SEE MEMO. 8-9-51 from GOWEN WITH DMA 1207

1205X withdrawn and combined with 1207 X

FILE COPY
Surface

July 2, 1951

Memorandum

To: J. B. Gowen

From: C. H. Johnson

Subject: Calumet & Hecla Exploration (DMA-1205X, 1206X, 1207X)

Mr. A. B. Needham phoned June 29, 1951 at 10:45 AM from Minneapolis to say that the Field Team reports on the Calumet and Hecla exploration application had been mailed. He wished to submit the following priority list as representing the opinion of the Field Team regarding the various sub-sections of the project. Numbers 2 and 3 are items not included in the original application but which are being added by an amendment thereto.

Priority	Designation
1	Delaware D.D.H. No. 83
2	Centennial 48 South Drift
3	Seneca 26 North Drift
4	Ash Bed
5	Iroquois 22
6	Iroquois 18
7	St. Louis Trenching
8	Calumet Conglomerate
9	Iroquois Trenching
10	Centennial 23
11	Calumet Amygdaloid Trenching
12	Kearsarge Hanging-wall Trenching
13	West Delaware Trenching
14	Mayflower - Old Colony

C. H. Johnson

C. H. Johnson

CHJohnson:pf

Copy to: D. MacLaren
C. H. Johnson
Files

FILE COPY
SURNAME:

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

May 24, 1951

Mr. E.R. Lovell, President
Calumet and Hecla Consolidated
Copper Company
1 Calumet Avenue
Calumet, Michigan

Subject: DMA-1205X
Re: Exploration Loan
Keweenaw Copper, Copper
Falls, Phoenix Garden
City, Meadow, Humboldt

My dear Mr. Lovell:

Receipt is acknowledged of your application and attachments of May 19, 1951 for an exploration loan under the Defense Production Act of 1950.

The application was assigned Docket Number DMA-1205X and was referred to Mr. J. B. Gowen, Chief, Copper Branch on May 21, 1951.

In any future correspondence relating to your application, kindly refer to DMA-1205X.

Sincerely yours,

LANDON F. STROBEL

Landon F. Strobel
Executive Secretary

LFSTROBEL:mab
cc: Strobel-2
Fiels
Gowen
Lyon

Form MF-103
(April 1951)

U. DEPARTMENT OF THE INTERI
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

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

DO NOT FILL IN THIS BLOCK

Docket No. .....

Date received .....

Participation .....

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
CALUMET DIVISION
1 CALUMET AVENUE
CALUMET, MICHIGAN

Name and address of applicant

Date May 19, 1951

FILL IN THIS BLOCK

Date of application May 19, 1951

Estimated cost $95,000

Mineral or metal Copper

Percentage of Government participation 50%

Location of mine Keweenaw County, Michigan

Date of filing MF-100 May 14, 1951

DMA Docket Number, if available .....

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four signed copies of the application to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive officer thereof, with your name and address on each sheet of the application and all accompanying papers. If any question is inapplicable, or if you cannot answer it, so state on the form. Where the space provided for answer is insufficient, answer on a separate sheet, annex it to the application form, and refer to it in space for answer. If the application is approved, you will be presented with an exploration project contract on Form MF-200, for your signature.

THE APPLICANT

*1. Is applicant an individual, partnership, or corporation?
*2. If a partnership, state names and addresses of partners.
*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
*4. Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who will manage the project.
*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property.
7. If lessee, attach a copy of the lease and state if it is in good standing.

NOTE.—It will be necessary to procure and attach to the exploration project contract agreements of claimants, lienors, encumbrances and lessors subordinating their interests in the property to the interest of the Government under the contract.

8. Furnish current financial statement, showing assets and liabilities, and a profit and loss statement.
9. How much money is applicant prepared to invest in proposed project? Is it sufficient to pay your part of the cost of the project as detailed in question 23 of this application form, in accordance with the regulations on Government participation (Section 9 of Mineral Order 5)?

*If you have already answered these questions on MF-100, you are not required to answer the questions for this application.

16—64067-1

THE PROPERTY

10. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.
    (*b*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

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

*11. State the present and former names of the property, if any.
*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.
*13. State source and quantity of water available for operations and its sufficiency at all seasons. State amount of power to be used, rate per hour or other cost, and source.
*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.
15. State in detail how the ore could be shipped and how and where milled.
*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.
*17. Production:
    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.
19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?
21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.
22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each.
    (*b*) Supervisors, by numbers and positions, with salaries of each.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each.
    (*f*) Cost of rental for equipment which the operator proposes to rent.
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work.
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each.
    (*i*) Cost of power, water, utilities, and any other items not provided for above.
24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

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

CALUMET AND HECLA CONSOLIDATED COPPER CO.
CALUMET DIVISION
(Name of company)

By _____
(Signature of authorized official)

May 19, 1951
(Date)

Vice President
(Title)

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

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
CALUMET DIVISION
CALUMET, MICHIGAN

Form MV-103
(April 1951)

1., 2., 3., and 4. Answered on Form MV-100.

5. Owner.

6. No liens.

7. Not applicable.

8. Statements attached as Exhibit A.

9. $47,500 (50% of project cost).

10. (a) Real property involved in the exploration project covers approximately 4½ miles of the outcrop of the Ashbed lode with sufficient area to allow mining to a depth of 4,000 feet.

(b) Legal descriptions are as follows:

NE¼, NE¼ of NW¼, S½ of NW¼, S½ of Section 15
S½ of NE¼, SE¼ of NW¼, S½ of Section 16
SE¼, NE¼ of SW¼, S½ of SW¼ of Section 17
NE¼, S½ of NW¼, S½ of Section 19
N½, N½ of SW¼, SW¼ of SW¼ of Section 20
N½ of NE¼, N½ of NW¼, SW¼ of NW¼ of Section 21
NW¼ of NW¼ of Section 22
NW¼ of NE¼, N½ of NW¼, SW¼ of NW¼ of Section 30

All in Township 58 North, Range 31 West, Houghton Township, Keweenaw County, Michigan.

Attached as Exhibit B is a map showing location of these descriptions and their relationship with their outcrop of the Ashbed lode.

11. Keweenaw Copper Company
Copper Falls Mining Company
Phoenix Mining Company
Garden City Mining Company
Meadow Mining Company
Humboldt Mining Company

12. The property is traversed by M-26, a hard-surfaced all-weather road. It is also crossed by a road which runs eastward from the county seat of Keweenaw County. This is a well drained gravel road. The property lies adjacent to Eagle River, the county seat of Keweenaw County, Michigan, which is connected by M-26 with US-41 at Phoenix, Michigan. It is approximately 17 miles north of Calumet, Michigan. The nearest railroad connection with the Applicant's private railroad would be at its Iroquois mine, approximately 10 miles distance. However, if operations were conducted, transportation of ore from the mine to rail or to mill would be by truck.

Attached as Exhibit C is a map showing the location of the property and its relation to roads, railroads, towns, etc.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 21 1951
LANDON F. STROBEL
Executive Secretary

13. For the exploration no water is necessary. For operations water would be obtained from Lake Superior a distance of no more than a mile. It would be sufficient at all seasons. Power would be obtained either from Upper Peninsula Power Company which serves Eagle River, Michigan, or from the Applicant's own generating plants. The latter course would require approximately 10 miles of pole line. However, no clearing of a pole line would be necessary since the Applicant owns the old right of way of the Keweenaw Central Railroad. No power will be needed for the exploration.

14. There are no useable facilities on the property.

15. If a mine is developed, milling facilities are available at the Applicant's Ahmeek mill, approximately 20 miles distance. Ore would be shipped by truck either directly to the mill or to a ramp located on the Applicant's railroad, whichever proved to be more economical.

16. (a) For about a century, explorations upon the amygdaloidal known as the Ashbed have incidentally revealed the existence of copper in the several traps and amygdaloids in the hanging wall of this formation for a distance of from 135 to 165 feet horizontally. Most of this information has been obtained from diamond drill holes sunk to explore the Ashbed itself. The most attractive stretch of Calumet and Hecla holdings from the standpoint of copper showings in these rocks is approximately 3 miles in length along the strike, including old properties known as the Phoenix, Garden City, Meadow, Humboldt, and others. These came into possession of Calumet and Hecla through purchase of the holdings of the Keweenaw Copper Company, and the lands known as the Copper Falls some years ago.

In the area where this exploration is contemplated, there have been approximately 16 holes drilled. These holes showed scattered copper in the beds under consideration and the purpose of the present exploration is to determine its continuity and grade. Underground explorations have been conducted almost entirely upon the Ashbed which is at the bottom or footwall side of the Copper-bearing zone. The only underground exploration of any consequence, in the beds above the Ashbed has been at the Phoenix Consolidated mine, in the southwestern part of the area comprised in this project. Here an inclined shaft was sunk 1600 feet and the beds drifted upon for about 2500 feet. From October 1916 to December 1917, 67,215 tons of ore were hoisted, of which 18,993 tons were discarded; 48,063 tons stamped yielded 449,416 pounds of copper, a recovery of 9.35 pounds to the ton, with a loss in tailings of 5.65 pounds to the ton. With modern milling, this tailings loss would be substantially reduced. The total production from the Ashbed and overlying lodes by the Phoenix Consolidated Copper Company and the Phoenix Copper Company, its predecessor, was 806,448 pounds. All of these earlier explorations were abandoned because of the low copper content of the rock.

(b) There has been only minor production from the zone to be explored. The largest nearby was from the Copper Falls group of mines over 2 miles to

the east of the area where exploration is now contemplated. The production from the Copper Falls mines was approximately 20 million pounds. Only a few miles distant are the old producing fissure mines, the Central, Phoenix, and Cliff.

(c) Attached as Exhibit D is a copy of a report dated March 1, 1951 by Dr. T. M. Broderick, Chief Geologist for Applicant. Accompanying the report is a map, Exhibit E.

17. No production.

18. No reserves.

19. No peculiar conditions or circumstances.

20. This exploration is to be conducted for the purpose of determining whether copper occurs in commercial quantities in several trap veins of amygdaloidal structure. The principal vein to be explored is known as the "Ashbed." Others lie within several hundred feet in the hanging of the Ashbed.

21. The work planned consists of trenching across the structure through glacial drift at intervals of 500 feet along the strike. Thirty-five such trenches are proposed along the 1500 feet of strike in the area to be explored. After the trenching has exposed bedrock, the weathered outcrop will be broken by drilling and blasting. Samples will be taken and analyzed, and any promising occurrences may be actual mill tested.

The time required to complete this project will be approximately 12 months of actual operation. However, during 5 months of the winter season it will not be possible to carry on the operation. Provided this project is given approval without too great delay, it can be completed by November of 1952.

22. In the Michigan copper area copper is found in many amygdaloidal veins. Previous drilling in the area in question has showed scattered copper in the beds under consideration. Present exploration is for the purpose to determine its continuity and grade.

23. (a) 2 miners @ $12 per day each for 260 days ..... $ 6,240
2 laborers @ $10.50 per day each for 260 days 5,460
1 compressor operator @ $11 per day for 260 days 2,860
$14,560

(b) 1 geologist @ $600 per month ..... $ 7,200

(c) None required.

(d) None required.

23. (e) 300 c.f.m. portable compressor, cost $9,320, less estimated resale value $4,660 ..... $ 4,660

(f) 1, 1½-yard drag line shovel @ $184 per day for 175 days $32,200
1 D-8 bulldozer @ $168 per day for 175 days 29,400
$61,600

(g) 2 sludge pumps at $1 per day for 260 days ..... $ 260
2, 50-lb. jackhammers at 520
1, ½-ton truck @ $20 per day for 260 days 5,200
$ 5,980

(h) Drill steel, drill bits, air hose, water hose, pipe, tools, wrenches, powder, fuse and caps ..... $ 1,000

(i) No charges on these items.

24. Time Schedule

1st month of operation	$ 9,200
2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th months @ $9,200 each month	73,600
10th and 11th months @ $4,100 each month	8,200
12th month @ $4,000	4,000
	$95,000

EXHIBIT A.

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY

BALANCE SHEET AT DECEMBER 31, 1950

ASSETS

Current Assets	
Cash	$ 6,028,695
Federal, State and Municipal Securities	2,050,000
Accounts Receivable	4,024,165
Inventories	8,320,871
Marketable Securities (at cost)	6,399
Total Current Assets	20,430,130
Capital Assets	
Land and Land Improvements (at cost)	3,635,312
Stumpage and Timberlands (at cost)	462,205
Mine Lands (at cost of ore in place)	9,550,125
Plants and Equipment (at cost less amounts charged to past operations as depreciation)	15,241,759
Total Capital Assets	28,889,401
Other Assets	
Investment in Affiliates (at cost or less)	380,773
Explorations and Mineral Properties in Development	471,366
Charges to Future Operations (net)	262,498
Federal Tax Carryback Credit (1949)	475,000
Federal Tax Claims (1943-1945)	211,140
Total Other Assets	1,800,777
TOTAL ASSETS	$51,120,308

LIABILITIES

Current Liabilities	
Accounts Payable	$ 3,094,745
Bank Loans due in 12 months	400,000
Taxes Payable and Accrued	3,737,742
Total Current Liabilities	7,232,487
Deferred Liabilities	
Employment Contracts	57,780
Bank Loans due after 12 months	1,300,000
Insurance Company Loans due 1955 to 1964	5,700,000
Total Deferred Liabilities	7,057,780
TOTAL LIABILITIES	$14,290,267
Shareholders' Equity	36,830,041
TOTAL LIABILITIES and EQUITY	$51,120,308

CONDENSED INCOME STATEMENT FOR THE YEAR ENDED DECEMBER 31, 1950

Revenue from processing and selling metals and metal products		$46,948,761
Operating Costs - Production	$32,807,436	
- Freight, Selling, Admin. & Corporate Taxes	4,967,842	37,775,278
Net Operating Income		9,173,483
Other Income		1,063,605
Total Income		10,237,088
Other Charges		1,115,018
Net Gain before Depreciation, Depletion and Federal Taxes based on income		9,122,070
Depreciation	$1,303,137	
Depletion	375,499	1,678,636
Net Gain before Federal Taxes		7,443,434
Provision for Federal Income and Excess Profits Taxes		3,600,000
NET GAIN CARRIED TO EARNED SURPLUS		$ 3,843,434

Exhibit B

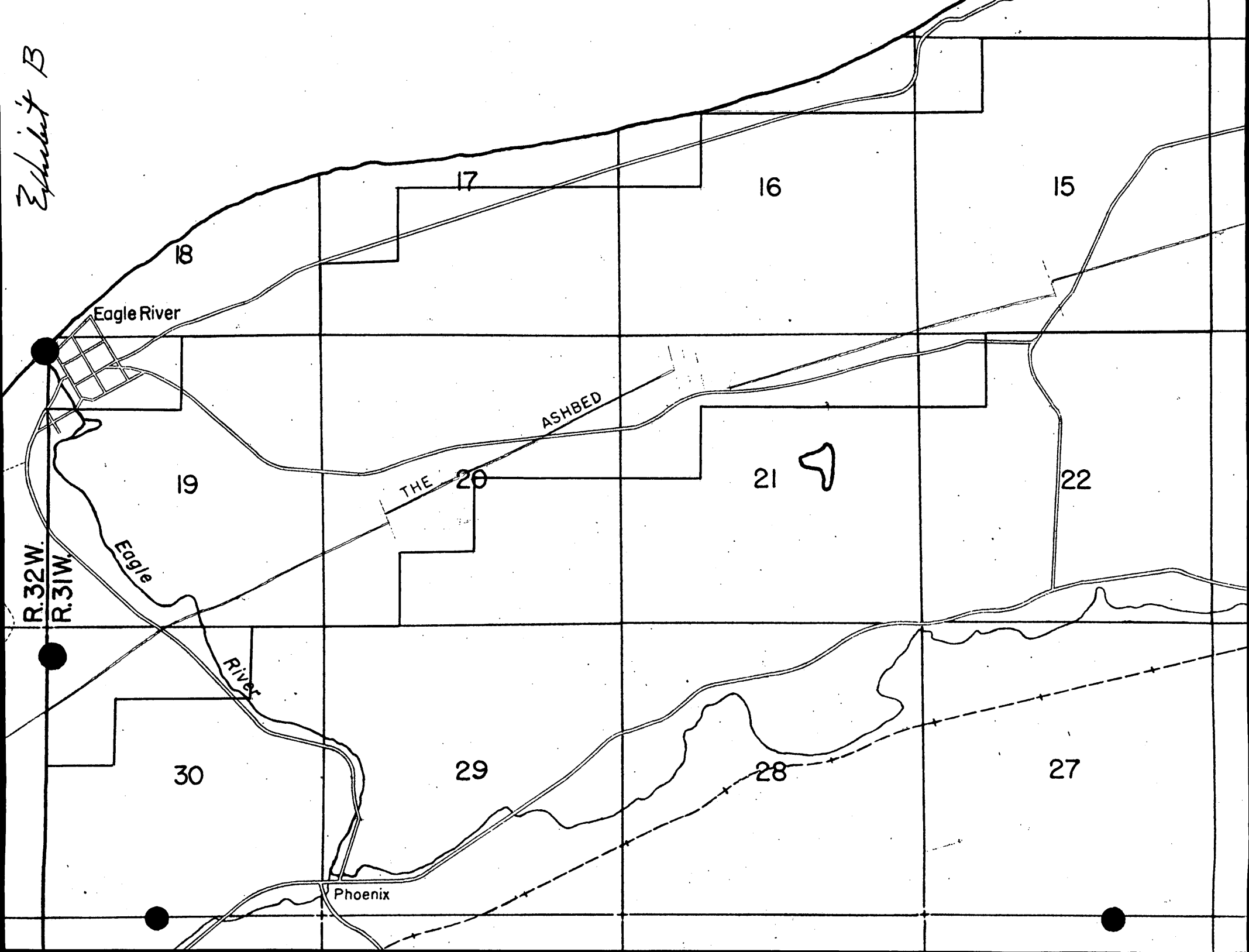
17
16
15
18
Eagle River
ASHBED
THE
19
20
21
22
Eagle
River
R.32W.
R.31W.
30
29
28
27
Phoenix

Exhibit C

INSET
ISLE ROYALE NAT'L. PARK
KEWEENAW COUNTY
SCALE OF MILES

R39W R38W R37W R36W R35W R34W

T67N T66N T65N T64N T63N

PASSAGE IS. BLAKE PT. BELLE ISLE RESORT TOBINS HARBOR RESORT ROCK HARBOR RESORT MIDDLE ISLANDS PASSAGE CHIPPEWA HARBOR TODD HARBOR LAKE SUPERIOR NORTH ROCK OF AGES WASHINGTON HARBOR GRACE HARBOR LONG POINT MENAGERIE IS. SIYAWIT BAY

LAKE

To Middle Islands Passage N26-50W 49 miles

CAT HARBOR EAGLE HARBOR GRAND MARAIS AGATE

GREAT SAND BAY COPPER FALLS DELAWARE EAGLE RIVER EAGLE HARBOR SHORT CUT CENTRAL PHOENIX FIVE MILE PT. SEVEN MILE PT. CLIFF MT. HORACE GREELEY HOUGHTON ALLOUEZ CUT BAY GRA

58-31 58-30 58-32 57-32 57-31 57-30 57-33 56-30 56-31

Black River Hill Creek Seneca Lake MOHAWK FULTON A.H. MEEK ALLOUEZ COPPER CITY Thayers Lake Trap Rock Brunsey Cr. Sucker Cr. Black Cr. Black River Tobacco River Canal Reservoir GAY BIG TRAVERSE BAY TAMARACK WATER WORKS HOUGHTON SHERMAN KEARSARGE To Calumet Waterworks No. 566 - To Ship Canal CALUMET LAURIUM U.S.-41 To Hancock LAKE LINDEN TORCH LAKE M-26 To Houghton

CO.

Exhibit D

March 1, 1951

Mr. E. R. Lovell, President
Calumet and Hecla Cons. Copper Company
Calumet, Michigan

Dear Sir:

Through purchase of the holdings of the Keweenaw Copper Company and the lands known as the Copper Falls some years ago, Calumet and Hecla came into possession of a long stretch upon the Ashbed formation. While the most attractive horizon, from the standpoint of copper content, has been the Ashbed itself, diamond drilling and underground operations have disclosed scattered copper in the traps and amygdaloids in the hanging wall of the Ashbed up to No. 17 Conglomerate, a horizontal distance commonly of from 135 to 165 feet.

The most attractive stretch of Calumet and Hecla holdings from the standpoint of copper showings in these rocks is approximately three miles in length, extending along the strike from the Cliff boundary northeastward. It includes the old Phoenix, Garden City, Meadow, Humboldt and other properties. Minor copper production has been obtained from these properties and especially from the Copper Falls which lies to the east of this stretch now recommended for trenching. The Copper Falls had a production of nearly twenty million pounds from the Ashbed and associated fissure deposits.

Few data are available to form the basis of an estimate of a possible tonnage of copper bearing rock. It is certain to be low grade and it may be too spotty to be mineable. However, in view of the fact that it is easily accessible, native copper of low arsenic and high silver content and amenable to the usual milling and smelting processes of the district, it would seem to be worthy of study.

The surface trenching as carried on last fall would constitute a satisfactory method of examination. The overburden is shallow and cross trenches of about 200 feet in length, at 500 foot intervals along the strike for the 17,000 foot length under discussion, would expose the bed rock so that large samples could be blasted out for testing. It would be necessary, of course, to get well into the rock below any zone of oxidation and leaching of copper. The uncertain depths of such a zone is one of the hazards of the project but experience in the district suggests that it will not be over a few inches.

The factors which enter into an estimate of cost of the project are not very definitely known. These include depth of overburden, irregularity of the rock surface, the water problem and the weather. Guesses can be made and combined with the cost experience gained from the Thornton tests last fall.

Our present ideas are as follows.

ASHBED HORIZON TRENCHING

Near Eagle River

Calumet and Hecla Lands
West line Sec. 30 to East line Sec. 16, T58N - R31W.

Linear feet along strike = 17,000 feet.
200 foot cross trench every 500 feet = 35 cross trenches.
35 x 200 = 7,000 feet of trenching.
Estimated average depth of overburden = 10 feet.
" " cross-section = 150 square feet.
Cubic feet of excavation 150 x 7,000 = 1,050,000 cubic feet.
Yards of excavation = 38,888 yards.
Estimated progress = 40 feet per day including moves.
" cost = $170.00 per working day including supervision.
" cost per trench = $850.00
" total cost = $29,750.00
" time to complete = 175 working days or 35 weeks @ 5 days per week. (Includes delays, etc.)
The above includes preparation of the site by use of a bulldozer.

The trenching and resultant rock exposure is only preliminary to the ultimate purpose, that of obtaining samples of the rock. It is impossible to outline the latter in detail before the rock is exposed. As it appears now, there will be at least two stages of sampling, the first being directed to getting roughly the copper distribution in the section being explored. Is it in bunches scattered throughout, is it disseminated throughout, it it concentrated in definite belts or horizons, etc? For this purpose a portable crusher to be used in the field, which will enable us to deliver a 25-50 pound sample to the laboratory for final quartering and assay, might be the answer. This stage of the sampling has its difficulties.

After having gained an idea of copper distribution, then we will be in a position to confer with the mining organization and plan larger scale mill tests made upon rock broken according to their ideas of what sort of stoping would be called for.

As noted above, this matter of sampling requires further study, and much of this study can only be made after the rock is exposed in the trenches. It will probably be subject to continuous modification as the work progresses. Therefore, any estimate of the cost will be very general and subject to modification. As a guess we might say that the sampling, assaying and engineering expense, plus other activities to be assumed by Calumet and Hecla rather than by the trenching contractor, such as pumping, drilling, blasting, etc. may be 50% of the trenching cost. The latter being about $30,000, the additional Calumet and Hecla expense will be $15,000, a total of $45,000 for the project.

Very truly yours,

/s/ T. M. Broderick, Chief Geologist

TMB:gm

Form MF-103
(April 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.
Approval expires 6-30-51.

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

DO NOT FILL IN THIS BLOCK

Docket No. Dma-1205X

Date received 5/21/51

Participation

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
CALUMET DIVISION
1 CALUMET AVENUE
CALUMET, MICHIGAN

Name and address of applicant

Date May 19, 1951

FILL IN THIS BLOCK

Date of application May 19, 1951

Estimated cost $95,000

Mineral or metal Copper

Percentage of Government participation 50%

Location of mine Keweenaw County, Michigan

Date of filing MF-100 May 14, 1951

DMA Docket Number, if available Dma-1205X

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*3. If a corporation, state names and addresses of officers, directors, and five largest stockholders.
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*5. Are you the owner or the lessee of the property?
6. If owner, state what claims, liens, or encumbrances, if any, are against the property.
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16—64067-1

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

*11. State the present and former names of the property, if any.
*12. State, in detail, the location of the property with reference to towns, railroads, roads, shipping points, including distances and directions and kinds and conditions of roads.
*13. State source and quantity of water available for operations and its sufficiency at all seasons.
State amount of power to be used, rate per hour or other cost, and source.
*14. Describe any existing useable facilities, equipment, buildings, or structure now on the property that will be devoted to the exploration work.
15. State in detail how the ore could be shipped and how and where milled.
*16. History:
    (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for any past suspensions of operations.
    (*b*) State briefly the known history and production of adjoining and neighboring properties.
    (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.
*17. Production:
    (*a*) If mine is in production, furnish the following information:

	Tons per day	*Grade or analysis*	*Cost per ton*	*Net value per ton*
(1) Mining				
(2) Milling				
(3) Shipped or sold				

*18. Ore or mineral reserves: (If property is or has been operating.)
    (*a*) Describe the ore or mineral deposits briefly.
    (*b*) Submit available maps and assay data.
    (*c*) Give estimated tonnage and grade of each class of ore reserves.
19. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

THE EXPLORATION

20. For what mineral or minerals and for what types of deposits and ores will the exploration be conducted?
21. Describe briefly, but concisely, the proposed work and the estimated time required to complete it.

    NOTE.—The Government will not participate in a project that will require more than 2 years to complete.
22. Furnish statement of the geological basis of the project with particular emphasis on factors leading the operator to expect the finding of commercial ore bodies. This statement should be accompanied by supporting maps such as geological maps, maps of the proposed openings and assay maps, sample lists, and other pertinent data.

THE REQUIREMENTS AND COSTS

23. Tabulate in the form of an itemized statement with a sum for each item the estimated requirements and costs of the project so that the total will give the estimated cost of the project in which the Government will participate, as follows:
    (*a*) Labor, by numbers and classes (miners, muckers, millmen, etc.), with wages of each.
    (*b*) Supervisors, by numbers and positions, with salaries of each.
    (*c*) Cost of necessary repairs to existing facilities, structures, and buildings.
    (*d*) Cost of necessary installation or construction of additional facilities, structures, and buildings.
    (*e*) Cost of items of equipment, not now owned by the applicant which must be purchased for operations at a cost of $50 or more each.
    (*f*) Cost of rental for equipment which the operator proposes to rent.
    (*g*) Rental value of items of equipment which the operator now owns and which will be devoted to the work.
    (*h*) Cost of materials and supplies, including items of equipment costing less than $50 each.
    (*i*) Cost of power, water, utilities, and any other items not provided for above.
24. Furnish a time schedule of the project, stated in terms of months after project is approved, showing progress expected to be accomplished and the money expected to be spent.

CERTIFICATION

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

CALUMET AND HECLA CONSOLIDATED COPPER CO.
CALUMET DIVISION
(Name of company)

By _____
(Signature of authorized official)

May 19, 1951
(Date)

Vice President
(Title)

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

*Same as footnote on page 1.

16—64067-1 U. S. GOVERNMENT PRINTING OFFICE

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
CALUMET DIVISION
CALUMET, MICHIGAN

Form MF-103
(April 1951)

1., 2., 3., and 4. Answered on Form MF-100.

5. Owner.

6. No liens.

7. Not applicable.

8. Statements attached as Exhibit A.

9. $47,500 (50% of project cost).

10. (a) Real property involved in the exploration project covers approximately 4½ miles of the outcrop of the Ashbed lode with sufficient area to allow mining to a depth of 4,000 feet.

(b) Legal descriptions are as follows:

NE¼, NE¼ of NW¼, S½ of NW¼, S½ of Section 15
S½ of NE¼, SE¼ of NW¼, S½ of Section 16
SE¼, NE¼ of SW¼, S½ of SW¼ of Section 17
NE¼, S½ of NW¼, S½ of Section 19
N½, N½ of SW¼, SW¼ of SW¼ of Section 20
N½ of NE¼, N½ of NW¼, SW¼ of NW¼ of Section 21
NW¼ of NW¼ of Section 22
NW¼ of NE¼, N½ of NW¼, SW¼ of NW¼ of Section 30

All in Township 58 North, Range 31 West, Houghton Township, Keweenaw County, Michigan.

Attached as Exhibit B is a map showing location of these descriptions and their relationship with their outcrop of the Ashbed lode.

11. Keweenaw Copper Company
Copper Falls Mining Company
Phoenix Mining Company
Garden City Mining Company
Meadow Mining Company
Humboldt Mining Company

12. The property is traversed by M-26, a hard-surfaced all-weather road. It is also crossed by a road which runs eastward from the county seat of Keweenaw County. This is a well drained gravel road. The property lies adjacent to Eagle River, the county seat of Keweenaw County, Michigan, which is connected by M-26 with US-41 at Phoenix, Michigan. It is approximately 17 miles north of Calumet, Michigan. The nearest railroad connection with the Applicant's private railroad would be at its Iroquois mine, approximately 10 miles distance. However, if operations were conducted, transportation of ore from the mine to rail or to mill would be by truck.

Attached as Exhibit C is a map showing the location of the property and its relation to roads, railroads, towns, etc.

13. For the exploration no water is necessary. For operations water would be obtained from Lake Superior a distance of no more than a mile. It would be sufficient at all seasons. Power would be obtained either from Upper Peninsula Power Company which serves Eagle River, Michigan, or from the Applicant's own generating plants. The latter course would require approximately 10 miles of pole line. However, no clearing of a pole line would be necessary since the Applicant owns the old right of way of the Keweenaw Central Railroad. No power will be needed for the exploration.

14. There are no useable facilities on the property.

15. If a mine is developed, milling facilities are available at the Applicant's Ahmeek mill, approximately 20 miles distance. Ore would be shipped by truck either directly to the mill or to a ramp located on the Applicant's railroad, whichever proved to be more economical.

16. (a) For about a century, explorations upon the amygdaloidal known as the Ashbed have incidentally revealed the existence of copper in the several traps and amygdaloids in the hanging wall of this formation for a distance of from 135 to 165 feet horizontally. Most of this information has been obtained from diamond drill holes sunk to explore the Ashbed itself. The most attractive stretch of Calumet and Hecla holdings from the standpoint of copper showings in these rocks is approximately 3 miles in length along the strike, including old properties known as the Phoenix, Garden City, Meadow, Humboldt, and others. These came into possession of Calumet and Hecla through purchase of the holdings of the Keweenaw Copper Company, and the lands known as the Copper Falls some years ago.

In the area where this exploration is contemplated, there have been approximately 16 holes drilled. These holes showed scattered copper in the beds under consideration and the purpose of the present exploration is to determine its continuity and grade. Underground explorations have been conducted almost entirely upon the Ashbed which is at the bottom or footwall side of the Copper-bearing zone. The only underground exploration of any consequence, in the beds above the Ashbed has been at the Phoenix Consolidated mine, in the southwestern part of the area comprised in this project. Here an inclined shaft was sunk 1600 feet and the beds drifted upon for about 2500 feet. From October 1916 to December 1917, 67,215 tons of ore were hoisted, of which 18,993 tons were discarded; 48,063 tons stamped yielded 449,416 pounds of copper, a recovery of 9.35 pounds to the ton, with a loss in tailings of 5.65 pounds to the ton. With modern milling, this tailings loss would be substantially reduced. The total production from the Ashbed and overlying lodes by the Phoenix Consolidated Copper Company and the Phoenix Copper Company, its predecessor, was 806,448 pounds. All of these earlier explorations were abandoned because of the low copper content of the rock.

(b) There has been only minor production from the zone to be explored. The largest nearby was from the Copper Falls group of mines over 2 miles to

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
MAY 21 1951
LANDON F. STROBEL
Executive Secretary

the east of the area where exploration is now contemplated. The production from the Copper Falls mines was approximately 20 million pounds. Only a few miles distant are the old producing fissure mines, the Central, Phoenix, and Cliff.

(c) Attached as Exhibit D is a copy of a report dated March 1, 1951 by Dr. T. R. Broderick, Chief Geologist for Applicant. Accompanying the report is a map, Exhibit E.

17. No production.

18. No reserves.

19. No peculiar conditions or circumstances.

20. This exploration is to be conducted for the purpose of determining whether copper occurs in commercial quantities in several trap veins of amygdaloidal structure. The principal vein to be explored is known as the "Ashbed." Others lie within several hundred feet in the hanging of the Ashbed.

21. The work planned consists of trenching across the structure through glacial drift at intervals of 500 feet along the strike. Thirty-five such trenches are proposed along the 1500 feet of strike in the area to be explored. After the trenching has exposed bedrock, the weathered outcrop will be broken by drilling and blasting. Samples will be taken and analyzed, and any promising occurrences may be actual mill tested.

The time required to complete this project will be approximately 12 months of actual operation. However, during 5 months of the winter season it will not be possible to carry on the operation. Provided this project is given approval without too great delay, it can be completed by November of 1952.

22. In the Michigan copper area copper is found in many amygdaloidal veins. Previous drilling in the area in question has showed scattered copper in the beds under consideration. Present exploration is for the purpose to determine its continuity and grade.

23. (a)

2 miners @ $12 per day each for 260 days	$ 6,240
2 laborers @ $10.50 per day each for 260 days	5,460
1 compressor operator @ $11 per day for 260 days	2,860
	$14,560

(b) 1 geologist @ $600 per month ..... $ 7,200

(c) None required.

(d) None required.

23. (e) 300 c.f.m. portable compressor, cost $9,320, less estimated resale value $4,660 ..... $ 4,660

(f) 1, 1½-yard drag line shovel @ $184 per day for 175 days $32,200
1 D-8 bulldozer @ $168 per day for 175 days 29,400
$61,600

(g) 2 sludge pumps at $1 per day for 260 days ..... $ 260
2, 50-lb. jackhammers at 520
1, ½-ton truck @ $20 per day for 260 days 5,200
$ 5,980

(h) Drill steel, drill bits, air hose, water hose, pipe, tools, wrenches, powder, fuse and caps ..... $ 1,000

(i) No charges on these items.

24. Time Schedule

1st month of operation ..... $ 9,200
2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th months @ $9,200 each month 73,600
10th and 11th months @ $4,100 each month 8,200
12th month @ $4,000 4,000
$95,000

EXHIBIT A.

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY

BALANCE SHEET AT DECEMBER 31, 1950

ASSETS

Current Assets	
Cash	$ 6,028,695
Federal, State and Municipal Securities	2,050,000
Accounts Receivable	4,024,165
Inventories	8,320,871
Marketable Securities (at cost)	6,399
Total Current Assets	20,430,130
Capital Assets	
Land and Land Improvements (at cost)	3,635,312
Stumpage and Timberlands (at cost)	462,205
Mine Lands (at cost of ore in place)	9,550,125
Plants and Equipment (at cost less amounts charged to past operations as depreciation)	15,241,759
Total Capital Assets	28,889,401
Other Assets	
Investment in Affiliates (at cost or less)	380,773
Explorations and Mineral Properties in Development	471,366
Charges to Future Operations (net)	262,498
Federal Tax Carryback Credit (1949)	475,000
Federal Tax Claims (1943-1945)	211,140
Total Other Assets	1,800,777
TOTAL ASSETS	$51,120,308

LIABILITIES

Current Liabilities	
Accounts Payable	$ 3,094,745
Bank Loans due in 12 months	400,000
Taxes Payable and Accrued	3,737,742
Total Current Liabilities	7,232,487
Deferred Liabilities	
Employment Contracts	57,780
Bank Loans due after 12 months	1,300,000
Insurance Company Loans due 1955 to 1964	5,700,000
Total Deferred Liabilities	7,057,780
TOTAL LIABILITIES	$14,290,267
Shareholders' Equity	36,830,041
TOTAL LIABILITIES and EQUITY	$51,120,308

CONDENSED INCOME STATEMENT FOR THE YEAR ENDED DECEMBER 31, 1950

Revenue from processing and selling metals and metal products		$46,948,761
Operating Costs - Production	$32,807,436	
- Freight, Selling, Admin. & Corporate Taxes	4,967,842	37,775,278
Net Operating Income		9,173,483
Other Income		1,063,605
Total Income		10,237,088
Other Charges		1,115,018
Net Gain before Depreciation, Depletion and Federal Taxes based on income		9,122,070
Depreciation	$1,303,137	
Depletion	375,499	1,678,636
Net Gain before Federal Taxes		7,443,434
Provision for Federal Income and Excess Profits Taxes		3,600,000
NET GAIN CARRIED TO EARNED SURPLUS		$ 3,843,434

Exhibit B

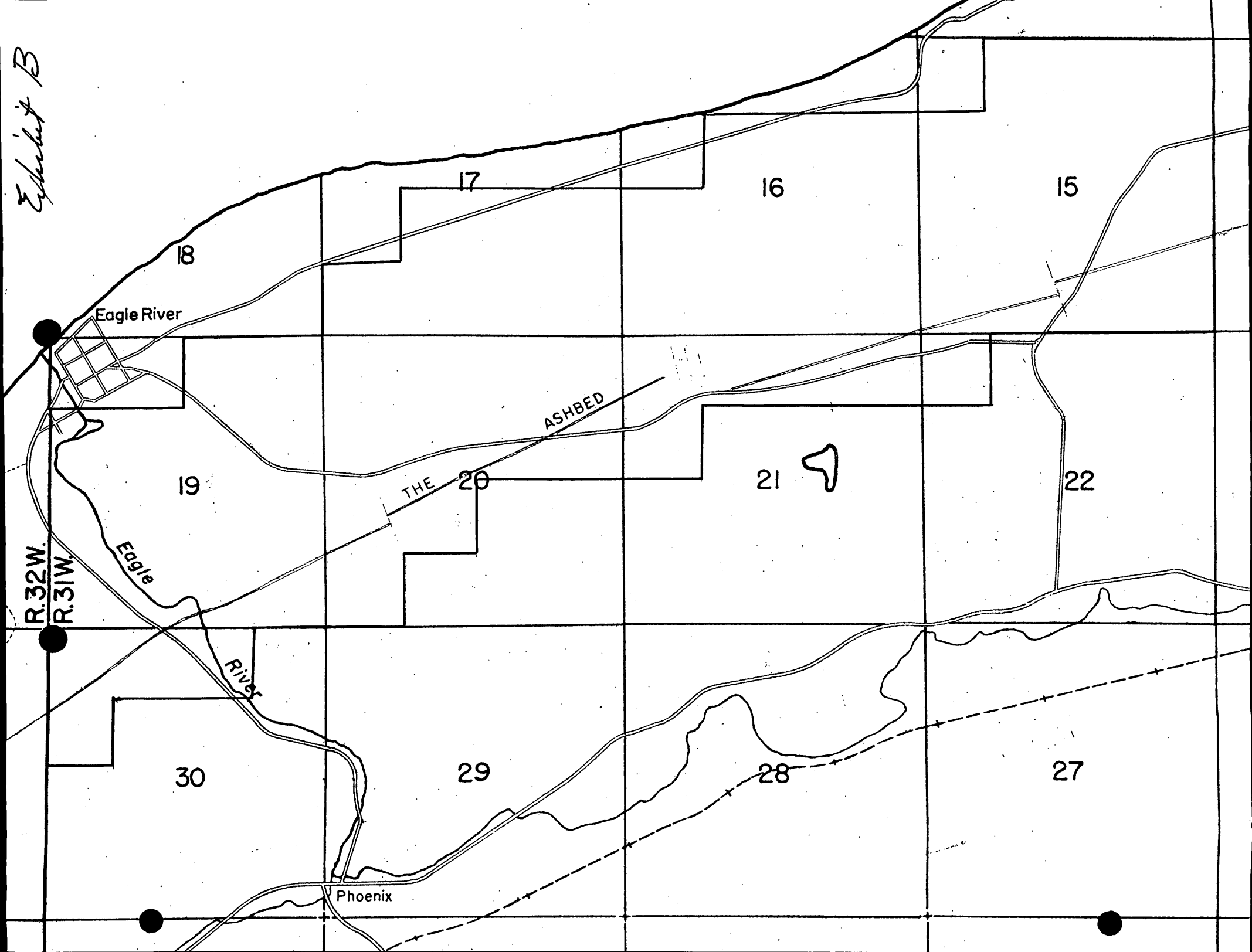

17
16
15
18
Eagle River
ASHBED
THE
19
20
21
22
Eagle
River
R.32W.
R.31W.
30
29
28
27
Phoenix

Exhibit C

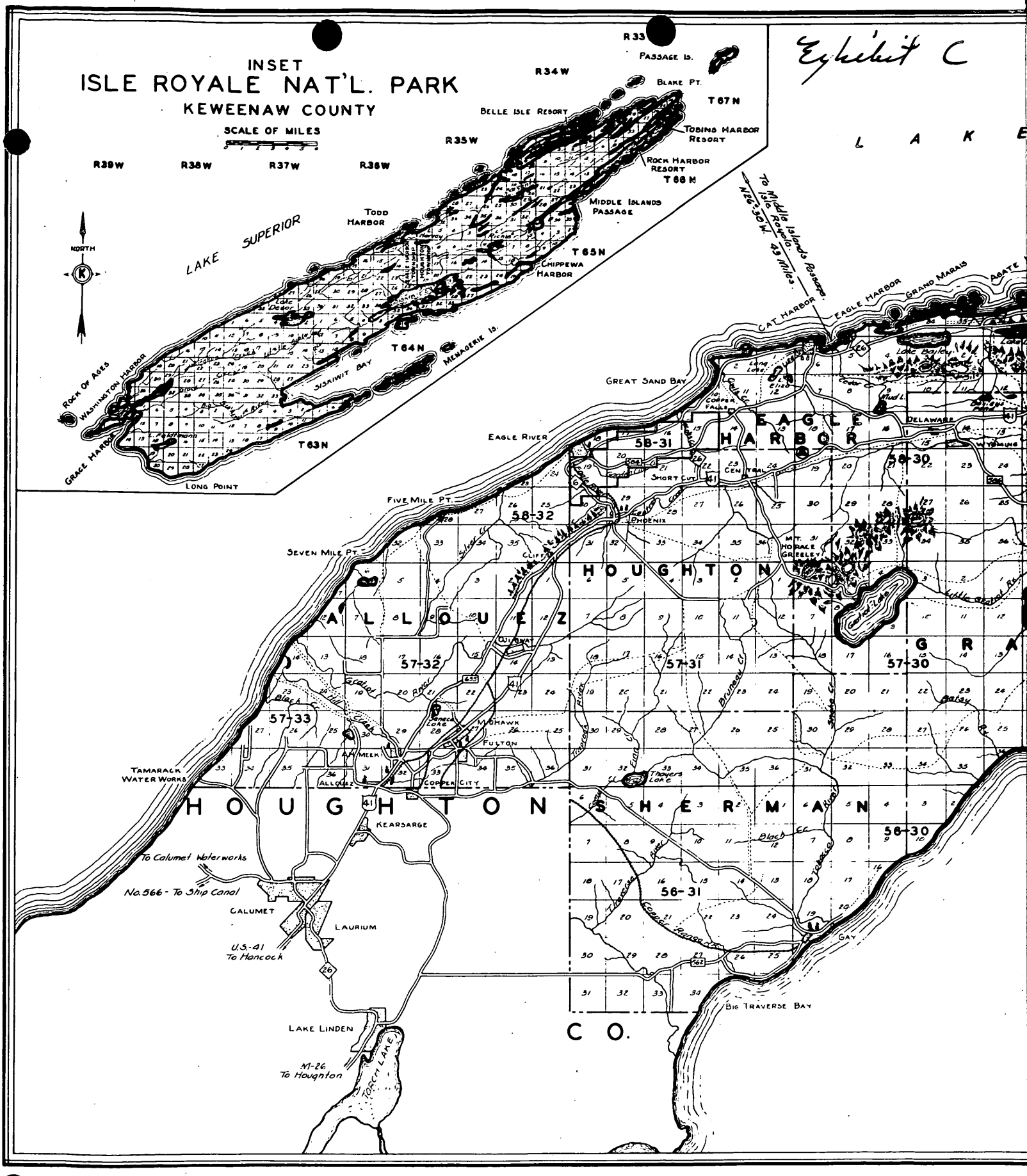

INSET
ISLE ROYALE NAT'L. PARK
KEWEENAW COUNTY
SCALE OF MILES
R39W
R38W
R37W
R36W
R35W
R34W
R33
T67N
T66N
T65N
T64N
T63N
NORTH
LAKE SUPERIOR
PASSAGE IS.
BLAKE PT.
BELLE ISLE RESORT
TOBINS HARBOR RESORT
ROCK HARBOR RESORT
MIDDLE ISLANDS PASSAGE
TODD HARBOR
CHIPPEWA HARBOR
MENAGERIE IS.
SIDAIWIT BAY
ROCK OF AGES
WASHINGTON HARBOR
GRACE HARBOR
LONG POINT
To Middle Islands Passage N26°30'W. 43 Miles
CAT HARBOR
EAGLE HARBOR
GRAND MARAIS
AGATE
GREAT SAND BAY
EAGLE RIVER
EAGLE HARBOR
58-31
58-30
58-32
FIVE MILE PT.
SEVEN MILE PT.
SHORT CUT
PHOENIX
HOUGHTON
ALLOUEZ
57-32
57-31
57-30
57-33
MOHAWK
FULTON
TAMARACK WATER WORKS
COPPER CITY
HOUGHTON
SHERMAN
KEARSARGE
56-30
56-31
To Calumet Waterworks
No. 566 - To Ship Canal
CALUMET
LAURIUM
U.S.-41 To Hancock
LAKE LINDEN
M-26 To Houghton
TORCH LAKE
BIG TRAVERSE BAY
GAY
CO.

Exhibit D

March 1, 1951

Mr. E. R. Lovell, President
Calumet and Hecla Cons. Copper Company
Calumet, Michigan

Dear Sir:

Through purchase of the holdings of the Keweenaw Copper Company and the lands known as the Copper Falls some years ago, Calumet and Hecla came into possession of a long stretch upon the Ashbed formation. While the most attractive horizon, from the standpoint of copper content, has been the Ashbed itself, diamond drilling and underground operations have disclosed scattered copper in the traps and amygdaloids in the hanging wall of the Ashbed up to No. 17 Conglomerate, a horizontal distance commonly of from 135 to 165 feet.

The most attractive stretch of Calumet and Hecla holdings from the standpoint of copper showings in these rocks is approximately three miles in length, extending along the strike from the Cliff boundary northeastward. It includes the old Phoenix, Garden City, Meadow, Humboldt and other properties. Minor copper production has been obtained from these properties and especially from the Copper Falls which lies to the east of this stretch now recommended for trenching. The Copper Falls had a production of nearly twenty million pounds from the Ashbed and associated fissure deposits.

Few data are available to form the basis of an estimate of a possible tonnage of copper bearing rock. It is certain to be low grade and it may be too spotty to be mineable. However, in view of the fact that it is easily accessible, native copper of low arsenic and high silver content and amenable to the usual milling and smelting processes of the district, it would seem to be worthy of study.

The surface trenching as carried on last fall would constitute a satisfactory method of examination. The overburden is shallow and cross trenches of about 200 feet in length, at 500 foot intervals along the strike for the 17,000 foot length under discussion, would expose the bed rock so that large samples could be blasted out for testing. It would be necessary, of course, to get well into the rock below any zone of oxidation and leaching of copper. The uncertain depths of such a zone is one of the hazards of the project but experience in the district suggests that it will not be over a few inches.

The factors which enter into an estimate of cost of the project are not very definitely known. These include depth of overburden, irregularity of the rock surface, the water problem and the weather. Guesses can be made and combined with the cost experience gained from the Thornton tests last fall.

Our present ideas are as follows.

ASHBED HORIZON TRENCHING

Near Eagle River

Calumet and Hecla Lands
West line Sec. 30 to East line Sec. 16, T58N - R31W.

Linear feet along strike = 17,000 feet.
200 foot cross trench every 500 feet = 35 cross trenches.
35 x 200 = 7,000 feet of trenching.
Estimated average depth of overburden = 10 feet.
" " cross-section = 150 square feet.
Cubic feet of excavation 150 x 7,000 = 1,050,000 cubic feet.
Yards of excavation = 38,888 yards.
Estimated progress = 40 feet per day including moves.
" cost = $170.00 per working day including supervision.
" cost per trench = $850.00
" total cost = $29,750.00
" time to complete = 175 working days or 35 weeks @ 5 days per week.
(Includes delays, etc.)
The above includes preparation of the site by use of a bulldozer.

The trenching and resultant rock exposure is only preliminary to the ultimate purpose, that of obtaining samples of the rock. It is impossible to outline the latter in detail before the rock is exposed. As it appears now, there will be at least two stages of sampling, the first being directed to getting roughly the copper distribution in the section being explored. Is it in bunches scattered throughout, is it disseminated throughout, it it concentrated in definite belts or horizons, etc? For this purpose a portable crusher to be used in the field, which will enable us to deliver a 25-50 pound sample to the laboratory for final quartering and assay, might be the answer. This stage of the sampling has its difficulties.

After having gained an idea of copper distribution, then we will be in a position to confer with the mining organization and plan larger scale mill tests made upon rock broken according to their ideas of what sort of stoping would be called for.

As noted above, this matter of sampling requires further study, and much of this study can only be made after the rock is exposed in the trenches. It will probably be subject to continuous modification as the work progresses. Therefore, any estimate of the cost will be very general and subject to modification. As a guess we might say that the sampling, assaying and engineering expense, plus other activities to be assumed by Calumet and Hecla rather than by the trenching contractor, such as pumping, drilling, blasting, etc. may be 50% of the trenching cost. The latter being about $30,000, the additional Calumet and Hecla expense will be $15,000, a total of $45,000 for the project.

Very truly yours,

/s/ T. M. Broderick, Chief Geologist

TMB:gm

Dma-1205X

CALUMET AND HECLA CONSOLIDATED COPPER COMPANY
CALUMET DIVISION
CALUMET, MICHIGAN

Amendment to MF-101 - Ashbed Exploration - DMA No. 1205X

9. $35,568.50

21. Thirty-five trenches are proposed along 17,000 feet of the strike of the structure including the Ashbed lode.

23.(a)

No.	Class	Rate per Hour	Hours per Week	Weeks	Cost	
2	Miners	$1.50	60	35	$7,350	
2	Laborers	1.35	60	35	6,615	
1	Compressor man	1.40	60	35	3,430	
1	Truck driver	1.40	60	35	3,430	
1	Assayer	1.50	40	20	1,200	$22,025

(b) One Geologist - $600 per month - 8 months 4,800

(c) None

(d) None

(e) None

(f) 1, 1½-yard dragline shovel - 8 months - rental $1,379 per month, operating cost $1,050 per month $19,432
1, D-8 bulldozer - 8 months - rental $1,105 per month, operating cost $1,000 per month 16,840
1, 315CFM portable gasoline air compressor - 8 months - rental $390 per month, operating cost $200 per month 4,720 40,992

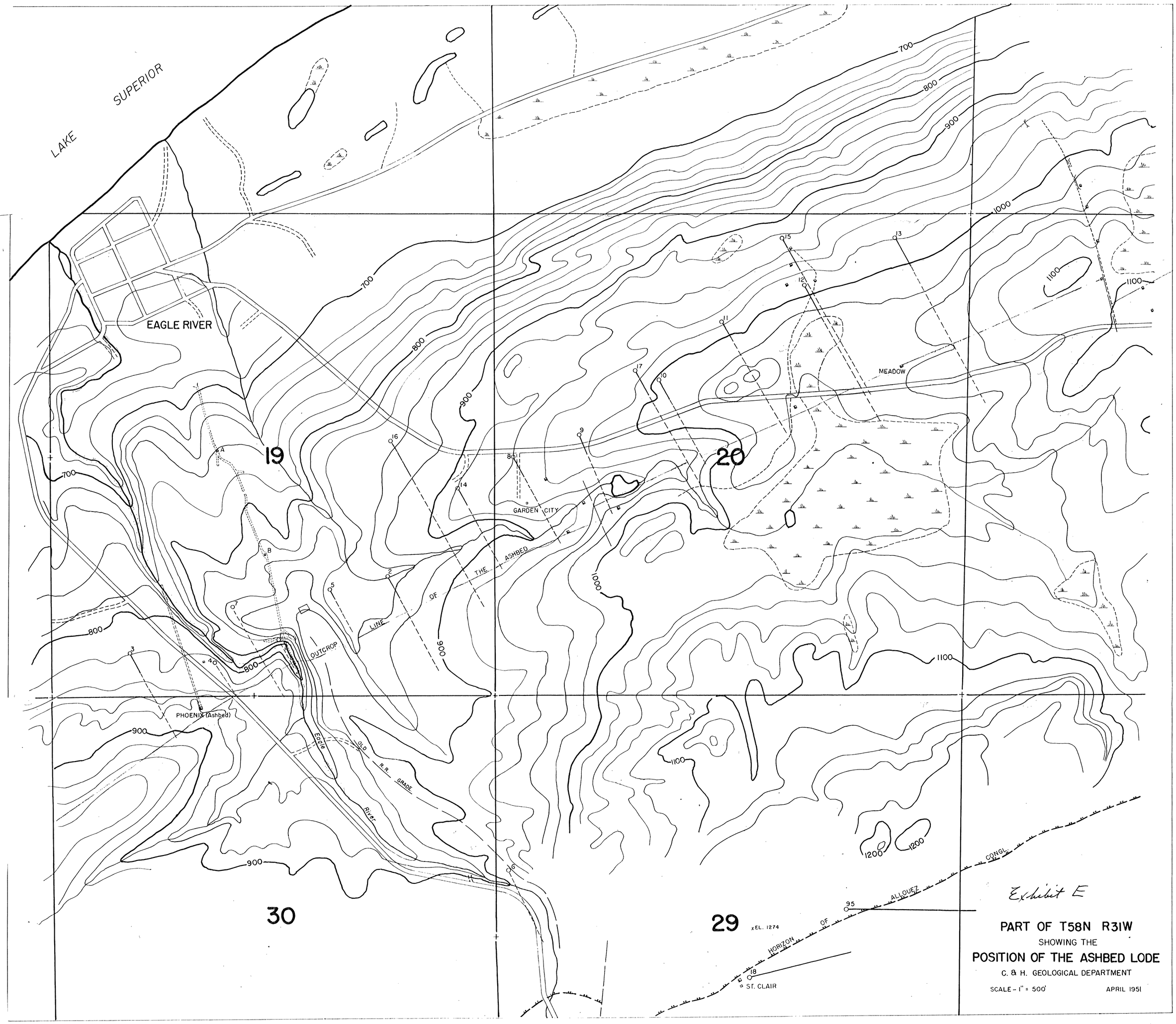
(g) 2 sludge pumps - 8 months - rental value $4 per month each $ 64
2, 50# jackhammers - 8 months - rental value $6 per month each 96
1, 1½-ton pickup truck - 36 weeks @ $60 per week 2,160 2,320

(h) Drill steel, bits, air hose, water hose, pipe, tools, wrenches, powder, fuse, and caps 1,000

(i) No charges

$71,137

24. Time schedule. This project will take 8 months to complete at a cost of $8,880 per month.


LAKE SUPERIOR
EAGLE RIVER
MEADOW
GARDEN CITY
THE ASHBED LINE OF OUTCROP
PHOENIX (Ashbed)
Eagle River
OLD R.R. GRADE
19
20
30
29
x EL. 1274
HORIZON OF ALLOUEZ CONGL.
ST. CLAIR
700
800
900
1000
1100
1200
Exhibit E
PART OF T58N R31W
SHOWING THE
POSITION OF THE ASHBED LODE
C. & H. GEOLOGICAL DEPARTMENT
SCALE - 1" = 500'
APRIL 1951

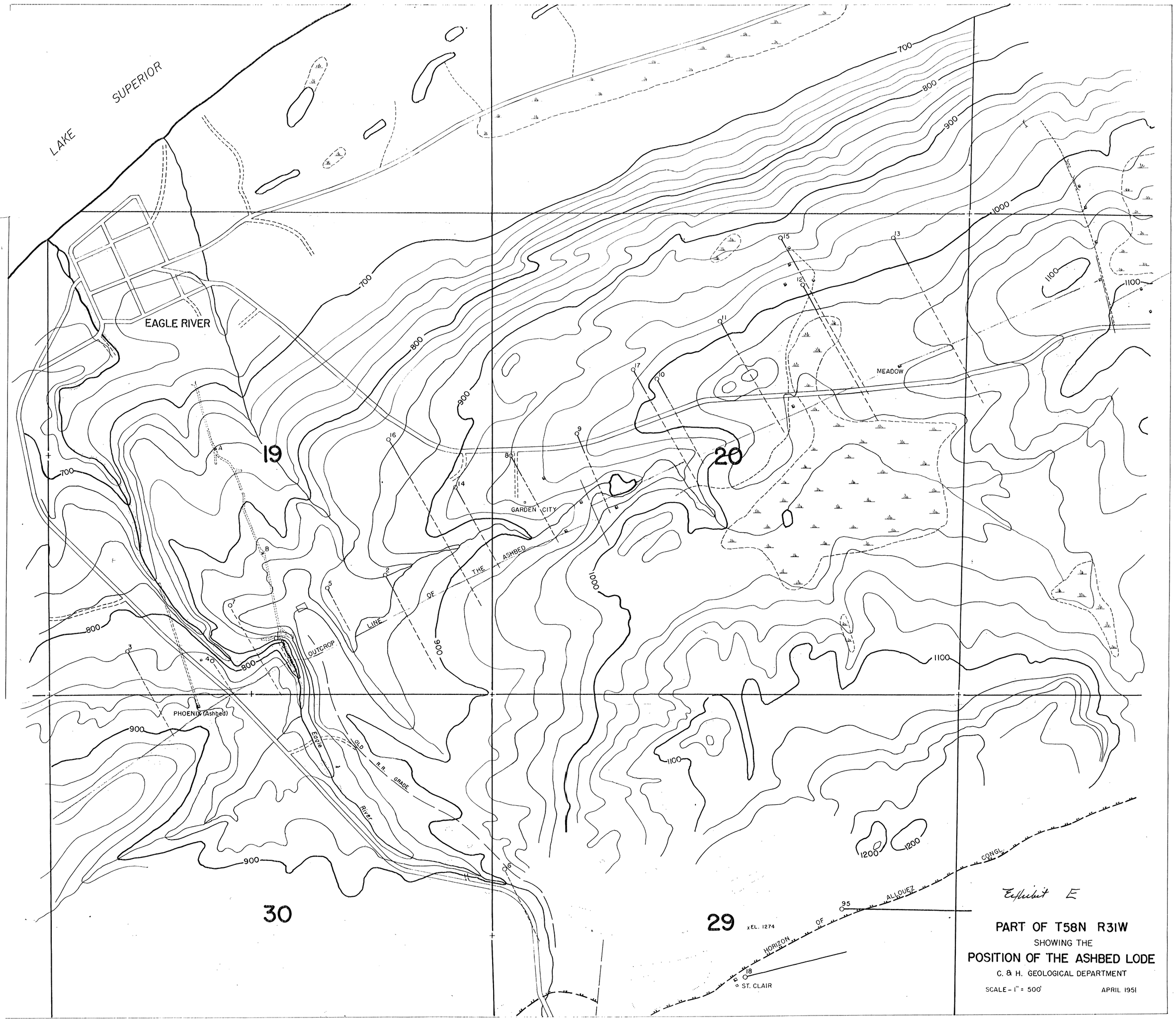


Exhibit E

PART OF T58N R31W
SHOWING THE
POSITION OF THE ASHBED LODE
C. & H. GEOLOGICAL DEPARTMENT
SCALE - 1" = 500'
APRIL 1951