment is subject to the written acceptance by the Assignee of the terms, provisions and conditions of the Contract and to the written consent of the Government.

Dated this 11 day of March, 1955.

INDEX MINING COMPANY

By C V Brennan (Seal)
C. V. Brennan, President

ASSIGNEE'S ACCEPTANCE

The Assignee, Granore Company, hereby accepts the above Assignment and agrees to be bound by the terms, provisions and conditions of the Contract.

Dated this 11TH day of March, 1955.

GRANORE COMPANY

Encl. (3)

By [illegible] (Seal)

I, Elizabeth Barnes, certify that I am the secretary of the corporation named as Assignee herein; that R. M. MacRae, who signed this Acceptance on behalf of the Assignee was then Vice President of said corporation; that said Acceptance was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Elizabeth Barnes (Corporate Seal)

GOVERNMENT'S CONSENT

The Government, this _____ day of _____, 1955, hereby consents to the above Assignment without releasing the Assignor, Index Mining Company, from any of the terms, provisions and conditions of the Contract.

THE UNITED STATES OF AMERICA

By _____
Administrator, Defense Minerals Exploration Administration

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 30 1955

MF-203
(Revised July 1, 1954)

OWNER'S CONSENT TO LIEN

WHEREAS, the undersigned, as owner, co-owner, lessor, or seller has an interest in certain property in the State of Washington, County of Snohomish, described as follows: 1/ The description appears in ANNEX I attached to Exploration Project Contract Docket No. DMEA-2612, a copy of which said ANNEX I is attached hereto and by this reference incorporated herein.

which is the subject of a proposed exploration project contract, hereinafter called the "contract", between the United States of America, hereinafter called the "Government", and

2/ INDEX MINING COMPANY, a Washington corporation, which contract is being assigned to GRANORE COMPANY, a Washington corporation.

hereinafter called the "Operator"; and

WHEREAS, under the provisions of said contract the Government is entitled to a percentage royalty on production and to other rights and equities which do or may conflict with or be adverse to the rights of the undersigned:

NOW THEREFORE, the undersigned, in consideration of said contract and as an inducement to the Government to enter into same, undertakes and agrees as follows:

1. The Government's equity in and right to dismantle, sever, take possession of, and remove and dispose of facilities, buildings, fixtures, equipment, or other items as provided in the contract or any amendment thereof shall prevail over and be prior and superior to any conflicting or adverse rights of the undersigned, and the Government is authorized to enter upon the land for such purposes.

2. To secure the payment to the Government of the percentage royalty on production 3/ provided for under the terms of said exploration project contract or any amendment thereof there is hereby granted to the Government a lien upon the land above referred to and upon any production of minerals therefrom until said royalty is fully paid or ten years have elapsed from the date of the contract, whichever occurs first.

1/ Either (a) insert the legal description of the land, or (b) strike out the words "as follows" and insert "in a lease [or contract, deed, or other document] dated _____, and recorded in book _____ page _____ official records of said county." If (b) is used, the book and page of recordation cannot be dispensed with. If the space provided is insufficient, use an Annex, and refer to the Annex in the space.

2/ Insert the name of the Operator as it will appear in the exploration project contract.

3/ Mining or production from the land is not required, and in the absence of production there is no obligation to repay the Government.

(OVER)

Encl. (2)

3. The undersigned shall commit no act nor assert any claim that may contravene or conflict with the lien, claim, or rights of the Government under the provisions of said contract. This agreement shall be binding upon the heirs, executors, administrators, successors, and assigns of the undersigned.

4. Changes and added provisions _____

_____

_____

_____

Dated this 11 day of March, 1955.

INDEX MINING COMPANY [Seal]

By: C. V. Brennan [Seal]
C. V. Brennan, President

A. J. Brennan [Seal]
Secretary

(Attachment to "OWNER'S CONSENT TO LIEN",
form MF-203, Revised ~~July 1, 1954)~~.
March 24, 1955,

EXPLORATION PROJECT CONTRACT
INDEX MINING COMPANY
DOCKET NO. DMEA-2612

ANNEX I

The North 1/2 of Section 1 and the Northeast 1/4 of Section 2, Township 27 North, Range 10 East, W.M.; and the following mining claims:

Star and Black Bear (both covered by patent #488234), Black Bear Extension, W.H.B., Boundary, Hazel C., Ivy R., Mountain Side, Ravine, Mono (all covered by patent #886270), and those portions of the Mabel Lode and Lloyd B. Lode not included in the North 1/2 of Section 1. The land is shown in part, on the map, "Figure 2 Index Mining Co. Patented Claims," attached to the Original Contract and made a part hereof.

THIS LEASE made this 23rd day of March A.D. 1955.

BETWEEN:

INDEX MINING CO., a Corporation duly incorporated pursuant to the laws of the State of Washington, one of the United States of America, and having its chief place of business at Seattle, Washington.

hereinafter called "the Lessor"

OF THE FIRST PART

AND:

GRANORE COMPANY, a Corporation duly incorporated under the laws of the State of Washington, one of the United States of America, and having its registered office at 1640 Exchange Building, Seattle, Washington.

hereinafter called "the Lessee"

OF THE SECOND PART

AND:

THE GRANBY CONSOLIDATED MINING SMELTING AND POWER COMPANY LIMITED, a Company incorporated under Private Act of the Province of British Columbia, and having its registered office at 675 West Hastings Street, in the City of Vancouver, in the Province of British Columbia.

hereinafter called "Granby"

OF THE THIRD PART

A. WHEREAS, the Lessor is the owner of certain interests in real property (including, inter alia, both patented and unpatented mining claims, and other parcels of real estate), situate in Snohomish County, State of Washington, United States of America (hereinafter referred to as "the said mineral lands") all as more particularly described in Exhibit "A" attached hereto and by this reference incorporated herein.

B. AND WHEREAS, the Lessor is the holder of Surface Water Permit No. R-152 which does not expire until June 1, 1956;

and has also acquired a certain Water Power License (known as "Trout Creek Claim No. 189"), the annual license fee on which has been paid in full for the calendar year 1955; and the Lessor has not encumbered the same, and they and each of them are in good standing as of the date hereof.

C. AND WHEREAS by an Exploration Project Contract entered into between the Lessor and the United States of America, Department of the Interior, Defense Minerals Exploration Administration, on the 20th day of February, A.D. 1953, the United States of America did, pursuant to the terms and conditions therein contained, agree to lend to the Lessor an aggregate total amount not in excess of $57,500.00 and of that amount the Lessor does represent and warrant that it, as of the date hereof, has received from the United States of America under the said Contract a sum not exceeding $2,250.00.

D. AND WHEREAS the Lessor represents and has warranted to the Lessee that it is presently carrying on negotiations with the United States of America for the purpose of acquiring an extension of One (1) year to the terms and conditions of the said Exploration Project Contract and to acquire an amendment to the said Contract whereby the manner of exploration therein referred to shall be altered to provide for diamond drilling, as set forth on the plan or plans prepared on behalf of the Lessee and delivered to the Lessor prior to the date of this lease, in lieu of drifting, cross-cutting and diamond drilling.

E. AND WHEREAS the Lessee is desirous of obtaining this lease and the Lessor is desirous of granting this lease covering the Lessee's use, occupancy, exploration and development of the said mineral lands, together with any mineral claims or other properties that may hereafter be acquired by any of the parties hereto, their servants, agents and employees within a four (4) mile radius of the portal of No. 2 Level on the Star Mineral claim.

NOW THEREFORE, it is AGREED between the parties hereto as follows:

1. Subject to the terms and conditions herein contained, the Lessor doth demise and lease unto the Lessee the said mineral lands including all mineral rights therein, together with any mineral claims or other properties which are or may hereafter be acquired by any of the parties, their servants, agents or employees, within a four (4) mile radius of the portal of No. 2 Level on the Star Mineral claim; and together with all buildings thereon erected, or hereafter during the term hereby demised to be erected, and also with all ways, paths, passages, waters, water courses, privileges, advantages and appurtenances whatsoever to the said mineral lands belonging or otherwise appertaining to, together with all Surface Water Permits and Water Power Licences, as specified hereinabove; PROVIDED HOWEVER, that the Lessor reserves and retains the timber and/or trees now or hereafter growing upon the said mineral lands and upon all other properties which shall hereafter be included within the said mineral lands, it being further understood and agreed that the lessor reserves and retains the right and privilege

of utilization and occupancy of all surface properties not required by the Lessee in its mining operations hereunder for all tree farm purposes, including, without limiting the foregoing, planting, cultivating, harvesting and the use of any and all roads or ways which may be required for said retained purposes, whether said roads or ways be now existing or hereafter constructed, for access to or from all portions of said mineral lands and/or any other properties which the Lessor may reasonably require relating to and in connection with its tree farm operations. PROVIDED HOWEVER, the Lessor shall not have the right to use or utilize any of the said mineral lands in such a manner as to interfere with any operations of the Lessee which the latter may be engaged in or may contemplate being engaged in pursuant to the terms of this lease in connection with the Lessee's exploration development and removal of minerals from said mineral lands, it being the general intent of this lease that mining activities performed by or on behalf of the Lessee shall take precedence over any and all other activities, in the same area. It is further mutually agreed that the Lessor hereby reserves an easement of way over the leased properties to and from other properties not subject to this lease, to the extent that such easement shall not create any unreasonable interference with the Lessee's mineral operations.

2. The term of this lease shall commence on the 15th day of March, A.D. 1955, and shall end on the first day of March, A.D. 1956, PROVIDED HOWEVER, that said lease may, at the sole option of the Lessee, be renewed for Forty-nine (49) separate

but additional successive periods of One (1) year each, which renewal periods shall in each case commence on the day following the last day of the preceding lease period and terminate on the last day of the month of February of the next following year. It is further mutually agreed that the Lessee shall be deemed to have exercised its option to renew this lease at the end of the initial term of this lease, and at the end of each successive renewal period in turn unless the Lessee shall, at least Sixty (60) days prior to the termination of any such lease period, have given notice to the Lessor in writing of its desire not to renew the then existing lease period for a further successive period of One (1) year.

3. As rental for the term of this lease, the Lessee shall pay to the Lessor, upon the execution of this lease, the sum of Ten ($10.00) Dollars, and as further and additional consideration for each One (1) year period for which this lease may hereafter be renewed, the Lessee shall pay to the Lessor an additional sum of Ten ($10.00) Dollars on or before the first day of any such renewal period.

4. The Lessor covenants and agrees with the Lessee to use its best endeavours to acquire, at the earliest possible date but not later than the 1st day of June, A.D. 1955, an extension of the Exploration Project Contract entered into between it and the United States of America, Department of the Interior, Defence Minerals Exploration Administration, on the 20th day of February, A.D. 1953, from the 20th day of February, A.D. 1955 to the 20th day of February, A.D. 1956, and the Lessor does further covenant and agree with the Lessee to use its best endeavours to acquire, at the earliest possible

date but not later than the 1st day of June, A.D. 1955, the consent of the United States of America to an amendment of the terms and conditions of the said Exploration Project Contract whereby the manner of exploration therein referred to shall be altered to provide for diamond drilling, as set forth on the plan or plans prepared on behalf of the Lessee and delivered to the Lessor prior to the date of this lease, in lieu of drifting, cross-cutting and diamond drilling, and such other alterations or revisions as shall be required by the United States of America, and forthwith after receipt by the Lessor of a communication from the United States of America advising that the said extension and the said amendment have been granted or rejected, the Lessor shall advise the Lessee accordingly. It is agreed between the parties that the Lessee may with the approval of the United States of America make such minor alterations to the aforesaid plan or plans as it may deem necessary.

5. In the event the United States of America shall refuse to grant the extension and the amendment referred to in the preceding paragraph hereof, or in the event the Lessor shall not be successful in acquiring from the United States of America the said extension and the said amendment on or before the 1st day of June, A.D. 1955, then, or in either of the said events, this lease shall forthwith determine and the rights and the obligations of the parties hereunder shall cease and terminate.

6. If the United States of America shall agree to the said extension and the said amendment and the said agreement shall have been communicated by the Lessor to the Lessee within

the time hereinbefore referred to, the Lessor covenants and agrees with the Lessee to forthwith assign, set over and transfer unto the Lessee all its right, title and interest in and to the said Exploration Project Contract.

7. In the event the United States of America shall have granted the extension and amendment to the Exploration Project Contract, as referred to in the preceding paragraph of this lease, and the fact that such extension has been granted has been communicated by the Lessor to the Lessee on or before June 1st, 1955, and in the event the benefits and provisions of the said extension of the said Exploration Project Contract have been assigned, transferred and set over to the Lessee for utilization by it in carrying out the exploration work thereunder then, and thereupon the Lessee does further covenant and agree with the Lessor -

(i) To forthwith pay to the Lessor the sum of Fifteen Hundred ($1,500.00) Dollars.

(ii) To pay to the Lessor the further sum of Nineteen Hundred and Sixty ($1,960.00) Dollars at the expiration of six (6) months from the date this lease is executed.

(iii) To expend the maximum sum of money made available to the Lessee by way of a loan from the United States of America under and by virtue of the said amended Exploration Project Contract, in accordance with the terms of said contract, as amended.

(iv) To expend an additional sum equal to the amount loaned by the United States of America under and by virtue of the said amended Exploration Project Contract in the exploration, development or other beneficial operations of or upon the said mineral lands, or any of them. PROVIDED HOWEVER, that no amount in excess of Fifty-five Thousand ($55,000.00) Dollars shall be required to be expended by the Lessee pursuant to this paragraph notwithstanding the amount by which the sum loaned by the United States of America as aforesaid shall exceed the said sum of Fifty-five Thousand ($55,000.00) Dollars.

8. It is understood and agreed between the parties hereto that the exploration, development and other beneficial operations referred to in paragraph 7 hereof shall, subject to minor alterations which may hereafter be made by the Lessee, consist of the exploratory diamond drilling set forth on the plan or plans prepared on behalf of the Lessee and delivered to the Lessor prior to the date of this lease and shall, without limiting the generality of the foregoing, include engineering and supervisory expenses, wages, cost of transportation of employees to and from the said mineral lands, the cost of all materials and equipment used or expended in developing, exploring or carrying operations thereon or thereunder, the cost of the rental of all materials and equipment used in or about the said mineral lands and all other expenses which shall be incidental to said exploration, development and other beneficial operations.

9. As from the date of this lease and until February 29th, 1956 the Lessor shall and it does hereby covenant with the Lessee to do or cause to be done at its own cost and

expense the annual assessment work on each of the unpatented mining claims subject hereto, as required by the mining laws of the United States and of the State of Washington, and regulations thereunder and to make, file and record the proofs thereof, as required by law, to the end that the said unpatented mining claims shall at all times until said date of February 29th, 1956, be kept in good standing; and the Lessor shall and does hereby further covenant with the Lessee as from the date aforesaid to pay all taxes accruing against the said mineral lands and all other costs whatsoever of any charges or assessments imposed against any or all of said mineral lands and required to be paid on or prior to February 29th, 1956. The Lessor further agrees that where any of the said mineral lands are held under a lease, contract, option or other arrangement requiring the payment of any instalment on the purchase price, rentals, or other charge (except royalties resulting from any mining operations conducted by the Lessee, which royalties the Lessee hereby agrees to pay if and when due) or the performance of any other obligation in order to keep said lease, contract, option or other agreement in good standing, the Lessor shall pay all such sums and perform all such covenants or obligations required to be paid, done or performed on or before said date of February 29th, 1956, in order to keep said lease, contract, option or other arrangement in good standing; provided that the Lessor shall not be obligated to carry out the requirements of this paragraph as to any mining claims or other property acquired by the Lessee, and the Lessee agrees to keep any such mining claims or property acquired by it in good standing unless and until such claims or property have been abandoned or withdrawn from this lease, as herein provided.

10. The Lessee, after having performed fully the covenants of paragraphs 7(i), 7(ii), 7(iii) and 7(iv) and not otherwise being in default in any respect or in breach of any of the covenants herein contained may, at any time before March 1st, 1956, give notice to the Lessor that it proposes to proceed with the development of the said mineral lands with the object of placing the same in production within four (4) years from the said first day of March, A.D. 1956, and the Lessee covenants that it will, within the said four (4) years construct a mill upon the said mineral lands having a daily capacity to treat 250 tons of ore from the said mineral lands, unless, prior to the expiration of the said four (4) years the Lessee shall have given to the Lessor notice of withdrawal and abandonment, as hereinafter set forth. In the event the Lessee shall not give the notice referred to in this paragraph on or before the said 1st day of March, A.D. 1956, then this lease shall forthwith determine, except, however, that the Lessee shall not be discharged from performing fully the obligations set out in paragraphs 7(i), 7(ii), 7(iii) and 7(iv) hereinabove; and except further, that the Lessee shall retain the rights set forth hereinafter in paragraph 21 hereof.

11. In the event the Lessee shall give the notice referred to in this paragraph on or before the 1st day of March, A.D. 1956, this lease shall remain in full force and effect, subject, however, to the terms and conditions hereof, and in such event, the Lessee shall pay to the Lessor the sum of One Thousand ($1,000.00) Dollars on the 1st day of March, A.D. 1956; and a further sum of One Thousand ($1,000.00) Dollars on the first

day of each and every month thereafter during the continuance of this lease or any renewal thereof. PROVIDED HOWEVER, that in the event the monthly royalties referred to in paragraph 17 hereof shall equal or exceed the said monthly payments of One Thousand ($1,000.00) Dollars, the obligation on the part of the Lessee to pay to the Lessor the said monthly payments shall cease for so long as the said monthly royalty shall equal, or exceed, the said amount, and if at any time during the continuance of this lease the said monthly royalties shall decrease to an amount of less than the said monthly payments of One Thousand ($1,000.00) Dollars for any reason whatsoever, whether beyond the control of the Lessee or otherwise, then the Lessee shall re-commence to pay to the Lessor the said monthly payments of One Thousand ($1,000.00) Dollars commencing as from the date the said monthly royalties shall drop in value to an amount of less than One Thousand ($1,000.00) Dollars. It is understood and agreed between the parties hereto that none of the monthly payments of One Thousand ($1,000.00) Dollars hereinbefore referred to shall be paid by the Lessee to the Lessor on account of the royalties hereinafter reserved, and that none of the said monthly payments shall constitute a prepayment thereof. It is further understood and agreed between the parties hereto that if the royalties hereinafter reserved shall be for an amount of less than One Thousand ($1,000.00) Dollars per month, there shall be no obligation on the part of the Lessee to pay to the Lessor any royalties for that month or any month during which the same shall have a value of less than the amount aforesaid.

12. In the event the Lessee shall have fully performed the covenants of paragraphs 7(i), 7(ii), 7(iii) and 7(iv) of this lease,

then notwithstanding the payment by the Lessee to the Lessor of the sum of One Thousand Five Hundred ($1,500.00) Dollars referred to in paragraph 7(i) hereof, and the payment by the Lessee to the Lessor of the sum of One Thousand Nine Hundred and Sixty ($1,960.00) Dollars referred to in paragraph 7(ii) hereof, and the expending of the moneys referred to in paragraphs 7(iii) and 7(iv) hereof, or the payment of any one or more of the monthly amounts of One Thousand ($1,000.00) Dollars referred to in paragraph 11 hereof, or the payment of any other moneys for any other purpose whatsoever, or the expending of any money in drilling or mining development work, or the doing of any other act hereunder, or the submitting to the doing of any other act by any other person whomsoever shall not be construed to mean that the Lessee shall be further obligated under the terms and conditions hereof, or to do any further act herein, or to submit to any acts being done herein or carry on any further mining development work, but the Lessee having been advised that the United States of America has agreed to the extension and the amendment of the Exploration Project Contract hereinbefore referred to and having received delivery of the assignment referred to in paragraph 10 hereof and having paid to the Lessor the sum of One Thousand Five Hundred ($1,500.00) Dollars referred to in paragraph 7(i) hereof, and having paid to the Lessor the sum of One Thousand Nine Hundred and Sixty ($1,960.00) Dollars referred to in paragraph 7(ii) hereof, and having expended the moneys referred to in paragraphs 7(iii) and 7(iv) hereof, shall have the privilege at any time of withdrawing from this lease and abandoning it notwithstanding that further moneys may have been paid or further work done or further submission made to acts of others, and in the event of withdrawal the Lessee shall cease to be in any way obligated under this lease, including any obligation with respect to doing of assessment work, the payment of taxes and the payment of moneys due

under the said agreements for sale and purchase, etc. PROVIDED HOWEVER, that said withdrawal and said abandonment shall not become effective until the Lessee shall have given to the Lessor thirty (30) days' notice that it is withdrawing from and abandoning this lease after the expiration of the said thirty (30) days, and PROVIDED FURTHER, that the Lessee notwithstanding said withdrawal and said abandonment shall remain liable hereunder for any and all obligations which shall have accrued prior to the effective date of said withdrawal and abandonment. It is understood and agreed between the parties hereto that said notice may be given by the Lessee to the Lessor at any time during the term hereby demised, subject to all of the provisions of this paragraph.

13. Inasmuch as a portion of the said mineral lands consists of unpatented mining claims requiring the performance of annual assessment work and the recording of such work on or before July 1st of each calendar year as a condition precedent to the maintenance of the claim of title to such mining claims, it is mutually agreed that any notice of withdrawal or abandonment, as provided for herein, shall not become effective at any time during the calendar months of May or June in any year unless the Lessee shall have given notice to the Lessor prior to May 1st of said year of the Lessee's intention to withdraw from and abandon this lease at some time within the sixty (60) day period preceding July 1st of said year.

14. The Lessor covenants and agrees that so long as this lease remains in force the Lessee shall be entitled to exclusive possession of the said mineral lands and all buildings situate thereon as and from the date and during the currency of this lease, subject only to the reservations, limitations and easements expressly set forth herein, and shall have the right, by its servants, agents, workmen, contractors and subcontractors to enter upon and into the

said mineral lands, and each of them, and the said buildings, and to use any and all pipes and rails presently installed thereon, and to carry on thereon or thereunder, subject to the provisions of this lease, such development, exploration or other mining operations as the lessee shall consider fit; and the lessee shall also have the right to take, extract and remove such ores or minerals from the said mineral lands as it may see fit.

13. It is understood and agreed between the parties hereto that after the lessee has given to the lessor the notice referred to in paragraph 10 hereof, the lessee may tear down, alter or remove any or all buildings presently situate upon the said mineral lands without payment of any compensation by the lessee to the lessor, and the decision as to whether or not any or all of the said buildings shall be torn down, altered or removed, and the manner in which the same shall be effected shall be determinable by the lessee in its sole discretion.

14. It is understood and agreed between the parties hereto that at any time within four (4) years after the 1st day of March, A.D. 1956, the lessee may enter into any contracts or agreements with the United States of America whereby the latter may agree to loan to the lessee moneys for the development of the said mineral lands, and, as security for the repayment thereof, the lessor does hereby grant unto the lessee the right to charge, hypothecate, lien and mortgage any or all of the minerals which may be situate in, under or upon the said mineral lands and all the plant and equipment of the lessee then or thereafter upon the said mineral lands for a total amount not exceeding Three Hundred Thousand ($300,000.00) Dollars (including any amounts loaned under the original Kaiser Exploration Project Contract) to the intent and purpose that the

United States of America may acquire the right, as security for the repayment of any loan or loans not exceeding the said sum, to a royalty for a period of not to exceed ten (10) years from the date of such government contract or contracts of up to five (5%) per cent of all ore or concentrates mined or produced from the said mineral lands upon the net smelter returns (defined in substantially the same manner as set out in United States, Department of Interior, DMEA Form MF-200 Revised June 1954), until the total amount contributed by the United States of America, up to an amount not exceeding the said sum of Three Hundred Thousand ($300,000.00) Dollars is fully paid. PROVIDED, that the Lessee shall in each instance expend an additional sum, equal to the amount so loaned by the United States of America, in the exploration, development or other beneficial operations of or upon the said mineral lands or any of them. Notwithstanding anything to the contrary herein contained, the Lessee may acquire a loan or loans for any amount from the United States of America, but in the event said loan or loans shall be in excess of the said total sum of Three Hundred Thousand ($300,000.00) Dollars the right to charge, hypothecate, lien and mortgage all of said minerals or other property subject to this lease shall extend only to that part of the said loan or loans which shall be represented by the said sum of Three Hundred Thousand ($300,000.00) Dollars.

17. Subject as hereinafter provided, and if the Lessee shall acquire a loan from the United States of America, it is agreed between the parties hereto that as often as the Lessee shall remove any ore or concentrates from the said mineral lands, the Lessee, its successors or assigns, shall pay to the Lessor Five (5%) per cent of the net smelter returns on any and all concentrates or ore shipped or sold from the said mineral lands for so long as the Lessee shall

be obligated to the United States of America to repay a loan or loans made at any time during the four (4) year period referred to in paragraph 16 hereof for a totalamount not exceeding Three Hundred Thousand ($300,000.00) Dollars, and upon repayment of the said loan or loans, if any, the Lessee shall pay to the Lessor a royalty of ten (10%) per cent of the net smelter returns on any and all concentrates or ore shipped or sold from the said mineral lands during the continuance of this lease, or any extension thereof.

"Net smelter returns" wherever used in calculating royalties payable to the Lessor shall be the gross proceeds (including any bonuses, premiums, allowances, or other benefits) from the production sold, in the form sold (ore, concentrates, metal, or equivalent) from which will be deducted;

(a) All freight and transportation and handling charges beyond the delivery point.

(b) Sampling, assaying and representation after leaving the delivery point.

(c) All smelting, refining and sales charges necessary to put metal in commercially marketable form, excluding fabricating and manufacturing.

The words "delivery point" as used in the preceding paragraph shall refer to delivery to carrier at Index, Washington.

18. The Lessee covenants and agrees to submit to the Lessor within thirty (30) days following the end of any calendar month of the term, or of any renewal thereof, in which any ore or concentrate has been carried or shipped from the leased properties a written report disclosing all quantities so carried or shipped and the destination of such ore or concentrates. The Lessee further covenants

to submit to the Lessor within One Hundred and Twenty (120) days following the end of any calendar month of this lease, or any renewal thereof, in which the Lessee has received any returns resulting from the disposition of any of said ores or concentrates, a full accounting as to all such proceeds and to make payment to the Lessor of any portion thereof to which the Lessor shall be entitled hereunder. The Lessor shall at any and all reasonable times be entitled to examine the books and accounts of the Lessee or have an audit made by a certified public accountant on its behalf and at the Lessor's expense, to determine the accuracy and completeness of any and all reports which the Lessee shall provide to the Lessor, as provided for herein, and the Lessee shall give its full co-operation to the Lessor in carrying out any such audit.

19. The Lessee agrees that it will make or cause to be made records showing all diamond drilling and other work done on the said mineral lands, and it will keep, or cause to be kept, proper records of all work done and do any such work according to good mining practice. The foregoing records shall be available for inspection by the Lessor and periodic reports (at least quarterly) shall be submitted in writing by the Lessee to the Lessor, outlining the progress made on work done at the said mineral lands during the preceding quarterly or other period of time.

20. It is mutually agreed by the parties hereto that all personal property, machinery, fixtures and equipment, presently situated on the said mineral lands, with the exception of buildings and of rails and pipe in place within the portals of the mine and between such portal and rock dump, may, at the Lessor's option, be

retained by the Lessor and not be subject to this lease. The Lessor may, if it so desires, sell all or any portion of such property and remove it from the said mineral lands; however, the Lessor shall have no obligation to remove all or any portion of said properties, and it may elect to permit said properties to remain. It is understood and agreed that the Lessee assumes no responsibility with respect to said properties of the Lessor which the latter may elect to leave on the premises; and the Lessee further may move, dismantle or store said properties at any point more convenient to the Lessee, if the Lessee so desires.

21. In the event the Lessee shall abandon or terminate this lease, or any renewal thereof, on or before the expiration of twenty-five (25) years from the date of this lease, or in the event this lease, or any renewal term thereof, shall be permitted to expire prior to the end of said twenty-five (25) years from the date of this lease, if the Lessee, save as hereinafter provided, shall have fully paid and satisfied all debts, liens, charges or encumbrances whereby the said mineral lands may be charged by reason of any act or thing done or omitted to be done by the Lessee so that neither it nor the Lessor shall be under any liability in respect of or for any debt, liability or obligation incurred or undertaken hereunder by the Lessee, save and except with respect to the charges, hypothecations, liens or mortgages referred to in paragraph 16 hereof, it shall be at liberty within sixty (60) days after termination or abandonment of this lease or the expiration of the term, or any renewal thereof, hereby granted, to remove therefrom all machinery, tools, equipment, fixtures, buildings and supplies brought and placed thereon by the Lessee, its representatives or agents, PROVIDED HOWEVER, that the Lessee shall not remove

any rails and pipe installed or affixed within the portals of the mine, or between such portals and the mine dump. Any and all such rails and pipes (excluding fan pipes) shall, in the event of termination or expiration of the lease as aforesaid, be and become the property of the Lessor.

22. It is mutually agreed that the sixty (60) day period referred to in the preceding paragraph shall become One hundred and eighty (180) days in the event of any termination or expiration of this lease or any renewal thereof occurring later than two (2) years after the date of this lease.

23. It is further understood and agreed that the Lessee shall upon any termination or expiration of this lease, as aforesaid, not unreasonably damage or disturb any foundation structure which may theretofore have been placed upon the properties.

24. In the event the Lessee shall continue to effect renewals of the term of this lease as provided herein so as to extend its occupancy and possession of all or any part of the said mineral lands beyond a period of twenty-five (25) years after the date of this lease, then it is understood and agreed by the parties hereto that upon any termination or expiration of any period of occupancy thereafter, any and all properties whatsoever (including, without limiting the foregoing, buildings and improvements, machinery, equipment, fixtures or other personal property located on the said mineral lands, or used in connection with the operations of the Lessee at the said mineral lands, or any part thereof) shall thereupon be and become the property of the Lessor, and the Lessee shall have no right of removal of the same. It is further mutually agreed that on and after the beginning of any renewal terms of this lease which shall commence or be effective after the expiration

of twenty-five (25) years from the date of this lease, the Lessee covenants and agrees that except as hereinafter provided, it shall at no time remove any of the installations or properties which are either at the said mineral lands or used in connection with said mineral lands at that time, or shall be thereafter added to said properties. It is, however, the general intent of the parties hereto that the Lessee shall be permitted to utilize any and all of its properties located at the said mineral lands, or used in connection therewith in the same manner as was done during the first twenty-five (25) year period, except that no property shall be thereafter removed without replacement of the properties removed by other properties which can be as effectively employed for the performance of the same function that was theretofore served by the properties being removed.

25. In the event the Lessee shall have given to the Lessor the notice referred to in paragraph 10 hereinabove, the Lessee shall and does hereby covenant with the Lessor that on and after March 1st, 1956, the Lessee shall do or cause to be done at its own cost and expense the annual assessment work on each of the unpatented mining claims subject hereto, as required by the mining laws of the United States and of the State of Washington, and regulations thereunder and to make, file and record the proofs thereof, as required by law, to the end that the said unpatented mining claims shall at all times be kept in good standing; and the Lessee shall and does hereby further covenant with the Lessor as from the date aforesaid to pay all taxes accruing against the said mineral lands, and all other costs whatsoever of any charges or assessments, imposed against any or all of said mineral lands and required to be paid on or after March 1st, 1956. The Lessee further agrees that where any of the said mineral lands are held under a lease, contract,

option or other arrangement requiring the payment of any instalment on the purchase price, rentals, royalties or other charge, or the performance of any other obligation in order to keep said lease, contract, option or other arrangements in good standing, the Lessee shall, after having given the notice to the Lessor referred to in paragraph 10 hereinabove, either pay all sums and perform all other covenants or obligations required to be paid, done or performed in order to keep said arrangements in good standing, or, in lieu thereof, give notice to the Lessor at least thirty (30) days prior to the time for performance of any such payment, covenant or obligation that the Lessee has elected to relinquish the property interest being acquired under such arrangement from the terms of this lease, whereupon, at the end of said thirty (30) day period, any and all further obligations of the Lessee with respect to said property shall be terminated, provided, however, that this shall not discharge the Lessee from any obligation or liability which shall have accrued by reason of any such arrangements prior to the effective date of said notice.

26. The Lessee shall have the right to abandon any one or more of the parcels of said mineral lands referred to in Exhibit "A" attached hereto or which may have become subject to this lease by reason of its acquisition by one of the parties hereto during the existence of this lease, or any renewal thereof, and such abandonment shall become effective upon the termination of a period of thirty (30) days after notice has been given to the Lessor of the desire of the Lessee to effect such abandonment. PROVIDED HOWEVER, that the Lessee shall notify the Lessor of its intention to abandon any unpatented mining claim at least sixty (60) days prior to the date upon which any proof of annual assessment work must be filed to comply with the laws relating thereto. It is understood and agreed

that the aforesaid right to abandon shall extend also to the water rights referred to in paragraph 1 of this agreement.

27. It is mutually agreed that the right and privilege of the Lessee hereunder to abandon and relinquish any portion of the said mineral lands included under this lease must be exercised, if at all, with respect to any and all interest in and to any particular parcel of property. To illustrate, the Lessee may not abandon or relinquish its interest in an undivided interest in certain mining claims while retaining an interest in a different undivided interest in the same claims.

28. It is mutually agreed that the interest in mineral claims which the Lessor has acquired or may hereafter acquire in the Southwest Quarter of Section 17, Southeast Quarter of Section 18, Northeast Quarter of Section 19 and Northwest Quarter of Section 20 of Township 27 North, Range 11 E.W.M., Snohomish County, Washington (commonly referred to as the "Merchant" claims), is hereby declared to be outside of the scope and provisions of this lease, PROVIDED HOWEVER, that if, on or before March 1st, 1956, the Lessee shall notify the Lessor that it desires to have the properties in said described area included under this lease then, from the date of said notice, all of such properties shall be and become subject to this lease to the same extent as if they had been originally included thereunder.

29. The Lessor shall have the right, at all reasonable times, by its duly appointed representatives, to inspect the mining development work carried on by the Lessee upon the said mineral lands, pursuant to the terms and conditions hereof, including assays done or being done by the Lessee on the said mineral lands, or any one of them, but before entering upon the property for the

purpose of making such inspection one (1) day's notice in writing shall be given to the person in charge of the property, provided, that if no one is in charge no such notice shall be necessary.

30. The Lessee covenants that it will, immediately upon the termination or abandonment or expiration of the lease herein granted, or any renewal thereof, surrender possession of the said mineral lands unto the Lessor, reserving however, its rights set forth in paragraph 21 hereof, and shall turn over to the Lessor, without charge, all assay returns, maps, charts, plans and other data which shall have been prepared as a result of any exploration and mining operations carried on by the Lessee on the said mineral lands under the terms hereof.

31. The parties hereto mutually covenant and agree that if any of them or their servants, agents or employees have or shall hereafter stake or cause to be staked any mineral claims, or have or shall hereafter acquire or cause to be acquired any other property or interest within a radius of four (4) miles of the portal of No. 2 level on the Star mineral claim, the same shall be and become the property of the Lessor and be subject to the provisions hereof to the same effect as if specifically mentioned and described as part of the said mineral lands, unless and until such time as the Lessee shall have elected by notification as herein provided to withdraw or abandon its rights with respect to such property, or until the expiration or other termination of this lease, or any renewal thereof, after which time any such property or interest shall revert to the Lessor free and clear of any interest of the Lessee under this Lease, save as provided in paragraph 16 hereof. The parties hereto mutually agree to execute any and all other instruments of conveyances or other instruments which may be or

become necessary to fully carry out the provisions of this paragraph.

32. The leased premises have been inspected by and are acceptable to the Lessee in their present condition. In the event that this lease, or renewals thereof shall be effective after twenty-five (25) years from the date of this lease, the Lessee shall thereafter maintain the properties in a reasonable state of repair, normal wear and tear and damage by fire or the elements excepted.

33. Except as otherwise provided herein, all personal property on the said mineral lands shall be at the sole risk of the Lessee. The Lessor or the Lessor's agents shall not be liable for any damage either to person or property sustained by the Lessee or others, caused by any defects now in the said mineral lands or hereafter occurring therein, or from any act or neglect of the Lessee's employees or any other persons, or due to the happening of any accident from whatsoever cause in and about the said mineral lands. The Lessee will hold and save the Lessor harmless from all loss, damage, liability or expense resulting from any injury to any person or any loss or damage to any property suffered or alleged to be suffered in or about the said mineral lands by any person, firm or corporation. The Lessee shall, furthermore, at its own expense, maintain liability insurance with a reputable insurance company or companies covering bodily injury claims in the amount of Five hundred thousand dollars ($500,000.00) for each person, Five hundred thousand dollars ($500,000.00) for each accident and property damage in the amount of Two hundred and fifty thousand dollars ($250,000.00) for each accident. The Lessor shall be named as additional parties insured in any such policy or policies of insurance and shall be furnished with a copy thereof. It is further

mutually agreed that the provisions of this paragraph shall be inapplicable to any and all of the Lessor's tree farm operations and to any logging operations which may occur upon the said mineral lands whether they be the Lessor's operations or the operations of any party who is upon the premises because of any grant or other arrangement made by the Lessor other than this lease.

34. If this lease be renewed beyond twenty-five (25) years, then the Lessee agrees that thereafter it shall, at its sole expense, keep in force fire insurance, insuring the Lessor and the Lessee as their interest may appear against direct loss to any improvement or other properties placed upon the said mineral lands. (The said insurance shall be for an amount equal to the appraised value of the said improvements and other properties.)

35. In the event of a loss arising from a fire which shall damage or destroy the said improvements or other properties, the Lessee may at its sole option have the proceeds of the said insurance applied towards the repair or replacement of the same and the Lessor does hereby agree to give its consent to the release of the proceeds of such insurance in order that such proceeds may be applied in the manner aforesaid.

36. The Lessee shall not, without the written consent of the Lessor first had, let or sublet or assign the whole or any part of the said mineral lands, except to employees for living quarters. However, the Lessor agrees that consent to such assignment or sublease shall not be unreasonably withheld.

37. The Lessee agrees that the premises included hereunder shall at all times be kept and used in accordance with the laws of the United States, the State of Washington, the County of Snohomish

and any other municipal corporation, governmental subdivision or agency having jurisdiction thereof, and to comply with any and all rules, regulations, ordinances or orders of any governmental authority or department which may be applicable to the said mineral lands. The Lessee shall further observe and conform to all statutory provisions for paydays with respect to any operation upon or connected with the said mineral lands, and shall keep any and all operations thereon covered under the Workmen's Compensation Laws of the State of Washington.

38. The Lessee shall, except as provided in paragraph 16 hereof, keep the leased properties free from any and all liens or charges whatsoever arising out of any work performed, materials furnished to, or obligations incurred by the Lessee, or acts done by or on behalf of the Lessee. The Lessee shall post and at all times keep posted in a conspicuous place or places on the said mineral lands notice to the effect that the premises are leased to the Lessee hereunder and that the Lessor shall not be liable for labour performed thereon, services rendered or materials furnished to or at the said mineral lands. The Lessee covenants and agrees to pay currently, when due and owing, all expenses and costs of operations and of the properties during its occupancy under this lease, except as otherwise expressly provided in this lease. In the event the Lessee becomes insolvent, voluntarily or involuntarily bankrupt, or if a receiver, assignee or other liquidating officer is appointed for the Lessee or for any of its assets, then the Lessor may, at its option, terminate this lease, in which event, however, any and all obligations or liabilities which may theretofore have accrued shall remain in full force and effect hereunder.

39. If the Lessee shall make default in the payment of any

rents, royalties or other sums above provided to be paid, or any part thereof, and such default shall continue for thirty (30) days after notice thereof by the Lessor to the Lessee, or should the Lessee be in default in fulfilling any of the other covenants or agreements herein contained and such default shall continue for a period of thirty (30) days after notice thereof by the Lessor to the Lessee, except in the case of default which cannot be with due diligence remedied or cured within a period of thirty (30) days, if the Lessee fails to proceed promptly after the service of such notice and with all due diligence to remedy or cure the same, the Lessor may terminate this lease and re-enter the said mineral lands but, notwithstanding such re-entry by the Lessor, the liability of the Lessee for the payments provided for herein shall not be extinguished for the period up to and including the time when the Lessor re-enters the said mineral lands. It is further agreed that neither the acceptance of any sums due herein nor any other act or omission of the Lessor at any time or times, whether after the happening of any event authorizing the termination of this lease or not, shall operate as a waiver of any present, past or future violation, breach or failure to keep or perform any covenant, agreement, term or condition hereof, or to deprive the Lessor of its rights to terminate this lease as herein provided, nor be construed at any future time to estop the Lessor from exercising its right of termination or any other right, option or remedy. If, by reason of the default on the part of the Lessee, it becomes necessary for the Lessor to employ an Attorney to bring suit or institute other proceedings for the collection of rentals or other sums, or for the enforcement of any other rights or remedies of the Lessor, the Lessee agrees to pay all costs and expenses thereof and such reasonable Attorney's fees as may be expended or incurred by

the Lessor in connection therewith.

40. In consideration of the demise of the said mineral lands by the Lessor to the Lessee, the Party of the Third Part does hereby unconditionally guarantee to the Lessor that the Lessee will observe and perform each and every one of the covenants, terms, conditions, agreements, stipulations, undertakings and provisoes in this lease, or any renewal thereof, contained and on its part to be observed or performed; PROVIDED however, that if the Lessee shall make any default hereunder the Party of the Third Part shall not be lia le to the Lessor unless and until the Lessor has given to the Party of the Third Part thirty (30) days' written notice specifying the default by the Lessee, and the Lessee or the Party of the Third Part has not remedied or cured the same within the said thirty (30) days either:

(a) In the event the specified default shall be in relation to the non-payment by the Lessee of monies covenanted to be paid hereunder, by the payment thereof.

(b) In the event the specified default shall be in relation to any other matter or matters, by the payment of damages which may be agreed upon between the Lessor and the Party of the Third Part or, failing agreement, as may be determined by arbitration. Said payment shall be made within thirty (30) days after agreement or thirty (30) days after the arbitrators' award is communicated to the Party of the Third Part. If it shall be necessary to proceed to arbitration hereunder then the Lessor or the Party of the Third Part may give notice in writing to that effect to the other and thereupon the damages shall be settled by a board of

three arbitrators and the Lessor and the Party of the Third Part shall be bound by the decision of the said arbitrators. In such event one arbitrator shall be appointed by the Lessor and one by the Party of the Third Part, and the third shall be selected by the two so appointed. It is hereby agreed that said arbitration shall be held in the City of Seattle, in the State of Washington, one of the United States of America, under the provisions of the Revised Code of the State of Washington Title 7 Chapter .04 and this lease and the reference of the said damages to said arbitrators shall be a submission to and under the said Code.

41. The Party of the Third Part does covenant and agree with the Lessor that its liability hereunder shall not be affected by the release of collateral or other securities (if any) held or to be held by the Lessor, or by any extension of time for payment, or the taking of any note or other obligation for payment of all or any part of the monies payable under this lease, or by the Lessor taking any securities whatever for such payment or performance of any obligation of the Lessee, or by any amendment or alteration of the terms of this lease, or by any indulgence granted to the Lessee or by laches on the part of the Lessor.

42. The Party of the Third Part does further covenant and agree with the Lessor that the Lessor shall not be bound to exhaust its recourses against the Lessee or any other persons, or against any property or securities, or to value any securities before proceeding under and by virtue of paragraph 25 hereof.

43. The Party of the Third Part does further covenant and agree with the Lessor that in the event it should be

necessary for the Lessor to bring proceedings against the Party of the Third Part by way of arbitration or otherwise as herein provided, the Party of the Third Part, except as otherwise provided herein, and subject to its rights specified in paragraph 25 hereof, shall be liable in any such proceedings in the same manner and to the same extent as if it were the Lessee hereunder, and the Party of the Third Part, except as aforesaid, does further agree that it shall not have or assert any defence or defences in any proceedings which may be brought against it hereunder which would not have been available to the Lessee in any action brought by the Lessor against the Lessee for the non-performance of any provision contained in this lease.

44. If the Lessee shall at any time be in default under any of the covenants herein contained whereby the Lessee has covenanted to pay money to third persons, and neither the Lessee nor the Party of the Third Part shall have cured the same after notice given pursuant to paragraph 40 hereof, then the Lessor, at its option, may cure any such default, and any and all amounts paid or expenses incurred in curing such default or defaults shall forthwith become due and owing from the Lessee to the Lessor hereunder. PROVIDED, HOWEVER, that nothing herein contained shall obligate or require the Lessor to cure any such default or defaults.

45. Any notice to the Lessor shall be in writing and shall be by personal delivery to the President of the Lessor at 2430 Monta Vista Place, Seattle 99, Washington, U. S. A. or by prepaid registered letter or by prepaid telegram addressed as follows:

Index Mining Co.
2430 Monta Vista Place
Seattle 99,
Washington, U. S. A.

46. Any notice to the Lessee shall be in writing and shall be given by personal delivery to the Secretary of the Lessee at 1640 Exchange Building, Seattle 4, Washington, U. S. A. or by prepaid registered letter or by prepaid telegram addressed as follows:

Cranore Company
1640 Exchange Building
Seattle 4
Washington, U. S. A.

47. Any notice to the Party of the Third Part shall be in writing and shall be given by personal delivery to the President of the Party of the Third Part at 675 West Hastings Street, Vancouver 2, British Columbia, Canada, or by prepaid registered letter or by prepaid telegram addressed as follows:

The Granby Consolidated Mining Smelting
and Power Company Limited
675 West Hastings Street
Vancouver 2
British Columbia, Canada.

48. Either of the parties hereto may change the addresses hereinbefore referred to by notification in writing to each of the other parties hereto.

49. Where a notice is provided for by the terms of this lease and such notice is given by registered letter, the notice shall be deemed to have been served on the party to whom it is addressed on the second day after the mailing of the notice, and where such notice is given by telegram the notice shall be deemed to have been served upon the party to whom it is addressed on the first day after the date of the despatch thereof.

50. Subject to the provisions hereof pertaining to the assignment and subletting of this lease, the covenants and agreements

contained in this lease shall be binding upon and shall enure to the benefit of the successors and assigns of the parties hereto.

IN WITNESS WHEREOF the parties hereto have executed this lease and have hereunto caused their Corporate Seals to be affixed in the presence of their duly authorized officers, the day and year first above written.

THE CORPORATE SEAL of INDEX MINING CO. was hereunto affixed in the presence of:

By C. V. Brennan
President

By A. G. Brennan
Secretary
for Index Mining Co

THE CORPORATE SEAL of GRANORE COMPANY, was hereunto affixed in the presence of:

By: Charles Lee
Vice president

By: Elizabeth Jones
Secretary

for Granore Company

THE CORPORATE SEAL OF THE GRANBY CONSOLIDATED MINING SMELTING AND POWER COMPANY LIMITED, was hereunto affixed in the presence of:

By Charles Lee
Vice president

for Granby Consolidated Mining Smelting and Power Co. Ltd.

STATE OF WASHINGTON }
COUNTY OF K I N G } ss.

On this 23rd day of March, 1955, before me personally appeared C. V. BRENNAN and A. G. BRENNAN, to me known to be the President and Secretary, respectively, of INDEX MINING CO., the corporation that executed the within and foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute said instrument and that the seal affixed is the corporate seal of said corporation.

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

Donald E. Leland
DONALD E. LELAND
Notary Public in and for the State of Washington, residing at Seattle.

STATE OF WASHINGTON }
COUNTY OF K I N G } ss.

On this 23rd day of March, 1955, before me personally appeared R. M. MacRAE and ELIZABETH BARNES, to me known to be the Vice President and Secretary, respectively, of GRANORE COMPANY, the corporation that executed the within and foregoing instrument and acknowledged said instrument to be thefree and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute said instrument and that the seal affixed is the corporate seal of said corporation.

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

Donald E. Leland
DONALD E. LELAND
Notary Public in and for the State of Washington, residing at Seattle.

STATE OF WASHINGTON }
COUNTY OF K I N G } ss.

On this 23rd day of March, 1955, before me personally appeared R. M. MacRAE ~~and ELIZABETH BARNES~~, to me known to be the Vice President ~~and Secretary, respectively,~~ of GRANBY CONSOLIDATED MINING SMELTING AND POWER COMPANY, LIMITED, the corporation that executed the within and foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute said instrument and that the seal affixed is the corporate seal of said corporation.

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

Donald E. Leland
DONALD E. LELAND
Notary Public in and for the State of Washington, residing at Seattle.

EXHIBIT A

PROPERTY OWNED AND/OR HELD BY INDEX MINING CO.
AND INCLUDED AS PROPERTY SUBJECT TO THE LEASE OF

JANUARY , 1955

FROM INDEX MINING CO. TO GRANORE COMPANY

The listing which follows includes the legal description of all properties included in the Lease by parcel and further states the nature of the interest of Index Mining Co. in each parcel and the manner in which each parcel was acquired by Index Mining Co. The Lessor agrees to make available for inspection by Lessee or its representatives any and all of the deeds, agreements, title policies and other documents referred to in the following summary of the parcels of property subject to the Lease Agreement, but Lessor in granting this Lease does not and has not made any representation or warranty with respect to the title to said properties except the representation and warranty that Lessor has not caused or created any lien or encumbrance against said properties other than as expressly referred to in this Lease Agreement.

I. REAL ESTATE PARCELS WITH EXISTING TITLE INSURANCE POLICIES:

(a) Acreage and patented mining claims acquired by deed from N. C. Strong, Trustee for bondholders of Sunset Copper Company (dated July 12, 1945, and recorded in Volume 420 of Deeds, page 472 et seq., office of County Auditor), and described as follows:

North 1/2 of Section 1, Township 27 N. R. 10 E.W.M., EXCEPT County road, ALSO, the following patented mining claims:

Mountainside, Mountainside #2, Mountainside #3, Mountainside #4, Ravine, Ravine Extension, Mono, Mono #2, Ivy R, Hazel C, Black Bear Extension, Boundary, WHB, Miss Helen, Success, Star #2, and Fractional Claims - Star, Black Bear, Lebanon and 4th of July Extension (the balance of which are included in Section 1,) as said mining claims are designated and described in United States Mineral Survey #1026, all of said claims being in Index Mining District, in Snohomish County, Washington.

(Fee title to the last described parcel is insured in the amount of $45,000.00 under Puget Sound Title Insurance Company Policy No. L-19828, dated August 9, 1948, subject only to the exceptions listed in Schedule B of said policy.)

(b) Acreage held under contract of purchase from Earl Smith, Trustee for certain judgment creditors (lien holders), (dated June 14, 1954, and recorded in Volume 545 of Deeds, page 5, office of County Auditor), described as follows:

The NE 1/4 of Section 2, Township 27 N., R. 10 E.W.M., except County road; situate in the county of Snohomish, State of Washington.

(Fee title to the last described parcel is insured in Earl Smith, Trustee, in the amount of $1500.00 under Puget Sound Title Insurance Company Policy No. L-52607, subject only to the exceptions listed in Schedule B of said policy, dated October 4, 1954.)

(c) Patented mining claims with an undivided one-half interest in Index Mining Co. and the other undivided one-half interest being acquired under a real estate contract from Tom Stiger, et al., (dated July 13, 1953, and recorded in Volume 49, page 243 of Mining, office of County Auditor), which patented mining claims are described as follows:

Patented Mining claims, Royal, Royal Extension #1, Royal Extension No. 2, New Lone Star, New Lone Star Extension No. 1, New Lone Star Extension No. 2, New Lone Star Extension No. 3, Blue Mud,

Blue Mud Extension No. 1, Blue Mud Extension No. 2, Blue Mud Extension No. 3, Blue Mud Extension No. 4, Imperial, Imperial Extension No. 2, Imperial Extension No. 3, Imperial Extension No. 4, Copper Bullion Extension No. 3, Copper Bullion Extension No. 4, Nonpareil Extension No. 2, Nonpareil Extension No. 3 and Five Brothers Extension No. 2; all situate in the County of Snohomish, State of Washington.

(Fee title to an undivided one-half interest in the patented mining claims and the interest of a purchaser under a contract from Tom Stiger, et al, in the other undivided one-half interest in the last described mining claims is insured in the amount of $5,000.00 under Puget Sound Title Insurance Company Policy No. L-37579, dated July 14, 1953, subject only to the exceptions listed in Schedule B of said policy.)

(d) Acreage less minerals, etc. acquired by deed (dated September 30, 1948, and recorded in Volume 423, page 517 of Deeds, Office of County Auditor) from H. F. Josefsky, and described as follows:

Government Lots 5, 6 and 7 of Section 35, Township 28 N., R. 10 E.W.M., EXCEPT County Road; situate in the County of Snohomish, State of Washington.

(Fee title less minerals, etc. to the last described parcel is insured in the amount of $500.00 under Puget Sound Title Insurance Company Policy No. L-20337 dated , subject only to the exceptions listed in Schedule B of said policy.

II. REAL ESTATE PARCEL HELD UNDER CONTRACT FROM THE STATE OF WASHINGTON:

Mining Contract No. 393 in favor of Index Mining Co. (dated September 8, 1953) with expiration date June 23, 1974, covering property described as follows:

The south one-half of the southwest one-quarter of Section 35, Township 28 North, Range 10 E.W.M., situate in Snohomish County, State of Washington. (Approximately 80 acres).

III. UNPATENTED MINING CLAIMS WITHOUT EXISTING TITLE INSURANCE POLICIES:

(a) Mining claims staked by or on behalf of and in the name of Index Mining Co. as follows:

In the northwest one quarter of Section 2, Township 27 North, Range 10 E. W.M., Snohomish County, State of Washington, as follows:

"Y"
"K"
"L"
"T"
"4th of July"

(b) Mining claims staked on behalf of and in the name of C. V. Brennan, Jr. and/or Index Mining Co. in the vicinity of the so-called Nonpareil, or Tiger, patented mining claim group, as follows:

In Section 7, Township 27 North, Range 11 E. W.M., Snohomish County, State of Washington, as follows:

"G"
"H"
"I"
"X"
"L"
"M"
"Mona Fraction"
"Sunset Fraction"
"Copper"

(c) Mining claims staked on behalf of and in the name of C. V. Brennan, Jr., as follows:

In Section 6, Township 27 North, Range 11 E. W.M., Snohomish County, State of Washington, as follows:

"A"
"B"
"C"

(d) Mining claims staked on behalf of and in the name of C. V. Brennan, Jr., as follows:

In Section 31, Township 28 North, Range 11 E. W.M., in Snohomish County, State of Washington, as follows:

"1"
"2"
"3"
"4"

(e) Mining claims staked on behalf of and in the name of Index Mining Co., Snohomish County, State of Washington, as follows:

In Section 1, Township 27 North, Range 10 E. W.M.

"Lloyd B. Extension"

In Section 6, Township 27 North, Range 11 E. W.M.

"Mable Extension"

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

1201 N. Division St.
Spokane 2, Washington
March 23, 1955

MEMORANDUM

To: DMEA Field Team, Region I, NW District

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Docket No. DMEA 2612 (copper), Index Mining Company, Snohomish County, Washington, Contract No. Idm-E489

Mr. Harvey Parliment of the Granore Company phoned me on March 19, 1955. He said that he intended to start work at the Sunset mine on the 21st of March. Initial work is to consist of surveying for drill sites and clean-up work underground preparatory to drilling. He thought they would be able to commence drilling about the 1st of April.

Lynch Bros. of Seattle are to be the diamond drill contractors. It is proposed to use two surface drills and two underground drills on a double shift. This should give them over 200 feet of core per day. This amount of drilling will probably make it advisable for DMEA representatives to visit the property more often than the usual monthly visits.

E. A. Magill

Orig. & 3 cys - Wash.
USGS (2)
DMEA
M/D
AD
EAM/he

Defense Minerals Administration
RECEIVED
MAR 11 1955

xxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

March 7, 1955

The Granby Consolidated Mining,
Smelting, and Power Company, Ltd.
Copper Mountain
British Columbia

Re: Docket No. DMEA-2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-5489

Gentlemen:

Mr. Magill, our field representative in Seattle, Washington, has informed us that legal counsel for your company has requested written confirmation from this office that we are aware that the proposed diamond drilling at the Sunset mine is to be under the supervision of the Granby Consolidated Mining, Smelting, and Power Company, Ltd.

The exploration at the Sunset mine is to be completed under terms of a unit cost contract. If the work is done in accordance with the terms of the contract, and properly reported on the necessary forms, it does not matter who actually does the work. Although we are aware that the proposed diamond drilling is to be supervised by engineers from the Granby Consolidated Mining, Smelting and Power Company, Ltd., according to the terms of the present contract, all our payments will be made to Mr. Brennan, president of Index Mining Company.

However, if there has been some agreement whereby Granby Consolidated Mining, Smelting and Power Company, Ltd., has assumed control of the Index mine, it would be highly desirable to assign the present contract from the Index Mining Company to the new operating company. Before an assignment can be made it is necessary that we be supplied with a copy of the instrument formalizing the change in control of the property. Other than this, the actual assignment is very simple, necessitating only the completion of a simple assignment form which we will be able to supply. Also, an assignment of the contract will in no way relieve the Index Mining Company of any of its responsibilities in regard to the provisions of the contract.

We hope that this letter will satisfactorily answer the questions brought up by your legal counsel.

By Field Team, Region I, NW District

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: DMEA (2)
USBM (2)
USBM(AD)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~

1201 N. Division St.
Spokane 2, Washington
February 1, 1955

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA 2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract Idm-E489

Dear Mr. Selfridge:

Enclosed are the Government, Docket, and Division copies of the Amended Contract for the captioned Operator.

Distribution of this contract has been made in the usual manner.

With reference to your comments on the proposed diamond drill hole No. A, a justification for this hole will be submitted to you before the hole is drilled.

Sincerely yours,

Thomas E Howard

Thomas E. Howard
for: Wing G. Agnew, Member
DMEA Field Team, Region I
Northwest District

Enclosure

cc: USGS (2)
Finance Office w/encl.

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

Ching
Talpo
Ellis
Selfridge
Johnson

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

JAN 11 1955

Re: Docket No. DMEA-2612 (Copper)
Contract No. Idm-E489
Index Mining Company
Sunset Mine
Snohomish County, Washington

Dear Mr. Weissenborn:

In accordance with your recommendations and our teletype of December 14, 1954, we are forwarding the original and five copies of an Amended Contract (short form) which supersedes the Original Contract, dated February 20, 1953, as amended.

The Amended Contract has been executed by the Administrator. If you and the Operator find it in order, please have the latter sign all six copies and make the usual distribution thereafter.

We note that the proposed underground diamond drill hole No. 4, for 750 feet and dipping 30° in a southwesterly direction, appears to have no definite target, and were wondering if it was being drilled purely on a wildcat basis. Some justification for this hole appears to be in order.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (24B)

Enclosures

MChing/gla
1-6-55
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. C. H. Johnson, Rm. 3621
T. H. Kiilsgaard, Rm. 5224
Code 700
Mr. Ching

APPROVED:

J. H. Hedges
Member, Bureau of Mines (24B)

Thor H. Kiilsgaard
Member, Geological Survey (24B)

RCS

xxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Bureau of Mines Administration
RECEIVED
JAN 10 1955

January 7, 1955

Mr. C. V. Brennan, President
Index Mining Co.
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMSA-2612 (copper)
Sunset Mine
Snohomish County, Washington
Contract No. Idm-2489

Dear Mr. Brennan:

This will acknowledge your letter of December 21, 1954.

In regard to your first question we have requested an extension of the contract for one year, which we assume will be sufficient to complete the proposed diamond drilling. If you do not think that is sufficient, please let us have your estimate of the time you think will be necessary.

In regard to your second question we assume that the Amended Contract will define royalty as it is in Form M-200 (Revised June 1954) and not as it is in your existing contract, as it is the usual ~~routine~~ practice in amending old contracts to bring them in line with the current contracts.

I trust this answers your questions.

Sincerely yours,

A. H. Weissenborn
Exec. Officer, Field Team
Region II, DMSA

cc: DMSA(2)
USBM(2)
Duffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SOLICITOR
WASHINGTON 25, D. C.

JAN - 4 1955.

Memorandum

To: The Administrator, DMEA
Attention: E. W. Ellis

From: Acting Assistant Solicitor, Defense Minerals

Subject: Index Mining Company, Docket No. DMEA-2612 (Copper)

We have prepared the attached draft of Amended Contract covering the above described project, as requested in a memorandum dated December 21 from Mr. Ching.

It should be noted that Amendment No. 1 to the Original Contract provided for a "pseudo-certification" in the event that work was not resumed by June 1, 1954, in a manner to bring it to completion. As the work was not resumed as required, this pseudo-certification is now in effect and would remain in effect were it not for the fact that the Amended Contract supersedes the Original Contract in entirety with one minor exception. As only a very small amount of the Original Contract work was performed (costs of $4,500.00 were incurred against an estimated total of $115,000.00), the pseudo-certification was not retained as to the amount of money spent under the original contract.

The maps referred to in Exhibit "A" must be attached to the contract prior to execution.

J. L. Hoffluud

J. L. Hoffluud
Acting Assistant Solicitor,
Defense Minerals

Operating Committee, DMEA, Washington, D. C.

The attached copies of Brennan's ltr of 12/21/54 should have accompanied copies of our ltr to Brennan of 1/7/55 mailed to you on 1/7.

EMRaymond, Region II

INDEX MINING COMPANY

2430 MONTE VISTA PLACE

SEATTLE 99, WASHINGTON

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JAN 14 1955

December 21, 1954

Mr. E. A. Neissenborn,
Executive Officer, DMEA,
Field Team, Region 11
South 157 Howard Street,
Spokane 4, Washington.

Re: Contract No. DMT1-6610 (amended)
Project Manager
Okanogan County, Washington
Contract No. [illegible]

Dear Mr. Neissenborn:

This will acknowledge your letter of December 15 in connection with authorization to go forward with the work at the Sunset Mine in connection with our present contract with the DMEA. We have agreed to the changes which are suggested in your letter and have so informed Mr. Jarill.

The winter season is now here and it is unlikely that the extensive diamond drilling authorized will not started before early spring.

There are two questions that I would like to have a record on, 1. What length of extension is being granted ? and 2. Is the definition of royalty in the new contract to be the same as in the original contract of last year, or will it be the same as the royalty definition now used in form MF-200 dated June 1954?

With kindest personal regards and thank you for all your goodness and cooperation in this matter. A merry Christmas and a happy and prosperous New Year to you and your family, I am,

Sincerely yours,

C. V. Brennan.

CVB:A

RECEIVED
DEC 23 1954
U.S.
SPOKANE, WASH.

Surname 700

Ching

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

December 21, 1954

Memorandum

To: Acting Assistant Solicitor, DMEA

From: Michael Ching, Mining Engineer
Rare and Miscellaneous Metals Division

Subject: Docket No. DMEA-2612 (Copper)
Contract No. Idm-E489
Index Mining Company
Sunset Mine
Snohomish County, Washington

Will you kindly prepare an Amended (Short Form) Contract to amend and supersede the subject contract in accordance with the attached rough draft.

/s/ Michael Ching

Michael Ching

Attachments

MChing:am
cc to: Docket
Code 700
Mr. Ching

Defense Minerals Administration
RECEIVED
DEC 16 1954

RECEIVED
Dec 15 3 27 PM '54
GENERAL SERVICES ADMIN
PROPERTY MANAGEMENT
BUS - COMMUNICATIONS

XDXXXXXX-052K

YWD024 WA SP 23 I-GS-G /DUPE AND CCT CPY/

WA SP 22

SPOKANE WN 12-15-54 1140A

GEORGE C SELFRIDGE CHAIRMAN OPERATING COMM DEMA DEPT OF INTERIOR

WA

RE INDEX MINING COGN DOCKET 2612. WE HAVE VERBAL CONFIRMATION FROM THE OPERATOR THAT THE AMENDMENT TERMS UOUTLINED IN YOUR TELETYPE OF DECEMBER 14,1954 ARE ACCEPTABLE. THEY ARE NOT SURE WHEN DRILLING CAN PROCEED AS SNOW HAS FALLEN IN THE AREA.

A E WEISSENDORN SP

2612 14 1954

WN 1145A

DEC 15 3 40 PM '54

BUREAU OF MINES
MAIL ROOM
WASHINGTON, D C.

xxxxxxxxxxxxxxxxxx
So. 157 Howard Street
Spokane 4, Washington

December 15, 1954

Mr. C. V. Brennan, President
Index Mining Co.
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMEA-2612 (copper)
Sunset Mine
Snohomish County, Washington
Contract No. Idm-2489

Dear Mr. Brennan:

Following is a copy of a teletype referring to the proposed exploration at your property:

"You may authorize Operator commence drilling at own risk on basis following amendment terms: Actual costs $4,500, diamond drill 15,670 feet at $7.00, assays 405 at $2.00, total estimated costs $115,000, provided that the exclusion in Annex II of contract of ground below number 2 level is eliminated, and those portions of the Mabel Lode and Lloyd B Lode, Figure 2 of contract, not included in north half of Section 1 are included as contract land."

According to Mr. Magill, you are willing to proceed with the proposed work under the terms of the teletype, weather permitting.

Would you please write us and confirm this so that your agreement can be placed in our files.

Sincerely yours,

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

cc: DMEA (2)
USBM (2)
Puffett

STANDARD FORM No. 14
APPROVED BY THE PRESIDENT
MARCH 10, 1926

TELETYPE

~~TELEGRAM~~

OFFICIAL BUSINESS—GOVERNMENT RATES

FROM [redacted] M.Ching/gla

BUREAU DMEA, Department of the Interior

CHG. APPROPRIATION 14X4401(01) Revolving Fund, Defense Production Act, Interior (Allocated Working Fund to the Office of the Secy.)

U.S. GOVERNMENT PRINTING OFFICE

Ching
Ellis
Newcomb
Selfridges
Mittendorf

A. E. LEISSENBORN, EXECUTIVE OFFICER
DMEA FIELD TEAM, REGION II
SOUTH 157 HOWARD STREET
SPOKANE 4, WASHINGTON

DEC 14 1954

REURLET DECEMBER 1, 1954 INDEX MINING COMPANY DOCKET 2612 YOU MAY AT OWN RISK AUTHORIZE OPERATOR COMMENCE DRILLING/ON BASIS FOLLOWING ASSIGNMENT TERMS: ACTUAL COSTS $4,500.00, DIAMOND DRILL 15,670 FEET AT $7.00, ASSAYS 405 AT $2.00, TOTAL ESTIMATED COST $115,000.00, PROVIDED THAT THE EXCLUSION IN ANNEX II OF CONTRACT OF GROUND BELOW NO. 2 LEVEL IS ELIMINATED, AND THOSE PORTIONS OF THE MABEL LODE AND LLOYD B LODE, FIGURE 2 OF CONTRACT, NOT INCLUDED IN NORTH HALF OF SECTION ONE ARE INCLUDED AS CONTRACT LAND.

George C. Selfridge

GEORGE C. SELFRIDGE, CHAIRMAN (GCS)
OPERATING COMMITTEE

MCHING/gla
12-10-54
cc to: Admr.'s Reading File
Operating Committee
Docket
Messrs. C. H. Johnson, Rm. 3621
T. H. Kiilsgaard, Rm. 5224
Code 700
Mr. Ching
Confirmation to Region II

cc

12/13/54 gla

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
DEC 15 1954

December 10, 1954

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA-2612 (Copper) Index Mining Company, Snohomish County, Washington

I have reviewed the memos of Magill (November 15) and Puffett (November 18) to the Field Team regarding the proposal to amend the Index Mining Company contract, Idm-E489 to substitute some 15,000 feet of surface and underground diamond drilling for the underground exploration provided for in the existing contract. It is understood Granby Consolidated has planned and will do the work.

The proposed amendment seems to me to be an improvement, and I shall be glad to concur in it.

As mentioned in discussion with Mr. Ching this morning, some explanation or justification might be requested for the 750-foot southward hole to be drilled from just inside the portal of the adit. If it is purely on a wildcat basis, the money might be better used to test the anomaly marked B, at depth, by lengthening holes B and C.

C. H. Johnson

C. H. Johnson

Copy to: T. H. Kiilsgaard, USGS
Minerals Division
C. H. Johnson
Files

XXXXXXXXXXXXXXXXXX
1201 N. Division St.
Spokane 2, Washington

December 7, 1954

Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMEA 2612
Contract No. Ida-E489
Monthly operating report for
period March to Nov. 8, 1954.

Gentlemen:

The subject operating report has been processed and forwarded to the Disbursing Officer in Portland, Oregon, for payment.

This is to inform you that payment could not be made in the full amount claimed. Amounts deleted are explained in the attached copy of a memorandum to the Field Team from the DMEA Certifying Officer, Region II.

By Field Team, Region II

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: DMEA (2)
USGS (2)

DMEA FIELD TEAM, REGION II

November 15, 1954

DMEA Certifying Officer, Region II

Contract Idm-E489, Docket DMEA 2612, Index Mining Company
Monthly operating report for March to Nov, 8, 1954.

The subject operating report has been received and processed.

A deletion of $2,394.69 was made from the amount of $3,932.47 submitted by the operator for payment. The details of this deletion follow.

$1,305.90 was deducted from the amount claimed for geophysical survey. The contract allows $3,000.00 for this item. The amount is starred. The amount deleted represents the amount claimed by the operator in excess of the $3,000.00

$1,088.79 was deducted from the amount claimed for trenching. The contract allows $1,500.00 for trenching and the $1,500.00 is starred. The amount deleted represents the amount claimed by the operator in excess of the amount allowed by the contract.

Myrtle Purdy

cc: DMEA (2)
USGS (2)

12/6/54 gla

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

December 1, 1954

Mr. George C. Selfridge, Chairman
DMEA Operating Committee
Department of the Interior
Washington 25, D. C.

AIR MAIL

Re: Docket No. DMEA 2612 (copper)
Index Mining Company
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

Enclosed are four copies of memoranda by Willard P. Puffett, Geological Survey, and E. A. Magill, Bureau of Mines, along with four copies of a letter from C. V. Brennan of the Index Mining Company requesting that additional property be added to that covered under the contract.

In a telephone conversation with the Executive Officer on November 10, 1954, Mr. C. V. Brennan, President of Index Mining Company, requested an amendment extending the subject contract and revising it so as to allow for the remaining funds to be expended entirely on a diamond drill program.

As you are undoubtedly aware, the Index Mining Company signed the original contract on February 20, 1953. Contract work has been very slow because of the illness of Mr. Brennan. The only work accomplished under the contract has been a geophysical survey and some surface trenching.

According to Mr. Brennan, Granby Consolidated Mining, Smelting & Power Company, Ltd., has become interested in the property and on the basis of the geophysical survey carried out under the DMEA exploration project (see Report on the Geophysical Survey, Sunset Mine Area, Index, Washington, by A. R. Clark received with March-August 1953 MF-104), they would like to carry out an extensive diamond drilling program. If this drilling proves successful, Granby will bring the property into production.

It is proposed to make an extension and amendment to the present contract to allow the contemplated diamond drilling, although all work actually will be done by Granby. It would appear that an arrangement of this type would expedite the proposal. Such an arrangement is entirely satisfactory to both Granby and the Index Mining Company.

Granby is very anxious to start work as soon as possible, i.e., before the snow prevents the starting of the work. Otherwise, it will be necessary to wait until about the 1st of April. If approval can be granted by the middle of December, they expect to be able to carry out the underground diamond drilling this winter.

The proposed contract revision will permit the exploration of more geophysical anomalies than the original program without adding to the original cost. It appears that the Government will be getting much more exploration for its money and with a far greater chance that substantial reserves may be located.

We agree with Mr. Puffett that the other anomalies in the area warrant exploration and that Group 5 drill holes are not necessary because of the previous Bureau of Mines drilling. However, Granby has proposed several thousand feet more drilling than there is money in the DMEA contract; consequently, if they still wish to drill the holes in Group 5 it could be for their own account. Of course, it is understood that the location of all holes is subject to Government approval so that any discrepancies in the location of the proposed drill holes could be taken care of before they were actually drilled.

We recommend that the proposed project amendment as suggested in Mr. Magill's memorandum be approved and that the expiration date be extended for an additional year. The diamond drilling under the proposed amendment will explore all the original exploration objectives plus a number of new ones indicated by the geophysical survey.

An early reply as to your decision in the matter will be greatly appreciated by the parties concerned so that, if approval is given, it will not be necessary to postpone work commencement until next spring. Granby has indicated that they will commence immediately upon receipt of a telegram indicating that approval of the amendment will be given.

By Field Team, Region II

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey

Wing G. Agnew, Member
U. S. Bureau of Mines

Enclosures

cc: USBM (2)
Puffett

Lehman Brothers Inc.
DEC 3 1954

XXXXXXXXXXXXXXXXXX
No. 157 Howard Street
Spokane 4, Washington

November 18, 1954

Memorandum

To: DMEA Field Team, Region II

From: Willard P. Puffett, Geologist, U. S. Geological Survey

Subject: Docket No. DMEA-2612 (copper), Proposed diamond drilling at the Sunset Mine, Index Mining Company, Snohomish County, Washington, Contract No. IDm-5489

Following is a discussion of the proposed diamond drilling at the Sunset mine. This diamond drilling has been proposed by the applicant as an amendment to the present contract, to take the place of the building of roads, drifting, crosscutting, and diamond drilling as specified in the contract. It is understood that the proposed new diamond drilling will be supervised by the Granby Consolidated Mining, Smelting, and Power Company, Ltd. of British Columbia. The purpose of the diamond drilling is to determine if there are sufficient reserves of copper ore at the Sunset Mine to encourage the Granby Mining Company to reach an operating agreement with the Index Mining Company by which Granby Mining Company will continue development of this property and eventually put it into production.

Granby Consolidated Mining, Smelting, and Power Company, Ltd., have submitted copies of two maps on which the proposed diamond drilling is shown. This drilling has been planned by Dr. B. S. W. Buffam, geologist for the Granby Mining Company. In this discussion, reference will be made to these maps and also to the map, fig. 3, attached to the contract.

Dr. Buffam has proposed a total of 7,275 feet of diamond drilling from underground locations in the No. 2 adit of the Sunset mine. Holes A, B, C, D, E, F, G, H, and I will explore the area east of the drift on the Sunset vein. The geophysical survey completed by Dr. Clark for the Index Mining Company has indicated a definite anomaly above this area. In the No. 2 adit, crosscutting from the portal to the Sunset vein has exposed at least five fairly strong shear zones, which though not too well mineralized do strike and dip parallel to other productive veins in the mine. One vein, 130 feet east of the Sunset vein assays 1.05 percent copper across 2.1 feet. The proposed drilling will determine if these shear zones contain ore to the east and to the west of the crosscut, and will also determine if the geophysical anomaly indicated on the surface has been created by a mineralized area underground.

Holes J, K, and L will explore the area between the west end of the Red Devil vein and the east end of the Barrington and Johnson vein, all of these veins have contained ore.

Hole N will explore for the western extension of the Johnson vein. Holes M, P, and O will explore for the western extension of both the Barrington and the Sunset vein. Hole D will explore for the eastern extension of the Blank vein.

All of the drilling from the underground stations will in effect be in substitution for the crosscutting and drifting on the Barrington vein which is specified in the contract. This drilling, while exploring for extensions of the Barrington vein on the No. 2 adit level, will also explore for extensions of many other known veins. All the proposed holes, with the exception of hole A are to be drilled horizontally. It is presumed, and expected, that should any hole intersect a promising mineralized vein, more holes will be drilled from the same location to explore the vein in the same vertical plane both above and below the No. 2 adit level. The footage for such drilling will be in place of drilling other holes now tentatively planned.

For instance, it is proposed to test the area south of the Sunset vein west of the adit crosscut by five horizontal drill holes. In all probability, if after the completion of two of these holes, it is found that no vein exists in this area, the other three holes will not be drilled in this area, but the footage allowed for the remaining three holes can be used for further exploration of other areas, if results in drilling other holes justify it.

Dr. Buffum has proposed a total of 10,200 feet of diamond drilling from surface locations. This drilling has been grouped in 3 different groups to explore anomalies indicated by the recently completed geophysical exploration conducted by Dr. Clark for Indar Mining Company.

In 1950, the U. S. Bureau of Mines conducted a diamond drilling program at the property which tested anomalies which had been indicated by a geophysical survey in 1950. The Bureau of Mines drilling program was successful in intersecting a mineralized vein which had been indicated by the geophysical survey. Also, the recent geophysical survey has indicated anomalies above known veins. Thus, it appears, that in this area at least anomalies found as a result of geophysical work are worthy of further investigation.

The location of the U. S. Bureau of Mines diamond drilling has been shown on the applicant's map in red pencil. It is to be noted that the eastern end of Anomaly D has been quite thoroughly tested by the Bureau of Mines drilling program. Seven Bureau of Mines drill holes were placed in this area. Bureau of Mines drill holes Nos. 4, 6, 3, and 7 were successful in intersecting a mineralized vein which ranged in thickness from 1.99 feet to 6.97 feet and assayed from 0.19 to 5.10 percent copper. Holes 8 and 12 were barren. To the east of this area

the Bureau of Mines drilled holes Nos. 11, 10, 13, and 14. All of these holes intersected a mineralized vein, but the assays were low, ranging from 0.04 to 0.13 percent copper across thickness ranging from 3.73 to 9.00 feet.

As a result of the Bureau of Mines drilling, it is believed that the drilling proposed by Dr. Buffam as group 5, which includes 5 holes totalling 1,730 feet, is not justified.

The Bureau of Mines drill holes 9 and 5 have partially tested that area which Dr. Buffam proposes to drill with the holes shown in group 2. Bureau of Mines drill hole 5 intersected a mineralized zone which assayed 1.09 percent copper across 25 feet. It is believed this vein probably represents the eastern extension of the Sunset vein.

Other than the two Bureau of Mines drill holes, the area to the east of the underground workings has not been explored, except by geophysical methods.

No surface holes have been proposed to explore Anomaly C, which is much broader than any of the other anomalies. In the report of this geophysical survey, Dr. Clark states: "The low erratic values are chiefly due to overburden. Any other conducting ore zone is completely masked." Drilling from underground locations will reach the northern margin of this area and will determine if perhaps the localization of an ore body has had some effect in producing this anomaly.

The surface drilling proposed as groups 1, 3, 4, 6, and 7, are to explore narrow elongate anomalies, similar in outline to those anomalies over known ore-bearing veins. Drilling by the U. S. Bureau of Mines in 1950 proved the existence of a mineralized vein at depth beneath a similar shaped anomaly. Thus, it appears that other such anomalies merit additional exploration in the Sunset mine area.

Distribution:
DMEA (Orig. & 3)
DMM (2)
Lockat
Buffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~xxxxxxxxxxxxxxxxxx~~
WASHINGTON 25, D. C.
1201 N. Division St.
Spokane 2, Washington
November 15, 1954

MEMORANDUM

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Proposed contract amendment, Contract Idm-5489, Index Mining Company, Snohomish County, Washington, Docket No. DMEA 2612 (copper)

Mr. C. V. Brennan, president of the Index Mining Company, and Mr. Robert H. MacRae, one of the vice-presidents of Granby Consolidated Mining, Smelting and Power Co., Ltd. of Copper Mountain, B.C., Canada were in the office to discuss a proposed change in the subject contract. The change was also discussed with Mr. H. Parliment of Granby and Mr. Willard Puffett, U.S.G.S.

As you are undoubtedly aware, the only work which has been carried out under the contract is a geophysical survey by Dr. A. R. Clark. Several bulldozer trenches to check one of the anomalies were unsuccessful in finding bedrock. The slow progress under the contract can be attributed directly to Mr. Brennan's health. He suffered a stroke a week or so before the contract was approved in 1952.

The Granby Cons. M., S. and P. Co. would like to carry out an exploration program at the property with DMEA assistance. They propose to spend the remaining monies in the contract (about $110,000) for diamond drilling, both surface and underground (see attached maps for tentative hole locations); this drilling to test the anomalies found in the geophysical survey and to test several areas where potential ore-bearing structures are known. A program of this type has a much better chance of finding larger reserves of ore than the existing contract. The property's present ore reserves are not sufficient for Granby to be interested in placing the property in production. However, if the proposed diamond drilling program is successful, Granby will go ahead and further develop the property.

Time is essential, from Granby's standpoint, in commencing work. Their operations at the Grand Duke property in northern British Columbia are shutting down for the winter; this will release men for the work at the Sunset. If the DMEA approves the diamond drilling program they could start work by the 1st of December and carry it on through the winter months.

However, if they are not able to commence work in December, it would probably be the middle of March before weather conditions would allow them to establish camp, etc. Consequently, they would appreciate an early decision on the proposed program.

In order to save time and simplify matters it is proposed that the present contract, still in the name of Index Mining Company, be amended to allow a diamond drilling program (see proposed amendment below). This arrangement is satisfactory to Granby who will actually carry out the work. The diamond drilling will be under the supervision of Dr. B. S. W. Buffam who is consulting geologist for Granby Consolidated. The Index Mining Co. will prepare the invoices and sign the DMEA payments over to Granby.

Proposed Changes to Contract

Extend the completion date to February 20, 1956.

Annex I. No longer applicable.

Annex II. Add to the property covered by the contract the northeast quarter of sec. 2, T. 27 N., R. 10 E., W.M. (see copy of letter from Index Mining Co. attached).

Change Exhibit "A" to:

Description of the Work

The object of this work is to explore for copper ore in the area indicated on the maps entitled Figure 7, Sunset Mine, Proposed Underground Drill Plan, and Figure 8, Sunset Mine, Proposed Surface Drilling. The proposed drill holes are indicated on the two maps.

1. Conduct a geophysical survey in the area located roughly between the "Bureau" ore body and the Sunset vein and also in the area east of the present Sunset Mine workings.

2. If the geophysical survey indicates the advisability of so doing, dig trenches to the necessary depth and length on any favorable indications found by the geophysical survey.

3. A total of 15,300 feet of diamond drilling as shown on attached maps.

The diamond drill holes must be of a size necessary to obtain the required geological information.

The location, direction and extent of all work is subject to the approval of the Government engineers.

Agreed Unit Costs

Diamond drill 15,300 feet @ $7/ft.	$107,100.00
Assaying 450 copper assays @ $2/ea.	900.00
	$108,000.00

The Government will contribute to the costs of the diamond drilling and assaying on the basis of these agreed unit costs per foot, or each, as the case may be, as they accrue, for units of work actually performed in lieu of actual costs. The rest of the described work estimated in the items listed below, and those items of cost which are excluded from the unit costs will be contributed to by the Government on the basis of actual costs (all work under actual cost items has been completed prior to November 8, 1954).

Estimated Actual Costs

*Indicates allowable maximum

Geophysical survey 1/	$3,000.00*
Trenching on favorable geophysical showings 1/	1,500.00*
Contingencies	2,500.00*
	$7,000.00

1/ With respect to this item of work, all schedules are waived. The sum allowed includes all costs including that of necessary technicians, labor, supervision, equipment, materials and supplies.

Summary

Agreed unit costs	$108,000.00
Estimated actual costs	7,000.00*
Estimated total cost of project	$115,000.00*
Government participation @ 50%	57,500.00*

All work under the estimated actual costs portion of the contract has been completed; this has been placed in the new amendment to the contract only to make the picture complete. A figure of $7.00 per foot for diamond drilling is proposed; this is the same as was in the original contract. The Granby people estimate that their costs will be $8.00 per foot or over, i.e., including preparation of drill sites, access roads, core boxes, supervision, engineering, rehabilitation of underground workings, camp facilities, etc.

Granby representatives stated that if accepting the $7.00 figure will speed up the acceptance of the contract amendment, they are willing to accept such a figure. They propose to drill all holes AX in size. Their plans call for a minimum of 3 drill rigs on a double shift basis.

The proposed program would appear to be the only way of obtaining a lot of information in a short period of time and it gives the very definite possibility of finding additional ore reserves. There are very few properties which have the benefit of an extensive well-directed exploration program of this type. I believe that such a program will discover additional ore shoots such as were discovered by the Bureau of Mines in their drilling in 1950.

Orig. & 3 cys - Wash.
USGS (2)
DMEA
AD
KAM/he

E. A. Magill

Wash

INDEX MINING COMPANY

2430 MONTE VISTA PLACE

SEATTLE 99, WASHINGTON

Defense Minerals Administration
DEC - 3 1954

November 9, 1954

Mr. E. A. Magill,
Bureau of Mines,
Room 215,
Federal Building,
Seattle 4, Seattle.

Dear Mr. Magill:

In connection with our conversation this morning we should add to the Sunset ground of Index Mining Company shown in figure 2 of Contract DMEA 2612 Idm-E489, the north east quarter of Section 2, Township 27 North, Range 10 East. The easterly end of figure 2 requires no change.

Thanking you I am,

Most sincerely yours,

C V Brennan

C. V. Brennan.

CVB:A

11/15/54 gla

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

Department of the Interior
Defense Minerals Administration
RECEIVED
NOV 15 1954

November 10, 1954

Memorandum

To: Wing G. Agnew, Member, DMEA Field Team, Region II

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

Subject: Docket No. DMEA-2612 (copper), Index Mining Company, Sunset Mine, Snohomish County, Washington, Contract Idm-1489

I had a telephone conversation this morning from C. V. Brennan who holds a contract on the subject property.

The contract period expires in February 1955. Some geophysical work has been done but very little else due to the serious illness of Mr. Brennan. Brennan tells me he is now expecting to complete an arrangement by which Grandby Consolidated will take over the property. He would, therefore, like to have the termination date extended and perhaps to have the contract transferred to the Grandby Consolidated Company.

The original contract provided for exploration by both diamond drilling and drifting. According to Mr. Brennan, Granby engineers would like to increase the amount of the drilling at the expense of drifting but without altering the total cost of the contract. This may or may not change the objectives of the program and if it does it would not be within the authority of the Field Team to make an amendment. I told Mr. Brennan that although I could not guarantee anything and we could give no answer until we had all the facts clearly in mind we would certainly be glad to consider the proposal that he has made.

Since Mr. Brennan is able to travel only with great difficulty I would appreciate it if you would request E. A. Magill to call on Mr. Brennan and obtain from him the Grandby proposal, which he says he has available. Magill might also call on Mr. Robert H. MacRae, one of the Grandby vice-presidents, whose address is 1040 Exchange Building, Seattle 4, Washington, and whose telephone number is ELLiot 5133. Magill could then give us a memo reviewing the situation which we could use for making recommendations to the Operating Committee.

cc: DMEA (2)
Duffett

(Dictated 11/4/54)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D. C.~~
So. 157 Howard Street
Spokane 4, Washington

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
APR 30 1954

April 27, 1954

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

Enclosed are the original and two signed copies of Amendment No. 1 to the above-referenced contract. Distribution of this amendment is being made in the usual manner.

Wherever appearing on the first page of the amendment, the date September 1, 1953, has been changed to December 1, 1953. The need for this change was explained in our letter of April 6, 1954, and approval given in the Administrator's teletype of April 14, 1954. The operator made the change on his copy of the amendment.

Sincerely yours,

Thor H. Kiilsgaard
Acting Member
DMEA Field Team, Region II

Enclosure
cc: Finance Office w/encl.
USBM (2)
Puffett

Surname
Docket Copy

700

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

Ching
Ellis
Martin
Hoffland

APR 14 1954

T E L E T Y P E

MChing/gla
DMEA - Dept. of the Interior

1/4/01 (01) Revolving Fund,
Defense Production Act,
Interior (Allocated Working Fund to the Office of the Secy.)

A. R. WEINSHENCK, EXECUTIVE OFFICER
DMEA FIELD TEAM, REGION II
SOUTH 157 HOWARD STREET
SPOKANE 4, WASHINGTON

RE FIELD TEAM LETTER APRIL 6 CONCERNING AMENDMENT NO. 1, DOCKET DMEA-2612, CONTRACT DM-4489, DRAY MINING COMPANY, WHICH SET OUT A CHANGE SEPTEMBER 1, 1953 DATE TO OCTOBER 1, 1953 WHERE NOTED ON FIRST PAGE OF AMENDMENT.

C. O. Mittenderf (for)

C. O. MITTENDERF, ADMINISTRATOR

MChing/gla
4/13/54
cc to: Adm. Reading File
Docket
Code 700
MChing
Messrs. CHJohnson, Rm. 3621
ARKinkel, Jr. Rm. B-242A, GSA
Confirmation to DMEA Field Team, Region II

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

April 14, 1954

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Re: Amendment No. 1
Docket DMEA 2612 (copper)
Sunset Mine
Snohomish County, Washington
Contract Im-2489

Dear Mr. Brennan:

Reference is made to our letter of March 22 to you and your reply of April 1 regarding the recess period of your contract. After you called our attention to the fact that you had done some work in September, October, and November of 1953 and that you felt the Government might well share in the costs, we contacted our Washington office, which has given approval to change the effective date of Amendment No. 1 from September 1, 1953 to December 1, 1953.

Therefore, if this meets with your approval, would you please change on your copy, wherever found on the first page of the amendment, the September 1, 1953 date to December 1, 1953. This will allow us to participate in costs for the period mentioned above. Return the other copies to this office and we will make the changes on them.

Thank you for calling this to our attention.

Sincerely yours,

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

cc: DMEA (2)
USEM (2)
Puffett

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

April 6, 1954

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Selfridge:

On March 22, 1954, we forwarded to the Operator copies of Amendment No. 1 to the captioned contract, as directed in your letter of March 18.

On April 2, we received a letter from the Operator stating that he would sign the amendment, but that as he had incurred contract costs during the months of September, October, and November, after the start of the recess period, he wanted an agreement before signing wherein he would be assured of reimbursement of the Government's share of these costs.

In the Field Team letter of March 8 requesting a recess amendment, it was noted that the contract had been inactive since September 1953. This statement was based on an interim inspection report by E. A. Magill, U. S. Bureau of Mines, dated September 14, 1953. In Magill's report, mention is made of a geophysical survey made on the property during the summer months, and which was being completed during the forepart of September. It was also mentioned that it would be sometime in October before the computations were completed and the information correlated with known geological features. Presumably, it is the costs of computing and report writing that the Operator refers to in mentioning costs of September, October, and November, as we are reasonably sure that no physical exploration was done during that time. We cannot confirm this, however, as the Operator has not submitted invoices for those months.

As the costs of report writing and computation of the geophysical survey are valid contract costs, even though the office work was done after the start of the recess period, we believe that we can participate in these costs without further change in Amendment

No. 1. We would appreciate, however, your council in this matter before instructing the Operator to sign the present amendment. If you believe we can participate in contract costs for the months of September, October, and November under terms of Amendment No. 1, please advise and we shall so inform the Operator. On the other hand, if Amendment No. 1 rules against such payment, we recommend that the starting date of the recess period be extended to December 1, 1953.

By Field Team, Region II

for: Thomas E Howard
Wing G. Agnew, Acting Exec. Officer
U. S. Bureau of Mines

Thor H Kiilsgaard
Thor H. Kiilsgaard, Acting Member
U. S. Geological Survey

cc: USBM (2)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
~~WASHINGTON 25, D. C.~~
No. 157 Howard Street
Spokane 4, Washington

March 22, 1954

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMEA-2612 (copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington
Contract No. Idm-E489

Dear Mr. Brennan:

Enclosed are the original and 6 copies of Amendment No. 1 to your DMEA contract. This amendment permits a recess in exploration work at the Sunset mine from September 1, 1953, to not later than June 1, 1954. If work is not resumed by June 1, 1954, the contract will be terminated. If the contract is terminated, there will be a lien against the property for the amount which the Government has contributed toward the exploration. This lien will be for a period of ten years from the date of the contract and will be repaid from royalties on any such production that may be obtained from the mine during this period.

It is our current policy to amend contracts on dormant exploration projects in this manner, in order to be able to more definitely determine what the future status of these contracts will be. This is now common procedure and similar amendments have been prepared for practically all our projects that have been forced to close down for the winter months.

If the terms and conditions of this amendment meet with your approval, please sign all copies, retain that copy marked for the operator and return the remaining copies to this office.

cc: USBM (2)
DMEA (2) ✓
Puffett

Sincerely yours,

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

700

DOCKET
SURNAME

Ching
Ellis
Chambers
Selfridge
J. Johnson

MAR 18 1954

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

Re: Docket No. DMEA-2612 (Copper)
Contract No. Idm-Kh09
Imlay Mining Company
Sunset Mine
Snohomish County, Washington

Dear Mr. Weissenborn:

In accordance with your recommendation of March 18, 1954, we have drawn up and are enclosing the original and five copies of a proposed Amendment No. 1 to the captioned contract, signed by the Administrator.

Please have all the documents signed by the Operator, retain copies for the Operator, Field Team, and Finance Officer, and return the remaining copies to this office.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (245)

Enclosures

MChing/foc 3-16-54
cc to: Adm. Reading File
Operating Committee
Docket
Messrs. C. H. Johnson, Rm. 3641
A. R. Kinkel, Jr. Rm. B-242A, GSA
M. Ching
Code 700
DMEA Field Team, Region II

APPROVED:

J. H. Hedges
Member, Bureau of Mines (245)

Philip W. Guild
Member, Geological Survey (246)

R.C.S.
3-18-54

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

Department of Defense Minerals
RECEIVED
MAR 10 1954

March 8, 1954

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Re: Docket No. DMEA-2612 (copper)
Index Mining Company
Snohomish County, Washington
Contract Idm-E489

Dear Mr. Selfridge:

Project work on the subject contract has been inactive since September 1953. The shutdown has been due in part to the winter weather and in part to illness of Mr. C. V. Brennan, the operator. We have been informed that the operator intends to resume work in the spring but that his plans are indefinite.

In line with the DMEA policy of extending recess agreements to contracts that have suspended operations because of winter weather, we recommend that such a recess agreement be granted the subject contract. Further, this agreement should specify that work is to be resumed no later than June 1, 1954, and that if work is not resumed as of that date, the contract shall be terminated effective that date.

The contract has been in effect for more than one year but the only work that has been completed has been a geophysical study of part of the property. As it now stands, the time limit of the contract probably will have to be extended if the project is to be completed. We realize that Mr. Brennan's illness has made it very difficult for him to push the project, but we believe that in all fairness to the Government, project work should either be resumed as soon as possible and vigorously advanced, or else the contract should be terminated.

By Field Team, Region II

A. E. Weissenborn

A. E. Weissenborn, Executive Officer
U. S. Geological Survey

Wing G. Agnew

Wing G. Agnew, Member
U. S. Bureau of Mines

cc: USBM (2)
Puffett

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

FILE COPY
Surname:

Apr. 9/53

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

Dear Mr. Weissenborn:

Attached herewith is one copy each of contracts Idm-E-173, 489 and 493.

These "extra copies" are for use of your office in making reports on these projects.

Sincerely yours,

/s/ c/o Mittendorf

Administrator

Attachments - 3
REAdams/meb
4-8-53
cc to: Adm. Reading File
Mails & Files Br.

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

March 17, 1953

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 20 1953

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Snohomish County, Washington
Contract Idm-E489

Dear Mr. Selfridge:

Enclosed herewith are signed Government, Docket, and Division copies of the subject contract.

Copies of this contract have been retained by the Operator, the Field Team, and the Finance Officer.

Sincerely,

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

Enclosure

cc: USBM (2)
Puffett

cae
3/23

3-4-53 gem

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
~~WASHINGTON 25, D. C.~~
1201 W. Division St.
Spokane 2, Washington
February 25, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAR 3 1953

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Wash.

Subject: Docket No. DMEA 2612 (copper)
Index Mining Company
Exploration Project Contract

Dear Mr. Brennan:

Enclosed are the original and five copies of the subject contract which have been signed for the Government by C. O. Mittendorf, Administrator, Defense Minerals Exploration Administration. If this contract meets with your approval please have all copies signed by an authorized official of your company, retain the copy marked "Operator's Copy" for your files, and return the original and remaining copies to this office.

You will note in the contract that the patent number of the Black Bear Extension group of claims has been changed from 866270 to 886270 and that the name of the claim Mona has been changed to Mono in order to conform with the official Patent Plats of the Bureau of Land Management.

Sincerely yours,

M. E. Volin, Member
DMEA Field Team
Region II

Enclosure

cc: DMEA, Wash. (2)
USGS (2)

FILE COPY
70 SURNAME:

Schmidt
Ellis
Selfridge
Johnson
Whittendorf

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

FEB 2 0 1953

RW.

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

Re: Docket No. [illegible]-2612 (Amended)
Index Mining Company
Snohomish County, Washington

Dear Mr. Weissenborn:

Enclosed are the original and five copies of the subject contract which have been signed by the Government. When the original and all copies have been signed by the operator, they are to be distributed according to the usual practice.

In the letter of [illegible] of January 19, 1953, [illegible] contract be used. This is in addition to [illegible] where [illegible] in the [illegible], the contract requires an interest in the [illegible], unit costs [illegible] whenever possible [illegible], drifting [illegible], and in [illegible] drilling. [illegible] agencies have been advised [illegible] D.C.

The [illegible] of Mr. Magill of January 19, 1953, has been accepted as a satisfactory explanation of the points raised in our letter of December 22, 1952.

It will be noted that the present number of the place near extension group of claims has been changed from [illegible]6270 to [illegible]6270 and the name of the claim Rena has been changed to Rona in the contract, in order to conform to the official patent [illegible] of the Bureau of Land Management.

Sincerely yours,

S.H. 2/20/53

George C. Selfridge (JB)

Chairman, Procurement Committee

Enclosures
As stated:

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

D. M. Lemmon (JB)
Member, Geological Survey

F. Schmidt/jem 2/11/53
cc to: Adm. Reading File Docket
Messrs. CHJohnson-3621
RRinkel-4234 GSA
Spr. Com. Ellis Schmidt
Field Team, Region II

FILE COPY
SURNAME:

AEKane

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

February ~~4~~ 10, 1953

Memorandum

M. S. in R. v. R.

To: Administrator

Through: Mr. E. W. Ellis

From: Chief Counsel

Subject: Index Mining Company - Docket No. DMEA-2612 (Copper)

There is attached hereto in satisfactory legal form for execution an exploration project contract, subject to the attachment of the maps referred to in the contract.

A. E. Kane
for J. L. Hofflund
Chief Counsel

Attachments
AEKane/ema
cc: Mails & Files
J. L. Hofflund
A. E. Kane
E. W. Ellis
Chron.

DMEA 2612

Notes On Proposed Contract , Amount $115,000.00
by
F. Sommer Schmidt 1/29/53 Copper

Contract $115,000

Project recommended by Helena Meyer of the Bureau and Kinkel for the Survey and Field Team.

The Sunset Mine has produced 263,416 tons averaging 2.45% recovered copper probably assay of ore 2.63.

Average silver recovered 0.59 Oz. per ton.

Average gold recovered 0.0057 Oz. per ton.

Pleistocene glaciation has removed oxidized portion of the veins. Glacial debris in the vicinity.

Minerals chalcopyrite and bornite (primaries) small amounts of chalcocite and covellite in upper workings.

There are 4 veins Sunset is the principal. Has been stopped for 1,000 ft. on the strike and 500 ft. on the dip stoping width at times 20 ft.

The other veins are the Little Copper King and the Harrington and the Bureau of Mines veins. All of them have been productive, except the Bureau of Mines Vein which has 5.5 ft. width, 275 ft. length of ore shoot assay value given 4.09% little or no post mineral faulting.

Total ore reserves of the Sunset mine are estimated by the Bureau of Mines to be, indicated 134,500 tons of 3.69% copper and inferred 173,000 tons of 3.28% copper.

If this exploration project is as successful as expected it should add to the reserve total 54,000 tons indicated 3.0%, and 32,000 tons inferred 3.09% copper.

The ore is erratic therefore diamond drilling cannot be considered a satisfactory method of determining a commercial find but it does help to indicate where mineralization exists which should be explored by underground work.

The proposed contract is unusual in so far as the applicant does not include all his property and mine. He excludes that part of his mine that is under water. Namely all that under the No. 2 level which is at the 1420 ft. elevation. Kinkel in his memo of October 25, 1952 is aware of this consideration, "The exploration program is probably justified because the discovery of new reserves above the flooded workings may lead to production and the mining of the reserves in the flooded sections of the mine."

In the memo of Helena Meyer October 24, 1952, she refers to the cost of the project as $107,160. which is one of the figures used in the Field Team report, but there is also another on page 5 of $117,520.

My objection to the proposed contract was that the costs were too high. The Field Team Magill has replied substantiating their position but admitting the costs are high. The costs of labor are above the average of $1.70 an hour and are $17.50 per shift for miners because of competition with timber land workers. Then the method of figuring the cost of the equipment to be purchased based on the American Contractors Association figures is not satisfactory to us. This caused the Applicant to agree that we would jointly buy the equipment which while raising the cost of the contract from $107,160 to $112,185* is due to the purchase of $23,205 worth of equipment of which we have a 50% interest or $11,602.

The printed map Fig. 5 shows the Harrington stope in plan Fig. 7a shows the stope in section just above the 1400 ft. elevation. The ore isstoped 50 feet high. This stope is 350 feet long and is stoped up from the No. 2 level of the Sunset with which it is connected by underground workings. This elevation is 1400 ft. at the portal of the Sunset tunnel and about 1420 at the Harrington stope. This application calls for a crosscut to this Harrington vein directed toward the center of this stope, but at 1600 ft. elevation or 180 feet above the stope. The question naturally arises whether this is development work or exploration.

However, in drifting East 700 ft. toward the objective of the Red Devil Vein it is only the first 200 feet that overlies the Harrington stope and after that the next 500 feet is in virgin ground with no workings above or below.

Since the Field Team 9/29/52 indicates the amount of ore it is planned to find with this project it is of interest to make some rough calculation as to what the royalty return might be. It is recognized that we do not engage in these exploration projects with the idea that we can hope to figure in advance how we are to get back our share of the money through royalties.

* + contingency

TThe Field Team report page 4 shows inferred ore 32,000 tons plus 54,000 tons indicated ore average 3.04% This is a total of 86,000 tons at 3.04% Cu plus Ag and Au making 61 lbs copper per ton or 5,250,000 lbs copper gross.This would probably net about 4,000,000 lbs cu paid for at price of copper 24.5 cents gross or 22 cents per lb net making $880,000 necovered. Royalty at 5% is $44,000. which is 83% of the government share of the contract $57,500.

1/29/53

Notes On Making Contract
by
F. Sommer Schmidt

In figuring the cost per foot of the drifts the applicant included 10% contingencies making the total cost $36.17. In view of the unit cost this contingency could not be pooled in a general contingency fund.

In the case of the roads 2400 feet there was also a contingency of 10% making the total $2.20 and here again it is a unit cost so the cost per foot was used at $2.20 in the case of the roads which are lumped with the buildings in (6) of the original field team report of 9/29/52 this 10% contingency cannot be put in the general contingency fund.

It will be noted that none of the Field Team figures have been changed, they have simply been rearranged and a final contingency $2,914 added to bring the total to $115,000.

Without this contingency the total would be $112,086 whereas field team as per their latest of 1/19 which is $112,186. This discrepancy is in the contingency that is left after taking out the $480 for roads and leaving $100 to go into the general contingency so that I am really only adding $2,914 less $100 or $2,814 which is my own contribution to the contingency. This matter of contingency of roads and buildings lumped together is in the original field team report of 9/29 page 11 item (6).

I realize that $2,814 is not much of a contingency for a $112,000 job but the fact is that I still think that the costs are high and therefore I do not think that any greater amount of contingency should be added.

The Bureau is leaning backward in their report of 1/19/53 in every possible defense of the high costs. For instance after they were informed that the figures of the Associated General Contractors of America are not acceptable to us this report again quotes them. I am familiar with this organization and have interviewed them, their figures are not based on such conditions as we work under, they are intended to make a profit for their members at every turn. In this particular case the amount is not on a sufficiently large scale to make much difference and I am inclined to go along, but the fact is that we have made a reduction in the cost of the contract by acquiring a 50% interest in the equipment.

There is a question whether some of this work is not development. If some of this work is diamond drilling it would seem that diamond drilling is of value. The Bureau of Mines ore body was discovered by diamond drilling. I am not satisfied with Magills answer to this.

Holding out all reserves of ore under the No. 2 level of the Sunset Mine which part is now under water and is the 1420 ft. elevation is reasonable since there are ore reserves under water and since the exploration contract will not be the cause of the discovery or development of this ore, it is a legitimate request that the part of the Sunset Mine under water be excluded from the area that is to be liable for royalty payments.

There seems to be constant repetition asking for a short form contract. Where the Government acquires an interest in equipment or buildings there cannot be a short form contract.

1/27/53 gla

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D. C.~~ DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

Spokane, Washington
January 21, 1953

MEMORANDUM

To: Chairman, Operating Committee, DMEA, Washington, D. C.

From: DMEA Field Team, Region II

Subject: Docket No. DMEA ~~2618~~ 2612 (copper)
Index Mining Company, Snohomish County, Wash.
Application for exploration assistance

Enclosed are four copies of a reply prepared by E. A. Magill, Mining Engineer, Bureau of Mines, to a letter dated November 20, 1952, from Frank E. Johnson, Chairman, Operating Committee, regarding the subject application.

The cost figures objected to in Mr. Johnson's memo have been revised to $36.17 per foot for untimbered drifts and crosscuts, with the Government participating in the purchase of the major items of equipment. The Field Team believes that this revised figure compares reasonably well with costs for similar work at some of the contracts now in effect, and recommends favorable consideration.

By Field Team, Region II

A. E. Weissenborn

A. E. Weissenborn, Exec. Officer
U. S. Geological Survey
157 South Howard Street

M. E. Volin

M. E. Volin, Member
U. S. Bureau of Mines
1201 N. Division Street

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
1201 N. Division St.
Spokane 2, Washington
January 19, 1953

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration

MEMORANDUM

See Magill Report 9/29/52

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Docket No. DMEA ~~2613~~ 2612 (copper)
Index Mining Co., Sunset Mine, Snohomish County, Wash.;
Reply to letter from Frank E. Johnson, Chairman,
Operating Committee, dated November 20, 1952.

In reply to the subject letter the following information is supplied. Mr. C. V. Brennan, President of the Index Mining Co., was contacted in Seattle on January 8, 1953, and the problems in Mr. Johnson's letter were discussed with him.

To facilitate reference to specific items in Mr. Johnson's letter, a copy is attached. The capital letters inserted refer to the answers given below.

A. The cost of timbered drifts at $54.66 per foot does appear to be high; however, it is to be remembered that equipment must be purchased or rented for the job, as the Operator has no usable equipment, and a good portion of this cost represents equipment cost. A number of other DMEA projects have higher per foot costs for similar work. In line with Mr. Johnson's request, the cost figures have been reviewed with the applicant and revised figures are submitted.

B. Figures are reviewed in this memo.

C. In this type of deposit, diamond drilling cannot supply detailed or accurate enough information to warrant the capital expenditures necessary to bring the mine and mill into production. The ore shoots are not uniform, and the ore itself does not always core well.

D. The applicant would prefer a short form contract. It is doubtful that a long form contract would effect a saving to the Government in light of the costs so far experienced on such contracts.

Impossible Equipment to be purchased + 53,203

E. The proposed exploration program will crosscut and drift on the Bureau of Mines (Radiore B) ore body at a depth of about 120 feet below the deepest diamond drill hole intersection at present.

The work on the Harrington vein will explore a portion of the vein which has not been prospected before.

F. The wages for timberman at $19.20 per shift include workmen's compensation, O.A.B., and normal "fringe" benefits. Base pay for timberman is figured at $17.50 per 8-hour shift, while that of a foreman is figured at $18.50.

G. In actual use, a 60-month write-off on all types of equipment cannot be considered a realistic figure in all cases. The figures of the Associated General Contractors of America for annual depreciation vary between 8 to 50 percent. However, annual depreciation figures do not enter into the revised cost estimates.

H. The applicant is agreeable to the proposal of purchasing all items of equipment jointly, with the Government contributing one-half of their cost.

I. Mr. Johnson does not take into consideration, while allowing 10 months use for the equipment, that part of the equipment will be used in diamond drilling and road construction. It is estimated that the project will take 15 months of actual working time to complete.

J. The per foot cost of steel and bits was discussed with the local representative of Copco Pacific Co., Ltd. (Coromant). He stated that costs on actual jobs varied between $1.50 per foot and $2.55 per foot. Mr. Brennan stated that he had taken his figures from actual test work carried out at the Holden mine of the Howe Sound Company at Chelan, Wash. By using the Copco Pacific data, a figure of $2.04 per foot is arrived at as follows.

<u>Steel and bit cost</u>

Basis:

Drill - Atlas drill with pusher leg
Steel - Coromant 7/8"
Bits - Tungsten carbide chisel bit integral part of steel
300 ft. of hole per drill steel (Coromant representative figures)
Basis of 5-foot round (although overall average for contract is figured at 4 feet due to breakdowns, etc.)
20 holes per round (at least 27 holes will be needed in the crosscuts and where vein structure is tight, but possibly less than 20 in ore.)

Footage of hole drilled per round - 16 holes @ 5.0' = 80
4 holes @ 6.0' = 24
Total 104'

300' hole
- 3 Rounds
= 15 ft drift
6' steel 15
2.5' drift
full ft steel

Cost of 6' Coromant steel - $20.40 plus 3% state tax = $21.01

6 | 21.01
3.50 / ft
Rush

Cost of piece of steel $\frac{21.01}{300'}$ = $0.07 per foot of drill hole
Average footage per steel

Total footage of hole per round = 104 x .07 = $7.28 per round

Cost of sharpening steel:

20 sharpenings per grinding wheel (Coromant representative's figures)

Sharpen steel for 20 feet of drilling

$\frac{104'}{20}$ per round = 5.2 sharpenings per round

$\frac{20}{5.2}$ = 3.8 rounds per wheel

Grinding wheels cost $3.40 each

$\frac{3.40}{3.8}$ = $0.90 per round - cost of grinding wheels

Recap of steel and bit costs

Steel and bits	$7.28
Sharpening	0.90
	$8.18 per round

$\frac{8.18}{4}$ = $2.04 per foot of adit advance

Small tools and miscellaneous amount to $0.75 per foot ($1350.00 for entire project); this is a low figure considering that all items must be purchased new by the applicant. A partial list of the items which must be purchased under this heading follows: 1350 1800 .75

Shovels	Carbide lights
Picks	Carbide
Bars	Electric blasting machine
Pipe dies	Carpenter tools
Wrenches	Mechanic tools
Acetylene outfit	Galvenometer
Vise - bench and pipe	Loading sticks
Sledge hammers	Blasting wire
Saws	Rags
Fuel storage tanks	Heating stoves
Fuel measures	Engineering supplies, not including analytical work
Anvil	

Maintenance and repairs of unspecified equipment

The unspecified equipment is obviously that specifically listed in the Field Team report as necessary to carry out the project. Based on the Associated General Contractors of America ownership expense for a 15-months working period as listed below, the maintenance expense for the necessary equipment would amount to $2.22 per foot not including field repairs.

Item	Cost of equipment	Average annual expense percent of capital investment without field repairs	Cost per year
Air compressor	$10,000	15%	$1,500.00
Loader	3,100	15%	465.00
Air trammer	2,100	15%	315.00
Mine cars	1,200	10%	120.00
Drills, air	1,950	10%	195.00
Truck	2,275	15%	341.25
Grinder	200	10%	20.00
Fan	350	15%	35.00
Vent tube	1,000	10%	100.00
Air hose	245	10%	24.50
Water hose	135	10%	13.50
Saw, air driven	250	10%	25.00
Air receiver	400	10%	40.00
		Total	$3,195.25

$$(\$3195.25 \times \frac{15^{*}}{12}) \div 1800 = \$2.22 \text{ per foot}$$

*Estimated number of actual working months to complete work.

Inasmuch as it is proposed to buy all new equipment, possibly these figures are high for the first 15 months operation. Consequently, a figure of $2.00 per foot is used in the revised estimate.

K. Twenty holes is an average figure. Undoubtedly, 27 holes or more will have to be drilled in the crosscuts and unproductive portions of the vein. Under Contract Idm-E417 (Curtis and Rogers, Snohomish County, Wash.) the Operator is using 27 holes in similar ground and experiencing difficulty in breaking a 4-1/2'x7' round.

The vein material has a tendency to slab, making it necessary to timber although it may take 20 or more holes to pull a round.

L. Actually, the Operator, if he has any faith in his property, will probably carry his main crosscuts and drifts at least 6'x8' in the clear so that they may eventually be used for haulage without expensive enlarging. The estimated unit cost, however, is on the basis of minimum cross-section, 5-1/2'x7' rounded.

M. Diamond drilling certainly has its place in exploration, but to accurately determine ore grades of this type work must be done by actual openings. As was stated before, copper mineralization within the ore shoots themselves is erratic; furthermore, the productive sections of the veins are highly sericitic and consequently difficult to core with a diamond drill.

N. In order to run jobs 2 and 6 concurrently, it would be necessary to duplicate all the major items of equipment.

After consultation with the applicant, the revised cost schedule given below is proposed for a unit cost contract.

Crosscuts and Drifts

	Cost/ft.
Labor and supervision	$18.59
Material installed	2.17
Supplies and maintenance	10.04
Power	2.08
	32.88
10% contingency	3.29
Cost, untimbered drifts and crosscuts	$36.17
Timbering	8.39
Cost, timbered drifts	$44.56

In the suggest form of the contract as outlined in the Field Team report of September 29, 1952, under Estimated Costs of the Project, the following would be substituted under paragraph (4), Operating Equipment.

Operating Equipment

To be purchased

Number	Type	Estimated cost
1	Air compressor, 315 cfm diesel	$10,000
1	Loader, Eimco 12B or equivalent	3,100
1	Air trammer	2,100
4	Mine cars @ $300/ea.	1,200
3	Drills with air leg @ $650/ea.	1,950
1	Truck pickup	2,275
1	Grinder, air driven	200
1	Fan, gas engine driven	350
1000 ft.	Vent tube @ $1/ft.	1,000
250 ft.	Air hose, 1"	245
150 ft.	Water hose, 3/4"	135
1	Saw, air driven hand	250
1	Air receiver tank, 36"x8'	400
	Total	$23,205*

*Allowable maximum

To be rented

None

To be furnished by Operator

None

Under paragraph (7), Miscellaneous, the following would be substituted:

(7) Miscellaneous		
Crosscutting 750 ft. @ $36.17/ft.**	$27,127.50	
Drifting 1050 ft. @ $36.17/ft.**	37,978.50	
*Timbering 525 ft. @ $8.39/ft.**	4,404.75	
Diamond drilling 1000 ft. @ $7/ft.**	7,000.00	
Equipment to be purchased	23,205.00	
Analytical work	600.00	
Trenching	1,500.00	
Geological and geophysical survey	3,000.00	
	$104,815.75	includes contingency of 3.29x1800= 5,922.2 Page 5
+ 7.3%		
Total estimated cost of project	$112,185.75	
Government participation @ 50%	56,092.87	

*It is estimated from the present workings that at least half of the drifts have to be timbered.

**These are unit costs.

E. A. Magill

Orig. & 3 cys - Wash.
USGS (2)
DMEA
M/D
EAM/he

9/29 (5) 790. [illegible]
9/29 (6) 2360. [illegible]
104,815
112,185.

700

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

NOV 29 1952

Mr. A. E. Weissenborn
Executive Officer, Region IV
DMEA Field Team
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington

Dear Mr. Weissenborn:

This acknowledges receipt of the Field Team Report by L. E. Macill dated September 29, 1952, with proposed contract on the subject application.

The cost figures pertaining to the underground work are high compared with usual costs in projects of this kind. The cost
A of timbered drifts is estimated at $54.66 per foot for tunnel work. It therefore seems advisable to give some consideration to the following alternatives:

First: Review the figures in this proposed short form
B contract, and determine whether they cannot be reduced to approximately more normal costs.

Second: If these costs are to be so great, consider the
C possibility of doing all this exploration work by drilling, and eliminating the expensive underground work.

Third: Consider the long form contract, listing all estimated
D costs to be paid for as incurred, and justified by agreement of the Field Team.

Details

First: Review of figures in this proposed short form contract.

It would seem advisable to consider whether the underground work planned is not more in the nature of development than exploration. It is not clear from the Field Team report which proposes to do under-
E ground work where drilling has already indicated or possibly even found ore, whether we are making a sufficiently clear distinction between exploration and development work.

Labor and Supervision

The wage rate is high. It is understood that this property is located where logging wages are $20 to $25 per day. This is one of the items that may therefore have influence in considering some other method of exploration.

F The cost of these drifts at $4.65 per foot, includes the wages of timbermen at $19.20 per shift when the foreman gets $20.50 per shift. A

Equipment to be purchased

The cost of this item in the Field Report is figured on the basis of "Contractors Equipment Ownership Expense" as published by the Association General Contractors of America, and is correctly figured if that basis were standard practice in writing these contracts. Where the operator does not own equipment, and it is necessary to purchase it, there are two methods available.

G (a) The operator can purchase the equipment and depreciate it on the basis of 60 months life for such months as it is in use on this project. B

(b) The cost of the equipment can be entered as a cost item, in which case the Government contributes one half of the amount and
H also retains a one half interest in the ownership of the equipment. The two methods are our standard practice, and should be made clear to the applicant by the Field Team.

The proposed equipment cost figures are acceptable. A comparison of the different methods of calculating the costs are therefore as follows, assuming that operator buys the equipment as per the proposed contract.

Applicant's method: The total "expense" per working month of all
I items is $1,316.65. Total footage of underground work 1800. Footage per month 175 or 10 months of actual underground work, at $7.47 per foot, or $13,160.90 total cost. C

Standard practice method A: Total cost of equipment as $23,205.00 to be bought by Operator, and depreciation on basis of 60 months for a period of 10 months actual use of $386.75 per month or $3,867.50 total cost.

Standard practice method B: Charge the total cost of equipment $23,205.00 to the contract. The Government share is $11,602.50 with the Government owning a half interest in the equipment.

Both of the Standard practice methods are more advantageous to the Government. Either of them are available to the Operator, but not the Contractors Ownership Expense Percentage. Using Standard method A would give a cost per foot of $2.15 instead of $7.47 a difference of $5.33 per foot.

Supplies and Maintenance

The cost of several items under this heading require
J clarification. The cost of steel and bits at $2.75 per foot is $11.00 per round of holes. Small tools and miscellaneous is $7.00

per round and maintenance and repairs of unspecified equipment is $12.00 per round. These figures are not substantiated in any way and they require explanation.

K It is noted that the Operator expects to drill 20 holes per round. This seems excessive unless the ground is exceptionally hard, and this does not accord with the fact that half of the footage of drifts need timbering, with full lagging on top and half way up the sides. It is not made clear why exploratory workings of this kind need to be 5½ feet x 7 feet in the clear of all timbers instead of the standard 5 feet x 7 feet.

Second: Possibility of eliminating underground work.

The ore body called the "Bureau of Mines Radiore [illegible]" was discovered by drilling. It is proposed to explore this indicated ore body by three drill holes from the proposed Bureau of Mines crosscut (Job 2 in proposed contract). Since this seems to be a successful and accepted method of doing this exploration work on this property, it is suggested that the diamond drilling method be used on all the objectives. If the cost of the underground work amounting to $27,000 be used for drilling at $7.00 per foot, it would amount to over 12,500 feet.

M

Third: Use of Long Form Contract.

Since there are so many items of cost in this report and the proposed contract that seem excessive, and since it is incumbent on us in using the short form to use the minimum cost figures per unit that seem justified, it is indicated that a more realistic estimate of costs be made, and that it be put on the long form so that the Government will only pay for actual costs incurred in an operation in which the Field Team will play its part in supervision.

N In planning the work the question naturally arises as to whether it would be expedient to run jobs 2 and 6 namely the Bureau of Mines and the Harrington underground work simultaneously.

Sincerely yours,

(signed) Fred S. Henderson

Chairman, Operation Committee

Approved:

Member, Bureau of Mines

A.R. Kinkel Jr.

Member, Geological Survey

FSSchmidt/jem 11/14/52

cc to: Adm. Reading File Docket
Messrs. C.H.Johnson-Rm. 3621
A.R.Kinkel-Rm.5214
Ellis Schmidt
Opr. Committee
Field Team, Region IV

12/30/52 gla

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

December 18, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
DEC 1952

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

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington

Dear Mr. Johnson:

Please refer to your letter of November 20, 1952 regarding the subject docket. Attached is the original with three copies of a memorandum dated December 9, 1952 from E. A. Magill to the Field Team.

As pointed out by Mr. Magill, because of the illness of Mr. Brennan, president of the company, it will not be possible to answer your letter of November 20 until he is able to discuss costs, etc. with a representative of the Field Team.

Very truly,

A. E. Weissenborn

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

cc: USBM (2)
Puffett

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

1201 North Division St.
Spokane 2, Washington

December 9, 1952

MEMORANDUM

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Index Mining Co. exploration application, Snohomish County, Washington, Docket No. DMEA 2618 (copper)

The Field Team has received a letter dated November 20, 1952 from Frank E. Johnson, Chairman, Operating Committee, DMEA. This letter asks for a reevaluation of costs on the subject application and has been referred to me for a reply.

Unfortunately, Mr. Brennan, the president of the Index Mining Co. recently suffered a stroke while addressing the West Coast Mineral Association in Seattle. He is still in the hospital. Consequently, it will be several weeks before it will be possible to discuss costs with the applicant and prepare a reply to Mr. Johnson's letter.

E A Magill
E. A. Magill

Orig. & 3 - Wash.
USGS - 2
DMEA
A/D
EAM/vf

Schmidt

MF-50

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

REFERRED TO: DATE 11/19/52

DMEA-2612

1. ~~Opr. Committee~~
2. ~~Mr. Mittendorf~~ Henry
3. ~~Mails and Files~~
4. Ellis (Docket) 4640

FOR:

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

REMARKS: This letter was discussed with Al. Weissenborn today. He thinks it is O.K. and should be sent out to the field. EHE

Check (X) before the items needing attention.

GPO 16—63815-1

Ernest Wm. Ellis
Initials of sender.

FILE COPY
SURNAME:

Schmidt

UNITED STATES
DEPARTMENT OF THE INTERIOR

DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

NOV 20 1952

Mr. R. E. Weissenborn
Executive Officer, Region IV
DMEA Field Team
224 New Customhouse Building
Denver 2, Colorado

Re: Docket No. DMEA-2612 (Copper)
Index Mining Company
Sunset Mine
Snohomish County, Washington

Dear Mr. Weissenborn:

This acknowledges receipt of the Field Team Report by [illegible] Megill dated September 29, 1952, with proposed contract on the subject application.

The cost figures pertaining to the underground work are high compared with usual costs in projects of this kind. The cost of timbered drifts is estimated at $[illegible].00 per foot for tunnel work. It therefore seems advisable to give some consideration to the following alternatives:

First: Review the figures in this proposed short form contract, and determine whether they cannot be reduced to approximately more normal costs.

Second: If there appears to be no [illegible], consider the possibility of joining the exploration work or drilling, and eliminating the expensive underground work.

Third: Consider the long form contract, listing all estimated costs to be paid for as incurred, and justified by agreement of the Field Team.

Details

First: Review of figures in this proposed short form contract.

It would seem advisable to consider whether the underground work planned is not more in the nature of development than exploration. It is not clear from the Field Team report which proposes to do underground work where drilling has already indicated or possibly even found ore, whether we are making a sufficiently clear distinction between exploration and development work.

Labor and Supervision

The wage rate is high. It is understood that this property is located where logging wages are $2[illegible] to $25 per day. This is one of the items that may therefore have influence in considering some other method of exploration

The cost of these drifts at [illegible] per foot, includes the wages of timbermen at $19.20 per shift when the foreman gets $20.50 per shift.

Equipment to be purchased

The cost of this item in the field report is figured on the basis of "Contractors Equipment Ownership Expense" published by the Associated General Contractors of America, and is correctly figured if that is in fact standard practice in writing these contracts. Where the operator does not own equipment, and it is necessary to purchase it, there are two methods available.

(a) The operator can purchase the equipment and depreciate it on the basis of 60 months life for each month it is in use on this project.

(b) The cost of the equipment can be considered as a cost item, in which case the Government contributes one half of the cost and also retains a one half interest in the ownership of the equipment. This and various other methods are available, but this is a matter to be applied by the field men.

The proposed equipment cost figures are not exact. A comparison of the different methods of equipment costs, the costs are therefore as follows, assuming that operator buys the equipment as per the proposed contract.

Applicant's method: The Government's share of the cost of all items is $[illegible]. Total footage of underground work [illegible]. Cost per month 7% of 18 months of actual underground work, is $7.47 per foot, or $33,[illegible] total cost.

Standard practice method: Total cost of equipment is $3,[illegible] to be bought by operator, and depreciated on basis of 60 months for a period of 18 months actual use of $306.7[illegible] per month or $3,[illegible] total cost.

Standard practice method: Over a the total cost of equipment $23,[illegible] to the contract, the Government share is $11,602.50 with the Government owning a half interest in the equipment.

Both of the standard practice methods are more advantageous to the Government. Either of them are available to the operator, but not the Contractors Ownership Expense Percentage. Using standard method would give a cost per foot of $2.14 instead of $7.47 a difference of $5.33 per foot.

Supplies and Maintenance

The cost of several items under this heading require clarification. The cost of steel and bits at $2.74 per foot is $11.[illegible] per round of holes. Small tools and miscellaneous is $2.00

11/19/52

Index Mining Co DMEA 2612

Conference with Weissenborn concerning ~~ly~~ our letter of _____ which it was thought should be discussed with him before presenting to the Operaing Committee. He thought the points in the latter were well taken and that it should be sent to his office for Magill to go over and that he agreed with me that the costs were too high and that the contract should be put on the long form so as to make the costs what they actually will be and not be based on unit costs. He thinks that the underground work should not be considered as development which was a point that I raised. The ore in the veins is bunchy erratic and varies ~~xxxxx~~ suddenly in grade so that the drill holes are not satisfactory exploration. The point of my letter is that there is not sufficient justification for the high ~~xxxxx~~ costs.

2/11 See final contract for final unit cost figures.

Sch.

11/21/52 gla

Ses

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
1201 N. Division St.
Spokane 2, Washington
November 17, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
NOV 20 1952

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Subject: Docket No. DMEA 2618 (copper)
Index Mining Company
Snohomish County, Washington

Dear Mr. Brennan:

This is in reference to your long distance telephone call earlier in the month, requesting information on the status of your exploration application under the subject docket number.

In our telephone conversation I promised to try to obtain some definite information for you in a few days, and I did refer the matter to the Executive Officer, Mr. A. E. Weissenborn, at that time. Mr. Weissenborn received some information from the Washington office about a week ago to the effect that the approved contract was being forwarded to his office, but to date it has not arrived.

Mr. Weissenborn now has gone back to the Washington office for conferences and will, he assured me, make it a point to find out something definite about the status of your contract. We will get in touch with you immediately when we receive additional information about it.

Please accept my apologies for not replying sooner to your telephone call.

Sincerely yours,

M. E. Volin, Member
DMEA Field Team
Region II

MEV/he

cc: DMEA, Wash. (2)
USGS (2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.
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November 17, 1952

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Sincerely yours,

M. E. Volin, Member
DMEA Field Team
Region II

MEV/he

cc: DMEA, Wash. (2)
USGS (2)

10/28/52 gla

IN REPLY REFER TO: G-MD-CF

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

October 24, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 28 1952

Memorandum

To: E. W. Ellis

From: A. R. Kinkel, Jr.

Subject: Docket DMEA 2612 (copper)
Index Mining Co. (Sunset Mine), Snohomish Co., Washington

I agree with the field team that this mine has good exploration targets and that the proposed exploration would add to the reserves of the mine. The exploration appears to be well laid out and well documented, and adequate information is available on the mine.

However, there are apparently no geologic reasons to expect that the ore found by exploration will be wider or of better grade than the ore that has been mined in the past. The narrow veins and the isolated ore shoots in the vein, together with a rather low grade ore, do not give much promise of a profit margin even if the reserves expected are developed. If only the ore found by the proposed exploration (estimated at (1) 52,000 tons on the Radiore "B" ore body and 27,000 tons on the Harrington vein) is made subject to royalty payments the Government could recover only about one third of the amount of the loan. (2) ?

The exploration program is probably justified because the discovery of new reserves above the flooded workings may lead to production and the mining of the reserves in the flooded sections of the mine.

A R Kinkel Jr.

A. R. Kinkel, Jr.

(1) Radiore 32,000
Harring 54,000
86,000 ton 3.04% Cu + Ag + Au.
61 # cu
86
516
5,246,000 # gross Cu
4,000,000 # recover 24½ ¢ gross
22 net
22 ¢
$ 880,000
5%
$ 44,000 Royalty = 83% of Govern. share of $57,000

10/27/52 gla

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

October 24, 1952

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 24 1952

Memorandum

To: E. W. Ellis, DMEA

From: Helena M. Meyer for C. H. Johnson

Subject: DMEA - 2612, Index Mining Company, Sunset Mine (copper) Snohomish County, Washington, Field Team Report

I have reviewed the subject Field Team report and recommend approval of the proposed propect with an estimated cost of $107,160.75, and Government participation amounting to $53,580.37.

Helena M. Meyer
Helena M. Meyer for
C. H. Johnson

Copy to: Mr. Nelson, USGS
Minerals Division
Base Metals Branch
Mr. Johnson
F I L E S

ON-SITE Report

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

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 8 1952

1201 N. Division St.
Spokane 2, Washington
October 6, 1952

MEMORANDUM

To: Chairman, Operating Committee, DMEA, Washington, D. C.

From: DMEA Field Team, Region II

Subject: Docket No. DMEA 2618 (copper)
Index Mining Company
Snohomish County, Washington
Application for exploration assistance

Enclosed are four copies of a report on the subject application prepared by E. A. Magill, Mining Engineer, Bureau of Mines. The information in the report results mostly from investigations of the property made by the Bureau of Mines in 1950.

Mr. Magill concludes that the Bureau work indicates attractive exploration targets on the property. The Field Team concurs with his recommendation that the proposal be given favorable consideration.

By Field Team, Region II

A. E. Weissenborn, Exec. Officer
(U. S. Geological Survey)

M. E. Volin, Member
(U. S. Bureau of Mines)

Enclosure

cc: DMEA, Wash. (3)
USGS, Spokane (2)

Reviewed by DMEA Oper. Comm. 10-13-52.

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

1201 N. Division St.
Spokane 2, Wash.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
OCT 8 1952

September 29, 1952

MEMORANDUM

To: DMEA Field Team, Region II

From: E. A. Magill, Mining Engineer, Bureau of Mines

Subject: Exploration Application, Index Mining Co., Snohomish County, Washington, Docket No. DMEA 2618 (Copper)

RECOMMENDATION

It is recommended that the Index Mining Co. be granted an exploration loan in the amount of $107,160.75.

LOCATION

The Sunset mine is located in sec. 1, T. 27 N., R. 10 E., W.M., Index mining district, Snohomish County, Washington. Index, Washington, is 6 miles by graveled road from the mine on the Great Northern Railroad. Seattle is 65 miles and the American Smelting & Refining Co. smelter at Tacoma is 95 miles distant.

TOPOGRAPHY AND CLIMATE

The area is characterized by precipitous slopes, having been deeply glaciated by alpine glaciers. The valley floors are deeply covered with till and the oversteepened walls are partially covered by moraine debris and talus.

The annual precipitation at the Sunset mine averages over 100 inches. The heaviest precipitation occurs from October through March. Heavy snows accumulate from December through February and may cause temporary curtailment of operations for a 4-month period during the winter.

PROPERTY

The property involved in the application is owned by the Index Mining Co. and consists of the N. 1/2 sec. 1, T. 27 N., R. 10 E., W.M. and the following patented mining claims:

Name	Patent number	Survey
Star	488234	1026
Black Bear	"	"
Black Bear Ext.	~~866270~~ 886270 *	"
W. H. B.	"	"
Boundary	"	"
Hazel C	"	"
Ivy R	"	"
Mountain Side	"	"
Ravine	"	"
Monaco	"	"

The applicant has requested that the part of the Sunset mine (below the No. 2 level) presently under water be excluded from the area covered by the exploration project contract.

COMPETENCE OF APPLICANT

The applicant is competent to direct the proposed exploration program.

PAST PRODUCTION

Intermittent operations between 1902 and 1947 have produced a total of 263,416 tons of ore which contained:

Average copper recovered per ton mined	-	2.45 percent
Average silver recovered per ton mined	-	0.59 ounce
Average gold recovered per ton mined	-	0.0057 ounce

A 95 percent mill recovery can be assumed giving a grade of 2.63 percent copper.

For a more complete breakdown of production data, see manuscript for R. I., Investigations of the Sunset Copper Mine, Snohomish County, Washington, by P. H. Toepher. 1/

DESCRIPTION OF PROPERTY

The Sunset deposits lie entirely within the Index granodiorite. About 1-1/2 miles to the east 2/ of the mine workings the granodiorite contacts the metamorphosed sediments and interbedded igneous flows of the Gunn Peak formation.

Pleistocene glaciation has largely removed the oxidized portion of the veins. Glacial debris covers bedrock in the vicinity of the mine.

1/ Manuscript in preparation

2/ Weaver, C. E., Geology and Ore Deposits of the Index Mining District, Wash., Washington Geological Survey Bulletin No. 7 (1912).

* Official Patent Plat

The granodiorite adjacent to the ore bodies has been crushed and hydrothermally altered. Sericitic alteration appears to accompany the ore bodies although the converse is not true. The principal ore minerals are chalcopyrite and bornite, although small amounts of chalcocite and covellite appear in the uppor workings.

The Sunset deposits are made up of at least 4 veins (see attached map, fig. 5, from Toepher's manuscript, Geology main level, Sunset mine, Snohomish County, Wash.).

The Sunset vein has been the principal producer in the past. It has a strike of N 60 to 78° W and dips 70 to 80° N. It has been stoped at intervals for over 500 feet on the dip and over 1,000 feet on the strike. Stoping width has varied up to and over 20 feet. (See attached Fig. 6).

The Little Copper King vein strikes N 80° W and is vertical. It averages about 2 feet in width but is of a better grade than the other veins; it contains predominantly bornite. It has been stoped at intervals for a distance of 650 feet on the strike and 250 feet on the dip. (See attached Fig. 8.).

The Harrington vein strikes east and west and dips north 70 to 80°. It has been stoped for a length of 220 feet on the No. 2 level and has been drifted on, according to reports, in good ore for 400 feet on the No. 4 level (No. 4 level is now under water). Its width varies up to 10 feet.

The Bureau of Mines vein has a dip and strike similar to that of the Sunset vein but is not on line. An oreshoot on the vein is estimated to be 5.5 feet in width and 275 feet in length. There is no surface indication that it is a portion of the Sunset vein which might have been offset by a fault; consequently, it has been assumed that it is entirely new structure.

Little or no post mineral faulting has occurred. The veins are not known to be offset by unmineralized faults.

Metallization is neither uniform nor continuous within the linked vein system of the Sunset deposits. It appears that the oreshoots in the various veins will continue downward and upward from the present levels. There is also reason to believe that future exploration work will discover additional ore shoots.

RECOVERABLE ORE RESERVES

The Bureau of Mines has estimated that 2/ or 3/ in the area to be explored by the proposed program there are indicated and inferred ore reserves as follows:

2/ Toepher, P.H., Manuscript for R.I., Investigation of the Sunset Copper Mine, Snohomish County, Wash., Confidential Section.

3/ Memorandum to M. E. Volin from E. A. Magill, subject Sunset Mine, Snohomish County, Wash., Docket No. 1254 (copper) Report made in connection with production loan application.

Ore body	Width (ft.)	Indicated ore (tons)	Grade (%Cu)	Inferred ore (tons)
*Bureau of Mines (Radiore "B") ore body				
No. 2 level to Surface	5.49	20,000	4.09	
Below No. 2 level	5.49		3.09	17,500
Little Copper King ore body				
Above head of stope	2.00	14,000	4.50	8,500

*Reserve estimates for Bureau of Mines orebody are based solely on diamond drill hole data and are totally undeveloped.

It is estimated that the proposed exploration program if successful should add to the reserve tonnage as follows:

Ore body	Width (ft.)	Indicated ore (tons)	Grade (% Cu)	Inferred ore (tons)
Bureau of Mines (Radiore "B") orebody (In addition to that already estimated by Bureau of Mines)	5.5		3.09	32,000
Harrington vein	5.0	54,000	3.00	27,000

3.04 6.5.5

This does not check with above

The total ore reserves of the Sunset mine are estimated by the Bureau of Mines to be indicated 134,500 tons of 3.69 percent copper, inferred 173,000 tons of 3.28 percent copper.

APPLICANT'S PROPOSAL

The applicant has proposed the following exploration program to explore the Bureau of Mines (Radiore B), Harrington, and Red Devil veins:

1. Construct road 600 feet in length to the proposed "Bureau" crosscut and prepare portal site. (See attached map Figure 3).

2. Crosscut 600 feet to Bureau of Mines vein and drift a minimum of 300 feet on the vein (270 feet below the outcrop).

3. Conduct a geological and geophysical survey between the Bureau of Mines ore body and the Sunset vein and the extension of the mineralized area eastward from the present Sunset workings.

4. Surface trenching on any favorable indications of the geophysical survey.

5. Construct road 1800 feet in length to proposed "1600 level" crosscut.

6. Crosscut 150 feet to the Harrington vein, drift east on the Harrington vein 750 feet to explore the virgin ground between the crosscut and the upward extension of the Red Devil vein.

7. Drill three diamond drill holes from the "Bureau" crosscut to explore the Bureau of Mines ore body 150 feet below the crosscut (420 feet below the outcrop).

To accomplish this exploration the applicant proposes the following costs on a fixed per foot cost for road construction, crosscutting, drifting and diamond drilling:

Roads (7) 600 (5) 1800 = 2400
Xcut (2) 600 (6) 150 = 750
Drift (2) 600 (6) 750 = 1050
D.D.H 3 x 333⅓ = 1000

1.	Roads, 2400 feet at $2.20 per foot	$5,280
2.	Crosscut and drift a total of 1800 feet at $54.47 per foot	98,050
3.	Geological and geophysical survey	3,000
4.	Surface trenching	1,500
5.	Diamond drilling, 1000 feet @ $7 per foot 3 holes	7,000
6.	Analytical work	600
7.	Rehabilitation and repairs	990
8.	Two buildings at portal sites, $550 each	1,100
	Total	$117,520

5447
18
43576
5447
98,904.6

DISCUSSION OF APPLICANT'S PROPOSAL

The applicant's proposal appears to be a feasible exploration program to explore for additional ore. It is to be noted that the applicant has purposely omitted from the proposed program, work in the flooded portions of the mine. There is at present a substantial tonnage of partially developed ore 4/ in this section of the mine. Due to the condition of the winze and the amount of water which the mine makes, it would not be advantageous to carry out exploration in this area until such time as the property is ready to be brought into production. Rehabilitation and dewatering costs would be too great to allow these workings to be flooded again after carrying out an exploration program. Consequently, it is believed that the applicant has shown a wise choice in choosing exploration targets above the water level until such time as conditions are right for bringing the entire property into production.

A brief resume of the exploration targets is as follows:

"Bureau of Mines" vein - The U. S. Bureau of Mines in 1950 conducted a diamond drilling program to test a geophysical (Radiore method) indication. (See figures 13, 10 and 11). Twelve holes were

4/ Toepher, Op. cit.

drilled in the area indicated by the geophysical survey. Three of these holes indicated an ore body 275 feet long and 5.5 feet wide containing over 4 percent copper, to a depth of 150 feet. The proposed "Bureau" crosscut would intersect the vein 120 feet below the ore indicated in the diamond drill holes or 30 feet above the lower limit of inferred ore. The crosscut will be located 30 feet above Trout Creek at a point nearest the ore body.

Geological and geophysical survey -- Inasmuch as geophysical methods have proven moderately successful in the past, more work along these lines appears to be indicated. The applicant proposes to have Dr. A. R. Clark of Vancouver, Canada, run either a self potential or restivity method survey over promising areas on the property. One of these methods has been used on the property before and has indicated promising structures. Dr. Clark spent a day on the property in the summer of 1950 when the Bureau of Mines was carrying out its exploration program. Using the self potential method he was successful in determining the strike of the new ore body which was later proven by diamond drilling. He was also successful in locating several structures which were found by drilling but unfortunately they were not metallized.

There are a number of areas on the extensions of the Sunset vein system which show surface indications of mineralization; there are also a number of areas where the "old timers" report copper showings. It would be very helpful to correlate and map these showings. Hand trenching will undoubtedly be necessary in a number of places to properly evaluate them.

Crosscut to and drift on Harrington vein - The applicant proposes to locate the 150 foot "1600 Level" crosscut near what is known as the "Wet tunnel" which is believed to be located on the Sunset vein and which contains a good showing of copper ore. The proposed crosscut will intersect the Sunset vein at a depth of about 60 feet and the Harrington vein (See Figure 7a) at a depth of about 100 feet. Backs will increase rapidly as the Harrington vein is drifted on eastward until over 400 feet of back will be attained in the vicinity of the Red Devil vein. This drift will explore an area on a promising vein structure which has not been explored in any previous work. The Harrington vein has shown good metallization on and below the main Sunset adit level 200 feet below the proposed crosscut.

Diamond drill the Bureau of Mines vein - A series of three holes fanned from the "Bureau" crosscut and located to intersect the vein 150 feet below should prove or disprove the downward extension of the ore shoot and possibly indicate a substantial tonnage of ore.

COST ANALYSIS

Drifting & Crosscutting - A detailed breakdown of costs is as follows, based on an advance of 4 feet per shift, 2 shifts per day, 5 days a week, 22 operating days a month, 8 months a year:

4' x 2 x 22 = 176'/mos.

Labor and Supervision

2 shifts x 4' = 8'

Number	Classification	Rate/day	Rate/mo.	Cost/day	Cost/ft.
3	Miners	$17.50		$52.50	
1	Miner foreman	18.50		18.50	
2	Surface men	16.00		32.00	
1	Supervisor-engineer	22 days	$600.00	27.27	
1	Accountant (part-time			5.00	
				$135.27	
	Workmen's compensation, OAB, etc. - 10%			13.52	
	Total			$148.79	$18.59

Normal
3 x 13 = 39
1 x 15 = 15
2 x 12 = 24
27 high
5
112
11
123
15.40 ft

Note: The above wage rates are slightly higher than are being paid in some of the established mining districts; however, the property is in an area of extensive logging operations where the wage scale averages between $20 and $25 per day.

Equipment Purchased*

Number	Type	Cost	Expense per working mo.**		Cost per ft.** *
1	Air compressor, 315 cfm, Diesel	$10,000	5.1%	$ 510.00	$ 2.88
1	Loader, Emico, 12B	3,100	5.1%	158.10	.90
1	Air trammer	2,100	5.1%	107.10	.61
4	Mine cars @ $300 each	1,200	3.6%	43.20	.25
3	Drills with air leg @ $650 ea.	1,950	6.1%	118.95	.68
1	Truck, pickup	2,275	8.9%	202.47	1.15
1	Grinder, air driven	200	8.3%	16.60	.09
1	Fan, gas engine driven	350	5.1%	17.85	.10
1000ft.	Vent tube @ $1.00/ft.	1,000	8.3%	83.00	.47
250 ft.	1" air hose	245	8.3%	20.33	.12
150 ft.	3/4" water hose	135	8.3%	11.20	.06
	Saw, air driven, hand	250	6.1%	15.25	.09
	Air Receiver tank 36"x8'	400	3.2%	12.80	.07
	Total	23,205		1316.85	$7.47

176 mos.

*Note -- The operator at the present time has no equipment suitable to be used on the project and equipment and miscellaneous tools of all types will have to be purchased.

** Expense per working month is based on Associated General Contractors of American "Contractors Equipment Ownership Expense" with the interest rate of 5% deducted; use based on an 8 months a year operation.

*** Based on 176 feet advance per month.

Material Installed

	Cost/foot
Rail, 20# @ $7.80/100#	$1.03
Ties, 24" gauge track, 3 bf @ $75/1000 bd ft.	0.22
Spikes, bolts, fishplates	0.14
Air line, 2" @ $48.63/100'	0.49
Water line, 1" @ $20.28/100'	0.20
Switchs, 4 @ $50 each for 1800' too low 100 each	0.09
Total	$2.17

Supplies and Maintenance

	Est	Cost/foot
Steel and bits	2.04	$2.75
Powder, 18# per foot @ $22.50/100#	2.30	4.05
Caps, electric, 20 per round @ $0.24 each	.72	1.20
Small tools and misc.		0.75
Maintenance and Repairs of equipment ? what equipment		3.00
Total		$11.75

Power

	Gals/day	Cost/gal.	Cost/day	Cost/foot
Diesel Fuel (compr.)	50	$0.15	$7.50	$0.94
Gasoline (truck & fan)	16	.32	5.12	.64
Oil & Grease	2.5	1.60	4.00	.50
Total				$2.08

Timbering

Timbering based on 5-1/2'x7' in clear, sets on 5-foot centers, back lagged solid, sides lagged halfway up.

		Cost/foot
2 - 8"8" posts, 8' long	= 85.0 b.f.	367.3 bd ft
1 - 8"x8" caps, 7' long	= 37.63 b.f.	
2 - 4"x6" girts, 5' long	= 20.0 b.f.	
Lagging (3") top and 50% sides	= 225.0 b.f.	
367.6 b.f. of timber @ $75/1000	=	$5.51
Labor for installing timber per set - 2 men for 3 hours @ $2.40 per hour each		2.88
Total		$8.39

A recap of the drifting and crosscutting costs is as follows:

Est		Cost/foot
15.40	Labor and supervision	$18.59
2.14	Equipment	7.47
2.17	Material installed	2.17
5.00	Supplies and maintenance	11.75
1.50	Power	2.08
2.5 2.1		$42.06
	*10% contingency	4.21
4.2.0	Cost untimbered drifts and crosscuts	$46.27
3.01.16	Timbering	8.39
3.014		
53.4.5	Cost timbered drifts	$54.66

*Under present conditions it is believed that at least a 10% contingency cost is necessary when planning a two-year operation.

Diamond drilling - The surface diamond drilling carried out by the U. S. Bureau of Mines in 1950 cost over $6.00 per foot. An overall figure of $7.00 per foot for underground diamond drilling appears to be in line and probably slightly less than the job will actually cost. The contract diamond driller who drilled for the Bureau in 1950 when questioned stated that he would not accept the job for $7.00 per foot.

Roads - Considering the terrain which the proposed roads will have to cross over, the figure of $2.20 per foot appears to be in line because of the considerable amount of rock work involved. Logging roads constructed in the immediate vicinity and on more favorable ground have cost up to $20,000 per mile.

It is recommended that the geological and geophysical survey, the analytical work and surface trenching, rehabilitation and building construction be placed on an actual cost participation basis, not to exceed $7,190.00.

A suggested form of contract is as follows:

Exibit "A"

Description of the Work
(See attached map Fig. 3)

Time Schedule months*	
1	1. Construct road 600 feet in length to proposed "Bureau" crosscut and prepare portal site.
6	2. Crosscut 600 feet to Bureau of Mines (Radiore B) vein and drift a minimum of 300 feet on the vein.
7	
Concur-rent	3. Conduct a geological and geophysical survey between the Bureau of Mines ore body and the Sunset vein and the extension of the mineralized area eastward from the present Sunset workings.

$\frac{900}{176}$ = 6 Mos.

Time Schedule months*	Description of the Work
Concur-rent	4. Surface trenching on any favorable indication of the geological and geophysical survey.
1	5. Construct road 1800 feet in length to proposed "1600 level" crosscut.
6	6. Crosscut 150 feet to the Harrington vein and drift east on Harrington vein 750 feet to Red Devil vein.
1	7. Drill three diamond drill holes from the "Bureau" crosscut to intersect the Bureau of Mines ore body 150 feet below the crosscut, one hole to be on line with the crosscut and the other two to be 100 feet on either side.
8	

150
750
176 900
6 Mos

Total 7 + 8 = 9 yr

30 1000
33

OK If ② & ⑥ are not run at same time Why not?

* Weather conditions may make it advisable to suspend operations for about a 4--month period each year, consequently 24 months is allowed for completion.

Estimated Costs of the Project

(1) Independent contracts
None

(2) Labor, supervision, consultants

All labor connected with diamond drilling, cross-cutting, drifting and road work is figured on the unit cost for such items. The labor necessary for construction and rehabilitation of buildings, trenching, geological and geophysical survey will be at a rate not greater than the prevailing wage scale in the district.

(3) Operating materials and supplies

Included in per foot costs or in the allowable costs for completion of a certain job.

(4) Operating equipment

To be purchased - none
To be rented - none
To be furnished by Operator

All equipment necessary to carry out the exploraation program will be furnished by the Operator under the per foot or allowable costs for completion of a job.

(5) Rehabilitation and Repairs

Repair of 3 cabins, blacksmith shop, office and dry	$ 990.00	$ 990.00

(6) New buildings, improvements and installaations

Compressor and tool shed at "Bureau" adit	500.00	
Compressor and tool shed at "1600-level" adit	500.00	
Road to "Bureau" adit, 600' @ $2.00	1,200.00	2400 @ 20 ?
Road to "1600-level" adit, 1800' @ $2.	3,600.00	$480 contin
	$5,800.00	main roads 2-29
10% contingency	580.00	because unit cost
		the other 100 in
		general contingency
	$6,380.00	$6,380.00

(7) Miscellaneous

Crosscutting, 750 ft. @ $46.27/ft.	34,702.50	7 (87,689
Drifting, 1050 ft. @ $46.27/ft	48,583.50	
*Timbering, 525 ft. @ $8.39/ft	4,404.75	
Diamond drilling, 1000 ft. @ $7/ft	7,000.00	
Analytical work	600.00	
Trenching	1,500.00	
Geological & geophysical survey	3,000.00	
	$99,790.75	$99,790.75

Total estimated cost of project	$107,160.75
Government participation @ 50%	53,580.37

*It is estimated from the present workings that at least half of the drifts have to be timbered. (crosscuts ?)

E. A. Magill

Enclosures

CC: 3-Wash. DMEA
2- Wash. B/M
2-USGS
DMEA
M/D
EAM
R/O

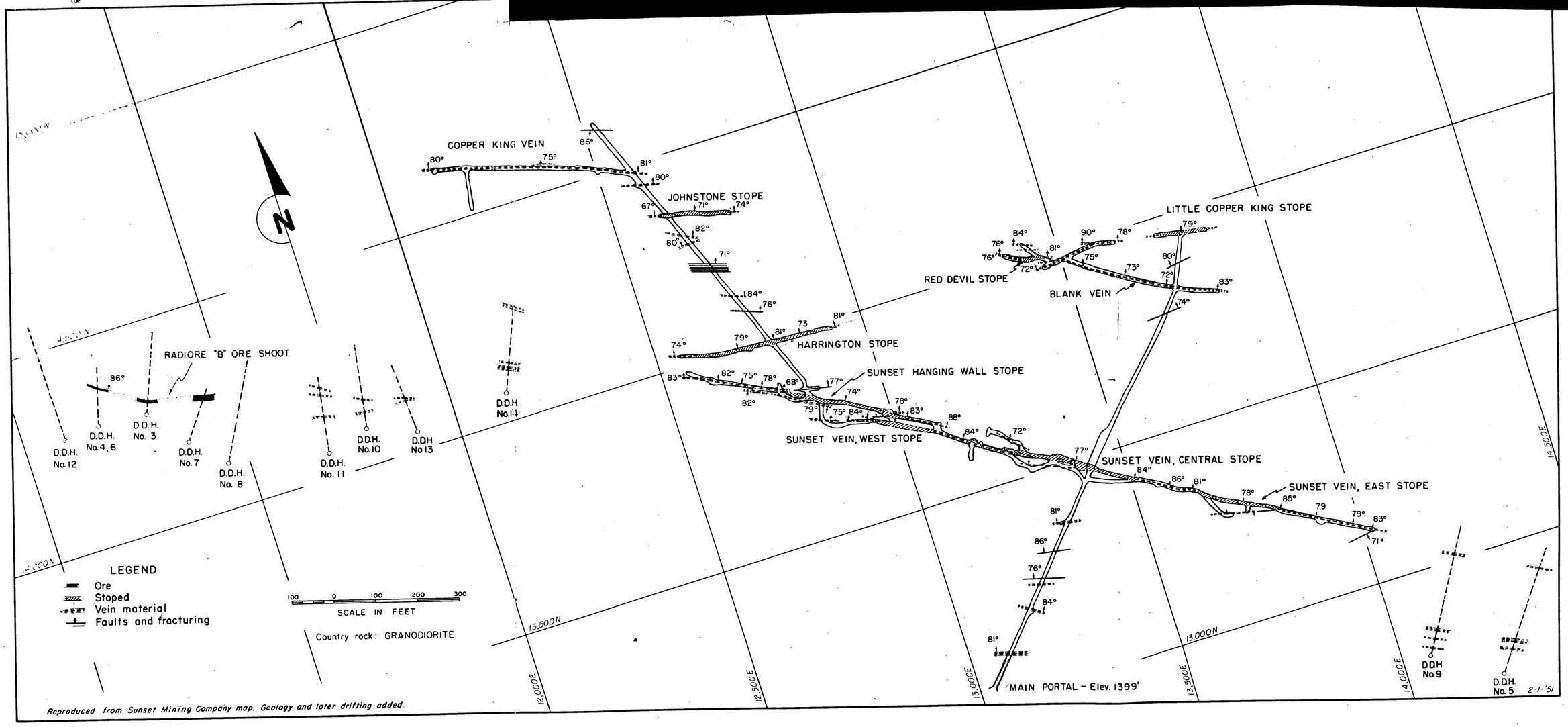
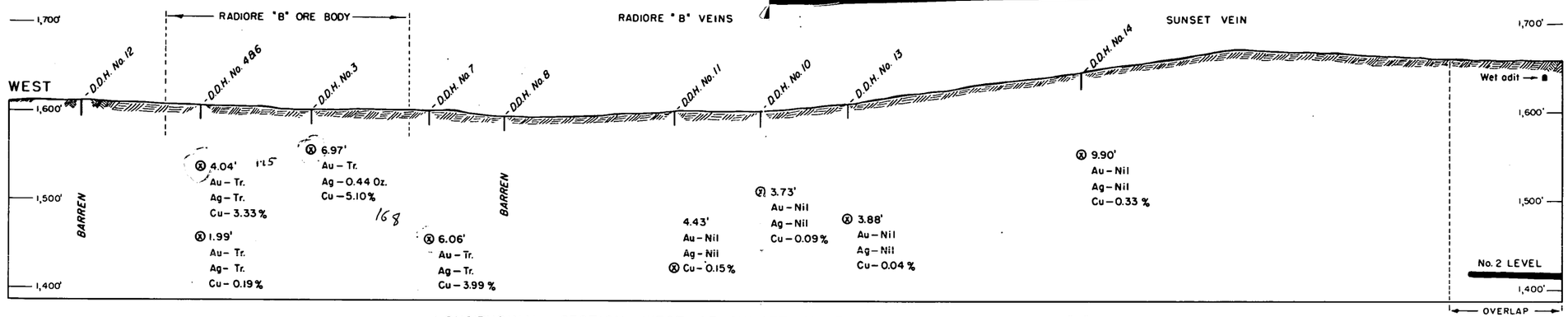
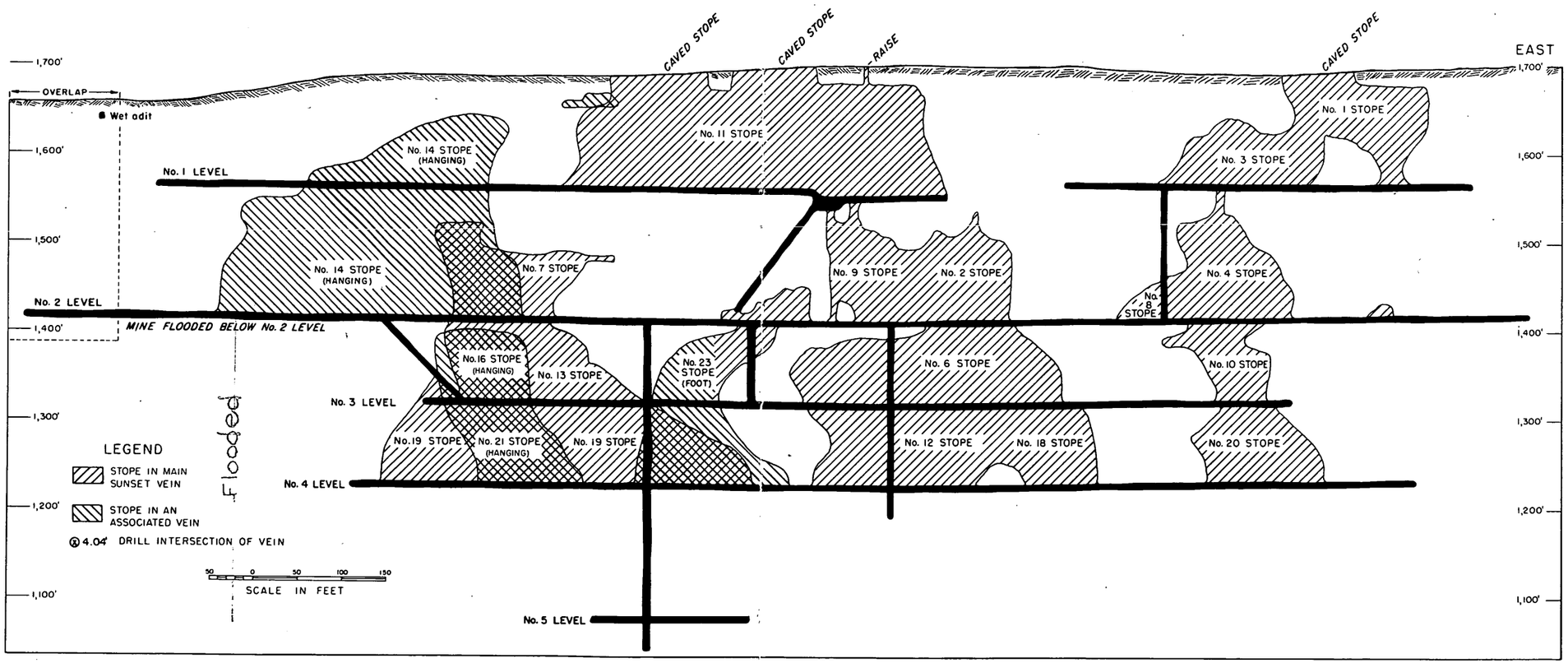


Figure 5. — Geology, main level, Sunset mine, Snohomish County, Washington.

336
168



LONGITUDINAL SECTION WEST OF SUNSET MINE WORKINGS, ON RADIORE "B" LINE.



LONGITUDINAL SECTION THROUGH SUNSET VEINS. (FROM SUNSET MINING COMPANY MAPS).

2-1-'51

Figure 6. — Longitudinal section of the Sunset mine, Snohomish County, Washington.

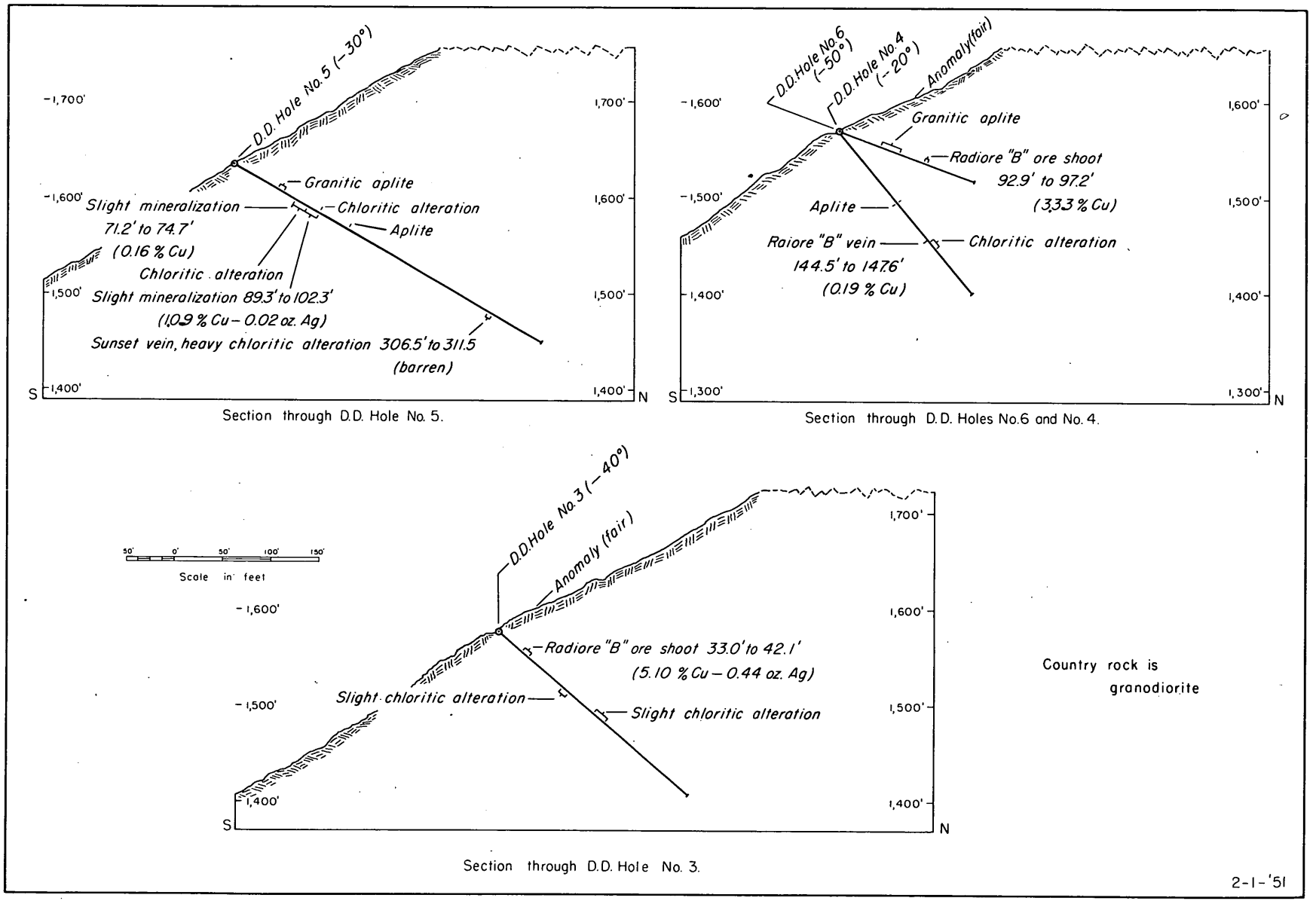


Figure 10.—Drill hole sections No. 5, 6 & 4, and 3, Sunset mine, Snohomish County, Washington.

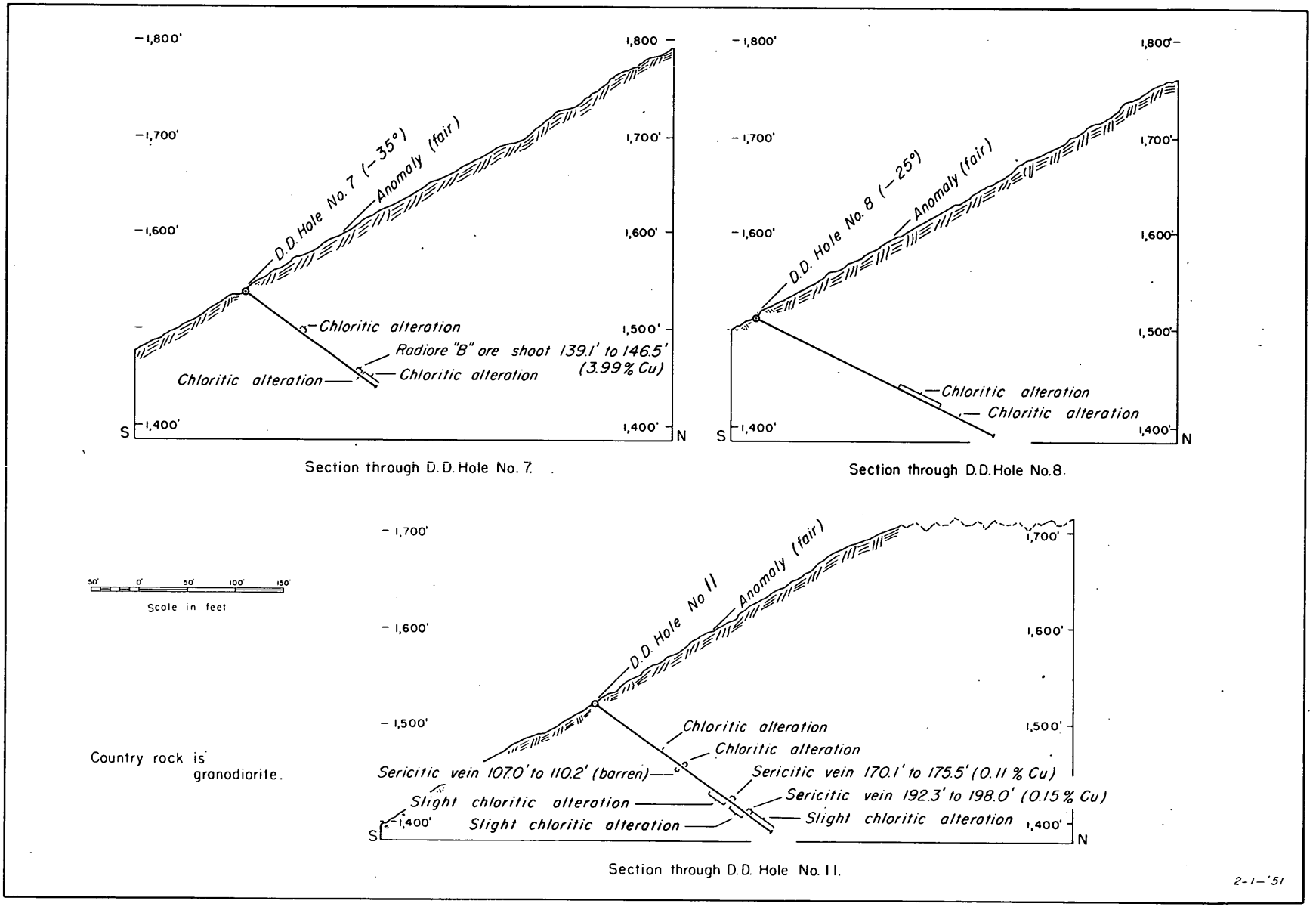


Figure 11 — Drill hole sections No. 7, 8, and 11, Sunset mine, Snohomish County, Washington.

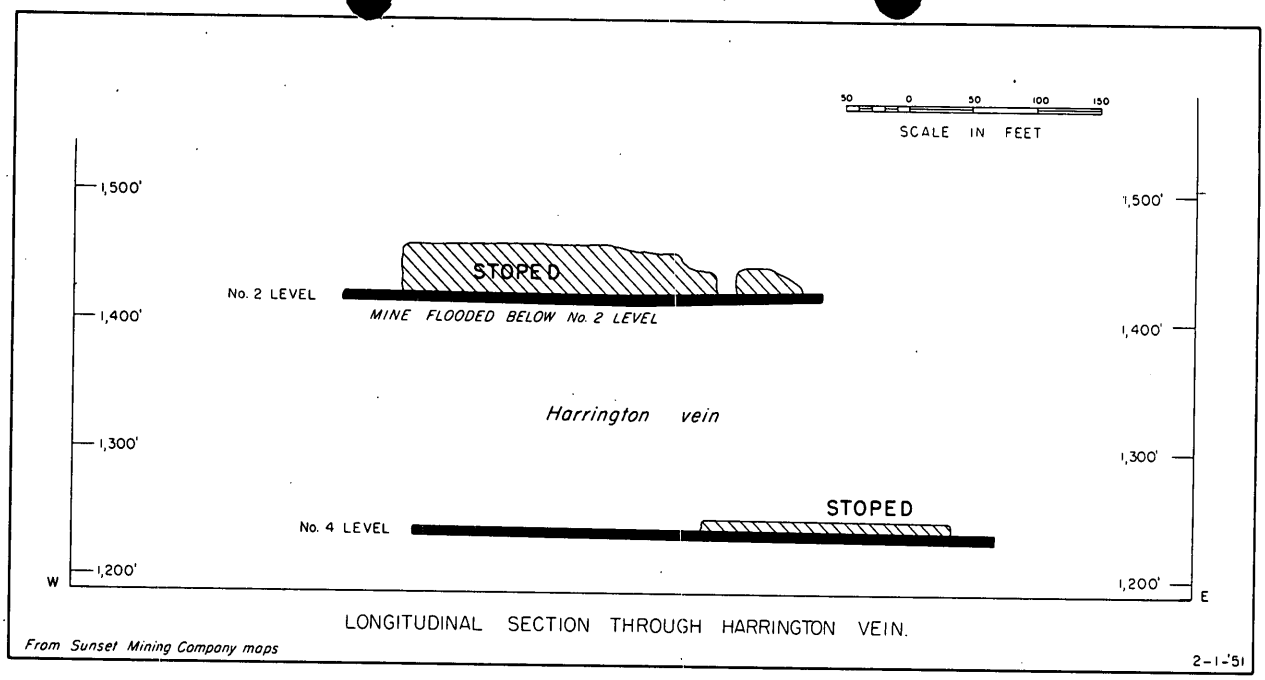


Figure 7a.—Longitudinal section of the Sunset mine, Snohomish County, Washington.

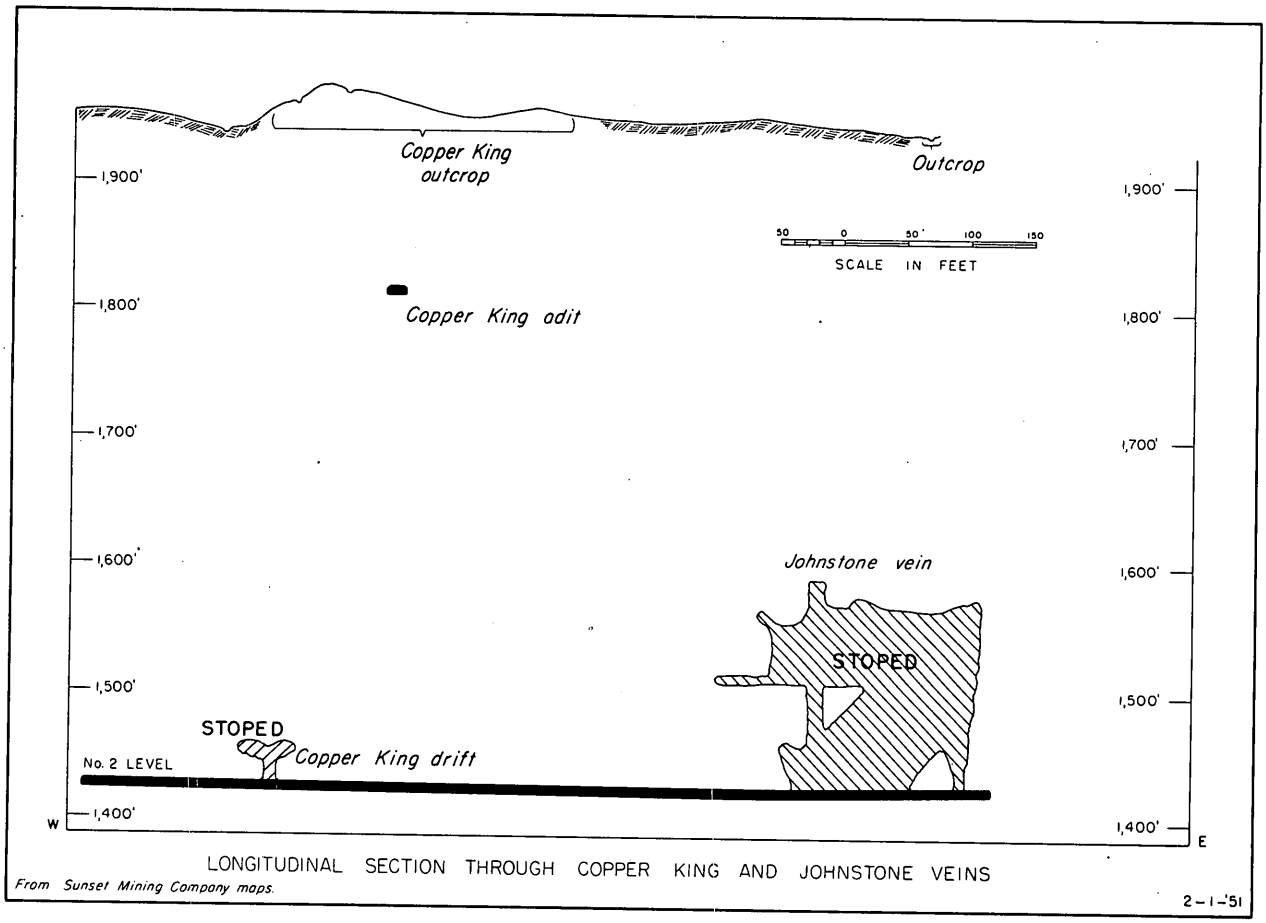


Figure 7b.— Longitudinal section of the Sunset mine, Snohomish County, Washington.

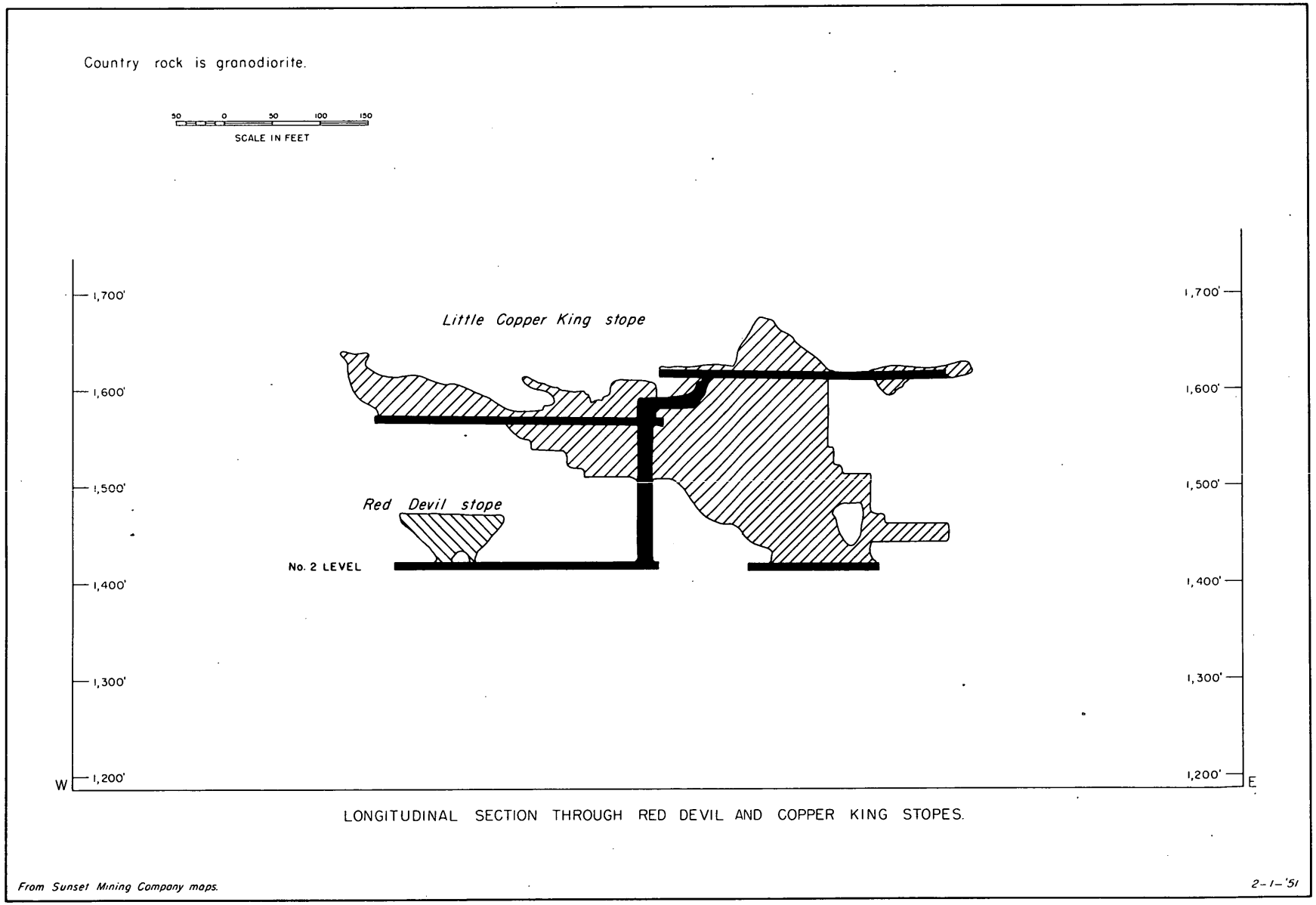


Figure 8. — Longitudinal section of the Sunset mine, Snohomish County, Washington.

9/4/52 gla

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

August 22, 1952

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

Re: Docket No. DMEA ~~2618,~~ 2612
Index Mining Co., Sunset Mine,
Snohomish County, Washington.

Dear Mr. Johnson:

This will acknowledge receipt of your letter of August 18 with copies of memoranda by Bureau of Mines and Commodity Specialist. Arrangements are being made for a Bureau of Mines engineer to inquire into the drifting and crosscutting cost. As suggested in your letter it is considered that there is enough information available so that a field examination will not be required.

Sincerely yours,

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

cc: USBM (2)
Attn: Mr. Magill

FILE COPY
SURNAME:

Schmidt
Ellis

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

AUG 18 1952

Mr. A. . . eisenhorn
xecutive Officer, Region II
DMA Field Team
South 157 Howard Street
Spokane 8, Washington

Re: Docket No. M -2512 (Copper)
Index Mining Co. Forest Line
Okanogan County, Washington

Dear Mr. Weisenhorn:

The captioned application is being referred to you for a field team report, which it is noted in your letter of July 8, might be made without the necessity of a field examination due to information already in your office.

It seems that the property has sufficient mechanical improvements to justify considering such an exploration program.

The estimate of costs in the application appears unrealistic, and out of line with current costs. There are many costs items that are too high with the result that the cost per foot of standard size drifts and crosscuts amounts to $[illegible] for their work, without bracing, timbering or timbering in a formation that is reported in the crosscuts and crushed altered areas in the drifts.

The proposed geophysical examination may be justified, and the choice of the method may be good but a recommendation concerning this matter would be appreciated.

An entirely new approach should be made toward efficient operation of this work which is not indicated in the application. Your report on this application will be awaited with interest.

Sincerely yours,

(signed) FRANK E. JOHNSON
(HB)
Chairman, Operating Committee

C. H. Johnson (HB)
Member, Bureau of Mines

S. M. Lemmon (HB)
Member, Geological Survey

8/14

Fdschmidt/jem 8/14/52
cc to: Adm. Reading File
Docket
Messrs. CHJohnson-3621
Ned Nelson-4216 GSA
Ellis Schmidt
Opr. Com.
Field Team, Region II

FILE COPY
SURNAME:

F.E. Johnson

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

AUG 18 1952

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

Re: Docket No. DMEA-2612 (Copper)
Index Mining Co. Sunset Mine
Snohomish County, Washington

Dear Mr. Brennan:

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

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

The Regional Office may contact you at an early date if they require additional information.

Sincerely yours,

C. O. Mittendorf (for) 8/18/52

Acting Administrator

FSSchmidt/FEJohnson/jem/bih
8/15/52
cc to: Docket
Admr's. Reading File
Region II (2)
Messrs. Ellis
Schmidt
FEJohnson

8/11/52 gla

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

August 8, 1952

Memorandum

To: E. W. Ellis, DMEA

From: C. H. Johnson, Bureau of Mines

Subject: DMEA - 2612, Index Mining Company, Sunset Mine (copper)
Snohomish County, Washington

I have reviewed the above-named application and recommend that a request be made for a report by the field. It may be unnecessary to make an examination as Bureau (and perhaps Survey) personnel are quite familiar with the mine.

The project seems to me to have a good deal of promise and deserves favorable consideration, but is perhaps a little oversize in view of the past history of the mine and the potential results. The estimated cost of $54.47 per foot of untimbered $5\frac{1}{2}$ by 7 foot crosscut and drift, with no hoisting, may be considerably higher than it should be, and should receive particular consideration by our engineers.

The application and Mr. Nelson's letter are returned herewith.

C. H. Johnson
C. H. Johnson

Attachment

Copy to - Mr. Nelson, USGS
Minerals Division
Base Metals Branch
Mr. Johnson
Files

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
AUG 8 1952

7/15/52 rgla

IN REPLY REFER TO:

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

July 14, 1952

Memorandum

To: Mr. E. Wm. Ellis

From: N. E. Nelson

Subject: DMEA-2612 (Copper) Index Mining Company
Sunset Mine, Index, Washington

Earlier in the year this company was an applicant for a DMPA loan based on a poorly determined tonnage of poorly determined grade.

The work of the present application would serve to make reasonably certain tonnages not now in that class, and explore ground more or less virgin.

Geologically the area is favorable as shown by the sizable production of earlier years. No great tonnage should be expected and a balance must be sought inasmuch as other help may be asked for later.

N. E. Nelson

N. E. Nelson
Geologist

DMEA-2612

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

3D

July 21, 1952

Memorandum

To: Executive Officer, DMEA Field Team, Region II

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned Docket Number to an application recently submitted from Region II.

DMEA-2612 - Index Mining Company

Chief, Operation's Control
and Statistics Division

cc: Mails & Files

EXPLORATION

Subject: DMEA-2612
Re: Exploration Loan
Sunset Copper Mine
July 14, 1952

Mr. C. V. Brennan
Index Mining Company
2430 Monte Vista Place
Seattle 99, Washington

My dear Mr. Brennan:

This will acknowledge receipt of your application dated June 1, 1952, for a loan under the Defense Production Act of 1950.

Your application was assigned Docket Number DMEA-2612 and referred to the Rare and Miscellaneous Metals Division.

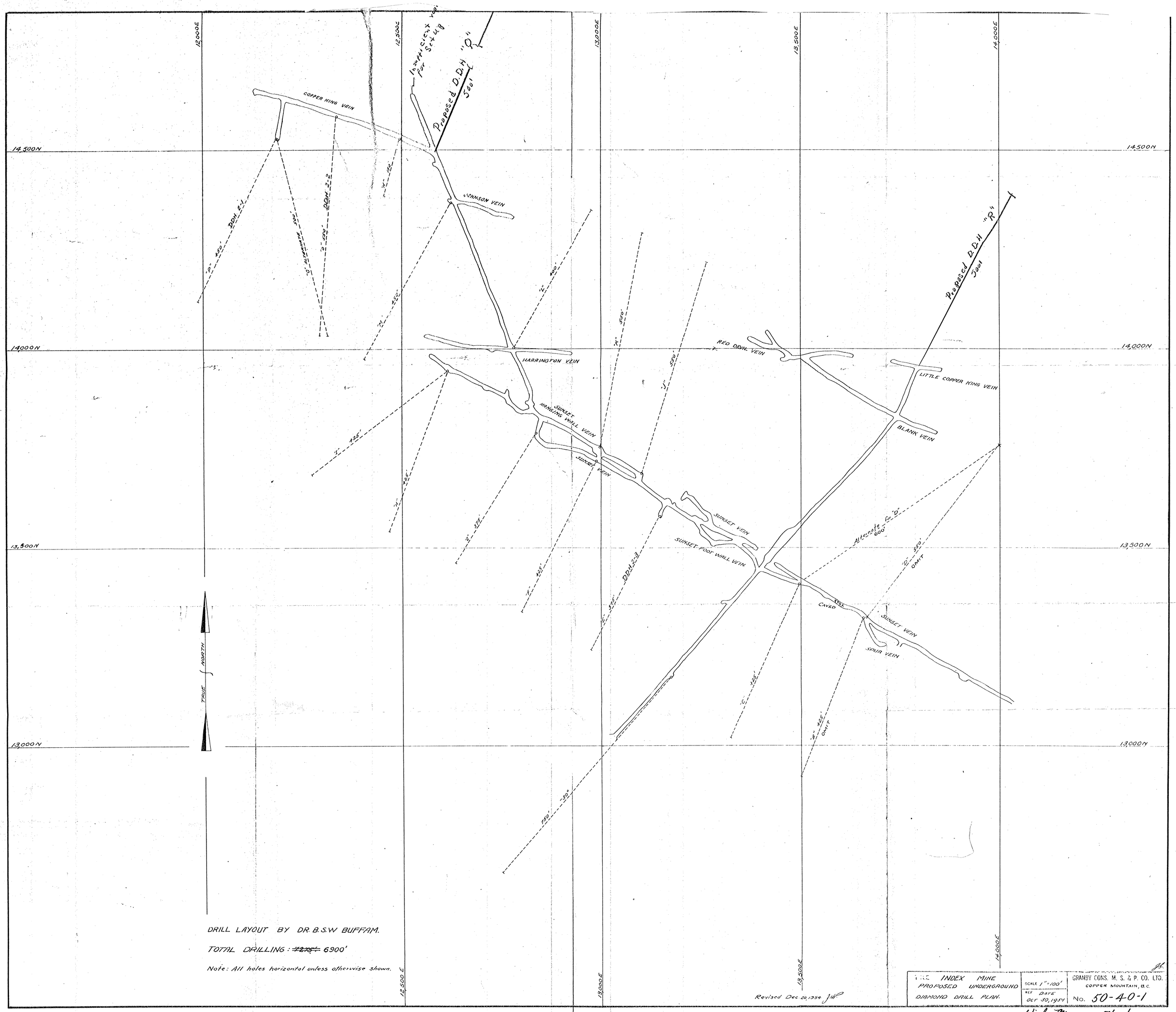
Kindly refer to DMEA-2612 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Administrative Officer

7862



DRILL LAYOUT BY DR. B.S.W BUFFAM.

TOTAL DRILLING: ~~[illegible]~~ 6900'

Note: All holes horizontal unless otherwise shown.

Revised Dec. 20, 1954 J.H.P.

TITLE INDEX MINE PROPOSED UNDERGROUND DIAMOND DRILL PLAN.	SCALE 1" = 100' REF DATE Oct 30, 1954	GRANBY CONS. M. S. & P. CO. LTD. COPPER MOUNTAIN, B.C. No. 50-40-1

With Memo - 7/20/1955

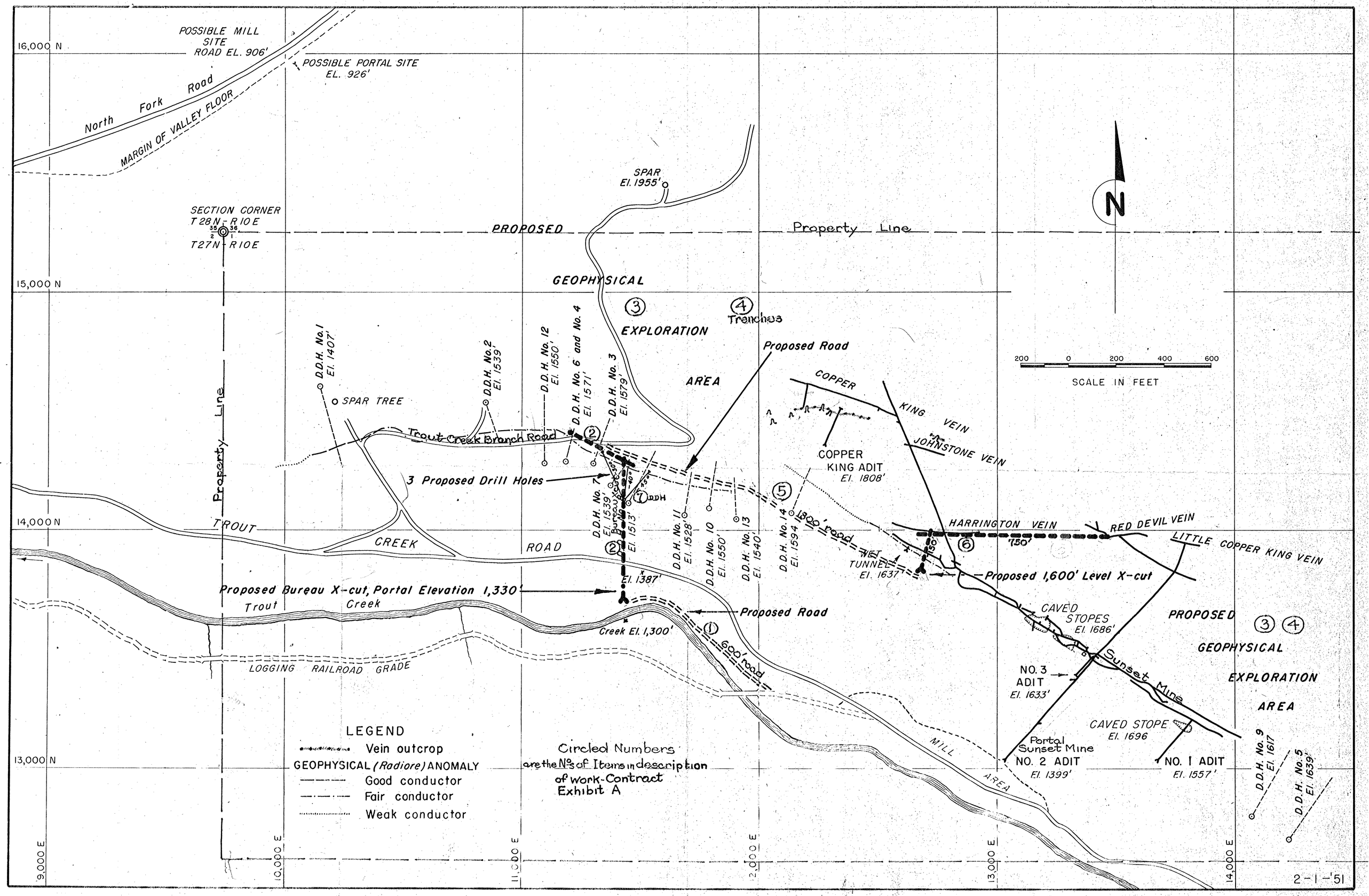
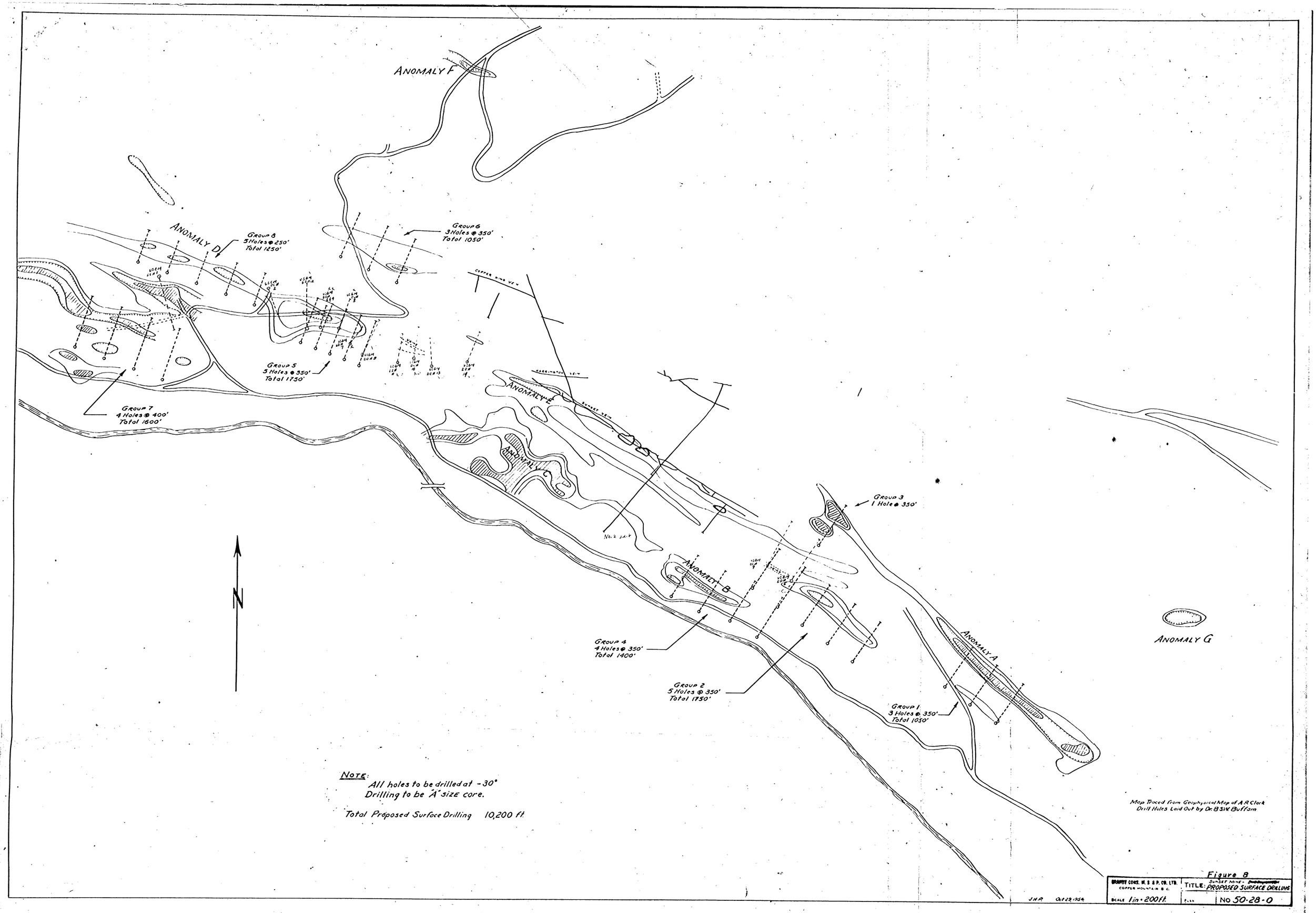


Figure 3 — Sunset mine area, Snohomish County, Washington.


ANOMALY F
ANOMALY D
Group 8
5 Holes @ 250'
Total 1250'
Group 6
3 Holes @ 350'
Total 1050'
COPPER KING VEIN
Group 5
5 Holes @ 350'
Total 1750'
Group 7
4 Holes @ 400'
Total 1600'
WASHINGTON VEIN
ANOMALY E
SUNSET VEIN
ANOMALY C
No. 2 ADIT
Group 3
1 Hole @ 350'
ANOMALY B
Group 4
4 Holes @ 350'
Total 1400'
Group 2
5 Holes @ 350'
Total 1750'
ANOMALY A
Group 1
3 Holes @ 350'
Total 1050'
ANOMALY G
N
NOTE:
All holes to be drilled at -30°
Drilling to be 'A' size core.
Total Proposed Surface Drilling 10,200 ft
Map Traced from Geophysical Map of A.R. Clark
Drill Holes Laid Out by Dr. B.S.W. Buffam
J.H.R. Oct 23 1954
GRANBY CONS. M. S. & P. CO. LTD.
COPPER MOUNTAIN B.C.
SCALE 1 in = 200 ft.
Figure 8
TITLE: SUNSET MINE - PROPOSED SURFACE DRILLING
No 50-28-0

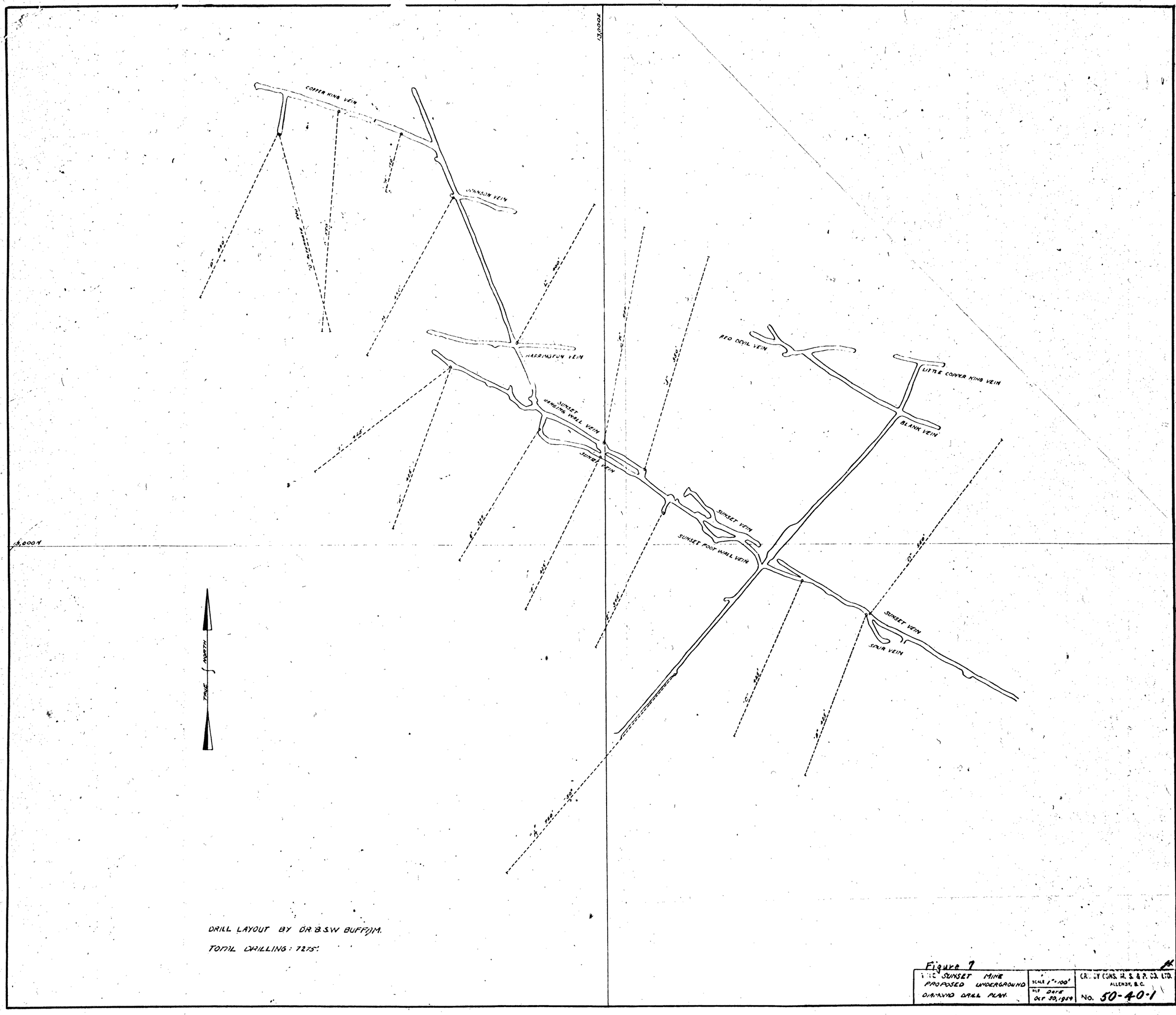


Figure 7

THE SUNSET MINE PROPOSED UNDERGROUND DIAMOND DRILL PLAN.	SCALE 1" = 100' / DATE OCT 30, 1959	CRANBROOK CONS. M. S. & P. CO. LTD. ALLENBY, B.C. No. 50-40-1