IMEA Form 9

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration

OFFICIAL DOCKET FILE

DMEA NO. 4676

Application (Denied ✓
(~~Withdrawn~~
(After disposition, delete items not applicable)

Contract (Terminated - not Certified
(Cancelled
(Terminated - Certified
(Royalty Agreement

This is the official contract file containing all official records of the project. The records contained in the files are checked and are arranged in this order:

Left Side

Interim Royalty Audits
Reports of Royalty Review
Certification of Discovery
Certificate of Audit (Final)
Interim Audit(s)
Report of Review
Termination Notice or Agreement
Recision Notice
Assignment of Contract
Contract Amendments (latest on top)
Contract with all exhibits and annexes
Owner's Consent to Lien
Subordination Agreement
Leases and assignments of leases
✓ Application and attachments
(3) Envelope for maps

Right Side

Project summary
Work completed analysis
All other material is filed in chronological order with correspondence including the following reports as checked:

Final Field Team Report (Tab)
Operator's Final Report
(2R) Interim Reports
(2R) Operator's monthly reports and all attachments (latest on top)
✓ On-site Exam Report(s) (Tab)
(4) Settlement Sheets

When the volume of records is expected to warrant additional folders, or when convenience of reference warrants separate folders for certain records, they should be set up in this order:

Left Side

Folder No. 2: (In chron. order) Interim Summary Reports by W. O. Engineers

Right Side

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

Folder No. 3: Maps (Use pocket folder or envelope. Fold maps with title block out and show reference to related document or correspondence.)

Folder No. 4: Settlement Sheets

Folder No. 5: Drill Logs

9774

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 11 1957

DATE	INITIALS	CODE

March 8, 1957

Memorandum

To: Operating Committee, DMEA, Interior Bldg., Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Loan Application (~~Tungsten~~) ? Mercury
Andrews Mining
Crystal Mine
Sonoma County, California

Enclosed are three sets of MF-103 Application for Aid forms relative to above subject. The fourth set has been retained in our files.

S. Ricker (f.t.)
S. Ricker

Encls.

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED MAR 11 1957 D.M.E.A.

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

Not to be filled in by applicant

Docket No. 4676 Spring
Metal or Mineral Tungsten
Date Received 3-11-57
Estimated Cost $33,020.25
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: ANDREWS MINING, PO. BOX 492, HEALDSBURG, CALIFORNIA, Partnership, Lowell E. Andrews and Albert L. Seip.

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

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

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Section 5 & 6 Township 10 N. Range 8 W. Also Section 31 Township 11 N. Range 8 W. Recorded Page 25 Volume 2 Records of Sonoma County, Santa Rosa, California

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

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

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

(*e*) If you own the land, describe any liens or encumbrances on it - - -

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

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

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

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

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. We live at the mine...good roads....20 miles to Healdsburg

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

16—66551-1

5. *The exploration project.*—(*a*) State the mineral or minerals for which you will to explore Cinnabar and native mercury

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

(*c*) The work will start within 5 days and be completed within 18 months from the date of an exploration project contract.

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

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

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

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

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

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

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. not applicable

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. NONE

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

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

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

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

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

[ ] Money [X] Use of equipment owned by you [X] Other Labor & Supervision

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated MARCH 6, 1957

ANDREWS MINING
(Applicant)

By Lowell E. Andrews,
Albert L. Seip

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

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

Andrews Mining, PO Box 492
Healdsburg, Calif.

#4 (c)

The California State Mining Bureau.....1903

THE CRYSTAL MINE
Mayacama District
Sec. 5 & 6, T. 10 N.R. 8W

This, the Northwestern extension of the Sonoma Mine, comprises the Crystal, Crystal No. 2, Crystal Extension Nos. 1, 2 3 and 4. Owner, Pacific Mining Co; A. Abbey, 611 Market St., Oakland, A. Anderson, Superintendent, Pine Flat, Sonoma County. (See Mon. XIII, U.S.G.S., Page 376; Report State Mining Bureau of California XIII, page 603.)

The country rock is mostly altered sandstone, through which the same belt of Serpentine which is found in the Northwestern part of the Sonoma mine runs in about the same strike, N.48 degrees W. (see figure 37). On the surface, some croppings show at the Southwestern contact of this Serpentine belt with the Sandstone, A crosscut tunnel (Pacific tunnel) direction nearly North, runs 265 feet below these croppings. Staring in the country rock southwest of the Serpentine it cuts through another belt of Serpentine 40 feet wide, 150 feet from the mouth, to the North of which is 60 feet of broken ledge matter, (called the Little Vein), upon which however no work has been done.

At 525 feet the tunnel reaches the foot-wall gouge, then goes through 25 feet of very much broken ledge matter, and at 550 feet reaches the Serpentine hanging wall, hereabout 75 feet wide. Short drifts have been run both ways along the hanging wall, but no workable ore bodies have as yet been found. The same contact has been found in other workings; the croppings show plainly along the crest of the ridge.

A tunnel (A) running along the vein and starting at the Southeast end of the hill, about 66 feet above the level of the Pacific tunnel, has disclosed some promising Ore. In this tunnel a shaft 40 feet deep has been sunk, which shows some very good Ore. Another tunnel (A1) about 25 feet lower and nearly aprallel to tunnel A has not yet connected this shaft.

The Crystal was closed down about 1891 because of the low price paid for Quicksilver and not because of lack of ore. It is far from mined out. It is just off good county road about 20 miles from Healdsburg just about center of Sonoma County Quicksilver District, on same fault the Mt. Jackson and Culver Baer are on.

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DATE	INITIALS	CODE

#5..Exploration Project

(d) The partners will carry out the work and supervision. One having 5 years and the other 3 years of experience in mining.

Andrews Mining
P O Box 492
Healdsburg, Calif.

#4 Physical Description

(A) The property has been idle since 1903. A cross-cut tunnel direction nearly North runs 265 feet below the croppings starting in the sandstone southwest of the serpentine it cuts through another belt of serpentine 40 feet wide, 150 feet from the mouth; to the north of which is 60 feet of broken ledge matter.

At 525 feet the tunnel reaches the foot wall gouge, then goes through 25 feet of very much broken ledge matter, and at 550 feet reaches the serpentine hanging wall about 75 feet wide. This tunnel was lost by a landslide and has been closed for 50 year. This tunnel was called the Pacific Tunnel.

A tunnel (A) running along the vein and starting at the southeast end of the hill about 66 feet above the level of the Pacific Tunnel. In this tunnel a shaft 40 feet deep has been sunk which shows some very good ore. Another tunnel (A1) about 25 feet below tunnel (A) has not yet connected with this shaft.

Andrews Mining
P O Box 492
Healdsburg, Calif.

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#6 Estimate of Cost

(A) Bulldozer Operations	
2665 cubic yards at 45¢	1,199.25
(B) Labor	
$2.50 per hour	10,400.00
(C) Lumber	4,840.00
Rail	1,800.00
Spikes	36.00
Fish plates, bolts & nuts	200.00
Fuel	3,640.00
Water	180.00
Power	728.00
Compressor air pipe	270.00
Water pipe	180.00
Air vent pipe	465.00
Air blower	850.00
Oil and grease	185.00
Drill steel and bits	750.00
Air hose	150.00
	25,873.25
(D) Rent	
Compressor	1,200.00
Jack hammer	250.00
Ore cars	120.00
Light plant	540.00
Water plant	256.00
Wench truck 1½ Ton	1,011.00
Jeep truck 1 Ton	890.00
Mucking machine	1,280.00
Small tools	560.00
Chain saw	90.00
	6,197.00
(H) Contingencies	
Repairs on equipment	950.00

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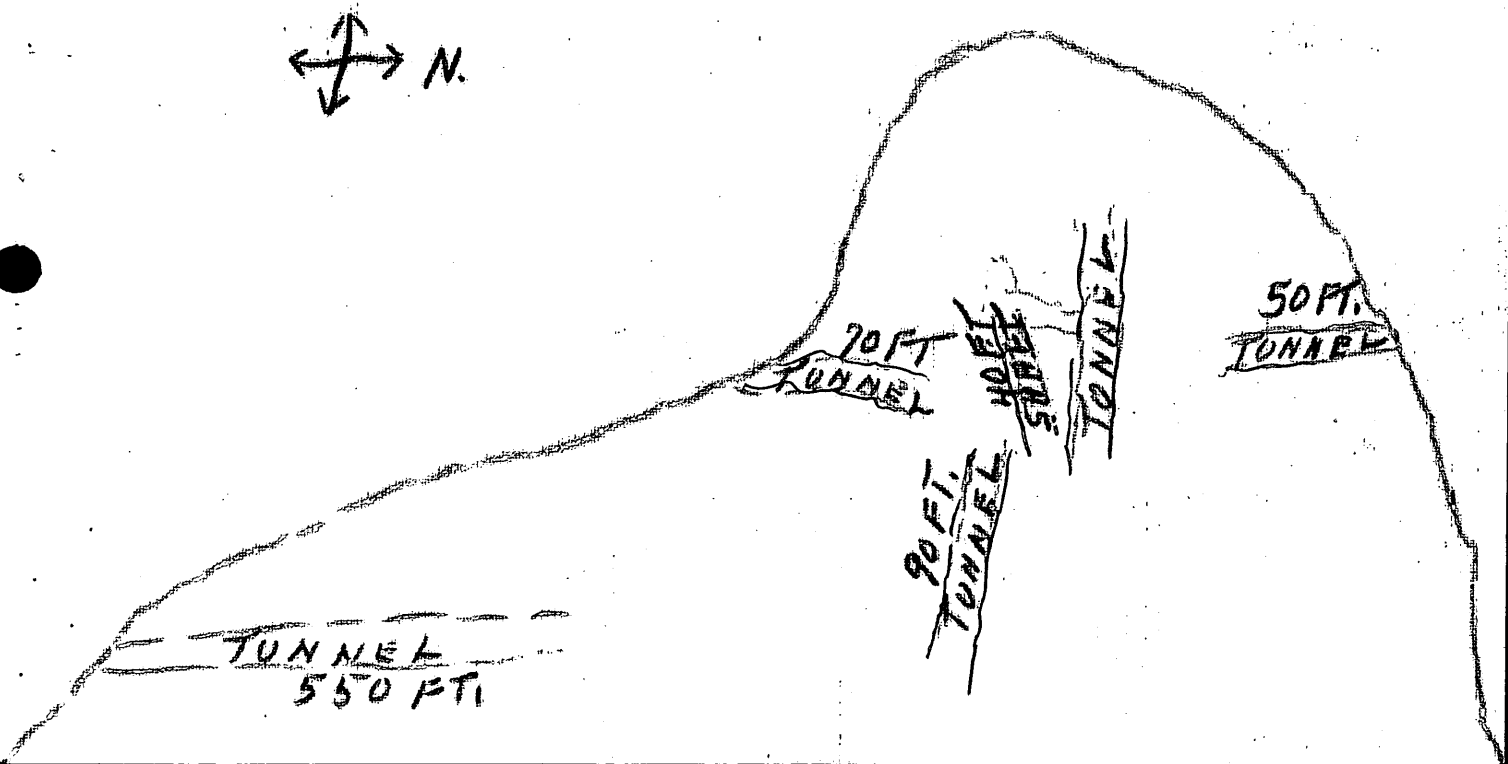
DATE	INITIALS	CODE

Andrews Mining
P O Box 492
Healdsburg, Calif.

#4(A)


N.
70 FT
TUNNEL
HOLES
TUNNEL
50 FT.
TUNNEL
90 FT.
TUNNEL
TUNNEL
550 FT.

OFFICIAL FILE COPY
DMPA
RECEIVED MAR 11 19
DATE | INITIALS | COD

4 (C)

N

VEIN - CINNABAR

THIS TUNNEL WAS LOST FOR 50 YEARS
IT WAS CLOSED DOWN IN 1903 BECAUSE
OF LOW PRICE. WE HAVE LOCATED
THE TUNNEL AND WANT TO REOPEN
IT AND EXTEND IT 200 FT MORE

SANDSTONE

SARPENTINE

OCHER

SILICA CARBONATE

SERPENTINE NOLT

SILICA CARBONATE

SANDSTONE

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D M E A
RECEIVED MAR 11 1957

DATE	INITIALS	CODE

Cancelling previous agreement:

This mutual agreement made July 1, 1955 between PARMELEE G. COX, owner of the CRYSTAL QUICKSILVER MINE at PINE FLAT, SONOMA COUNTY, CALIFORNIA.....and recorded in Vol. 2 of Mining Locations, Page 25, Records of Sonoma County, State of California and particularly described as follows, to-wit: "This claim joins the Sonoma on the N/W end. There is a tunnel 150 ft. S/E of discovery and 100 ft. from the S/E end of claim just a little north of the center line. The tunnel is open and therefore is a permanent monument. Claim is in Sec. 5 and 6 Township 10 N R 8 W, also, Sec. 31 Township 11 R 8 W".....and the ANDREWS MINING is to be as follows:

For ten dollars and other valuable considerations, PARMELEE G. COX will give permission to the ANDREWS MINING to mine for Quicksilver and any other mineral they wish. They are to have use of the cabin and any other equipment that is there as long as they operate the mine diligently. They agree to do all their work in a workmanlike and safe manner and to assume all obligations pertaining to the mine's operation. It is agreed that PARMELEE G. COX is to have access to the property and company books at all times and is to receive 15% of the gross sales of all mineral run through recovery plant, payable as sales are made. This agreement is to be for five years with an option fof renewal at that time.

ORIGINAL FILE COPY
DMEA
RECEIVED MAR 11 1957

DATE	INITIALS	CODE

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6-17	Hopkins	400
6-17	Chapman	400
6/19	Seffridge	130
6/19	Lloyd	130
6/19	Nelson	130
"	Johnson	110
2/	Mattendorf	100
6/21	C	220
		225

JUN 20 1957

Andrews Mining
P. O. Box 492
Healdsburg, California

Re: Docket No. DMEA 4676 - Mercury
Crystal mine
Sonoma County, California

Gentlemen:

Your application for aid for an exploration project and other data available to us in Washington concerning the above-referenced property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration must, in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of our information, although noting mercury mineralization on the Crystal Mine Quicksilver claim, indicates to us that the probability of disclosing significant mercury ore reserves is not sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application is denied.

We wish to thank you for your interest in the Defense Minerals Exploration Administration program and for bringing this property to our attention.

Sincerely yours,

C. O. Mattendorf
Administrator

SPHolt/dlm 6-17-57
cc to: Docket
Code 400
Admr. R. File
FT. REG. II
Messrs. J. W. Pennington, USBM
T. H. Kiilsgaard, USGS
Oper Com.

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
6-17	[illegible]	400
6-17	Chapman	400
		[illegible]
		100

June 17, 1957

MEMORANDUM

To: Administrator, DMEA

From: Division of Iron and Ferro-Alloys, DMEA

Subject: Denial of request for exploration assistance in the amount of $33,020.25
Docket No. DMEA 4676 - Mercury
Andrews Mining
Crystal mine
Sonoma County, California

Denial of the subject application is recommended by this Division based on the following information:

(1) The applicant, Andrews Mining, P. O. Box 492, Healdsburg, California, requested exploration assistance in the amount of $33,020.25 for reopening and rehabilitating an old adit drift, and drifting along a mineralized zone reported to have been found in the old adit.

(2) The applicant controls, by lease from the owner, Mr. Parmelee G. Cox, Healdsburg, California, one unpatented lode mining claim, situated in secs. 5 and 6, T. 10 N., R. 8 W., and sec. 31, T. 11 N., R. 8 W., M. D. B. and M., western part of the Mayacmas Mining District, Sonoma County, California, and recorded in the records of Sonoma County at Santa Rosa, California, as follows:

Claim Name	Recorded Volume	Recorded Page
Crystal Quicksilver Mine	2	25

(3) The proposed program is to re-open and rehabilitate the lowest adit, called the Pacific tunnel (which has been closed for 50 years), a distance of 550 feet, then drift an additional 200 feet along a silica-carbonate zone exposed in the tunnel. Proposed rehabilitation includes excavation of 2,665 cubic yards of material to clear the portal of the Pacific tunnel.

(4) In the area to be explored under the proposed program mercury occurs as small lenses containing cinnabar along two parallel northeast-trending shear zones about 75 feet apart in silica-carbonate rock, and in a fracture zone exposed in a cut about 400 feet N. 60° W. from No. 2 adit. The small size, erratic distribution, and low grade of the lenses exposed in the upper workings and on the surface do not substantiate the

applicant's statement that the mine was closed because of a decrease in the price of quicksilver in 1903 rather than from lack of ore, and that a large, low grade ore body exists at the face of the Pacific tunnel (Adit No. 1). No production resulted from the Pacific tunnel development, and no maps or records are available to support the applicant's statement.

(5) The Field Team concludes that the probability of finding ore bodies at the Pacific tunnel level of different size, distribution and grade than those in the upper levels is very small, and therefore recommends that Government assistance under the DMEA program be denied. The Commodity Divisions of the Geological Survey and the Bureau of Mines concur in this recommendation.

Thos. L. Chapman

T. L. Chapman, Acting Director
Division of Iron and Ferro-Alloys

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

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DMEA
RECEIVED JUN 5 1957

DATE	INITIALS	CODE
6/5	JWP	220
6/6	WSM	400
June 5, 1957		

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: Assistant Chief, Branch of Base Metals

Subject: Review of Field Team examination report Docket No. DMEA-4676 (Mercury), Andrews Mining, Crystal Mine, Sonoma County, California, $33,020.00.

The applicant proposes to rehabilitate the Pacific tunnel a distance of 550 feet, to drift 200 feet along a silica-carbonate zone, and to excavate about 2,665 yards of material at the portal of the Pacific tunnel at an estimated total cost of $33,020.25.

Examination of the property showed that the ore bodies exposed in the upper workings were neither large nor high grade and there is no geological indication of large or better ore bodies at depth.

I concur with the recommendation of the Field Team that the application for Government assistance be denied.

J. W. Pennington

Attachment
Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U. S. G. S.
F. D. Lamb
Files

IN REPLY REFER TO:

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

OFFICIAL FILE COPY
DMEA
RECEIVED JUN 5 1957

DATE	INITIALS	CODE
6-5	C	220
6/5	WSM	400

June 3, 1957

Re: DMEA 4676
Andrews Mining
Crystal Mine
Sonoma Co., Calif.
$33,020.25 Mercury

Memorandum

To: ~~W. S. Martin,~~ Defense Minerals Exploration Administration

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

Subject: Review of Field Team Report.

The applicant requested assistance in reopening an old caved crosscut to a reputed cinnabar bearing structure and drifting in the structure, if there.

The examiners found little evidence in support of the assertion that the old mine ceased work due to the low price of mercury, but rather the stoppage was due to the near exhaustion of the close-to-surface orebodies. The ore occurs in small lense like bodies, erratically distributed, and probably the best ore has been discovered and mined, but 400 tons of 16.1 pound ore is inferred as remaining in one chimney shaped body.

As the zone has been well explored and no blind bodies are to be expected, the examiners and the Field Team recommend that the application be denied.

I concur with the recommendation.

N. E. Nelson

N. E. Nelson

On-site EXAM Rpt.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
1605 Evans Avenue
Reno, Nevada

OFFICIAL FILE COPY
DMEA
RECEIVED MAY 28 1957

DATE	INITIALS	CODE
5/27	JWS	220
		130
6/3	C	220
6/3	WSM	400

May 23, 1957

Memorandum

To: Operating Committee, DMEA, Interior Building
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Docket No. DMEA-4676 (Mercury)
Andrews Mining
Crystal Mine
Sonoma County, California
(Your letter, March 22, 1957)

Enclosed are four copies of a report by J. D. Warne, Bureau of Mines, and R. G. Reeves, Geological Survey, on subject property.

Roscoe Smith and I concur in the recommendation that this application for DMEA exploration aid be denied.

S. Ricker

Encls.

Reviewed by
DMEA OPERATING COMMITTEE
5-31-57
(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 27 1957

DATE	INITIALS	CODE
		130
		220

APPLICATION REPORT

DMEA-4676 (Mercury)
Andrews Mining (partnership)
Crystal mine, Sonoma County, California

by

J. D. Warne
U. S. Bureau of Mines

R. G. Reeves
U. S. Geological Survey

May 17, 1957

Reviewed by
DMEA OPERATING COMMITTEE
5-31-57
(date)

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Applicant's Proposed Exploration	8

ILLUSTRATIONS

Figure 1 . . . . . Index map

2 . . . . . Geologic map of mine area

3 . . . . . Geologic map of mine

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DATE | INITIALS | CODE

INTRODUCTION

An application from Andrews Mining, a partnership, P. O. Box 492, Healdsburg, California, requested Government assistance in a $33,020 program under the Defense Minerals Exploration Administration, Docket DMEA-4676, to explore for mercury at the Crystal Mine, Sonoma County, California.

The mine was examined by R. G. Reeves, U. S. Geological Survey, and J. D. Warne, U. S. Bureau of Mines, on April 23, 1957, accompanied by Mr. L. E. Andrews.

CONCLUSIONS AND RECOMMENDATIONS

Small lenses of 0.1 to 16 lb. Hg/ton ore occur along northeast-trending shear zones exposed in Adit No. 2 and above the portal of caved Adit No. 4. The small size, erratic distribution, and low grade of the lenses exposed in the upper workings and on the surface do not substantiate the applicant's statement that the mine was closed because of a decrease in the price of quicksilver in 1903 rather than from lack or ore, and that a large, low grade body exists at the end of the Pacific tunnel (Adit No. 1). No production resulted from the Pacific tunnel development, and no reliable maps or records are available to support the applicant's statement. It is concluded that the probability of finding ore bodies at the Pacific level of different

size, distribution, or grade than those in the upper levels is very small, and it is therefore recommended that Government assistance under the DMEA program be denied.

LOCATION, PROPERTY, AND OWNERSHIP

The Crystal mine is in secs. 5 and 6, T. 10 N., R. 8 W., and in sec. 31, T. 11 N., R. 8 W., M.D.B.&M., in the western part of the Mayacmas mercury district, Sonoma County, California (fig. 1). The mine is reached over 19 miles of paved and graveled Sonoma County roads, and is about 12 miles airline northeast of Healdsburg, California.

Mine property included in the application consists of a single unpatented mining claim owned by Mr. Parmelee G. Cox, Healdsburg, California. The claim was leased to Andrews Mining, a partnership consisting of Lowell E. Andrews and Albert L. Seip, on July 1, 1956, for a five-year period.

HISTORY AND PRODUCTION

Cinnabar was discovered at the Crystal mine some time before 1877, and since that time the mine has been operated under the names Pacific, Red Cloud, and Abbey. The property was idle from 1903 until 1956, when it was leased to the present operators. The portal of the caved Pacific tunnel (adit No. 1; fig. 3), which had been closed by a landslide for 50 years, was located by the present operators.

No production was recorded from the earlier operations but the present operator has recovered about one flask of mercury from ore produced by surface bulldozer stripping near the main tunnel portal.

DEVELOPMENT

The main and lowest underground development consisted of a north-trending 550 foot crosscut adit known as the Pacific tunnel (adit No. 1, fig. 3). This adit, which is now caved, is reported to have intercepted the silica-carbonate ledge at about 265 feet below its outcrop; however, no evidence indicates that it encountered commercial ore. Another 125-foot crosscut adit driven 100 feet above the lower tunnel connects with drifts at 40 feet from its portal and at the face, and with two shafts or raises open to the surface (fig. 3). Several other caved adits, drifts, and other old workings exist on the property.

A small amount of bulldozing work has been done to expose the silica-carbonate mineralized zone near the portal of an upper adit (No. 2) about 70 feet vertically above the Pacific tunnel level.

GEOLOGY AND ORE DEPOSITS

The geology of the western part of the Mayacmas district was mapped by Bailey[1/] and others, and the regional geology

---

1/ Bailey, E. H., 1946, Quicksilver deposits of the western Mayacmas district, Sonoma County, California: Calif. Jour. Mines and Geology, N. 42, pp. 199-230.

---

is based mainly on that report. The western part of the Mayacmas district is underlain by rocks of Franciscan formation of Jurassic age, into which has been intruded serpentine that is in part hydrothermally altered to silica-carbonate rock (fig. 2). The topography is moderately rugged, but the Franciscan and serpentine rocks are generally not well exposed owing to their extensive weathering to soil cover; the silica-carbonate rock is generally well exposed owing to its resistance to weathering. A silica-carbonate body at the Crystal mine forms the backbone of a steep, north-trending ridge (fig. 3) and outcrops are numerous. The lower flanks of the ridge are covered with thick soil, which supports dense brush, and the contacts between the silica-carbonate rock, serpentine, and Franciscan rocks can be mostly only very approximately located.

At the Crystal mine the Franciscan formation consists of thin-bedded sandstone with shale partings. The individual sandstone layers are from two to six inches thick, and the shale is from 1/4 to one inch thick. The beds strike from N 60° W to west, and dip from 25° to 70° north. The Franciscan rocks are cut by northwest-trending bodies of serpentine, believed to have been intruded along shear zones.

The Crystal mine is near the southwestern contact between Franciscan sandstone and serpentine (figs. 2 and 3). The serpentine was subsequently hydrothermally altered in part to silica-carbonate rock, consisting of carbonates, ranging from calcite to dolomite, ankerite, and magnesite laced through with veinlets of quartz and calcedony. It is a distinctive light- to medium-brown and often has a porous or pitted surface where carbonates have been leached from the boxwork of resistant silica. At the Crystal mine, the silica-carbonate forms cliffs and pinnacles up to 30 feet high.

In the Mayacmas district the quicksilver ore bodies are mostly in the silica-carbonate rock, although at several properties serpentine is the host rock. The ore bodies at the Crystal mine are small lenses or pods along shear zones in the silica-carbonate rock.

Ore occurs along two parallel northeast-trending shear zones about 75 feet apart in the silica-carbonate rock, and in a fracture zone exposed in a cut about 400 feet N 60° W of adit No. 2 (fig. 3). About 200 tons of ore, reported by the applicant to be "high-grade", was mined from a chimney about 10 feet long, 4 feet wide, and 65 feet high between the west end of adit No. 2 and adit No. 3 (fig. 3) along the northwestern of the two shear zones. An ore body about 4 feet wide is exposed for 20 feet near the mouth of the adit along the southeastern of the two shear zones (fig. 3). The circular body of ore, about 10 feet in diameter, and assaying 16.1 lbs. Hg/ton, exposed in the small cut, is also thought to be along a northeast-trending shear zone; but this is not certain as the area around the cut is mostly concealed by soil and brush, and the rock is badly fractured in several directions.

Northwest of the Crystal mine the serpentine is under several patches of Franciscan rocks, which is considered by Bailey (oral personal communication) to indicate that the present surface of the serpentine body is only a very short distance below the original roof. As most of the cinnabar is commonly deposited just below the roof, the best ore should be

exposed at the present horizon, and less and poorer grade ore would be expected at greater depths below the present surface. There is no geological reason to infer better or larger ore bodies at depth. Therefore, the chance that the proposed drifts would cut larger or higher grade ore bodies appears to be very slight. The bodies exposed or encountered in the upper workings are neither large nor rich enough to justify the expenditure necessary to find others like them.

SAMPLING

Three samples were taken from the only accessible underground mine locations (shown in fig. 2) where some cinnabar was observed, and one sample from a surface cut above adit No. 3. Analyses and descriptions of these samples are as follows:

Sample No.	Lbs. Hg/ton	Description
1	<0.1	4-ft. chip sample across back of drift, 8 ft. from adit.
2	0.1	Grab of about 10 tons of silica-carbonate rock in bottom of open hole at upper adit level.
3	0.2	Grab of 5 tons of stockpiled material from raise at terminal of upper adit.
4	16.1	Chip sample across 10 ft. of ore, cut above adit No. 4.

ORE RESERVES

About 400 tons of ore assaying 16.1 lbs. Hg/ton are inferred in the zone 10 feet in diameter exposed in the cut above the No. 4 adit (400 ft. N 60° E from adit No. 2), assuming a depth of 50 feet (indications are that a similar "chimney" between adits No. 2 and No. 3 extended about 60 feet vertically). Another 800 tons of ore assaying less than 0.1 lbs. Hg/ton are inferred in a zone 4 feet wide, 50 feet long, and extending 25 feet above and below the level in the drift 40 feet from the portal of adit No. 2. Extensive surface stripping, and underground exploration around the flanks, of the silica-carbonate body has failed to find any other ore, and no additional reserves in "blind" deposits are inferred.

APPLICANT'S PROPOSED EXPLORATION

The applicants propose to reopen the main or lowest adit, called the Pacific tunnel, a distance of 550 feet, and to perform 200 feet of additional drifting along a silica-carbonate zone. This mineralized zone is reported to have been intercepted by the adit from 525 to 550 feet with some drifting done prior to 1903. In addition it is proposed to excavate about 2,665 yards of material at the portal of the Pacific tunnel to facilitate the reopening operation. The applicant's proposed cost of the work is $33,020.25.

The applicant's estimated unit costs for performing the work are too high, and their previous mining or exploration experience is limited.

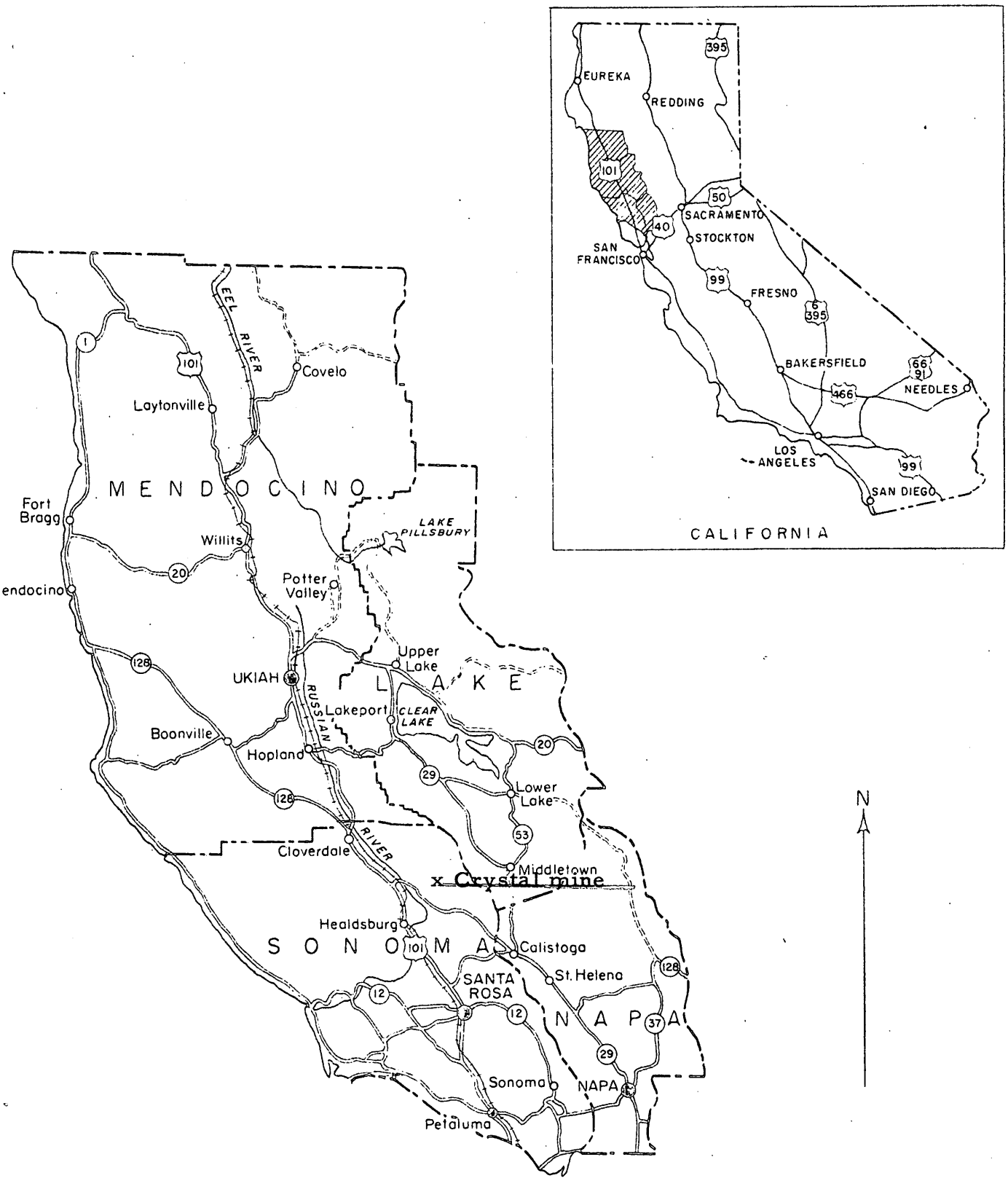

Figure 1. INDEX MAP OF LAKE, MENDOCINO, NAPA, AND SONOMA COUNTIES, CALIFORNIA

0 20 40 60 Miles

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
3/20	Chapman	400
3/20	Martin	400
3/22	Selfridge	130
"	[illegible]	110
"	Rutledge	100
3/23	C	220
		400

MAR 22 1957

Mr. Spangler Bicker, Executive Officer
DMEA Field Team, Region II
1605 Evans Avenue
Reno, Nevada

Re: Docket No. DMEA 4676 - Mercury
Andrews Mining
Crystal Mine
Sonoma County, California

Dear Mr. Bicker:

The above docketed application for exploration assistance is being referred to your office for a field examination of the property.

Copies of memoranda dated March 14 and March 20, 1957, by M. E. Nelson, Geological Survey, and A. D. McMahon, Bureau of Mines, respectively, relating to the project are enclosed. Also enclosed is one extra copy of the application for the use of the Field Team.

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee

APPROVED:

Frank D. Lamb

Member, Bureau of Mines

Thor H. Kiilsgaard

Member, Geological Survey

Enclosure

TLChapman:am 3/20/57
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT REG II
Messrs. A. D. McMahon, USBM
T. H. Kiilsgaard, USGS

8623

DMEA Form 7
(12-56)

OFFICIAL FILE COPY

Date	Surname	Code
3/20	Chapman	400
3/20	Martin	400
3/22	Selfridge	130
"	Johnson	110
"	Mittendorf	100
		220

MAR 22 1957

Andrews Mining
P. O. Box 492
Healdsburg, California

Re: Docket No. DMEA 4676 - Mercury
Crystal Mine
Sonoma County, California

Kilsgaard
Lamb

Gentlemen:

The above docketed application for exploration assistance for mercury ores has been reviewed in the Washington office of the Defense Minerals Exploration Administration, and referred to Mr. Spangler Ricker, Executive Officer, DMEA Field Team, Region II, 1605 Evans Avenue, Reno, Nevada, for a field examination of the property.

Any assistance you can give the members of the Field Team will be appreciated.

Sincerely yours,

C. O. Mittendorf

Administrator

TLChapman:am 3/20/57
cc to: Docket
Code 400
Admr. Read. File
Oper. Comm.
FT REG II
Messrs. A. D. McMahon, USBM
T. H. Kiilsgaard, USGS

8623

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

OFFICIAL FILE COPY
DMEA
RECEIVED MAR 21 1957

DATE	INITIALS	CODE
3/21	C	220
3/21	WSM	400

March 20, 1957

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: Commodity Specialist, Branch of Base Metals

Subject: Review of Application, Docket No. DMEA 4676 (mercury), Andrews Mining Co., Crystal Mine, Sonoma County, California $33,020.25

The applicant proposes to explore a silica-carbonate area by a 200 foot extension of an old drift that was closed down in 1903.

Apparently, the applicant contemplates more work than the 200 feet of drifting as an estimate of 18 months is shown for completion of the work and the estimated cost is excessive for just that amount of drifting.

Referral of the application to the Field Team is recommended.

A. D. McMahon
A. D. McMahon

Attachment

Copy to: Division of Minerals
Branch of Base Metals (2)
Thor Kiilsgaard, U.S.G.S.
F. D. Lamb
F i l e s

IN REPLY REFER TO:

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

FILE COPY
DMEA
RECEIVED MAR 18 1957

DATE	INITIALS	CODE
3/18	C	220
3/19	WSM	400

March 14, 1957

ReL DMEA 4676
Andrews Mining Co.,
Crystal Mine
Sonoma Co. Calif.
$33,020.25 - Mercury

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

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

Subject: Review of application

The applicant requests assistance in reopening an old crosscut to a cinnabar bearing structure and doing 200 feet of work in the structure.

The application depends for validity upon the reliability of handed down information concerning the findings in the crosscut which had been closed by a landslide for 50 years.

Perhaps the upper workings are open and support the inference that ore may be found at the low level, and reliable old time reports and data may confirm the results of the old time work as related in the application.

Referral of the application to the Field Team is recommended.

N. E. Nelson

N. E. Nelson

UNITED STATES
DEPARTMENT OF THE INTERIOR
Defense Minerals Exploration Administration
Washington 25, D. C.

March 13, 1957

Andrews Mining
P. O. Box 492
Healdsburg, California

Subject: DMEA-4676
Re: Exploration Assistance

Gentlemen:

Your application for exploration assistance, dated March 6, 1957 submitted to our office at Reno, Nevada has been assigned Docket Number DMEA-4676 and referred to the Iron & Ferro Alloys Division in the Washington office. Kindly identify all future correspondence relating to your application by this Docket Number.

Sincerely yours,

Allen S. Dakan, Chief
Operations Control and
Statistics Division

Copy to: Region II

3571

Asked Holliday's office to see that their copy goes to McMahon

Advised Nelson's office that is is a mercury, Not WO3

We can tell the F.T. when we write

M&R has been straightened out on this

WSM
3/13/57

1605 Evans Avenue
Reno, Nevada

March 8, 1957

EXTRA COPY
DMEA
RECEIVED FROM
DATE | INITIALS | CODE

Memorandum

To: Operating Committee, DMEA, ~~Interior Bldg.~~,
Washington 25, D. C.

From: Executive Officer, DMEA Field Team, Region II

Subject: Loan Application (Tungsten)
Andrews Mining
Crystal Mine
Sonoma County, California

Enclosed are three sets of MF-103 Application for Aid forms relative to above subject. The fourth set has been retained in our files.

S. RICKER

S. Ricker

Encls.

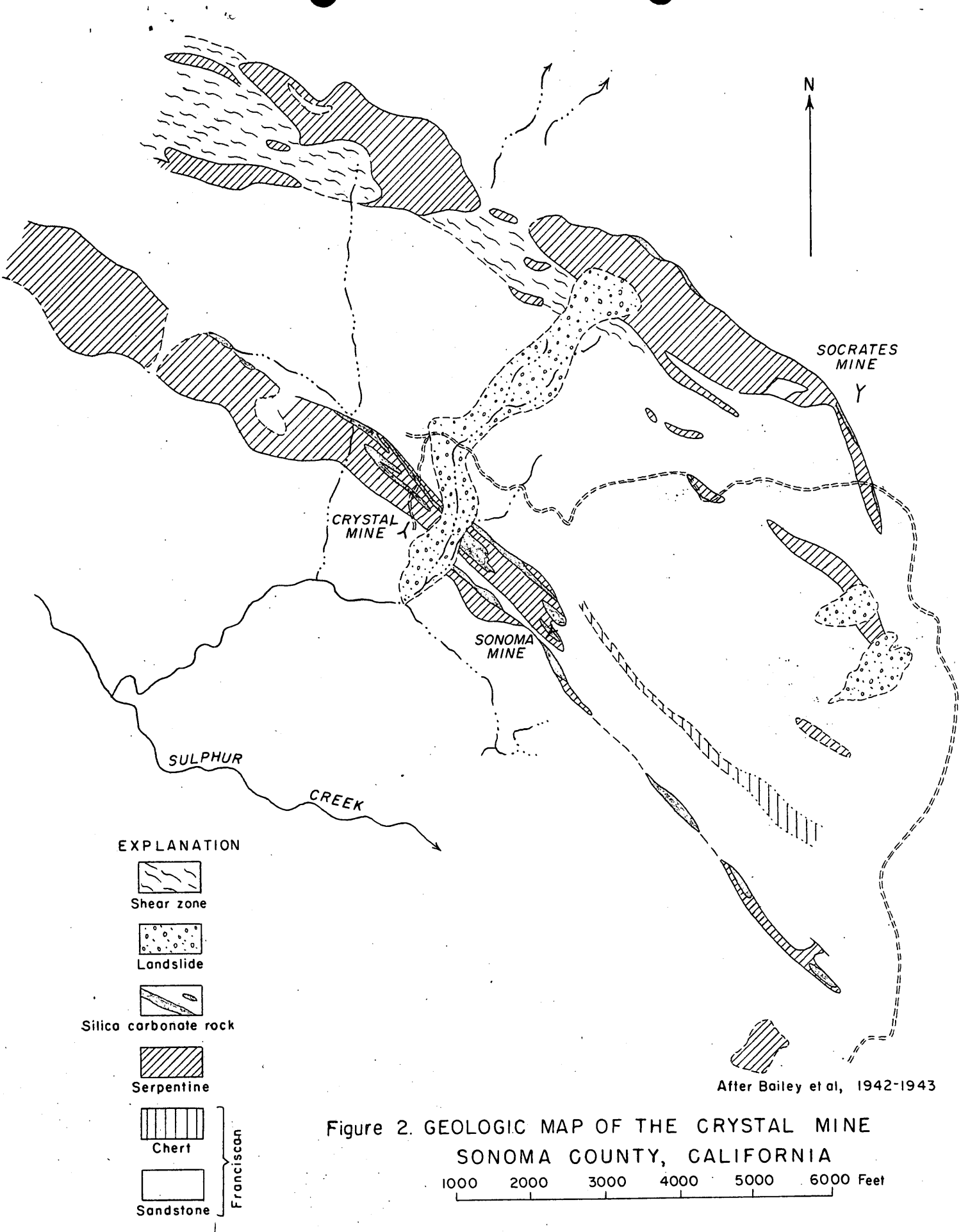

Figure 2. GEOLOGIC MAP OF THE CRYSTAL MINE
SONOMA COUNTY, CALIFORNIA

OFFICIAL FILE COPY
D M E A
RECEIVED
1957
DATE
CODE

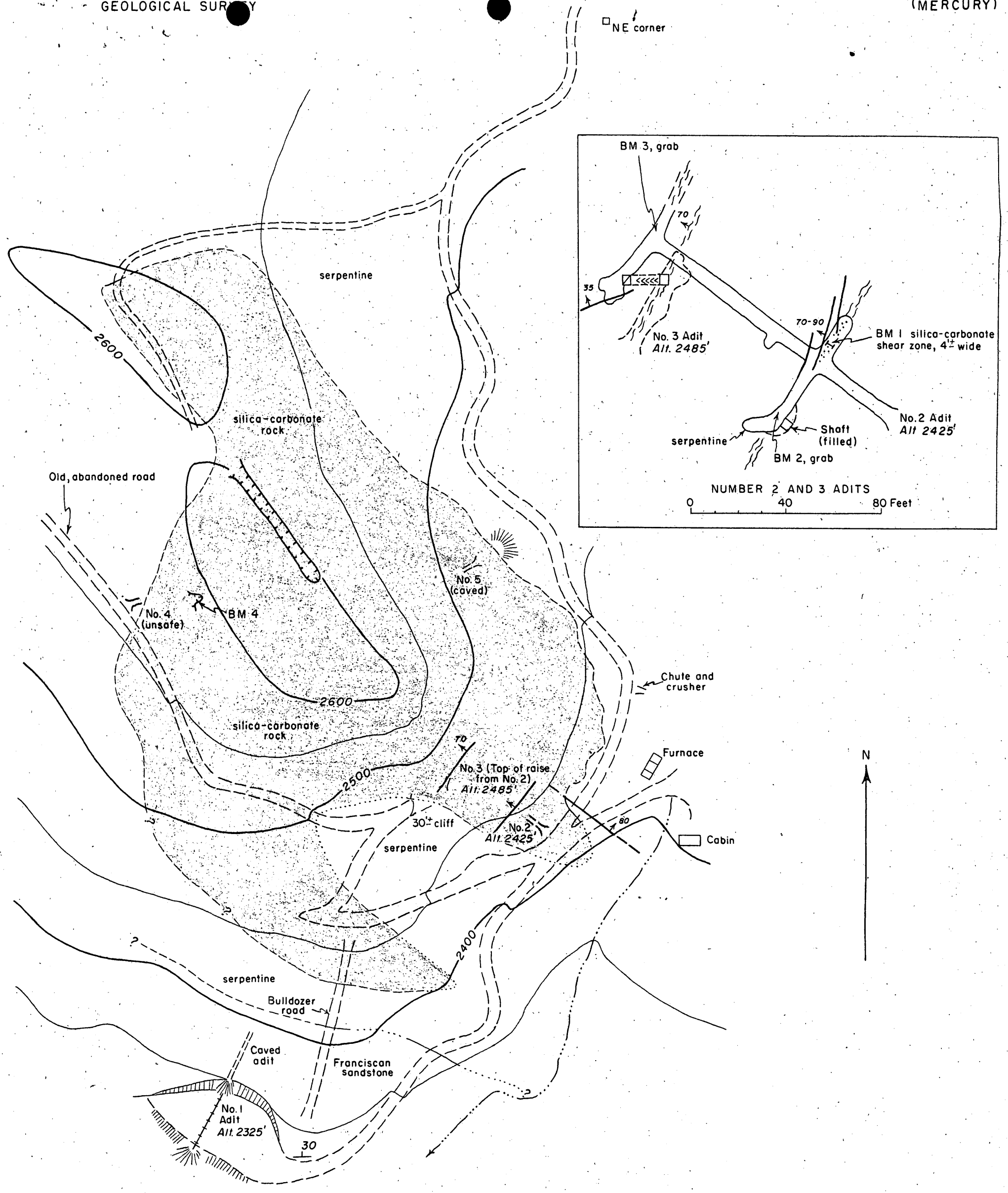

Figure 3. CRYSTAL MINE
SONOMA COUNTY, CALIFORNIA
0 100 200 Feet

Approximate location S.E claim corner (post knocked down, moved)

OFFICIAL FILE COPY
D M E A
RECEIVED MAY 22 1957

DATE	INITIALS	CODE