DEFENSE MATERIALS PROCUREMENT AGENCY
Washington 25, D. C.

11/30/51

Memorandum

To: Docket Control Center

From: Chief, Copper Branch

Subject: Application for Purchase Contract of Deep Ruth Mine, Kennecott Copper Corp. DMA 212, Commodity-Copper

This application has been withdrawn at a previous date by the applicant. The file is being kept in this office for future reference.

J. B. Gowen, Chief
Copper Branch

Attachment

HVWaugh:pk
11/30/51
Copy to: Field Team III
Copper Branch

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

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
MAR 30 1951
SAN FRANCISCO, CALIFORNIA

March 23, 1951

Refer to	Noted	Date
	Allen	3/30
Answered		

Memorandum

To: Director, Production Expansion Division

From: Director, Supply Division

Subject: Kennecott Copper Corporation, Deep Ruth Copper Project - DMA-212

A. Kennecott Copper Corporation
120 Broadway, N. Y. 5

B. Deep Ruth Mine
White Pine County, Nevada

C. Conclusions:

1. Project is pertinent to the copper program
2. Field Team reports it is technically feasible
3. Required material probably will be available
4. The Company will handle the financing
5. Applicant is decidedly competent

D. Recommendations:

Certificate of Necessity has been recommended to the extent of 85 percent. Copper Committee recommends negotiation of pruchase contract on most favorable terms obtainable but based on not more than 24½ cents as a starting price.

E. Applicant proposes to develop and equip an underground mine at Ruth, Nevada, which will produce 17,500 tons of copper annually by mining 8000 tons of ore daily averaging 0.787 percent copper. Capital expenditures are expected to be about $13,000,000. Applicant desires accelerated amortization and a 5 year purchase contract at 24½ cents per pound.

F. This is one of the major desirable copper expansion projects.

G. Technical:

1. Reserves are reported by the DMA Field Team to be 25,000,000 tons averaging 0.787 percent copper with an expected mill and smelter recovery of 88½ percent, yielding 13.7 pounds per ton.

2. Rate of production: 8000 tons of ore daily; 17,500 tons of copper annually.

3. Mining method: caving; costs: 84 cents per ton of ore, 3.4 cents per pound of copper.

4. Milling practice: flotation; cost: 4.7 cents per ton of ore, 3.4 cents per pound of copper

5. Marketing: regular Kennecott channels. Total cost 21 cents per pound.

6. Production schedule: will be ascertained.

Apparently 2 to 2½ years needed for preparation of mine and plant. We believe production will increase over a period of 2 to 4 years as production from the pits falls off.

H. Requirements available:

1. Most of the milling facilities are already in operation. Housing will need to be moved off the caving area.

2. Most of the mine equipment remains to be obtained new but presumably will be available. A little used equipment is on hand.

3. Double track railroad will be built 3½ miles

4. Manpower - 350 men for mine

5. Power - apparently not a problem

I. Financing:

1. Company will finance

2. No loan

3. Procurement contract for 5 years at market price with escalator is requested and seems reasonable, but we believe a longer contract with a lower floor would be better.

J. Kennecott is as competent as any organization

K Correspondence: Submitted herewith are the following:

December 20, 1950 - J. C. Kinnear to James Boyd letter outline project

~~January 24, 1951 - Project referred to Field Team~~

~~February 8, 1951 - Certificate of Necessity files~~

~~February 12, 1951 - Kennecott Appendix A, Summary Sheet~~

March 6, 1951 - Report by Field Team

March 9, 1951 - Cost data letter

Tom Lyon

Tom Lyon,
Director, Supply Division

Enclosures

JTCollins:bsl

Copy to: Executive Officer, DMA Field Team, Region III
Executive Secretary
Copper Commodity Committee
Files

Copy to Wendenbach. 3/30

1-1027
(April 1946)

UNITED STATES
DEPARTMENT OF THE INTERIOR

AGENCY Bureau of Mines

PBS TELETYPE

Originator:
Ext.: 264 Room:
1415 Appraisers Bldg., S.F.

Appro.: Bureau of Mines, San Francisco
Date: March 20, 1951
Time: 8:50 a.m.
No.:
To: Tom Lyon, Director, Supply Division, Defense Minerals Administration, Interior Building, Washington, D. C.
Subject:

Reurtt March 20 Report on Deep Ruth project Kennecott Copper Corp.

DMA-212 was mailed to you March 8.

H. C. Miller
Regional Director, Region III

Authorized:
H. C. Miller

HCMiller:am
Files
Chrono

Sign original message and transmit to Room ..... in duplicate

U. S. GOVERNMENT PRINTING OFFICE 16—50915-1

Refer to	Noted	Date
Answered		

DEPARTMENT OF INT
BUREAU OF MINES
REGION III
RECEIVED
MAR 20 1951
SAN FRANCISCO, CALIFORNIA

PBA

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TELETYPE DIVISION

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WASHINGTON 3-20-51 818A

HAROLD C MILLER EXECUTIVE OFFICER

DMA FIELD TEAM III 1415 U. S. APPRAISERS

BLDG. SF

CONSIDERABLE PRESSURE HERE RE DEEP RUTH PROJECT KENNECOTTCOPPER CORPORATION DMA-212. PLEASE INFORM STATUS FIELD STUDY AND WHEN REPORT EXPECTED HERE.

TOM LYON

DMA-212

EF 819A

March 8, 1951

Memorandum

To: Tom Lynn, Director, Supply Division, Defense Minerals Administration, Washington, D. C.

From: Regional Director, Region III

Subject: Docket DMA-212 - Kennecott Copper Corporation's Deep Ruth Mine, White Pine County, Nevada

Reference is to subject memorandum, dated January 24, Chairman, Copper Commodity Committee to Executive Officer, DMA Field Team, Region III. In accordance with the request expressed therein an investigation has been made by George H. Holmes, Jr., Mining Engineer, Bureau of Mines, and a report prepared by him setting forth answers to the questions asked in the January 24 memorandum.

There are attached the four copies of the report made by Mr. Holmes. Judging from the material presented in the report Region III DMA Field Team concludes that the projected work at the Deep Ruth Mine is well planned and that the proposed plan of bringing the mine into production is sound and feasible.

Attached also is a copy sent to us by your office of a letter, dated December 20, 1950, to Mr. James Boyd from J. C. Kinnear, Vice President.

H. C. MILLER

H. C. Miller
Regional Director, Region III

Attachments 2

Copy to: Ward Smith
A. C. Johnson

HCMiller:wmk

Files
Chrono.

March 6, 1951

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

DEFENSE MINERALS ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION III - CALIFORNIA-NEVADA

DMA-212, Kennecott Copper Corporation's Deep Ruth Mine
White Pine County, Nevada

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

DOCKET DMA-212

UNITED STATES DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

KENNECOTT COPPER CORPORATION'S DEEP RUTH MINE
White Pine County, Nev.

By George H. Holmes, Jr.[1]

INTRODUCTION AND SUMMARY

The estimate of ore reserves, plan of operation, major development, equipment, railroad and townsite estimates for the prospective Deep Ruth Mine, near Ruth, White Pine County, Nevada, DMA-212, submitted to the Mining Division, Bureau of Mines, Reno, Nevada, by the Kennecott Copper Corporation, have been reviewed and checked by engineers[2] of the Bureau of Mines.

The method of development of the Deep Ruth ore body and of estimating ore reserve tonnages and grades was discussed with K. W. Booker, Chief Engineer, and A. A. Bakewell, Ass't Chief Engineer, of the Ruth Division of the Kennecott Copper Corporation. Summary major development cost estimates, capital requirement for equipment, and cost of railroad and townsite facilities were also supplied by the Ruth office. The breakdown of equipment is itemized in Form NSRB-140, Application for a Necessity Certificate, to be filed by the company with the Washington office of the Defense Minerals Administration. The overall production cost furnished by the company has been checked and found acceptable.

1/ Mining Engineer, Mining Division, Region III, Bureau of Mines.
2/ George H. Holmes, Jr.
Glenn Gentry

The property at Ruth was visited for the purpose of discussing the project, to study mine models, and to view present operations. Cessation of underground mining and subsequent flooding of the Star Pointer shaft prevented examination of underground workings.

ACKNOWLEDGMENTS

Acknowledgment is made to J. C. Kinnear, Jr., General Manager; Paul Hett, Ass't General Manager; K. R. Booker, Chief Engineer, and A. A. Bakewell, Ass't Chief Engineer; of the Nevada Mines Division of the Kennecott Copper Corporation, for supplying maps and data necessary for the preparation of this report.

HISTORY

Approaching exhaustion of the porphyry-copper ore body at the Ruth mine during the 1930's and 1940's was the basis for the company decision to explore by drilling and exploration for additional ore bodies in this area. Churn drill holes from surface and levels from the Star Pointer shaft indicated the presence of a large porphyry-copper ore body below the Ruth ore body. This deposit, designated the Deep Ruth ore body, dips about 35 degrees to the west extending downward from the Star Pointer 11-level. The drilling did not delimit the southern and southwestern extensions of the mineralized zone and churn drilling is in progress to further explore these extensions.

In addition to the drilling, further exploration of the deposit was undertaken in 1942 and 1943. The Star Pointer shaft was further sunk and a prospecting level, known as the 16-level, was driven about

550 feet below the 11-level. Drifts and crosscuts were run to determine the limits of the mineralized zone. From these workings at intervals varying from 100 to 200 feet diamond drill holes were drilled upward in pairs at angles of approximately 50 degrees for lengths ranging from 100 to 435 feet.

Samples were taken at 5-foot intervals from the churn drill holes; core and sludge samples from diamond drill holes; and face samples at 5-foot intervals from the 16-level drift and crosscuts. A bulk sample was taken of all the material excavated from the 16-level and shipped to the company's concentrator and smelter at McGill, Nevada, for treatment.

GEOLOGY[3]

The country rocks of the Ely district are Paleozoic sediments intruded by monzonite porphyry and capped in places by Tertiary volcanic rock. The Paleozoic rocks consist of limestones, quartzites and shales ranging in age from Ordovician to Pennsylvanian, according to Spencer. These sedimentary rocks have been greatly disturbed by faulting and to a minor degree by folding, and their distribution is very irregular. The monzonite porphyry was probably intruded at the close of Jurassic time.

Two types of monzonite porphyry intrude the sediments and are mineralized to form the so-called disseminated copper ore bodies. The earlier of these is locally termed "ore porphyry" and it is within this type the bulk of the copper has been precipitated. The latter is

3/ Mining Districts and Mineral Resources of Nevada by Francis Church Lincoln. p. 247.

commonly named "Peanut porphyry", and is considerably coarser in grain and has suffered less hydrothermal alteration than the earlier ore porphyry.

MINERALIZATION[4]

Mineralized porphyry the most important ore.

The economically important bodies of copper ore may be conveniently considered in three groups. These are: First, the disseminated copper ores in porphyry; second, sulfide ores of copper in limestone; and third, oxidized ores of copper in limestone.

Alteration of the porphyry has produced abundant quartz, sericite and brown mica. At a slightly later stage the metallic minerals were introduced. Pyrite was the first of these minerals to be precipitated, but it was closely followed by chalcopyrite, the predominant mineral of the ore.

In addition to the copper minerals, the ore body carries gold and silver, and molybdenite in small quantities per ton.

A complete and detailed mineralogical report is available at the Ruth, Nevada office of the Kennecott Copper Co.

The Bureau of Mines engineers have noted silicified porphyry and limestones, together with sandstones, shales, in varying thickness in the various prospect drill holes.

The Deep Ruth ore body is a monzonite-porphyry deposit having a general North-South strike and dipping about 35 degrees to the west. The economic portion to be mined has a slope height of about 1,150 feet, a thickness of about 470 feet, and a length of about 720 feet.

4/ E. H. Pennebaker, Mining and Metallurgy, April 1932. p. 165.

ORE RESERVES

Ore reserve estimates for the Deep Ruth ore body assume a cut-off grade of 0.6 percent copper. Based on this figure the company estimates of tonnage within the deposit are about 27,000,000 tons averaging 0.65 percent copper. Approximately 2,000,000 tons will be lost during operations so the company's application is based on 25,000,000 tons. The adjoining Consolidated Copper Mining Company owns claims which cover part of the ore body on the "D" and "E" levels, or an estimated recoverable 2,500,000 tons, which leaves Kennecott with a total of 22,500,000 tons. The Consolidated Coppermine's ore will be mined by Kennecott.

Because of the height of the ore above draw points and based upon past experience in mining the Ruth ore body, the mining dilution will be small which will result in an estimated average grade of ore sent to the mill of about 0.77 percent copper.

It is estimated that Consolidated Coppermine's tonnage obtained from the upper part of the deposit will average 0.90 percent copper, after allowing for dilution. Total 25,000,000 combined tons will average 0.767 percent copper which at an estimated mill and smelter recovery of 85-1/2 percent, will yield 13.7 pounds copper per ton.

Sections across the ore body indicate a probable continuity to the southwest but the extremely conservative estimate made by the company disregards this possibility. No attempt was made by Bureau engineers to assume additional ore reserves.

The Bureau of Mines engineers closely checked the company's

sections through the deposit, independently checking areas by planimeter, and estimating tonnages. The company's figures for "lost" tonnage and the tonnage belonging to Consolidated Copperminas have been accepted as correct. The former tonnage is based on past experience in block-caving in the area. Sections furnished do not show claim lines.

Results of the estimates are:

Level	Tons Kennecott	Tons Bureau of Mines	Grade
D	4,386,400	4,710,480	
E	7,685,600	8,334,800	
F	12,548,000	12,956,820	
	24,620,000	26,002,100	0.83*

*Based on churn drill estimate for whole ore body.

Comparing the two estimates it will be seen that the Bureau of Mines tonnage exceeded Kennecott's estimate by 1,382,100 tons, or 5.6 percent. This difference is undoubtedly due to the planimetered areas, some small sections of which along the footwall were included by the Bureau, whereas the company considered them non-recoverable.

The overall tonnage figures and grades are in sufficiently close agreement to assume the figures submitted by Kennecott to be essentially correct. This tonnage estimate is acceptable to the Bureau of Mines.

SAMPLING

Underground workings at the Ruth mine are flooded and inaccessible for examination. Assay results were determined by checking churn drill and diamond drill hole logs and the assay map of the 16-level. Drill hole logs were checked between intercepts shown on the sections and

based on the 0.6 percent copper cut-off grade. The assay value of the production from the 16-level could not be checked but the company figure can be assumed correct. This material was milled and found to be amenable to treatment by flotation with a subsequent recovery of 90 percent and a concentrate grade of about 26 percent copper.

Assay results are:

Location	%Copper Kennecott	%Copper Bureau of Mines
16-level drifts and crosscuts, 19,472 tons	0.899	--
Average of face samples	.874	0.829
Average of churn drill samples (8 holes) 5 feet above to 5 feet below - 16 level	.815	.784
Average of churn drill samples (8 holes) 10 feet above to 10 feet below - 16 level	.809	.784
Churn drill estimate - whole ore body 26,500,000 tons (18 holes)	.850	.853

Assays indicate the ore to contain minor amounts of gold, silver and molybdenite.

Assays are sufficiently close to justify the company's figures.

PLAN OF OPERATION

The Deep Ruth orebody is so located to prevent the use of the Star Pointer shaft and present underground workings as they will fall within the caved area if mining is continued to the "F" or 5550-foot level. For safety, a 30 degree caving limit, extending from the 5550- to surface, average elevation 7,000 feet, has been planned. The present Ruth township with its mine offices, business houses and residence, also fall within this area and which will necessitate moving it to a new location.

Exhaustive studies by the company, and based on past experience in mining similar large porphyry-copper ore bodies in this area, indi-

cate that the ore body is adaptable to mining by block-caving methods.

It is planned to sink and timber a new shaft to a depth of 1700-feet from which the Deep Ruth ore body will be mined. This shaft, comprising 5-compartments including 2 hoisting compartments in which 12-ton capacity skips will be used in counterbalance; a service compartment, a compartment for a 2-deck cage for handling men and supplies, and a section for the cage counterweight, will be sunk about 3500 feet north of the Star Pointer shaft in an area that will be unaffected by ground subsidence. A pilot hole is being diamond drilled at this location to permit a prior study of rock formations through which the shaft will be sunk.

To comply with the Nevada State safety code for a second mine entrance, the Kellinske inclined shaft located about 1750 feet southeast of the Star Pointer shaft will be sunk an additional 2345 feet and connected with the new "D", "E", and "F" levels. It will also serve as a supply and pumping shaft. If required, comparatively short drainage levels will be driven from this shaft at 6450- and 5400-feet to drain any possible flow of water from old or new workings. No great amount of water is anticipated but sudden flows will be handled by 4 - 1,000 g.p.m. pumps.

Stations will be cut, skip pockets excavated, at the 6126, 5876 and 5550 foot levels of the new Deep Ruth shaft and haulageways driven to the deposit. Haulage distance from the northern part of the ore body will average 3000 feet. Series of parallel haulageways will be driven through the deposit on these three levels and the ore body prepared for block-caving by driving branch raises, scram drifts, and

finger raises.

New hoisting facilities comprising hoist, headframe, ore bins, etc., will be installed at the Deep Ruth shaft and a railroad branch built to this site. New hoisting facilities will also be required at the Kellinske shaft.

It is estimated 24 to 26 months will be required to bring the mine into production. Production rate is planned at a daily 2-shift rate of 8,000 tons averaging 0.787 percent copper which will yield about 126,000 pounds of copper assuming the estimated 88-1/2 percent mill and smelter recovery is maintained. Annual production is estimated at 38,000,000 pounds.

Manpower estimates indicate that an average of 350 men will be required to operate the mine.

The mining plan was discussed in detail with the technical staff at Ruth and drawings furnished by the company were reviewed and checked by Bureau of Mines engineers with the final conclusion that the proposed plan is sound and feasible.

PRODUCTION AND EQUIPMENT COST ESTIMATES

Overall production and equipment cost estimates were supplied by the Ruth office of the Kennecott Corp. and in Vice-President J. C. Kinnear's letter of December 20, 1950 to Dr. James Boyd, Director, Defense Minerals Administration. A breakdown of costs was not given this office but are contained in Form MSRB-140, Application for a Necessity Certificate, which will be filed by the company with the Washington office of the Defense Minerals Administration.

Costs of major categories are based on current quotations from

supply houses and labor costs both estimated by Kennecott engineers. Estimates have been made showing costs of major development by contractor and company account as of Jan. 25, 1951. Major development costs in the following table cover shaft sinking and development of the "D" level. Development costs pertaining to the "E" plus "F" levels comprise the item, "Remaining Capital Charges".

Additional expenditures envisioned to develop mine to production if work is done by contractors to expedite the time element

	By Contractor	By Kennecott See Est. of 1-24-51 Reappraisal	January 25, 1951 Additional Expenditures
Major Development:			
Ruth Shaft - 1700' @ $550./ft.	$ 935,000	$ 703,800	$231,200
Kellinske Shaft - 2245' @ $315./ft.	707,200	532,100	175,100
Haulageways - Inside Block - 3887' @ $95./ft.	369,400	276,000	93,400
Haulageways - Outside Block - 4900' @ $95./ft.	465,500	347,900	117,600
Pockets, Stations - 62,000 ft. @ $1.57/ft.	97,300	73,200	24,100
	$ 2,574,400	$ 1,933,000	$641,400
Branch Raises & Scrams:			
Branch Raises - 16,490' @ $44./ft.	725,600	$ 546,000	$179,600
Scrams	None	None	None
	$ 725,600	$ 546,000	$179,600
Totals	$ 3,300,000	$ 2,479,000	$821,000
Summary:			
Major Development - - - - - - - - -	$ 2,574,400	$ 1,933,000	
Branch Raises - - - - - - - - - - -	725,600	546,000	
Railroad - - - - - - - - - - - - - -	234,000	234,000	
Equipment - - - - - - - - - - - - -	3,716,000	3,716,000	
Townsite - - - - - - - - - - - - -	800,000	800,000	
Initial Capital Charges - - - - - -	$ 7,050,000	$ 6,229,000	
Remaining Capital Charges - - - - -	7,116,000*	7,116,000*	
Total Capital Charges- - - - - -	$14,166,000	$13,345,000	
Total Capital Charges - Kennecott	$13,345,000		
Difference - - - - - - - - - - - -	$ 821,000		

*Comprises E plus F level development costs.

These estimates have been checked as closely as possible by Bureau engineers and considering the many intangibles that must be taken into consideration, a close check was made; sufficiently close to permit their acceptance.

The overall estimated production cost of 21.06 cents per pound as stated by J. C. Kinnear, Vice-President of the company, has also been checked as closely as possible with the Bureau of Mines in agreement with this figure. As no breakdown of costs, indicating how the 21.06 cent figure was obtained, estimates were based on prior company costs with adjustments for the increased cost of labor and equipment.

CONCLUSIONS

The Bureau of Mines concludes that:

1. The Deep Muth ore body has been thoroughly explored and outlined by a comprehensive program comprising churn drilling, diamond drilling and underground development.

2. Estimate of tonnages and grades, based on a 0.6 percent copper cut-off, are conservative.

3. Company plans of developing and mining the deposit is economically sound. The large ore body should be adaptable to the block-caving system of mining.

4. The grade of the deposit makes it a border-line or marginal deposit. Production costs will necessarily be high with a subsequent small margin of profit. However, if its operation is dependent on Government cooperation, it should be granted readily.

5. Checking of maps, sections, tonnage and cost estimates supplied by the company are sufficiently close to permit acceptance

of company figures.

6. The company's request for 5-year amortization of the Deep Ruth project is recommended.

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
MAR 8 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES
Nevada - California

Mining Division
Region III

P. O. Box 1551
Reno, Nevada

Memorandum

March 7, 1951

To: H. C. Miller, Regional Director, Region III

From: Chief, Mining Division, Region III

Refer to	Noted	Date
Answered		

Subject: Docket DMA-212 -- Kennecott Copper Corporation's Deep Ruth Mine, White Pine Co., Nevada.

Enclosed are five copies of a report on the Kennecott Copper Corporation's Deep Ruth Mine in White Pine County, Nevada.

The estimate of ore reserves, plan of operation, major development, equipment, railroad, and townsite estimates for the prospective Deep Ruth mine has been checked by engineers of the Mining Division of Region III.

The work seems to be well planned and the conclusions of the engineers of the Bureau of Mines is that the proposed plan of bringing the Deep Ruth Mine into production is sound and feasible.

A copy of a letter from J. C. Kinnear, Vice-President to Dr. James Boyd, Director of the Defense Minerals Administration, is returned herewith.

A. C. Johnson

A. C. Johnson

1-1027
(April 1946)

UNITED STATES
DEPARTMENT OF THE INTERIOR

AGENCY Bureau of Mines

PBS TELETYPE

Originator:
Ext.: 264 Room:
1415 Appraisers Bldg.
San Francisco, Calif.

Appro.: Bureau of Mines, San Francisco
Date: March 6, 1951
Time: 2:30 p.m.
No.:
To: Tom Lyon, Director, Supply Division, Defense Minerals Administration, Interior Bldg., Washington, D. C.

Subject:

J. K. Richardson relayed to me today from Salt Lake City your message to him that we had not yet reported to you our cost estimate for copper at the Deep Ruth project. It was stated in Holmes' memorandum attached to my memorandum to you dated March 1 quote Based on prior company costs as applied to the new project the cost of 21.06 cents per pound was closely checked and found acceptable unquote. Richardson asked me to forward this information to you.

H. C. Miller
Regional Director, Region III

Authorized:
H. C. Miller

HCMiller:am

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Sign original message and transmit to Room ..... in duplicate

U. S. GOVERNMENT PRINTING OFFICE 16—50915-1

March 1, 1951

Air Mail

Memorandum

To: Tom Lyon, Director, Supply Division,
Defense Minerals Administration, Washington, D. C.

From: Regional Director, Region III

Subject: Kennecott Copper Corporation, Deep Ruth Project--DMA-212

Following our telephone conversation on February 27, I wrote our Mining Division at Reno about your request for a cost in cents per pound of copper figured for the subject property. Today I received a reply from Mr. George H. Holmes, Jr., Mining Engineer, acting as Chief of the Mining Division during Mr. A. C. Johnson's absence from the office. A copy of Mr. Holmes' memorandum is attached.

I trust that the information submitted herewith will be helpful to you.

[redacted]

H. C. Miller
Regional Director, Region III

Attachment
Copy: Regular mail

HCMiller:am

Files
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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
MAR 1 1951
SAN FRANCISCO, CALIFORNIA

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Refer to	Noted	Date
Answered		

Mining Division
Region III

NEVADA - CALIFORNIA

P. O. Box 1551
Reno, Nevada

February 28, 1951

Memorandum

To: Mr. H. C. Miller, Regional Director, Region III

From: Chief, Mining Division, Region III

Subject: Kennecott Copper Corporation, Deep Ruth Project—DMA-212

Replying to your memorandum of February 27: The average cost of production from Kennecott's Deep Ruth ore body is quoted in Vice President J. C. Kinnear's letter of December 20, 1950, to Dr. James Boyd, as follows:

"It is estimated (a) that once the mine has been placed in full production it will produce at the rate of 35,000,000 pounds of copper a year from the Deep Ruth ore body; (b) that the average cost of production will be at the rate of 21.06 cents per pound of copper."

No summary estimates of production cost or detailed plant and equipment costs were furnished the Bureau by the Kennecott Corporation; overall costs were given for each category. Based, however, on prior company costs as applied to the new project, the cost of 21.06 cents per pound was closely checked and found acceptable.

Ore reserve tonnages and grades and the company's plan of operation are being checked.

George H. Holmes Jr.
for A. C. Johnson

February 27, 1951

Memorandum

To: A. C. Johnson - Reno, Nevada

From: Regional Director, Region III

Subject: Kennecott Copper Corporation, Deep Ruth Project--DMA-212

Have just had a call from Tom Lyon, Director, Supply Division, Defense Minerals Administration, Washington, D. C., requesting us to submit to him the cost in cents per pound of copper at the subject property, just as soon as it has been calculated. Accordingly, will you give me this figure just as soon as you can.

H. C. MILLER

H. C. Miller
Regional Director, Region III

HCMiller:am

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1-1027
(April 1946)

UNITED STATES
DEPARTMENT OF THE INTERIOR

AGENCY Bureau of Mines

PBS TELETYPE

Originator:
Ext.: 264 Room:
1415 Appraisers Bldg.
San Francisco, Calif.

Appro.: Bureau of Mines, San Francisco
Date: February 26, 1951
Time: 3:30 p.m.
No.:
To: Tom Lyon, Director, Supply Division, Defense Minerals Administration, Interior Bldg., Washington, D. C.
Subject:

Reurtel today. Our Mining Division at Reno reports tonnages at Kennecott Deep Ruth project DMA-212 are now being checked from map sections. Also checking grade of ore and results of drill holes. Cost estimates look reasonable. Will be another week before work is completed.

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

Authorized:

H. C. Miller

HCMiller:am

Files
Chrono

Sign original message and transmit to Room ..... in duplicate

U. S. GOVERNMENT PRINTING OFFICE 16—50915-1

DEPARTMENT OF INTERIOR
BUREAU OF MINES
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Refer to	Noted	Date
Answered		

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TELETYPE DIVISION

428 SF WAF /I-BOM/

WASHINGTON 2-26-51 219P

H C MILLER EXECUTIVE OFFICER

DMA FIELD TEAM REGION III 1415 U S APPRAISERS BLDG SF

URGENTLY NEED OPERATING AND COPPER PRODUCTION COST ESTIMATES KENNECOT DEEP RUTH PROJECT DMA-607. PLEASE PHONE IF AVAILABLE OR ADVISE WHEN EXPECTED.

TOM LYON DIRECTOR SUPPLY DIVISION

CJA 222P

February 7, 1951

Memorandum

To: A. C. Johnson - Reno, Nevada

From: Regional Director, Region III

Subject: Kennecott Copper Corporation, Deep Ruth Project--DMA-212

In line with my telephone conversation of this morning, there are attached the documents from Washington relating to a field investigation of the subject property. Washington has indicated by telephone that this is an urgent assignment and that we should get busy on it right away.

You have indicated that you can have an engineer at McGill, Nevada, at our pleasure, so I will let you know after Ward Smith returns to the city and we discuss the matter when his geologist from Salt Lake City can meet your engineer at the company's offices at McGill.

For your use and for Ward Smith's use, I have had the letter from Mr. J. C. Kinnear to Mr. James Boyd copied and two copies are enclosed.

Will telephone you final details not later than Friday.

H. C. MILLER

H. C. Miller
Regional Director, Region III

Attachments 2

Copy to: Ward Smith, Geological Survey

HCMiller:am

Files
Chrono

2/14/51 - Informed A.C. this investigation not so urgent, but is to be completed

999.5 [illegible]

DEPARTMENT OF INTERIOR
BUREAU OF MINES
REGION III
RECEIVED
FEB 2 1951
SAN FRANCISCO, CALIFORNIA

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

January 24, 1951

Refer to	Noted	Date
	NELL	2/2
Answered		

Memorandum

To: Executive Officer DMA Field Team Region III
1415 U. S. Appraisers Building
San Francisco 11, California

From: Chairman, Copper Commodity Committee

Through: Operating Committee

Subject: Kennecott Copper Corporation, Deep Ruth Project, DMA-212

As indicated by the attached copy of a letter from Mr. J. C. Kinnear, Jr., Vice President, Kennecott Copper Corp., to Dr. Boyd, dated December 20, 1950, the Kennecott Copper Corp., has suggested a long-term purchase contract as a means of justifying it in undertaking the underground mining of certain copper-ore reserves at Ruth, Nevada. The Corporation may also apply for a Necessity Certificate to enable it to amortize the investment rapidly under the provisions of the current Federal Tax Law.

It is requested, therefore, that you have such investigation made of the project, and report thereon, as may enable the DMA to negotiate with the Corporation a fair and equitable purchase agreement, and possibly to consider an application for accelerated amortization.

Your report should set forth: Description of property; previous development and operations (not the whole Ruth mine, just the part in question); ore reserves (may be based on spot-checking of Company data and calculations); description of proposed development and mining project; itemized estimated capital costs and operating costs; labor, equipment and material requirements; power requirements; facilities for milling and smelting; time schedule.

Mr. J. C. Kinnear, Sr., has been informed that a field study of the project will be necessary, and he instructed us to have our Field Team call on Mr. J. C. Kinnear, Jr., General Manager,

McGill, Nevada, for this purpose.

Tom Lyon

Tom Lyon, Vice Chairman
Copper Commodity Committee

Enclosure

For Approval:

C O Mittendorf
Acting Chairman, Operating Committee

O. N. Rove

J. H. Hedges

February 5, 1951

Memorandum

To: Ward Smith, Representative, Region III Field Team, Geological Survey, San Francisco, California

From: Executive Officer, Region III Field Team

Subject: Kennecott Copper Corporation, Deep Ruth Project—DMA-212

There is attached the extra Washington copy of subject memorandum, dated January 24, together with a copy of the letter which accompanied the memorandum, dated December 20, from J. C. Kinnear, Sr., Vice President, Kennecott Copper Corp., to Mr. James Boyd, Director, Defense Minerals Administration.

Washington informed me by telephone that this is an urgent assignment and desire us to get busy on it right away. I want to discuss this investigation with you at the earliest opportunity, which probably will be sometime Tuesday (February 6) afternoon, after I return from Fresno. If I get back from Fresno on time to have you meet with me, I will give you a ring. In the meantime, you can give the matter consideration.

H. C. MILLER

H. C. Miller
Regional Director, Region III

Attachments 2

HCMiller:am

Files
Chrono

KENNECOTT COPPER CORPORATION
120 BROADWAY
NEW YORK 5, N. Y.

J. C. KINNEAR
VICE PRESIDENT

COPY

December 20, 1950.

Mr. James Boyd,
Director, Defense Minerals Administration,
Interior Building,
Washington, D. C.

Dear Sir:

Subject: COPPER — PROSPECTIVE "DEEP RUTH MINE" LOCATED NEAR RUTH, WHITE PINE COUNTY, NEVADA.

It was a pleasure to have had the opportunity to discuss the above subject with you briefly in your office on Monday.

In view of the President's declaration that an emergency exists and pursuant to your recent request that industry take such steps as it can in order to produce additional quantities of metals required for defense and urgent civilian needs — with an indication of governmental assistance in appropriate cases — we advise you as follows:

(1) Drilling and Prospecting

The Nevada Mines Division of this corporation, which carries on mining operations at Ruth, in White Pine County, Nevada, is now mining copper there in its open-cut mine. Heretofore it also operated, through its Star Pointer Shaft, an underground copper mine in that same area, which was known as the "Ruth Mine". Operations at the Ruth Mine terminated in 1949 because of the exhaustion of the orebody then being mined.

There remains an orebody lying well below the horizon at which it is possible to continue mining through the existing Star Pointer shaft. Moreover, this shaft is not serviceable for a continuation of mining at depth because both the shaft and the service facilities necessary thereto

fall within what would be the caved area if mining were to be continued at depth.

Foreseeing the approaching ore exhaustion of the Ruth Mine some years ago, our corporation embarked upon both drilling and exploration programs to determine whether additional ore existed and, if so, in what grades and whether in sufficient quantity to justify a mining operation.

The drilling program was carried on both from the surface and from underground. Six holes were drilled from the surface and eight holes were drilled from underground aggregating, respectively, 9,544 feet and 6,158 feet -- or a total of 15,702 feet of drilling. These efforts indicated a mineralized zone of ore having a general westerly dip of about 30 degrees, the center of which is about 450 feet below the present bottom of the shaft -- sea-level elevation 6,200 feet. This drilling did not define the southern and southwestern limits of the ore, and extensions in these directions appear probable.

The program mentioned above was followed by a further sinking of the Star Pointer shaft (solely for exploratory purposes) and the development of a prospecting level known as the "16 Level" (sea-level elevation 5,750 feet) from which drifts and cross-cuts were run to determine the limits of the mineralized zone. From these workings (at approximately 200-foot intervals) diamond drill holes were put up in pairs at about 50 degrees to a length of from 150 to 400 feet. The workings were then cut-sampled at 5-foot intervals and a bulk sample taken of the material extracted in the course of the development work above indicated.

After examination of the results of the drilling and exploratory programs mentioned above, together with a study of underground

mining when applied thereto, a tonnage of 22,500,000 tons of ore having an average grade of .83% copper was calculated.

(2) Other features

The ground appears to be adaptable to mining by the caving methods.

No large volume of water was encountered.

Certain of the ore recovered through the prospecting operations was actually put through the mill and the tests indicated that the material is amenable to treatment by flotation, with a recovery of about 90% and a concentrate grade of about 26% copper.

Small amounts of precious metals and molybdenite are present in the ore.

Because of the height of the ore above draw points, and based upon past experience, the mining dilution should be small, resulting in an estimated average grade of the ore sent to the mill of approximately 0.77% copper.

(3) Development

(a) Before it is possible to begin mining operations it will be necessary to sink and timber a shaft approximately 1,700 feet in depth. As above indicated, this is required because the existing shaft and its surface facilities will fall within the caved area if mining is carried on at greater depth.

In order to bring the mine into production, in addition to the sinking of the shaft it will be necessary to install haulageways, stations, pockets, air raises, branch raises, etc., at an estimated cost of $2,200,000; a railroad branch 2¼ miles long must be built, at a cost of

$150,000; surface equipment and buildings such as hoists, headframes, bins, etc. are required, at a cost of approximately $1,950,000; underground equipment, pumps, water lines, motors, etc., at a cost of $600,000., and a Townsite at $100,000; making a total cost of $5,000,000.

(b) Additional development expenditures will be incurred in the course of operations after the mine has once been brought into production. These are estimated to be as follows:

Haulageways and additional raises	$2,250,000.00
Pockets, stations, etc.	150,000.00
Branch raises, scrams and auxiliary raises	4,200,000.00
Moving of Townsite after caving from mining operations begins	1,400,000.00
T o t a l	$8,000,000.00
GRAND TOTAL:	$13,000,000.00

(4) When production could be begun

Before the above mentioned shaft is sink, it will be necessary to put down a drill hole in order to explore the nature of the ground for the shaft location. It is estimated that the drilling of such a hole, the sinking of the shaft and the carrying out of major developments necessary to bring the mine into production will require from 24 to 26 months.

(5) Projected rate of production, and cost

The projected rate of production and the cost thereof are as follows:

It is estimated (a) that once the mine has been placed in full production it will produce at the rate of 35,000,000 pounds of copper a year from the Deep Ruth orebody; (b) that the average cost of production will be at the rate of 21.06¢ per pound of copper.

(6) Manpower requirements

It is estimated that, on the average, 350 men will be required to operate this mine.

(7) Kennecott's viewpoint

The outcome of the drilling and exploratory programs and the estimates made in connection therewith make it apparent that the "Deep Ruth" orebody is a border-line deposit which, if developed, will, under present standards, produce at high costs, and the margin of profit will at best be small. For that reason, Kennecott has not to date seen (nor does it now see) its way clear to undertaking the development of the Deep Ruth as a commercial operation. However, in view of the existing emergency, the undersigned corporation is prepared to go forward with the development of the Deep Ruth mine and the operation thereof, provided —

(a) it will be appropriately authorized so it can, within five years from the beginning of operations of the mine, amortize 100% of the Deep Ruth facilities which are amortizable under the Internal Revenue laws on the bases specified; and

(b) the Government will guarantee to it a selling price for the copper produced therefrom at the rate of 24½¢ a pound — the present price — for a period of five years after the operation of the mine is begun.

It is anticipated that before the undersigned undertakes the development and operation of the mine a firm contract or contracts will be entered into by the undersigned and the appropriate governmental agency or agencies so that the undersigned will be protected in the manner hereinabove indicated.

The above estimates, of course, are made on the basis of existing conditions. If, because of the emergency, any substantial increase in costs shall occur, the outlay required of the undersigned would be larger than above indicated and corresponding adjustments would have to be made in order to protect the undersigned in its projected development and operation.

The undersigned is gathering the material and is beginning the preparation of an Application for a Necessity Certificate, pursuant to the provisions of Sec. 124-A (Amortization Deduction) of the Internal Revenue Code (Form NSRB-140). Upon advice from you that your agency of the Government is prepared to recommend, urge and approve the conditions above indicated, such Application will be filed, but on condition that 100% amortization be granted on the amortizable facilities.

In order that there may be no misunderstanding in regard to this situation, we want to express ourselves quite clearly on one point, viz., while we wish to be as co-operative as possible and to take every patriotic step we can, nevertheless since we are a public company which has in the neighborhood of 90,000 stockholders we cannot, in view of our stockholder relationship, enter into a transaction which will not reasonably protect that position. For that reason we want to emphasize that we cannot enter into a transaction relative to the "Deep Ruth" project unless we have at least the protection we have hereinabove indicated, or its equivalent.

In connection with mining the "Deep Ruth" ore, it should also be pointed out that the installation of a pipeline will be necessary to carry additional water to the concentrator to make such project fully effective. And it may also be that additional concentrator capacity may be required to be installed so as to permit Kennecott to discharge its existing com-

tractual obligation to Consolidated Coppermines Corporation and also mill the "Deep Ruth" ore. Amortisation of these facilities will likewise be a factor in this situation for which we should receive protection.

We shall be pleased to await your advices in regard to the above suggestion.

Respectfully yours,

J. K. Mnear

Vice-President.

JCK:ced