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

400

RECEIVED
MAY 18 1956

224 New Customhouse
Denver 2, Colorado

May 16, 1956

WSM

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., (Clyde mine), Boulder County, Colorado.

Enclosed are the Washington Office copies of the letter to Mr. G. C. Ridland, which were forwarded by your letter of May 11, 1956, for our review and, if found satisfactory, to forward the original on to Mr. Ridland.

We consider the letter to have been very well prepared and have forwarded the original to Mr. Ridland.

W. M. Traver

W. M. Traver

Enclosures

5/18/56
The enclosures will come down with the '400' copies.

MAY 15 1956

Mr. G. C. Ridland, Manager
Cold Spring Tungsten, Inc.
1036 First National Bank Building
Denver 2, Colorado

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

Dear Mr. Ridland:

Your letter of April 17, 1956, requests that we reconsider our denial of the subject application for exploration assistance; refers to our Docket No. DMEA-2810, Contract No. Idm-E592, executed August 31, 1953, and rescinded December 1, 1953; by agreement with Hetzer Mines, Inc. before any work was done, and states that nothing has changed at the property.

The following tabulation lists the claims included in the canceled contract, those included in two subsequent DMEA projects, and those covered by your subject application:

Hetzer Mines, Inc. DMEA-2810 Idm-E592	Johnson Bros. & Prime DMEA-3173 Idm-E657	Williams and Williams DMEA-3483 Idm-E748	Clyde Mine DMEA-4038
Laura			
Hidden Fortune			
Lily			
Pinto			
Elisa			
Ash Pan			
Cypress			
Slide		Slide	
Luck Bill		Luck Bill	
Gale		Gale	
Red Spruce		Red Spruce	Red Spruce
Red Pine			Red Pine
Occidental			Occidental
Gulch			Gulch
Clyde			Clyde
Lone Jack			Lone Jack
Blue Chip			Blue chip
McKenna	McKenna		McKenna
	Hunter		
	Phillip		
	Hoosier		

In addition, during the previous DMEA operations we were inclined to believe that the General Services Administration's tungsten program in the Boulder District might result in the production of large tonnages of lower grade that would contain a substantial number of units of WO_3. Experience in the area surrounding the Clyde has indicated that the earlier operators were thorough in exploring, developing and mining the ores in this area. The substantial amount of work completed under the DMEA projects mentioned indicates to us that the possibilities are relatively small for finding ore bodies in the included and surrounding area that will significantly improve the mineral supply position.

Considering all our present information we cannot agree that nothing has changed at the property; we do not feel we would now be justified in re-issuing our formerly proposed Batsar Mines, Inc. contract, and our denial of your subject application for exploration assistance is reaffirmed.

Sincerely yours,

C. O. Mittendorf

Administrator

TLChapman/fec
5/10/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.
FT. REG. III
R. W. Holliday, USBM
T. H. Kiilsgaard, USGS

Moreover, during previous DMEA operations we were inclined to believe that the General Services Administration's tungsten program might result in production of large tonnages of lower grade ores that would contain a substantial number of units of WO_3. Experience in the area surrounding the Clyde has indicated that the earlier operators were highly efficient in the exploring, developing and mining the ores in this area. The substantial amount of work completed under the DMEA projects mentioned indicates to us that the possibilities are relatively small for finding ore bodies in the included and surrounding area that will significantly improve the mineral supply position.

Considering all our present information we cannot agree that nothing has changed at the property; we do not feel that we would now be justified in re-issuing our formerly proposed Hetzer Mines, Inc. contract, and our denial of your subject application for exploration assistance is reaffirmed.

Sincerely yours,

Administrator

400

MAY 11 1956

Mr. W. M. Traver, Executive Officer
DMEA Field Team, Region III
224 New Customhouse
Denver 2, Colorado

Re: Docket No. DMEA 4038 - Tungsten
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado

Dear Mr. Travers:

Reference is made to your copy of letter of April 17, 1956, from Mr. G. C. Ridland, Manager, Cold Spring Tungsten, Inc. to Mr. C. O. Mittendorf, Administrator, DMEA, requesting that we reconsider our denial of the subject application for exploration assistance.

Also enclosed for your consideration is a reply to Mr. Ridland's above noted letter. If our letter meets with your approval please forward it to Mr. Ridland; if not please return it to us with your comments and any suggested changes.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

Enclosures

APPROVED:

/s/ Robert W. Geehan
Member, Bureau of Mines

N. E. Nelson
Member, Geological Survey

TLChapman/foc 5/8/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.
FT. REG. III
R. W. Holliday, USBM
T. H. Kiilsgaard, USGS

400

RECEIVED
APR 19 1956

April 17, 1956

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

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

WSM

Dear Mr. Mittendorf:

We wish to acknowledge receipt of your letter of April 2nd informing us that our application is denied for reason that the probability of disclosing minable tungsten ore reserves is not sufficiently promising to justify Government participation.

May we call your attention to the fact that we (Hetzer Mines, Inc, our predecessor) previously made application for exploration aid in the Clyde Mine, and you found it sufficiently promising at that time to enter into

Contract No. Idm-E592
Docket DMEA 2810,

total program to cost $30,400 of which the Government would participate in the amount of $22,800. The program was not carried out by Hetzer due to a lack of funds. At this time, however, we do have the capital required for our portion of the proposed program and could start immediately on the program authorized by this contract.

As the previous contract had been cancelled by the default of Hetzer, we applied for a new contract for a new program consisting largely of crosscutting and drifting rather than diamond drilling. This does not mean we would be adverse to the prior program and a reinstatement of the original contract.

It does not seem reasonable that at one time you find the property with sufficient promise to authorize a $30,400 program and at another time you find it not sufficiently promising. Nothing has changed at the property.

4-19-56
Correspondence
Original F.
400

Please reconsider our application, and a modification of the proposed program, if the one presented does not meet with your approval. We have no objection to amending the former contract, Idm-E592, to put it back in force, and we will start the work as soon as you give the word.

Yours very truly,

COLD SPRING TUNGSTEN, INC.

G. C. Ridland

GCR:bh

cc: Mr. W. M. Traver, Executive Officer
DMEA, Field Team, Region III
224 New Customhouse
Denver 2, Colorado

400

APR 2 1956

Cold Spring Tungsten, Inc.
1036 First National Bank Building
Denver 2, Colorado

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

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 tungsten mineralization in the Clyde Mine, indicates to us that the probability of disclosing minable tungsten 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. Stimson

Administrator

AIMcMAHON/foe
3-29-56
cc to: Docket
Code 400
Adm. Read. File
Operating Comm.
FT. REG. III
Messrs. Holliday, USBM
Kiilsgaard, USGS

March 29, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $128,180.00
Docket No. DMEA 4038 - Tungsten
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado

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

1. The applicant, Cold Spring Tungsten, Inc., 1036 First National Bank Building, Denver 2, Colorado, requested exploration assistance in the amount of $128,180.00 for diamond drilling, crosscutting, drifting and raising in the Clyde Mine.

2. The applicant controls by ownership the following patented lode mining claims comprising approximately 29 acres and located in the NW. ¼ sec. 7, T. 1 S., R. 72 W., 6th P. M., Boulder County, Colorado:

Claim Name	U. S. Survey No.
Red Spruce	1834
Red Pine	"
Occidental	"
Gulch	"
Clyde	"
Lone Jack	"
Blue Chip	"

3. The proposed program consists of:

Operation	Proposed Units	Total Estimated Cost	Unit Cost
Core drilling	800 feet	$ 4,000	$5.00/ft.
Rehabilitation	300 "	6,450	21.50/ft.
Raising	600 "	25,900	43.17/ft.
Crosscutting	550 "	29,700	54.00/ft.
Drifting	1,150 "	62,100	54.00/ft.

The above operations were designed to (a) intersect, and explore the westerly and downward projections of the Gale and Occidental veins beyond their known exposures in the Gale and Clyde mines; (b) to further explore the Lone Jack vein on the 4th level of the Clyde Mine and; (c) on this same level, to crosscut and drift on the Blue Chip vein.

4. The project area is underlain by fine to coarse-grained schist, slaskite and pegmatite above the 4th level of the Clyde Mine. Below the 4th level schist is found in the eastern part of this mine and on each succeeding level it is found west of its position on the level above.

The exposed surfaces of the Gale vein in the Clyde tunnel (3rd level) show a 1 to 3 feet width of brecciated country rock and barren quartz with very little ferberite mineralization. Crosscutting and drifting from the Gale shaft under an earlier RFCA contract (Docket No. 4483) failed to disclose a structure that could be identified as the Gale vein.

About 100 feet of the Occidental vein was explored by a drift from the Clyde tunnel. Where observed, the mineralized portion of the vein is from one-half to 2 inches wide and consists principally of brecciated barren quartz with a small amount of fine grained ferberite.

The Lone Jack vein is exposed, at intervals for about 400 feet on surface, by occasional prospect pits and by a 100 foot drift on the 4th level of the Clyde Mine. In this drift it is a weak 1-2 inch wide structure which sporadically contains small veinlets of ferberite not more than one-fourth inch wide.

The Blue Chip vein is intermittently exposed by prospect pits for about 400 feet on the surface which apparently did not justify additional exploration. This mine has not been explored underground.

5. The Field Examiners conclude that none of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material and recommend that the applicants' request for exploration assistance at the Clyde Mine be denied.

The Field Team and the Commodity Divisions of the Geological Survey and Bureau of Mines concur in this recommendation.

ADMcMAHON/fcc
3/28/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.

W. A. Martin, Chief
Iron and Ferro-Alloys Division

402

Copy retained 400

March 22, 1956

Memorandum

To: Chief, Iron and Ferroalloys Division - DMEA
Through: Chief, Branch of Ferrous Metals & Ferroalloys

From: Commodity Specialist - Tungsten

Subject: Review of Field Team Examination Report
Docket No. DMEA 4038
Clyde Mine
Boulder County, Colorado
Cold Spring Tungsten, Incorporated
1036 First National Bank Building
Denver, Colorado
$128,180.00 - Tungsten

This report is based on substantial knowledge of the area and shows careful consideration of geological factors and history of production. Although there is erratic mineralization in the area, the liklihood of discovering significant tonnages of ore grade material does not justify the proposed expenditure.

I concur with the field team recommendation that the application be denied.

R. W. Holliday

400

IN REPLY REFER TO:

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

RECEIVED
MAR 22 1956

Copy retained 400

March 20, 1956

Re: DMEA 4038
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder Co., Colorado
$128,180.00 - Tungsten

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 exploring by cross-cutting, drifting and diamond drilling the downward and lateral extensions of onetime productive tungsten veins.

The estimated cost of the proposed work is $128,180.00.

The examiners conclude that, "None of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material."

With the Field Team the examiners recommend denial of the application.

I concur with the recommendation.

N. E. Nelson

N. E. Nelson

NENelson:iml
G-3/20/56
cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
R. Holliday, 3513

See –
Geology & Oil deposits
of the Boulder County
Longmont District.
USGS. professional paper
545 (p. 118)

Page 119

400

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

March 12, 1956

224 New Customhouse
Denver 2, Colorado

RECEIVED
MAR 14 1956

NSM

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4036 (Tungsten), Cold Spring Tungsten, Inc., Clyde Mine, Boulder County, Colorado

Enclosed are the original and three copies of a joint engineering and geologic report on the subject docket.

The field examiners conclude that there is little possibility of discovering a significant amount of tungsten by the proposed exploration. They recommend that the application be denied, and we concur in this recommendation.

DMEA Field Team, Region III

W. M. Travers

By W. M. Travers
Executive Officer

Reviewed by
DMEA OPERATING COMMITTEE

DMEA
Date Rec'd.

MAR 9 1956

RECEIVED
MAR 14 1956

BUREAU OF MINES
Denver, Colorado

TRANSMITTED
MAR 12 1956

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
March 8, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman
John F. Shaw

Subject: Examination Report on Docket No. DMEA 4038 (Tungsten)
Cold Spring Tungsten, Inc., (Clyde mine) Boulder County, Colorado

Enclosed are the original and 7 copies of a Joint Engineering and Geologic Report by R. W. Osterstock and R. L. Belmer, mining engineer, covering Docket No. DMEA 4038.

Cold Spring Tungsten, Inc. applied for exploration assistance to explore the Clyde mine by diamond core drilling, crosscutting, drifting and raising.

A field examination was made on January 31, 1956 by R. W. Osterstock and R. L. Belmer. The examining team concluded that there was little possibility of discovering a significant amount of tungsten by the proposed exploration.

It is recommended that the application be denied.

E. N. Harshman

E. N. Harshman
Member Field Team

John F. Shaw

John F. Shaw
Supervising Mining Engineer

JFS/mw
cc: 7
ENHarshman
DMEA 4038
Chron

Reviewed by
DMEA OPERATING COMMITTEE

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
MAR 14 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

TRANSMITTED
MAR 12 1956

DMEA 4038

CLYDE MINE
COLD SPRING TUNGSTEN, INC.
Boulder County, Colorado

Tungsten

Joint Engineering and Geologic Report

R. W. Outerstock
Geological Survey

R. L. Palmer
Bureau of Mines

March 7, 1956

Reviewed by
DMEA OPERATING COMMITTEE

DMEA 4038

RECEIVED
MAR 14 1953

CLYDE MINE
COLD SPRING TUNGSTEN, INC.
BOULDER COUNTY, COLORADO

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Present Status of the property 10
Project proposals with costs 11
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ILLUSTRATIONS

Figure — Follows Page

1. Index map of Boulder County Tungsten District, Colo., showing location of Clyde Mine (Cold Spring Tungsten, Inc. DMEA 4038) 2

2. Geologic Plan and Section of the Clyde Mine 14

DMEA 4038
CLYDE MINE
COLD SPRING TUNGSTEN, INC.
BOULDER COUNTY, COLORADO

RECEIVED
MAR 14 1956

INTRODUCTION

Cold Spring Tungsten, Inc., 1036 First National Bank Bldg., Denver 2, Colorado, applied for aid in a project of exploration for tungsten at the Clyde mine, Boulder County, Colo. The application was made pursuant to DMEA Order 1, under the Defense Production Act of 1950, as amended. It was submitted to the Defense Minerals Exploration Administration October 24, 1955 and assigned Docket No. DMEA 4038.

In its application, the company proposed to core drill two horizontal holes northwesterly from the 6th level of the Clyde mine so as to intersect the westerly extensions and downward projections of the Gale and Occidental veins beyond their known exposures in the Gale and Clyde mines. If the results of such drilling prove promising, the company proposes an unspecified amount of crosscutting to, drifting along, and raising on those two veins. The company also proposes to rehabilitate some 300 feet of the 4th level of the Clyde mine and extend an existing 4th level drift 125 feet westerly and 175 feet easterly along the Lone Jack vein and to raise on this structure. In addition, it proposes to crosscut 200 feet southerly from the 4th level of the Clyde mine to intersect the Blue Chip vein and to drift 175 feet westerly and 875 feet easterly along, and to raise an unspecified distance on, that structure. Although the application is not specific as to the exact amount of work proposed for all the individual phases of the program, it does indicate that an aggregate total of 800 feet of core drilling, 300 feet of level rehabilitation, 600 feet of raising, 500 feet of crosscutting, and 1,150 feet of drifting is contemplated. The applicant estimated that the proposed project will cost a total of $188,100.00 and can be completed within a period of 15 months.

The company's application was reviewed in Washington and, on December

13, 1955, was referred to the DMEA Field Team, Region III for a field examination of the property. The property was inspected January 31, 1956 by an examining team from the Geological Survey and the Bureau of Mines. The inspection was made with D. H. Jardine, a representative of the applicant. The project proposals subsequently were discussed with Elmer Ketner, a former owner of the property and present superintendent of company operations in the district.

This report is based on the field examination of the property and on data either furnished by the applicant or obtained from other sources. It is prepared for the purpose of aiding the DMEA Field Team and others concerned in evaluating the applicant's request for exploration assistance.

LOCATION, TOPOGRAPHIC AND PHYSICAL FEATURES

The property is located in the NW¼ sec. 7, T. 1 S., R. 72 W., 6th P. M., Boulder County, Colo. The Clyde and Gale mines and the Lily and Prospect tunnels, which presently are owned by the applicant; the Rake-off mine, owned by Vanadium Corporation of America; and several other formerly productive properties all lie in close proximity within Sherwood Gulch at the western end of the Boulder County tungsten district (fig. 1). All of the mines are adjacent to State Highway 160 which passes through the gulch.

Nederland, Colorado, a community of about 300 population and the center of activity in the district, is approximately 2 miles south of the mine area. It is the site of the company's custom tungsten mill. Boulder, Colo., a town of some 25,000 population and the nearest supply center, is 18 miles east of Nederland. Denver, Colo., the financial and commerical center of the region, is some 35 miles southeast of the district.

The tungsten district lies on the lower eastern flank of the Colorado Front Range. It is a gently rising, dissected upland that extends from the foothills near Boulder to the steeper glaciated slopes of the Continental

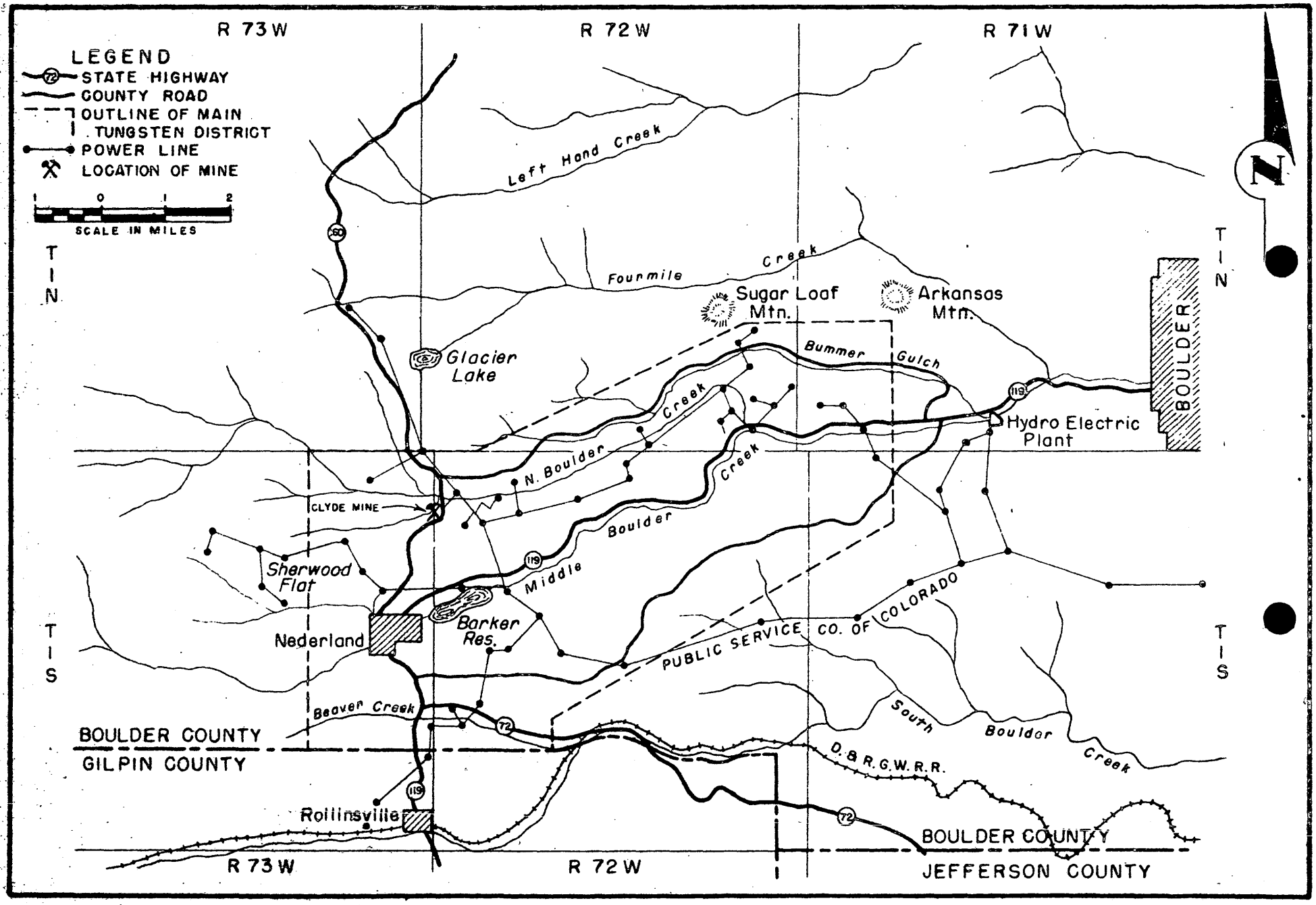

FIGURE 1 - INDEX MAP OF BOULDER COUNTY TUNGSTEN DISTRICT, COLO., SHOWING LOCATION OF CLYDE MINE.
(COLD SPRING TUNGSTEN, INC. DMEA 4038)

Divide west of Nederland. The area is characterized by rounded mountain tops and flat ridges separated by broad valleys and steep canyons. The general level of the upland surface ranges in altitude from 8,500 feet in the western part of the district to about 7,500 feet in the eastern part. Mountain tops within the area rise 300 to 400 feet above this level. In the western part of the district, broad valleys lie only 200 to 300 feet below the general level of the upland surface. Farther east, these valleys deepen rapidly and become steep-sided canyons.

The altitudes within the immediate mine area range from 8,203 feet at the portal of the Lily tunnel to 8,270 feet at the collar of the Gale shaft and the portal of the Clyde (3rd level) tunnel. The climate at such elevations, although somewhat severe during the late winter and early spring months, generally permits year around mining operations. The highway through Sherwood Gulch and the other main roads within the district are maintained and generally are kept open all year. The access roads to the individual mines usually are not maintained and are apt to be blocked by snow during the winter months.

There is little timber suitable for mining purposes on the property. Most mine timber is purchased from local sawmills. A small amount of water flows through Sherwood Gulch the year around. Most of the underground workings in the vicinity, however, do make sufficient water for all mining needs. The Gale and Clyde mines are connected to the power transmission network of the Public Service Company of Colorado. The Lily and Rake-off mines have been idle for many years and are no longer connected to this system. Experienced mining labor generally can be obtained in or around the district. Although some housing is available in Nederland and other camps throughout the area, most mine personnel live in Boulder and drive to and from work.

OWNERSHIP AND EXTENT

The property rights included with the company's application for exploration assistance include the following patented lode mining claims:

Red Spruce	U. S. Mineral Survey No. 18340
Red Pine	"
Occidental	"
Gulch	"
Clyde	"
Lone Jack	"
Blue Chip	"

The above claims are owned by Cold Spring Tungsten, Inc., the applicant for exploration assistance at the property. The extent and relative locations of the claims are shown on figure 2. The property rights stipulated in the application comprise approximately 29 acres and include the northernmost workings in the Gale mine and all the workings in the Clyde mine. All of the NW¼ of section 7 is taken up by mining claims, most of which are presently owned by the applicant company. The western boundary of the company's collective holdings coincide with the west line of section 7. The Red Spruce claim already is subject to lien by the Government under the provisions of Exploration Project Contract Idm-8748 (Williams and Williams, DMEA 3483).

HISTORY AND PRODUCTION

Tungsten was discovered near Nederland in 1899 and was first mined in 1900. The largest yearly output from the district (2,707 short tons of 60% WO_3) was in 1917 when the price reached a high of $105.00 per unit. Beginning with the year 1918, production rapidly declined. There was little or no ore mined during 1921-22, in 1932, and again in 1949. Since 1950, the output has gradually risen (see summary below) being stimulated by the higher price guaranteed through the Government's domestic purchase program and the exploration assistance available to the small mines. The total production from the district through 1954 is estimated at approximately 1½ million short ton units of tungsten trioxide. In 1954 (the latest year for which figures

are available), 358 tons of concentrates containing 16,489 short ton units of tungsten trioxide valued at $953,353.00 were shipped from the district.

Production from District (1949-54)

Year	s.t.u. WO_3	Year	s.t.u. WO_3
1949	96	1952	6,683
1950	539	1953	19,143
1951	3,258	1954	16,489

The Clyde, Gale and Lily mines were opened in the early nineteen hundreds and the greatest part of their production was made prior to 1918. The Wolf Tongue Mining Co., a subsidiary of the Firth-Sterling Steel and Carbide Corp., owned and operated the three properties during their most productive life. The Clyde mine, one of the larger producers in the district, was operated more or less continuously from 1907 to 1929. All of the Wolf Tongue properties were purchased by Hatzer Mines, Inc. in 1950. The Clyde and Gale mines were reopened in 1952 and since have been worked intermittently and on a small scale by Hatzer Mines or its lessees. Certain exploratory work was performed at the Gale mine in 1954-55. The work was carried out with Government assistance under Exploration Project Contract IdM-E748 (Williams and Williams, BMEA 3483). The project did not result in a significant discovery and the mine presently is idle.

The total recorded production from the various claims or mines in the Clyde-Gale-Lily group is summarized as follows:

Name	s.t.u. WO_3
Clyde	34,668.2
Gale	7,742.6
Lily	3,807.5
Red Pine	142.7
Red Spruce	65.2
Lone Jack	33.1
Rake-off	20-25,000 (estimated)

Although there is evidence that a small amount of ore may have been mined from a few of the other claims in the group, they have no recorded production.

The applicant company, Cold Spring Tungsten, Inc., gained control of all the former Wolf Tongue holdings in the district, including the mill at Nederland, in September 1954 through the purchase of all of the outstanding stock in Ketner Mines, Inc. This company since has continued to mill its own production from the Cold Spring mine and any custom ore it is able to buy from its lessees or other operators in the district. The ore from the Cold Spring mine, which was discovered as a result of an earlier RMEA project and heretofore has supplied from 60 to 80 percent of the feed to the Nederland mill, is essentially depleted. Consequently, the company has turned its attention to other formerly productive mines on its properties in an attempt to boost its dwindling mine production and thereby meet the minimum requirements of its mill.

GEOLOGY

The Boulder tungsten district is on the east flank of the Colorado Front Range and on the northeast end of the Front Range mineral belt. The district is underlain by Precambrian rocks, including coarse-grained gneissic granite (quartz monzonite) of the Boulder Creek batholith, and older schists and gneisses of the Idaho Springs formation. Pegmatite and gneissic aplite, probably related to the Boulder Creek granite, occur in dikes and irregular masses. The Precambrian rocks are intruded by dikes of various rock types, all believed to be Tertiary in age.

The most conspicuous structural feature in the district is a series of persistent northeasterly striking brecciated shear zones or "breccia reefs." They are probably Paleocene in age and pre-date the northeasterly to easterly trending fractures that contain the ferberite-bearing veins.

The Clyde-Gale mine workings are in the western or Sherwood Gulch section of the Boulder tungsten district. The project area, which includes the Clyde and Gale mines (fig. 2) is underlain by fine- to coarse-grained aplite, alaskite, and pegmatite above the 4th level of the Clyde mine. Below the 4th level schist is found in the eastern part of the Clyde, and on each succeeding level it is found west of its position on the level above. It has been suggested[1/] that the aplite-schist contact may have an average dip of 32° westerly below the Clyde 4th level. All of the Gale workings are within aplite and pegmatite although the schist must be very near the lowest level.

The aplitic country rock exhibits a marked gneissic structure believed to be a primary feature. The Hurricane Hill aplite mass with which this project is concerned carries significantly less biotite than aplitic bodies in other parts of the district. Both aplite and pegmatite are receptive hosts for tungsten deposits whereas schist forms a gouge relatively impermeable vein zone.

Two separate blocks of ground (Area I & Area II on fig. 2) are intended to be explored by the applicant's proposed program. Area I includes 2 parallel veins exposed on the surface southeast of the main Clyde workings and Area II includes the continued downward and westerly extensions of the Gale and Occidental veins.

AREA I

The Lone Jack vein, exposed on the surface by occasional prospect pits, lies about 150 feet southeast of the collar of the Clyde shaft. This structure is essentially parallel in strike and dip to the Clyde vein system.

On the surface the Lone Jack vein is intermittently exposed over a

1/ Lovering, T. S. and Tweto, O.; Geology and Ore Deposits of the Boulder County Tungsten District, Colorado; Geological Survey Professional Paper 245 (p. 118)

strike length of about 400 feet. The vein has been exposed by a 100-foot drift on the Clyde mine 4th level (fig. 2). In this drift it is a weak, 1- to 2-inch wide structure which contains sporadically located veinlets of ferberite not more than one-fourth inch wide. The vein at the extreme eastern end of the drift dips 50° NW and is barren of ore mineralization.

Approximately 200 feet southeast of the outcrop of the Lone Jack vein is the Blue Chip vein. This structure strikes northeasterly and dips 70° northwest, again essentially parallel to the main Clyde vein system. About 400 feet of strike length has been intermittently exposed on the surface by prospect pits. A few tons of carefully sorted ores may have been realized from this work; but it is noteworthy that no point on this structure was considered worthy of additional exploration.

Both of the above noted structures contain a small amount of relatively coarse-grained ferberite in small open spaces and veinlets in gray to black horn quartz. It is likely that the structures, though weak, are relatively persistent. However, district-wide observations have indicated that localization of ore shoots within a vein is not interdependent on the strength or persistence of the structure.

AREA II

The second block of ground which the applicant desires to explore includes the southwesterly extensions of the Gale and Occidental veins.

The Gale vein in its underground workings exhibited erratic dips ranging from 65° to 85° NW and even dipping 78° SE at the eastern limit of the workings in level 1. The vein also is explored by a 60-foot drift just in from the portal of the Clyde tunnel. Lovering and Tweto 2/ describes the structure as a weak vein which breaks into discontinuous fractures near an eastward trending vein in the Gale mine; the structure does appear, however,

2/ Op. cit. (page 119)

to become stronger in a southwesterly direction. Where opened on the Clyde tunnel level the Gale structure shows a 1 to 3 foot width of brecciated country rock and horn quartz; very little ferberite was noted in the exposed vein surfaces.

An earlier DMEA exploration program (Docket 3483) extended the Gale shaft 75 feet below the first level, but drifting and crosscutting operations on this new level failed to disclose a structure which could be identified as the Gale vein.

An allied objective in the Area II exploration block is the downward and eastward projection of the Occidental vein. This structure is intersected in the Clyde tunnel about 300 feet south of the portal where a 100-foot drift and a small stope were driven westerly from the tunnel level. The structure, where accessible, has an average strike of N. 65° E. and an imperfectly established dip of 75° NW. To the east of the Clyde tunnel the structure becomes frayed, breaking into thin nonpersistent fractures. To the west of the tunnel caving prevents access to more than a few tens of feet of the structure. Where observed, the mineralized portion of the vein is from one-half to 2 inches wide and consists principally of several generations of horn quartz now brecciated and sealed by a small amount of fine- and coarse-grained ferberite intimately associated with more horn quartz. Alteration is marked on both sides of the vein by the development of a parallel silicified zone generally less than 1 foot wide. Outside of this band is a wider but more irregular zone of sericitic alteration. There is no recorded production from the single stope on the Occidental, but it is doubtful that it exceeded a few hundred units of WO_3.

ORE RESERVES

There are no significant ore reserves of any classification in any of the Gale or Clyde mine workings although leasing operations might provide a small amount of ore from pillars and stope walls.

PRESENT STATUS OF THE PROPERTY

The Clyde vein was originally developed from the surface through the Clyde shaft. The upper four levels of the mine were turned from this shaft. A 900-foot crosscut adit (Clyde tunnel) later was driven from Sherwood Gulch to connect with the 3rd level workings of the old shaft. The newer 5th, 6th, and 7th levels of the mine subsequently were turned from an inclined winze that was sunk to a depth of some 300 feet below the tunnel level. Production from the mine has come from a hanging wall vein zone, which was developed to a depth of some 250 feet below the surface through the old shaft, and a footwall vein zone that was opened by the winze below the Clyde tunnel.

The original Clyde shaft and the older upper workings off of this shaft are caved and no longer accessible. The Clyde tunnel, however, is open and in good repair as is the winze below this level. Portions of the lower levels off the winze are caved or in poor repair. The winze is double compartment. One compartment contains a skidway for hoisting by means of a bucket; the other is provided with a ladderway. The station at the collar of the winze contains an electrical hoist which is connected and in operating condition. The workings below the tunnel level are kept pumped out by the operators of the nearby Hessjew mine who use the water in their milling operations.

The Occidental vein was opened by a 100-foot drift southwesterly off the Clyde tunnel. It was stoped for a length of about 45 feet along and to a height of some 60 feet above this level. These workings are caved and inaccessible. The Lone Jack vein was intersected in a southerly crosscut from the 4th level of the Clyde mine. It was followed for about 100 feet along this level. The Blue Chip vein is exposed in a few minor surface pits and trenches. It has not been explored underground.

The Gale mine is opened by a 182-foot inclined shaft; the two levels turned from this shaft have explored and developed the Gale system of

veins over a strike length of about 300 feet. A footwall split of the Gale vein also is exposed along a short drift just inside the portal of the Clyde tunnel. The Gale mine was open and accessible until recently when its lessees ceased operations and allowed the workings to flood. The surface plant, including buildings, headframe, and electrical hoist, is yet intact. The shaft is in operating condition; it is equipped with an electrical pump and a 2-inch pump column.

The underground exploration and development of the several veins in the Clyde and Gale mines is shown on figure 2 of this report and also on various figures and plates accompanying Professional Paper 245.

PROJECT PROPOSALS WITH COSTS

The project work proposed by the company is summarized in the introduction to this report. The extent and the relative locations of the proposed work are indicated on figure 2. The applicant's estimated project costs are summarized below.

Item of Cost	Estimated Cost
Independent Contracts: (800 feet core drilling at $5.00 per ft.)	$4,000
Labor and Supervision:	
Labor (8 miners, 4 surface men, 2 hoistmen)	58,696
Supervision	5,250
Technical Services	11,250
	$75,196
Operating Materials and Supplies:	
Timber	$4,000
Explosives	8,305
Pipe	6,450
Track	3,000
Power	4,950
Small tools, misc. supplies	2,214
	$28,919
Operating Equipment: (depreciation of owned equipment)	$2,043

Underground Rehab. and Repairs: (labor and Material) $3,856

Miscellaneous:

Maintenance of equipment	1,550
Assaying	375
Accounting	1,500
Liability insurance	2,168
Payroll taxes	7,773
	$13,166

Contingencies 1,000

Total estimated cost of project: $135,150

The above estimated costs were distributed to the various proposed operations as follows:

Operation	Proposed units	Total estimated cost	Unit cost
Core drilling	800 feet	$4,000	$5.00/ft.
Rehabilitation	300 "	6,480	21.50 "
Raising	600 "	25,900	43.17 "
Crosscutting	550 "	29,700	54.00 "
Drifting	1,150 "	62,100	54.00 "

The unit cost shown above for core drilling represents the independent contract price only; the costs of supervision, technical services, power, et cetera for the drilling program apparently have been distributed to the other operations. Underground core drilling of the type proposed usually can be performed for an overall unit cost of $6-7.00 per foot.

The unit costs shown for the various other proposed operations are excessive. Although most of the estimates for materials and supplies in the company's detailed cost schedule are high, the excessive unit costs primarily are due to the large amount of labor, supervision, and technical service that has been included.

In this district, the overall unit cost of drifting, crosscutting, and raising should not exceed $35.00 per foot, even under difficult conditions, and the cost of such work under normal conditions should average between $30.00 and $35.00 per foot. The unit cost of rehabilitating old drifts and crosscuts

in the mines of the district probably would average from $10.00 to $15.00 per foot depending upon the conditions encountered. The total cost of a project such as has been proposed should range between $80,000 and $90,000.

CONCLUSIONS

Two separate areas are considered for exploration under the application. Area I includes the exploration by drifting and raising from the 4th level of the Clyde mine on the downdip projection of the Lone Jack vein. This structure is prospected on the surface for a distance of about 400 feet along strike; and from the 4th level of the Clyde mine, 100 feet of drifting has prospected the vein at depth. No point on the vein, either on the surface or underground, has been considered worthy of additional work. Although the structure is apparently persistent, it has not been demonstrated to contain significant quantities of tungsten. Neither the northeasterly nor the southwesterly faces of the structure in the underground exposure show any sign of ore minerals. There is no reason to expect that this structure will contain more or better ore material than has been encountered underground or at the surface.

A second target within the block designated Area I involves exploration from the Clyde 4th level by crosscutting to and drifting and raising along the downdip projection of the Blue Chip vein. As with the Lone Jack vein, this structure has been intermittently exposed by prospect pits over a strike length of about 400 feet. There are no underground intersections of the Blue Chip vein. No minable concentrations of tungsten ore were encountered on the surface nor did any point on the structure show sufficiently encouraging signs of mineralization as to warrant continued exploration. There seems no reason to presume that this vein structure will contain more or higher grade ore material than has been exposed at the

surface.

Area II of the applicant's exploration program involves the downdip and westerly extensions of the Gale and the Occidental veins. The Gale vein, where exposed in the Gale mine, is noted to be a weak vein that breaks into discontinuous fractures in the northeast part of the workings. It is suggested, however, that the structure may gain strength to the southwest. Unfortunately, the southwesternmost exposures of the vein reveal it to be essentially barren of ore mineralization, and on the deepest level of the Gale mine the vein could not be identified. Thus there seems little reason to expect the Gale vein to contain minable ore bodies in the area for which exploration assistance has been requested.

The Occidental vein is exposed by a 100-foot drift from the Clyde tunnel. This structure contained only very meager amounts of tungsten mineralization which have been mined out. The easternmost exposure of the vein reveals it to have broken up; the westernmost exposure could not be observed because of caved ground. It may be stated that where seen the vein structure is relatively weak and contained only very minor tungsten mineralization. There is no reason to believe that the grade or size of ore mineralization will increase along strike or with depth.

Some of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material. The major premise of the application seems to involve a negative approach to ore exploration, i.e., although a vein is barren at one point, it may contain ore at another. Such reasoning leads to the presumption that all virgin ground is favorable for exploration.

RECOMMENDATIONS

It is recommended that the company's application for exploration assistance at the Clyde mine be denied.

DMEA
Date Rec'd.

DEC 21 1955

BUREAU OF MINES
Denver, Colorado

December 20, 1955

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Reg. III

From: Acting Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., Clyde mine, Boulder County, Colorado

The above brochure was received in this office on December 20, 1955.

An examination will be made and report prepared by an engineer from this office.

JOHN F. SHAW

John F. Shaw

cc: 2w/orig.
E. N. Harshman
J. F. Shaw
Sec. of Comm. (2)

40 O

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

RECEIVED
DEC 23 1955

December 19, 1955

224 New Customhouse
Denver 2, Colorado

Copy retained 4

Memorandum

To: J. F. Shaw (With brochure)
E. N. Harshman

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., Clyde Mine, Boulder County, Colorado

Enclosed is the subject application in the amount of $128,180.00. Also enclosed is a copy of a letter from the Chairman of the Operating Committee dated December 13, 1955 and attached memoranda of review of the application by the Tungsten Commodity Group.

A field examination and suitable report are required.

E. N. Harshman

E. N. Harshman

Enclosures

HMC:ab

cc: Sec. Op. Comm. (2)
Docket 4038
Chron.

400

DEC 13 1955

4038

Mr. W. M. Traver, Executive Officer
DMEA Field Team, Region III
224 New Custom House
Denver 2, Colorado

Re: Docket No. DMEA-4037, Tungsten
Cold Spring Tungsten, Inc.
Lily Mine
Boulder County, Colorado

Docket No. DMEA-4038, Tungsten
Clyde Mine

Docket No. DMEA-4072, Tungsten
Cold Spring & Forest Home Claims

also

Docket No. DMEA-1447, Tungsten
Contract No. Idm-E54
Cold Spring Claim, et al.

Dear Mr. Traver:

Reference is made to the captioned applications for exploration assistance. Reference is also made to Sec. 6.(e) of DMEA Order-1, Amended, which section provides that among the criteria to be considered and weighed in passing upon applications for exploration projects shall be the operating experience and background of the applicant.

By letter of July 7, 1954, the Executive Officer, DMEA Field Team, Region IV (now designated Region III), requested from Cold Spring Tungsten, Inc., the final engineering and geologic report for the subject contract (Idm-E54, Docket DMEA-1447). The Field Team on September 14, 1954, again requested the same report, and it was then our understanding that it would be available about December 1, 1954. Therefore, unless and until the applicant demonstrates its ability to comply with the existing contract by providing an acceptable final report, we cannot enter into further contracts with the same operator. Please advise Mr. Ridland accordingly.

As it is possible, however, that the necessary report will soon be available, we are referring the above-mentioned three applications to the Field Team, Region III, for review. Therefore, you can schedule or, if desirable, make field examinations for the respective properties while we are waiting for completion of all requirements for termination of the former contract.

Enclosed for your information are copies of memoranda, as listed below, relating to the captioned applications, prepared by the commodity specialists of the Bureau of Mines and Geological Survey:

Docket No.	Date of Memorandum	From	Agency
4037	11-1-55	N. E. Nelson	Geol. Survey
	11-16-55	R. W. Holliday	Bur. Mines
4038	11-3-55	N. E. Nelson	Geol. Survey
	11-16-55	R. W. Holliday	Bur. Mines
4072	11-30-55	N. E. Nelson	Geol. Survey
	11-29-55	R. W. Holliday	Bur. Mines

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee

Enclosures

APPROVED:

/s/ Robert W. Gechan
Member, Bureau of Mines

Thor H. Kiilsgaard
Member, Geological Survey

Copy to: Docket DMEA 4037
Docket DMEA 4038
Docket DMEA 4072
Code 400 (3)
Code 400-Reading File
Operating Committee
Admin. Reading File
Thor Kiilsgaard, USGS
R. W. Holliday, USBM
Field Team, Region 3

TLChapman/WSMartin/ls
12/7/55

IN REPLY REFER TO:

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

408

RECEIVED
NOV - 4 1955

November 3, 1955

Re: DMEA 4038
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado
$128,180.00 - Tungsten

Memorandum

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

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

Subject: Review of application.

Like application 4037 by the same company, this proposal concerns diamond drilling and underground work in a search for extensions, lateral and downward, of veins which where last seen or worked in were not tungsten-bearing.

Professional Paper No. 245, Geology and Ore Deposits of the Boulder County Tungsten District (1953) contains much information concerning the Clyde and Gale mines. Unless work done subsequent to the field work of the authors has bettered the outlook, the targets afforded are somewhat indefinite. Of the Gale vein one target of the diamond drilling and possibly underground work, the Paper says, " . . . It is a weak vein that breaks into discontinuous small fractures near the intersection with an eastward trending vein in the Gale mine, but it was fairly productive. The vein becomes stronger to the southwest, and indications of it, or of overlapping veins are found at the surface as far southwestward as the vicinity of the Phillip Extension and Hoosier mines. It evidently is a persistent vein zone, and its intersections with the Clyde and other eastward-trending veins seem worthy of exploration." The drill holes, probably because of property limits, as laid out, are not directed toward such an intersection.

The Occidental vein, as shown on Plate 12, was tungsten-bearing for a length of 55 feet and was stoped upward for 60 feet. A possible westward and downward extension of the vein would be prospected by the drill holes.

Of the Lone Jack and Blue Chip veins the Professional Paper gives no information other than showing X's and veins at their locations. If drilling is worthwhile in looking for

possible ore shoots in other veins, perhaps drilling rather than underground work should be used to get preliminary information on these veins which, according to the data on hand, have provoked little work and produced no ore.

A better program could be conceived if the claims to the west of the project block should be included.

To be brought up-to-date, information available to the Field Team is needed, and referral is recommended.

W. E. Nelson

W. E. Nelson

WENelson:iml
G-11/3/55

cc: Director's redding, 4212
Branch reading, 4212
IMRA (3) ✓
Docket file
R. Holliday, 3513

400

CLYDE AREA
BOULDER DISTRICT

CONTRACTS

Hetzer Mines, Inc. DMEA-2810, Contract No. Idm-E592. dated August 31, 1953.
Rescinded before any work was done.
Amount of contract, $30,400.00 3,800 feet of diamond drill holes.
12 holes to cover the following claims:

Hidden Fortune,	Lily	Pinto	Laura
Eliza	Ash Pan	Cypress	Slide
Gale	Red Spruce	Red Pine	Occidental
Gulch	Clyde	Lone Jack	Blue Chip
Luck Bill	McKenna		

Williams and Williams, DMEA-3483, Contract No. Idm-E748. Four amendments
Total cost $15,700.00. Total accepted cost $15,160.00
Work substantially completed. Non-Certification recommended
Claims included in contract:

Gale	Slide	Red Spruce	Luck Bill

Johnson Brothers and Prime. DMEA-3173, Contract No. Idm-E657. Two amendments
Total Accepted cost $37,744.00. Work substantially completed. Certified
The following claims were included in the contract

Hoosier	Phillip	Hummer	McKenna

Application

Cold Spring Tungsten, Inc. DMEA-4038. Denial recommended
Application for $128,180.00
The following claims were included in the application

Red Spruce	Red Pine	Occidental	Gulch
Clyde	Lone Jack	Blue Chip	

All these claims were in the Hetzer Mines, Inc. contract

RECEIVED
MAY 18 1956

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

224 New Customhouse
Denver 2, Colorado

May 16, 1956

Memorandum

To: Chairman, Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., (Clyde mine), Boulder County, Colorado.

Dist. made G.

Enclosed are the Washington Office copies of the letter to Mr. G. C. Ridland, which were forwarded by your letter of May 11, 1956, for our review and, if found satisfactory, to forward the original on to Mr. Ridland.

We consider the letter to have been very well prepared and have forwarded the original to Mr. Ridland.

W. M. Traver

W. M. Traver

Enclosures

Mailed in Field.

DOCKET
SURNAME
400 Chapman
Martin
Nelson
Yoga
Selfridge
Stephenson

MAY 15 1956

Mr. G. C. Ridland, Manager
Cold Spring Tungsten, Inc.
1036 First National Bank Building
Denver 2, Colorado

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

Dear Mr. Ridland:

Your letter of April 17, 1956, requests that we reconsider our denial of the subject application for exploration assistance; refers to our Docket No. DMEA-2810, Contract No. Idm-E592, executed August 31, 1953, and rescinded December 1, 1958, by agreement with Hetzer Mines, Inc. before any work was done, and states that nothing has changed at the property.

The following tabulation lists the claims included in the canceled contract, those included in two subsequent DMEA projects, and those covered by your subject application:

Hetzer Mines, Inc. DMEA-2810 Idm-E592	Johnson Bros. & Prime DMEA-3173 Idm-E657	Williams and Williams DMEA-3483 Idm-E748	Clyde Mine DMEA-4038
Laura			
Hidden Fortune			
Lily			
Pinto			
Kliss			
Ash Pan			
Cypress			
Slide		Slide	
Luck Bill		Luck Bill	
Gale		Gale	
Red Spruce		Red Spruce	Red Spruce
Red Pine			Red Pine
Occidental			Occidental
Gulch			Gulch
Clyde			Clyde
Lone Jack			Lone Jack
Blue Chip			Blue chip
McKenna	McKenna		McKenna
	Hunner		
	Phillip		
	Hoosier		

In addition, during the previous DMEA operations we were inclined to believe that the General Services Administration's tungsten program in the Boulder District might result in the production of large tonnages of lower grade that would contain a substantial number of units of WO_3. Experience in the area surrounding the Clyde has indicated that the earlier operators were thorough in exploring, developing and mining the ores in this area. The substantial amount of work completed under the DMEA projects mentioned indicates to us that the possibilities are relatively small for finding ore bodies in the included and surrounding area that will significantly improve the mineral supply position.

Considering all our present information we cannot agree that nothing has changed at the property; we do not feel we would now be justified in re-issuing our formerly proposed Hetzer Mines, Inc. contract, and our denial of your subject application for exploration assistance is reaffirmed.

Sincerely yours,

C. O. Mittendorf

Administrator

TLChapman/fec
5/10/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.
FT. REG. III
R. W. Holliday, USBM
T. H. Kiilsgaard, USGS

DOCKET
SURNAME
Chapman
Yeggin
Selfridge
FE Johnson

400

MAY 11 1956

Mr. W. M. Travers, Executive Officer
DMEA Field Team, Region III
224 New Customhouse
Denver 2, Colorado

Re: Docket No. DMEA 4036 - Tungsten
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado

Dear Mr. Travers:

Reference is made to your copy of letter of April 17, 1956, from Mr. G. C. Ridland, Manager, Cold Spring Tungsten, Inc. to Mr. C. O. Mittenderf, Administrator, DMEA, requesting that we reconsider our denial of the subject application for exploration assistance.

Also enclosed for your consideration is a reply to Mr. Ridland's above noted letter. If our letter meets with your approval please forward it to Mr. Ridland; if not please return it to us with your comments and any suggested changes.

Sincerely yours,

George C. Selfridge
Chairman, Operating Committee (S/S)

Enclosures

APPROVED:

/s/ Robert W. Geehan
Member, Bureau of Mines (S/S)

N. E. Nelson
Member, Geological Survey (S/S)

TLChapman/fec / 5/8/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.
FT. REG. III
R. W. Holliday, USBM
T. H. Kiilsgaard, USGS

R.C.S.

COLD SPRING TUNGSTEN, INC.
1036 FIRST NATIONAL BANK BUILDING
DENVER 2, COLORADO
Telephone: AMherst 6-0321

April 17, 1956

RECEIVED
APR 19 1956

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

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

Dear Mr. Mittendorf:

We wish to acknowledge receipt of your letter of April 2nd informing us that our application is denied for reason that the probability of disclosing minable tungsten ore reserves is not sufficiently promising to justify Government participation.

May we call your attention to the fact that we (Hetzer Mines, Inc, our predecessor) previously made application for exploration aid in the Clyde Mine, and you found it sufficiently promising at that time to enter into

Contract No. Idm-E592
Docket DMEA 2810,

total program to cost $30,400 of which the Government would participate in the amount of $22,800. The program was not carried out by Hetzer due to a lack of funds. At this time, however, we do have the capital required for our portion of the proposed program and could start immediately on the program authorized by this contract.

As the previous contract had been cancelled by the default of Hetzer, we applied for a new contract for a new program consisting largely of crosscutting and drifting rather than diamond drilling. This does not mean we would be adverse to the prior program and a reinstatement of the original contract.

It does not seem reasonable that at one time you find the property with sufficient promise to authorize a $30,400 program and at another time you find it not sufficiently promising. Nothing has changed at the property.

Please reconsider our application, and a modification of the proposed program, if the one presented does not meet with your approval. We have no objection to amending the former contract, Idm-E592, to put it back in force, and we will start the work as soon as you give the word.

Yours very truly,

COLD SPRING TUNGSTEN, INC.

G. C. Ridland

G. C. Ridland

GCR:bh

cc: Mr. W. M. Traver, Executive Officer
DMEA, Field Team, Region III
224 New Customhouse
Denver 2, Colorado

DOCKET
SURNAME
McMahon
Kelton
Gechan
Martin
Selfridge
Johnson

400

APR 2 1956

Cold Spring Tungsten, Inc.
1936 First National Bank Building
Denver 2, Colorado

Re: Docket No. DMEA 4038 - Tungsten
Clyde Mine
Boulder County, Colorado

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 tungsten mineralization in the Clyde Mine, indicates to us that the probability of disclosing minable tungsten 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. Mitterdorf

Administrator

ABMcMAHON/foc
3-29-56
cc to: Docket
Code 400
Adm. Read. File
Operating Comm.
FT. REG. III
Messrs. Holliday, USBM
Kiilsgaard, USGS

R.G.K.

DOCKET
SURNAME
McMahon
Nelson
Martin

March 29, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $126,180.00
Docket No. DMEA 4038 - Tungsten
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado

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

1. The applicant, Cold Spring Tungsten, Inc., 1036 First National Bank Building, Denver 2, Colorado, requested exploration assistance in the amount of $126,180.00 for diamond drilling, crosscutting, drifting and raising in the Clyde Mine.

2. The applicant controls by ownership the following patented lode mining claims comprising approximately 29 acres and located in the NW. ¼ sec. 7, T. 1 S., R. 72 W., 6th P. M., Boulder County, Colorado:

Claim Name	U. S. Survey No.
Red Spruce	1836
Red Pine	"
Confidential	"
Gulch	"
Clyde	"
Lone Jack	"
Mine Chip	"

3. The proposed program consists of:

Operation	Proposed Units	Total Estimated Cost	Unit Cost
Core drilling	800 feet	$ 4,000	$5.00/ft.
Rehabilitation	300 "	6,450	21.50/ft.
Raising	600 "	25,900	43.17/ft.
Crosscutting	550 "	29,700	54.00/ft.
Drifting	1,150 "	62,100	54.00/ft.

The above operations were designed to (a) intersect, and explore the westerly and downward projections of the Gale and Occidental veins beyond their known exposures in the Gale and Clyde mines; (b) to further explore the Lone Jack vein on the 4th level of the Clyde Mine and; (c) on this same level, to crosscut and drift on the Blue Chip vein.

4. The project area is underlain by fine to coarse-grained aplite, alaskite and pegmatite above the 4th level of the Clyde Mine. Below the 4th level schist is found in the eastern part of this mine and on each succeeding level it is found west of its position on the level above.

The exposed surfaces of the Gale vein in the Clyde tunnel (3rd level) shows a 1 to 3 feet width of brecciated country rock and horn quartz with very little ferberite mineralization. Crosscutting and drifting from the Gale shaft under an earlier DMEA contract (Docket No. 3483) failed to disclose a structure that could be identified as the Gale vein.

About 100 feet of the Occidental vein was explored by a drift from the Clyde tunnel. Where observed, the mineralized portion of the vein is from one-half to 2 inches wide and consists principally of brecciated horn quartz with a small amount of fine grained ferberite.

The Lone Jack vein is exposed, at intervals for about 400 feet on surface, by occasional prospect pits and by a 100 foot drift on the 4th level of the Clyde Mine. In this drift it is a weak 1-2 inch wide structure which sporadically contains small veinlets of ferberite not more than one-fourth inch wide.

The Blue Chip vein is intermittently exposed by prospect pits for about 400 feet on the surface which apparently did not justify additional exploration. This mine has not been explored underground.

5. The Field Examiners conclude that none of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material and recommend that the applicants' request for exploration assistance at the Clyde Mine be denied.

The Field Team and the Commodity Divisions of the Geological Survey and Bureau of Mines concur in this recommendation.

ADMcMAHON/foc
3/28/56
cc to: Docket
Code 400
Admr. Read. File
Operating Comm.

W. S. Martin, Chief
Iron and Ferro-Alloys Division

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

March 29, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $128,180.00
Docket No. DMEA 4038 - Tungsten
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado

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

1. The applicant, Cold Spring Tungsten, Inc., 1036 First National Bank Building, Denver 2, Colorado, requested exploration assistance in the amount of $128,180.00 for diamond drilling, crosscutting, drifting and raising in the Clyde Mine.

2. The applicant controls by ownership the following patented lode mining claims comprising approximately 29 acres and located in the NW. $\frac{1}{4}$; sec. 7, T. 1 S., R. 72 W., 6th P. M., Boulder County, Colorado:

Claim Name	U. S. Survey No.
Red Spruce	18340
Red Pine	"
Occidental	"
Gulch	"
Clyde	"
Lone Jack	"
Blue Chip	"

3. The proposed program consists of:

Operation	Proposed Units	Total Estimated Cost	Unit Cost
Core drilling	800 feet	$ 4,000	$5.00/ft.
Rehabilitation	300 "	6,480	21.50/ft.
Raising	600 "	25,900	43.17/ft.
Crosscutting	550 "	29,700	54.00/ft.
Drifting	1,150 "	62,100	54.00/ft.

The above operations were designed to (a) intersect, and explore the westerly and downward projections of the Gale and Occidental veins beyond their known exposures in the Gale and Clyde mines; (b) to further explore the Lone Jack vein on the 4th level of the Clyde Mine and; (c) on this same level, to crosscut and drift on the Blue Chip vein.

4. The project area is underlain by fine to coarse-grained aplite, alaskite and pegmatite above the 4th level of the Clyde Mine. Below the 4th level schist is found in the eastern part of this mine and on each succeeding level it is found west of its position on the level above.

The exposed surfaces of the Gale vein in the Clyde tunnel (3rd level) shows a 1 to 3 foot width of brecciated country rock and horn quartz with very little ferberite mineralization. Crosscutting and drifting from the Gale shaft under an earlier DMEA contract (Docket No. 3483) failed to disclose a structure that could be identified as the Gale vein.

About 100 feet of the Occidental vein was explored by a drift from the Clyde tunnel. Where observed, the mineralized portion of the vein is from one-half to 2 inches wide and consists principally of brecciated horn quartz with a small amount of fine grained ferberite.

The Lone Jack vein is exposed, at intervals for about 400 feet on surface, by occasional prospect pits and by a 100 foot drift on the 4th level of the Clyde Mine. In this drift it is a weak 1-2 inch wide structure which sporadically contains small veinlets of ferberite not more than one-fourth inch wide.

The Blue Chip vein is intermittently exposed by prospect pits for about 400 feet on the surface which apparently did not justify additional exploration. This ~~mine~~ vein has not been explored underground.

5. The Field Examiners conclude that none of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material and recommend that the applicants' request for exploration assistance at the Clyde Mine be denied.

The Field Team and the Commodity Divisions of the Geological Survey and Bureau of Mines concur in this recommendation.

W S Martin

W. S. Martin, Chief
Iron and Ferro-Alloys Division

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

March 22, 1956

Copy retained 400

Memorandum

To: Chief, Iron and Ferroalloys Division - DMEA
Through: Chief, Branch of Ferrous Metals & Ferroalloys

From: Commodity Specialist - Tungsten

Subject: Review of Field Team Examination Report
Docket No. DMEA 4038
Clyde Mine
Boulder County, Colorado
Cold Spring Tungsten, Incorporated
1036 First National Bank Building
Denver, Colorado
$128,180.00 - Tungsten

This report is based on substantial knowledge of the area and shows careful consideration of geological factors and history of production. Although there is erratic mineralization in the area, the liklihood of discovering significant tonnages of ore grade material does not justify the proposed expenditure.

I concur with the field team recommendation that the application be denied.

R W Holliday
R. W. Holliday

Docket

IN REPLY REFER TO:

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

RECEIVED
MAR 22 1956

March 20, 1956

Copy retained 400

Re: DMEA 4038
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder Co., Colorado
$128,180.00 - Tungsten

W 509

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 exploring by cross-cutting, drifting and diamond drilling the downward and lateral extensions of onetime productive tungsten veins.

The estimated cost of the proposed work is $128,180.00.

The examiners conclude that, "None of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material."

With the Field Team the examiners recommend denial of the application.

I concur with the recommendation.

N. E. Nelson

N. E. Nelson

Docket

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

March 12, 1956

RECEIVED
MAR 14 1956

224 New Customhouse
Denver 2, Colorado

WSM

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., Clyde Mine, Boulder County, Colorado

Enclosed are the original and three copies of a joint engineering and geologic report on the subject docket.

The field examiners conclude that there is little possibility of discovering a significant amount of tungsten by the proposed exploration. They recommend that the application be denied, and we concur in this recommendation.

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Reviewed by
DMEA OPERATING COMMITTEE
3-19-56
(date)

DMEA
Date Rec'd.
MAR 9 1956

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MAR 14 1956
BUREAU OF MINES
Denver, Colorado

TRANSMITTED

MAR 12 1956

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
March 8, 1956

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman
John F. Shaw

Subject: Examination Report on Docket No. DMEA 4038 (Tungsten)
Cold Spring Tungsten, Inc., (Clyde mine) Boulder County, Colorado

Enclosed are the original and 7 copies of a Joint Engineering and Geologic Report by R. W. Osterstock and R. L. Bolmer, mining engineer, covering Docket No. DMEA 4038.

Cold Spring Tungsten, Inc. applied for exploration assistance to explore the Clyde mine by diamond core drilling, crosscutting, drifting and raising.

A field examination was made on January 31, 1956 by R. W. Osterstock and R. L. Bolmer. The examining team concluded that there was little possibility of discovering a significant amount of tungsten by the proposed exploration.

It is recommended that the application be denied.

E. N. Harshman

E. N. Harshman
Member Field Team

John F. Shaw

John F. Shaw
Supervising Mining Engineer

JFS/mw
cc: 7
EMHarshman
DMEA 4038
Chron

Reviewed by
DMEA OPERATING COMMITTEE
3-19-56

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
MAR 14 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

TRANSMITTED
MAR 12 1956

DMEA 4038

CLYDE MINE
COLD SPRING TUNGSTEN, INC.
Boulder County, Colorado

Tungsten

Joint Engineering and Geologic Report

R. W. Osterstock
Geological Survey

R. L. Bolmer
Bureau of Mines

March 7, 1956

Reviewed by
DMEA OPERATING COMMITTEE
3-19-56
(Date)

DMEA 4038

CLYDE MINE
COLD SPRING TUNGSTEN, INC.
BOULDER COUNTY, COLORADO

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DMEA 4038
CLYDE MINE
COLD SPRING TUNGSTEN, INC.
BOULDER COUNTY, COLORADO

RECEIVED
MAR 14 1955

INTRODUCTION

Cold Spring Tungsten, Inc., 1036 First National Bank Bldg., Denver 2, Colorado, applied for aid in a project of exploration for tungsten at the Clyde mine, Boulder County, Colo. The application was made pursuant to DMEA Order 1, under the Defense Production Act of 1950, as amended. It was submitted to the Defense Minerals Exploration Administration October 24, 1955 and assigned Docket No. DMEA 4038.

In its application, the company proposed to core drill two horizontal holes northwesterly from the 6th level of the Clyde mine so as to intersect the westerly extensions and downward projections of the Gale and Occidental veins beyond their known exposures in the Gale and Clyde mines. If the results of such drilling prove promising, the company proposes an unspecified amount of crosscutting to, drifting along, and raising on those two veins. The company also proposes to rehabilitate some 300 feet of the 4th level of the Clyde mine and extend an existing 4th level drift 125 feet westerly and 175 feet easterly along the Lone Jack vein and to raise on this structure. In addition, it proposes to crosscut 200 feet southerly from the 4th level of the Clyde mine to intersect the Blue Chip vein and to drift 175 feet westerly and 275 feet easterly along, and to raise an unspecified distance on, that structure. Although the application is not specific as to the exact amount of work proposed for all the individual phases of the program, it does indicate that an aggregate total of 800 feet of core drilling, 300 feet of level rehabilitation, 600 feet of raising, 500 feet of crosscutting, and 1,150 feet of drifting is contemplated. The applicant estimated that the proposed project will cost a total of $128,180.00 and can be completed within a period of 15 months.

The company's application was reviewed in Washington and, on December

13, 1955, was referred to the DMEA Field Team, Region III for a field examination of the property. The property was inspected January 31, 1956 by an examining team from the Geological Survey and the Bureau of Mines. The inspection was made with D. H. Jardine, a representative of the applicant. The project proposals subsequently were discussed with Elmer Hetzer, a former owner of the property and present superintendent of company operations in the district.

This report is based on the field examination of the property and on data either furnished by the applicant or obtained from other sources. It is prepared for the purpose of aiding the DMEA Field Team and others concerned in evaluating the applicant's request for exploration assistance.

LOCATION, TOPOGRAPHIC AND PHYSICAL FEATURES

The property is located in the NW$\frac{1}{4}$ sec. 7, T. 1 S., R. 72 W., 6th P. M., Boulder County, Colo. The Clyde and Gale mines and the Lily and Prospect tunnels, which presently are owned by the applicant; the Rake-off mine, owned by Vanadium Corporation of America; and several other formerly productive properties all lie in close proximity within Sherwood Gulch at the western end of the Boulder County tungsten district (fig. 1). All of the mines are adjacent to State Highway 160 which passes through the gulch.

Nederland, Colorado, a community of about 300 population and the center of activity in the district, is approximately 2 miles south of the mine area. It is the site of the company's custom tungsten mill. Boulder, Colo., a town of some 25,000 population and the nearest supply center, is 18 miles east of Nederland. Denver, Colo., the financial and commerical center of the region, is some 35 miles southeast of the district.

The tungsten district lies on the lower eastern flank of the Colorado Front Range. It is a gently rising, dissected upland that extends from the foothills near Boulder to the steeper glaciated slopes of the Continental

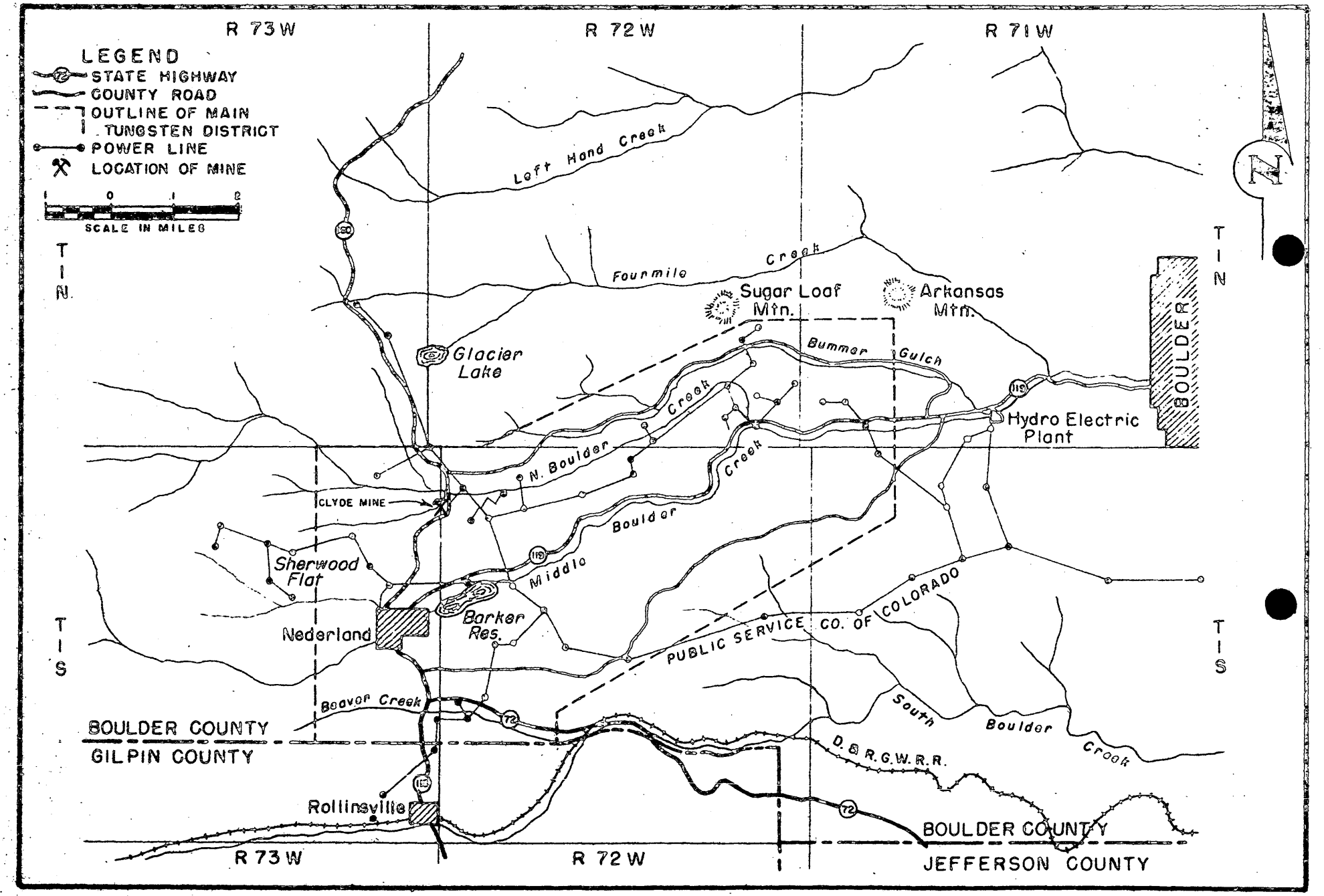

FIGURE 1 - INDEX MAP OF BOULDER COUNTY TUNGSTEN DISTRICT, COLO., SHOWING LOCATION OF CLYDE MINE.
(COLD SPRING TUNGSTEN, INC. DMEA 4038)

Divide west of Nederland. The area is characterized by rounded mountain 3 tops and flat ridges separated by broad valleys and steep canyons. The general level of the upland surface ranges in altitude from 8,500 feet in the western part of the district to about 7,500 feet in the eastern part. Mountain tops within the area rise 300 to 400 feet above this level. In the western part of the district, broad valleys lie only 200 to 300 feet below the general level of the upland surface. Farther east, these valleys deepen rapidly and become steep-sided canyons.

The altitudes within the immediate mine area range from 8,203 feet at the portal of the Lily tunnel to 8,270 feet at the collar of the Gale shaft and the portal of the Clyde (3rd level) tunnel. The climate at such elevations, although somewhat severe during the late winter and early spring months, generally permits year around mining operations. The highway through Sherwood Gulch and the other main roads within the district are maintained and generally are kept open all year. The access roads to the individual mines usually are not maintained and are apt to be blocked by snow during the winter months.

There is little timber suitable for mining purposes on the property. Most mine timber is purchased from local sawmills. A small amount of water flows through Sherwood Gulch the year around. Most of the underground workings in the vicinity, however, do make sufficient water for all mining needs. The Gale and Clyde mines are connected to the power transmission network of the Public Service Company of Colorado. The Lily and Rake-off mines have been idle for many years and are no longer connected to this system. Experienced mining labor generally can be obtained in or around the district. Although some housing is available in Nederland and other camps throughout the area, most mine personnel live in Boulder and drive to and from work.

OWNERSHIP AND EXTENT

The property rights included with the company's application for exploration assistance include the following patented lode mining claims:

Red Spruce	U. S. Mineral Survey No. 18340
Red Pine	"
Occidental	"
Gulch	"
Clyde	"
Lone Jack	"
Blue Chip	"

The above claims are owned by Cold Spring Tungsten, Inc., the applicant for exploration assistance at the property. The extent and relative locations of the claims are shown on figure 2. The property rights stipulated in the application comprise approximately 29 acres and include the southernmost workings in the Gale mine and all the workings in the Clyde mine. All of the NW$\frac{1}{4}$ of section 7 is taken up by mining claims, most of which are presently owned by the applicant company. The western boundary of the company's collective holdings coincide with the west line of section 7. The Red Spruce claim already is subject to lien by the Government under the provisions of Exploration Project Contract Idm-E748 (Williams and Williams, DMEA 3483).

HISTORY AND PRODUCTION

Tungsten was discovered near Nederland in 1899 and was first mined in 1900. The largest yearly output from the district (2,707 short tons of 60% WO_3) was in 1917 when the price reached a high of $105.00 per unit. Beginning with the year 1918, production rapidly declined. There was little or no ore mined during 1921-22, in 1932, and again in 1949. Since 1950, the output has gradually risen (see summary below) being stimulated by the higher price guaranteed through the Government's domestic purchase program and the exploration assistance available to the small mines. The total production from the district through 1954 is estimated at approximately 1$\frac{1}{2}$ million short ton units of tungsten trioxide. In 1954 (the latest year for which figures

are available), 358 tons of concentrates containing 16,489 short ton units of tungsten trioxide valued at $953,353.00 were shipped from the district.

Production from District (1949-54)

Year	s.t.u. WO_3	Year	s.t.u. WO_3
1949	96	1952	6,683
1950	539	1953	19,143
1951	3,258	1954	16,489

The Clyde, Gale and Lily mines were opened in the early nineteen hundreds and the greater part of their production was made prior to 1918. The Wolf Tongue Mining Co., a subsidiary of the Firth-Sterling Steel and Carbide Corp., owned and operated the three properties during their most productive life. The Clyde mine, one of the larger producers in the district, was operated more or less continuously from 1907 to 1929. All of the Wolf Tongue properties were purchased by Hetzer Mines, Inc. in 1950. The Clyde and Gale mines were reopened in 1952 and since have been worked intermittently and on a small scale by Hetzer Mines or its lessees. Certain exploratory work was performed at the Gale mine in 1954-55. The work was carried out with Government assistance under Exploration Project Contract Idm-E748 (Williams and Williams, DMEA 3483). The project did not result in a significant discovery and the mine presently is idle.

The total recorded production from the various claims or mines in the Clyde-Gale-Lily group is summarized as follows:

Name	s.t.u. WO_3
Clyde	34,068.2
Gale	7,742.6
Lily	3,807.5
Red Pine	142.7
Red Spruce	65.2
Lone Jack	33.1
Rake-off	20-25,000 (estimated)

Although there is evidence that a small amount of ore may have been mined from a few of the other claims in the group, they have no recorded production.

The applicant company, Cold Spring Tungsten, Inc., gained control of all the former Wolf Tongue holdings in the district, including the mill at Nederland, in September 1954 through the purchase of all of the outstanding stock in Hetzer Mines, Inc. This company since has continued to mill its own production from the Cold Spring mine and any custom ore it is able to buy from its lessees or other operators in the district. The ore from the Cold Spring mine, which was discovered as a result of an earlier DMEA project and heretofore has supplied from 60 to 80 percent of the feed to the Nederland mill, is essentially depleted. Consequently, the company has turned its attention to other formerly productive mines on its properties in an attempt to boost its dwindling mine production and thereby meet the minimum requirements of its mill.

GEOLOGY

The Boulder tungsten district is on the east flank of the Colorado Front Range and on the northeast end of the Front Range mineral belt. The district is underlain by Precambrian rocks, including coarse-grained gneissic granite (quartz monzonite) of the Boulder Creek batholith, and older schists and gneisses of the Idaho Springs formation. Pegmatite and gneissic aplite, probably related to the Boulder Creek granite, occur in dikes and irregular masses. The Precambrian rocks are intruded by dikes of various rock types, all believed to be Tertiary in age.

The most conspicuous structural feature in the district is a series of persistent northwesterly striking brecciated shear zones or "breccia reefs." They are probably Paleocene in age and pre-date the northeasterly to easterly trending fractures that contain the ferberite-bearing veins.

The Clyde-Gale mine workings are in the western or Sherwood Gulch section of the Boulder tungsten district. The project area, which includes the Clyde and Gale mines (fig. 2) is underlain by fine- to coarse-grained aplite, alaskite, and pegmatite above the 4th level of the Clyde mine. Below the 4th level schist is found in the eastern part of the Clyde, and on each succeeding level it is found west of its position on the level above. It has been suggested[1/] that the aplite-schist contact may have an average dip of 32° westerly below the Clyde 4th level. All of the Gale workings are within aplite and pegmatite although the schist must be very near the lowest level.

The aplitic country rock exhibits a marked gneissic structure believed to be a primary feature. The Hurricane Hill aplite mass with which this project is concerned carries significantly less biotite than aplitic bodies in other parts of the district. Both aplite and pegmatite are receptive hosts for tungsten deposits whereas schist forms a gougy relatively impermeable vein zone.

Two separate blocks of ground (Area I & Area II on fig. 2) are intended to be explored by the applicant's proposed program. Area I includes 2 parallel veins exposed on the surface southeast of the main Clyde workings and Area II includes the continued downward and westerly extensions of the Gale and Occidental veins.

AREA I

The Lone Jack vein, exposed on the surface by occasional prospect pits, lies about 150 feet southeast of the collar of the Clyde shaft. This structure is essentially parallel in strike and dip to the Clyde vein system.

On the surface the Lone Jack vein is intermittently exposed over a

1/ Lovering, T. S. and Tweto, O.; Geology and Ore Deposits of the Boulder County Tungsten District, Colorado; Geological Survey Professional Paper 245 (p. 118)

strike length of about 400 feet. The vein has been exposed by a 100-foot drift on the Clyde mine 4th level (fig. 2). In this drift it is a weak, 1- to 2-inch wide structure which contains sporadically located veinlets of ferberite not more than one-fourth inch wide. The vein at the extreme eastern end of the drift dips 50° NW and is barren of ore mineralization.

Approximately 200 feet southeast of the outcrop of the Lone Jack vein is the Blue Chip vein. This structure strikes northeasterly and dips 70° northwest, again essentially parallel to the main Clyde vein system. About 400 feet of strike length has been intermittently exposed on the surface by prospect pits. A few tons of carefully sorted ores may have been realized from this work; but it is noteworthy that no point on this structure was considered worthy of additional exploration.

Both of the above noted structures contain a small amount of relatively coarse-grained ferberite in small open spaces and veinlets in gray to black horn quartz. It is likely that the structures, though weak, are relatively persistent. However, district-wide observations have indicated that localization of ore shoots within a vein is not interdependent on the strength or persistence of the structure.

AREA II

The second block of ground which the applicant desires to explore includes the southwesterly extensions of the Gale and Occidental veins.

The Gale vein in its underground workings exhibited erratic dips ranging from 65° to 85° NW and even dipping 78° SE at the eastern limit of the workings in level 1. The vein also is explored by a 60-foot drift just in from the portal of the Clyde tunnel. Lovering and Tweto[2/] describes the structure as a weak vein which breaks into discontinuous fractures near an eastward trending vein in the Gale mine; the structure does appear, however,

2/ Op. cit. (page 119)

to become stronger in a southwesterly direction. Where opened on the Clyde tunnel level the Gale structure shows a 1 to 3 foot width of brecciated country rock and horn quartz; very little ferberite was noted in the exposed vein surfaces.

An earlier DMEA exploration program (Docket 3483) extended the Gale shaft 75 feet below the first level, but drifting and crosscutting operations on this new level failed to disclose a structure which could be identified as the Gale vein.

An allied objective in the Area II exploration block is the downward and eastward projection of the Occidental vein. This structure is intersected in the Clyde tunnel about 300 feet south of the portal where a 100-foot drift and a small stope were driven westerly from the tunnel level. The structure, where accessible, has an average strike of N. 65° E. and an imperfectly established dip of 75° NW. To the east of the Clyde tunnel the structure becomes frayed, breaking into thin nonpersistent fractures. To the west of the tunnel caving prevents access to more than a few tens of feet of the structure. Where observed, the mineralized portion of the vein is from one-half to 2 inches wide and consists principally of several generations of horn quartz now brecciated and sealed by a small amount of fine- and coarse-grained ferberite intimately associated with more horn quartz. Alteration is marked on both sides of the vein by the development of a parallel silicified zone generally less than 1 foot wide. Outside of this band is a wider but more irregular zone of sericitic alteration. There is no recorded production from the single stope on the Occidental, but it is doubtful that it exceeded a few hundred units of WO_3.

ORE RESERVES

There are no significant ore reserves of any classification in any of the Gale or Clyde mine workings although leasing operations might provide a small amount of ore from pillars and stope walls.

PRESENT STATUS OF THE PROPERTY

The Clyde vein was originally developed from the surface through the Clyde shaft. The upper four levels of the mine were turned from this shaft. A 500-foot crosscut adit (Clyde tunnel) later was driven from Sherwood Gulch to connect with the 3rd level workings of the old shaft. The newer 5th, 6th, and 7th levels of the mine subsequently were turned from an inclined winze that was sunk to a depth of some 300 feet below the tunnel level. Production from the mine has come from a hanging wall vein zone, which was developed to a depth of some 250 feet below the surface through the old shaft, and a footwall vein zone that was opened by the winze below the Clyde tunnel.

The original Clyde shaft and the older upper workings off of this shaft are caved and no longer accessible. The Clyde tunnel, however, is open and in good repair as is the winze below this level. Portions of the lower levels off the winze are caved or in poor repair. The winze is double compartment. One compartment contains a skidway for hoisting by means of a bucket; the other is provided with a ladderway. The station at the collar of the winze contains an electrical hoist which is connected and in operating condition. The workings below the tunnel level are kept pumped out by the operators of the nearby Hoosier mine who use the water in their milling operations.

The Occidental vein was opened by a 100-foot drift southwesterly off the Clyde tunnel. It was stoped for a length of about 45 feet along and to a height of some 60 feet above this level. These workings are caved and inaccessible. The Lone Jack vein was intersected in a southerly crosscut from the 4th level of the Clyde mine. It was followed for about 100 feet along this level. The Blue Chip vein is exposed in a few minor surface pits and trenches. It has not been explored underground.

The Gale mine is opened by a 182-foot inclined shaft; the two levels turned from this shaft have explored and developed the Gale system of

veins over a strike length of about 300 feet. A footwall split of the Gale vein also is exposed along a short drift just inside the portal of the Clyde tunnel. The Gale mine was open and accessible until recently when its lessees ceased operations and allowed the workings to flood. The surface plant, including buildings, headframe, and electrical hoist, is yet intact. The shaft is in operating condition; it is equipped with an electrical pump and a 2-inch pump column.

The underground exploration and development of the several veins in the Clyde and Gale mines is shown on figure 2 of this report and also on various figures and plates accompanying Professional Paper 245.

PROJECT PROPOSALS WITH COSTS

The project work proposed by the company is summarized in the introduction to this report. The extent and the relative locations of the proposed work are indicated on figure 2. The applicant's estimated project costs are summarized below.

Item of Cost	Estimated Cost
Independent Contracts: (800 feet core drilling at $5.00 per ft.)	$4,000
Labor and Supervision:	
Labor (8 miners, 4 surface men, 2 hoistmen)	58,696
Supervision	5,250
Technical Services	11,250
	$75,196
Operating Materials and Supplies:	
Timber	$4,000
Explosives	8,305
Pipe	6,450
Track	3,000
Power	4,950
Small tools, misc. supplies	2,214
	$28,919
Operating Equipment: (depreciation of owned equipment)	$2,043

Underground Rehab. and Repairs: (labor and Material)	$3,856
Miscellaneous:	
Maintenance of equipment	1,350
Assaying	375
Accounting	1,500
Liability insurance	2,168
Payroll taxes	7,773
	$13,166
Contingencies	1,000
Total estimated cost of project:	$128,180

The above estimated costs were distributed to the various proposed operations as follows:

Operation	Proposed units	Total estimated cost	Unit cost
Core drilling	800 feet	$4,000	$5.00/ft.
Rehabilitation	300 "	6,480	21.50 "
Raising	600 "	25,900	43.17 "
Crosscutting	550 "	29,700	54.00 "
Drifting	1,150 "	62,100	54.00 "

The unit cost shown above for core drilling represents the independent contract price only; the costs of supervision, technical services, power, et cetera for the drilling program apparently have been distributed to the other operations. Underground core drilling of the type proposed usually can be performed for an overall unit cost of $6-7.00 per foot.

The unit costs shown for the various other proposed operations are excessive. Although most of the estimates for materials and supplies in the company's detailed cost schedule are high, the excessive unit costs primarily are due to the large amount of labor, supervision, and technical service that has been included.

In this district, the overall unit cost of drifting, crosscutting, and raising should not exceed $35.00 per foot, even under difficult conditions, and the cost of such work under normal conditions should average between $30.00 and $35.00 per foot. The unit cost of rehabilitating old drifts and crosscuts

in the mines of the district probably would average from $10.00 to $15.00 per foot depending upon the conditions encountered. The total cost of a project such as has been proposed should range between $80,000 and $90,000.

CONCLUSIONS

Two separate areas are considered for exploration under the application. Area I includes the exploration by drifting and raising from the 4th level of the Clyde mine on the downdip projection of the Lone Jack vein. This structure is prospected on the surface for a distance of about 400 feet along strike; and from the 4th level of the Clyde mine, 100 feet of drifting has prospected the vein at depth. No point on the vein, either on the surface or underground, has been considered worthy of additional work. Although the structure is apparently persistent, it has not been demonstrated to contain significant quantities of tungsten. Neither the northeasterly nor the southwesterly faces of the structure in the underground exposure show any sign of ore minerals. There is no reason to expect that this structure will contain more or better ore material than has been encountered underground or at the surface.

A second target within the block designated Area I involves exploration from the Clyde 4th level by crosscutting to and drifting and raising along the downdip projection of the Blue Chip vein. As with the Lone Jack vein, this structure has been intermittently exposed by prospect pits over a strike length of about 400 feet. There are no underground intersections of the Blue Chip vein. No minable concentrations of tungsten ore were encountered on the surface nor did any point on the structure show sufficiently encouraging signs of mineralization as to warrant continued exploration. There seems no reason to presume that this vein structure will contain more or higher grade ore material than has been exposed at the

surface.

Area II of the applicant's exploration program involves the downdip and westerly extensions of the Gale and the Occidental veins. The Gale vein, where exposed in the Gale mine, is noted to be a weak vein that breaks into discontinuous fractures in the northeast part of the workings. It is suggested, however, that the structure may gain strength to the southwest. Unfortunately, the southwesternmost exposures of the vein reveal it to be essentially barren of ore mineralization, and on the deepest level of the Gale mine the vein could not be identified. Thus there seems little reason to expect the Gale vein to contain minable ore bodies in the area for which exploration assistance has been requested.

The Occidental vein is exposed by a 100-foot drift from the Clyde tunnel. This structure contained only very meager amounts of tungsten mineralization which have been mined out. The easternmost exposure of the vein reveals it to have broken up; the westernmost exposure could not be observed because of caved ground. It may be stated that where seen the vein structure is relatively weak and contained only very minor tungsten mineralization. There is no reason to believe that the grade or size of ore mineralization will increase along strike or with depth.

None of the targets of the proposed project hold sufficient promise of producing significant tonnages of ore grade material. The major premise of the application seems to involve a negative approach to ore exploration, i.e., although a vein is barren at one point, it may contain ore at another. Such reasoning leads to the presumption that all virgin ground is favorable for exploration.

RECOMMENDATIONS

It is recommended that the company's application for exploration assistance at the Clyde mine be denied.

Docket

DMEA
Date Rec'd.

DEC 21 1955

BUREAU OF MINES
Denver, Colorado

December 20, 1955

WSM

4038

Memorandum

To: W. M. Traver, Executive Officer, DMEA Field Team, Reg. III

From: Acting Superintendent, Denver Experiment Station, Reg. III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., Clyde mine, Boulder County, Colorado

The above brochure was received in this office on December 20, 1955.

An examination will be made and report prepared by an engineer from this office.

JOHN F. SHAW

John F. Shaw

cc: 2w/orig.
E. N. Harshman
J. F. Shaw
Sec. Op. Comm. (2)

Docket

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

RECEIVED
DEC 22 1955

December 19, 1955

224 New Customhouse
Denver 2, Colorado

Copy retained 4

WSM

Memorandum

To: J. F. Shaw (With brochure)
E. N. Harshman

From: Acting Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA 4038 (Tungsten), Cold Spring Tungsten, Inc., Clyde Mine, Boulder County, Colorado

Enclosed is the subject application in the amount of $128,180.00. Also enclosed is a copy of a letter from the Chairman of the Operating Committee dated December 13, 1955 and attached memoranda of review of the application by the Tungsten Commodity Group.

A field examination and suitable report are required.

E. N. Harshman

E. N. Harshman

Enclosures

HMC:ab

cc: Sec. Op. Comm. (2)
Docket 4038
Chron.

DOCKET
DMEA 4038
Chairman
Martin
Rubin
Dwyer
Selfridge
Fisher
Chambers

DEC 13 1955

Mr. W. M. Traver, Executive Officer
DMEA Field Team, Region III
224 New Custom House
Denver 2, Colorado

Re: Docket No. DMEA-4037, Tungsten
Cold Spring Tungsten, Inc.
Lily Mine
Boulder County, Colorado

Docket No. DMEA-4038, Tungsten
Clyde Mine

Docket No. DMEA-4072, Tungsten
Cold Spring & Forest Home Claims

also

Docket No. DMEA-1447, Tungsten
Contract No. Idm-E54
Cold Spring Claim, et al.

Dear Mr. Traver:

Reference is made to the captioned applications for exploration assistance. Reference is also made to Sec. 6.(e) of DMEA Order-1, Amended, which section provides that among the criteria to be considered and weighed in passing upon applications for exploration projects shall be the operating experience and background of the applicant.

By letter of July 7, 1954, the Executive Officer, DMEA Field Team, Region IV (now designated Region III), requested from Cold Spring Tungsten, Inc., the final engineering and geologic report for the subject contract (Idm-E54, Docket DMEA-1447). The Field Team on September 14, 1954, again requested the same report, and it was then our understanding that it would be available about December 1, 1954. Therefore, unless and until the applicant demonstrates its ability to comply with the existing contract by providing an acceptable final report, we cannot enter into further contracts with the same operator. Please advise Mr. Ridland accordingly.

As it is possible, however, that the necessary report will soon be available, we are referring the above-mentioned three applications to the Field Team, Region III, for review. Therefore, you can schedule or, if desirable, make field examinations for the respective properties while we are waiting for completion of all requirements for termination of the former contract.

Enclosed for your information are copies of memoranda, as listed below, relating to the captioned applications, prepared by the commodity specialists of the Bureau of Mines and Geological Survey:

Docket No.	Date of Memorandum	From	Agency
4037	11-1-55	N. E. Nelson	Geol. Survey
	11-16-55	R. W. Holliday	Bur. Mines
4038	11-3-55	N. E. Nelson	Geol. Survey
	11-16-55	R. W. Holliday	Bur. Mines
4072	11-30-55	N. E. Nelson	Geol. Survey
	11-29-55	R. W. Holliday	Bur. Mines

Sincerely yours,

George C. Selfridge

Chairman, Operating Committee (S/B)

Enclosures

APPROVED:

/s/ Robert W. Geehan (S/B)
Member, Bureau of Mines

Thor H. Kiilsgaard (S/B)
Member, Geological Survey

Copy to: Docket DMEA 4037
Docket DMEA 4038
Docket DMEA 4072
Code 400 (3)
Code 400-Reading File
Operating Committee
Admin. Reading File
Thor Kiilsgaard, USGS
R. W. Holliday, USBM
Field Team, Region 3

TLChapman/WSMartin/ls
12/7/55

Docket

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

RECEIVED
NOV 18 1955

November 16, 1955

Memorandum

To: Chief, Iron & Ferroalloys Division-DMEA
Through: Acting Chief, Branch of Ferrous Metals & Ferroalloys

From: Commodity Specialist-Tungsten

Subject: Docket No. DMEA 4038
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado
$128,180.00 - Tungsten

It is recommended that a field referral be made.

R. W. Holliday

R. W. Holliday

Copy to: Ferrous Metals
Mr. Geehan
Mr. Holliday
Files

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IN REPLY REFER TO:

Docket

RECEIVED
NOV - 4 1955

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

November 3, 1955

Re: DMEA 4038
Cold Spring Tungsten, Inc.
Clyde Mine
Boulder County, Colorado
$128,180.00 - Tungsten

Copy retained 400

WSM

Memorandum

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

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

Subject: Review of application.

Like application 4037 by the same company, this proposal concerns diamond drilling and underground work in a search for extensions, lateral and downward, of veins which where last seen or worked in were not tungsten-bearing.

Professional Paper No. 245, Geology and Ore Deposits of the Boulder County Tungsten District (1953) contains much information concerning the Clyde and Gale mines. Unless work done subsequent to the field work of the authors has bettered the outlook, the targets afforded are somewhat indefinite. Of the Gale vein one target of the diamond drilling and possibly underground work, the Paper says, " . . . It is a weak vein that breaks into discontinuous small fractures near the intersection with an eastward trending vein in the Gale mine, but it was fairly productive. The vein becomes stronger to the southwest, and indications of it, or of overlapping veins are found at the surface as far southwestward as the vicinity of the Phillip Extension and Hoosier mines. It evidently is a persistent vein zone, and its intersections with the Clyde and other eastward-trending veins seem worthy of exploration." The drill holes, probably because of property limits, as laid out, are not directed toward such an intersection.

The Occidental vein, as shown on Plate 12, was tungsten-bearing for a length of 55 feet and was stoped upward for 60 feet. A possible westward and downward extension of the vein would be prospected by the drill holes.

Of the Lone Jack and Blue Chip veins the Professional Paper gives no information other than showing X's and veins at their locations. If drilling is worthwhile in looking for

Copy retained 400

possible ore shoots in other veins, perhaps drilling rather than underground work should be used to get preliminary information on these veins which, according to the data on hand, have provoked little work and produced no ore.

A better program could be conceived if the claims to the west of the project block should be included.

To be brought up-to-date, information available to the Field Team is needed, and referral is recommended.

N. E. Nelson

N. E. Nelson

Subject: DMEA-4038
Re: Clyde Mine

Cold Spring Tungsten, Inc.,
1036 First National Bank Bldg.,
Denver 2, Colorado

October 28, 1955

Gentlemen:

The receipt of your application dated October 21, 1955 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4038 and referred to the Iron & Ferro Alloys Division.

Kindly identify all future correspondence relating to your application by this docket number.

Sincerely yours,

Robert E. Adams, Chief
Operations Control and
Statistics Division

60932

October 28, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region III.

DMEA-4038 Cold Spring Tungsten, Inc. (Clyde Mine)

Robert E. Adams
Chief, Operation's Control
and Statistics Division

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

RECEIVED
OCT 27 1955

224 New Customhouse
Denver 2, Colorado

October 24, 1955

4038

Memorandum

To: Secretary to the Operating Committee

From: Executive Officer, DMEA Field Team, Region III

Subject: Applications for DMEA aid (Tungsten) Cold Spring Tungsten, Inc. Boulder County, Colorado

Enclosed are the following:

1. Three copies of the application for exploration aid on the Clyde mine in the amount of $128,180.00.

2. Three copies of the application for exploration aid on the Lilly mine in the amount of $7,563.00.

When these applications are docketed, will you please distinguish between the number given the Clyde mine and that given the Lilly mine.

W. M. Traver

Enclosures

W. M. Traver

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

DMEA
Date Rec'd. OCT 24 19
Form Approved.
Budget Bureau No. 42-R1035.2.

RECEIVED
BUREAU OF MINES OCT 27 1955
Denver, Colorado

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. 4038
Metal or Mineral Tungsten
Date Received 10-21-55
Estimated Cost 128,180.00
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: Cold Spring Tungsten, Inc.
1036 First National Bank Building
Denver 2, Colorado

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

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

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

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

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract Please see additional sheets attached.

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

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

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

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

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

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

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

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

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

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

5. *The exploration project.*—(*a*) State the mineral or minerals for which you wish to explore Tungsten in the form of ferberite.

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

(*c*) The work will start within 30 days and be completed within 15 months from the date of an exploration project contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

[X] Money [ ] Use of equipment owned by you [ ] Other

Explain in detail on acompanying paper.

CERTIFICATION

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

Dated October 21, 1955

COLD SPRING TUNGSTEN, INC.
(Applicant)

By G. Killand

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

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OCT 27 1956

COLD SPRING TUNGSTEN, INC.
1036 First National Bank Building
Denver 2, Colorado

APPLICATION FOR AID IN AN EXPLORATION PROJECT

PURSUANT TO DMEA ORDER 1

1. (a) Applicant: Cold Spring Tungsten, Inc.
1036 First National Bank Building
Denver 2, Colorado

(b) Corporation - incorporated in the State of Colorado

(c) Officers: President - Boris Pregel, 630 Fifth Avenue
New York 20, New York
Vice-Pres. - Alexander Pregel, 630 Fifth Avenue
New York 20, New York
Secretary - Paul J. Newlon, 575 Madison Avenue
New York 22, New York
Treasurer - William Rosenblatt, 80 Broad Street
New York , New York

3. (a) The legal description of the property is as follows:

Name	U. S. Survey Lot No.
Red Spruce	18340
Red Pine	18340
Occidental	18340
Gulch	18340
Lone Jack	18340
Clyde	18340
Blue Chip	18340

These claims are located in the Grand Island Mining District of Boulder County, Colorado.

(b) The property is known as the Clyde Mine

(c) Interest in the land: owner

4. Physical Description

(a) The existing mine workings and mine facilities are as follows:

1. Surface Shaft - 300 foot deep, accessible, dipping north 25 degrees west at -74 degrees.

2. Winzes - (1) with collar on third level, 300 foot deep, accessible, dipping north 14 degrees west at 80 degrees;

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OCT 27 1956

COLD SPRING TUNGSTEN, INC.
1036 First National Bank Building
Denver 2, Colorado

collar is 50 feet east of the surface shaft; (2) with collar on third level, 215 foot deep, inaccessible, dipping north 26 degrees west at -66 degrees; collar is 187 feet east of the surface shaft.

3. Levels

First - At 30 feet from surface extending 20 feet west of surface shaft and 130 feet east

Second - At 78 feet from surface extending 60 feet west of surface shaft and 150 feet east

Third - (Clyde Tunnel level 210 feet from surface. Extending 50 feet west of surface shaft and 205 feet east of surface shaft. At a point 75 feet east of surface shaft there is a tunnel extending 530 feet north to connect with surface. At 120 feet south of the portal of this tunnel, there is a drift extending 200 feet east. At 210 feet south of the portal there is a drift extending 20 feet west and 30 feet east of the tunnel. At 255 feet south of the portal, there is a drift extending 100 feet west of the tunnel.

Fourth - At 250 feet from surface this level extends 20 feet west of surface shaft and 525 feet east of surface shaft. At the west side of the surface shaft, a crosscut extends south 110 feet from the drift to intersect the Lone Jack vein. A drift extends on the Lone Jack vein 10 feet west and 75 feet east of the crosscut.

Fifth - At 330 feet from surface extending 260 feet west of Clyde underground shaft and 350 feet east of it.

Seventh - At 500 feet from surface extending 320 feet west of Clyde underground shaft and 160 feet east of it. At a point 135 feet east of the shaft, a crosscut extends 125 feet north.

4. Stopes - stoping on the lower levels extends in an arc from a point 210 feet on the seventh level, up across the sixth and fifth levels, to a point 75 feet above the fourth level. The eastern end of this arc extends along the fourth level from 165 feet to 415 feet east of the surface shaft. Also, on the fourth level from 65 feet to 200 feet east of the surface shaft, a stope extends up past the third level for 150 feet. A third stope extends along the second level from 35 feet to 130 feet

east of the surface shaft and extends above the first level to the surface.

(b) Past Production - 8000 tons at 3.5% WO_3 (28,000 units WO_3)
Present Production - nil
Ore Reserves - unknown

(c) The Clyde mine was worked by the Wolf Tongue Mining Co. for 22 years. During this time it produced about 28,000 units of WO_3 in approximately 8,000 tons of ore that averaged around 3.5% WO_3. The two major veins in the mine are the Clyde and Footwall veins, striking north 50 - 70 degrees east and dipping 74 degrees north. There is evidence of much faulting in the area. The Footwall vein follows a pre-mineral fault which has been reopened by many successive movements. In addition to the en echelon faulting, there are sets of minor fractures that trend north 60 degrees east in the walls of both the Clyde and Footwall veins that carry ferberite and molybdenite. This mine is one of the very few places where molybdenite was observed, and it is one of the relatively few mines where tetrahedrite was found associated with ferberite. Ferberite occurs as the matrix of a horn breccia, as veinlets in the quartz gangue, outside the ore shoots is chiefly brecciated horn, cemented by later horn. The country rock above the fourth level is coarse-grained aplite or fine-grained granite cut by alaskite, fine-grained aplite and pegmatite. Below the fourth level, schist is found in each succeeding level, west of its position on the level above. The schist-granite contact dips about 32 degrees below the fourth level and has a much gentler dip above it. The areas proposed for exploration are similar in basic rock types and formations, and part of the en echelon veining of the area. The area proposed for exploration to the northwest of the existing workings is the probable continued, downward, westerly extensions of the Gale and Occidental veins that have been mined above and to the east, in the vicinity of the Clyde tunnel. The area proposed for exploration to the south includes the Lone Jack vein that is indicated at the surface and also at the fourth level in a drift that extends 10 feet west and 75 feet east of the crosscut. Another vein that is indicated at the surface, and which will be tested at depth in this exploration, is the Blue Chip vein. From their locations with regard to known workings, these veins will provide excellent possibilities for exploration.

(d) There is a good gravel road to the mill at Nederland only 2 1/4 miles distant. Residences are available at Nederland. Supplies are available at Boulder or Denver which are 17

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OCT 27 1955

COLD SPRING TUNGSTEN, INC.
1036 First National Bank Building
Denver 2, Colorado

and 40 miles away respectively.

(e) Manpower is available at the mining community of Nederland. Supplies and equipment are available at Boulder or Denver and water and power are immediately available at the mine site.

5. The Exploration Project

(a) Exploration minerals: tungsten in the form of ferberite.

(b) The proposed exploration work is in two parts, A and B, to run concurrently.

A. Diamond Drilling from the sixth level winze. Hole number one to be drilled at an angle of plus 5 degrees and in a direction of North 39 degrees West for 375 feet. Hole number two is to be drilled at an angle of plus 5 degrees and in a direction of North 24 degrees West for 425 feet. These holes are drilled to intersect the westerly downward extension of the Gale and Occidental veins from their known workings.

Depending on favorable results from the drilling, it is proposed to drive a crosscut from the sixth level winze station to these veins - then drift and raise on them.

B. Rehabilitate the fourth level of the Clyde mine for 150 feet to the south of a winze station to a drift that has been started on the Lone Jack Vein. Drift 125 feet to the west and 175 feet to the east on the Lone Jack vein. Crosscut 200 feet to the south to intersect the Blue Chip vein. Drift 125 feet west and 275 feet east on the Blue Chip vein and subsequently raise on both of them.

(c) The work to start within 30 days and to be completed within 15 months.

(d) The applicant is a Corporation organized for the purpose of exploring and operating prospective producing properties. The operation will be supervised by Dr. G. C. Ridland, Denver, Colorado, a Consulting Geologist who is known to the DMEA as manager of Cold Spring Tungsten, Inc. mine at Nederland, Colorado (DMEA Docket 1447X; Contract Idm - E54).

6. Estimate of Costs

(a) Independent contracts

Diamond Drilling - 800 feet @ $5.00/foot	$ 4,000.00

The applicant considers it possible to contract

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OCT 27 1955

diamond drilling at $5.00 per foot plus engineering, geological work, supervision and power.

6. (b) Labor, Supervision, Consultants

Miners and drillers (8men)	18,560 hrs.	@ $1.80	$ 33,408.00
Surface men (4men)	9,280 hrs.	@ 1.80	16,704.00
Hoist men (2men)	4,640 hrs.	@ 1.85	8,584.00
Superintendent	15 mo.	@ 350.00	5,250.00
Engineer	15 mo.	@ 500.00	7,500.00
Consultant	15 mo.	@ 250.00	3,750.00
			$ 75,196.00

(c) Operating materials and supplies

Small tools - shovels, picks, etc.		200.00
Mine Timber 50M @ $80.00 M (2"x8"x16')		4,000.00
Rails - 16 lb. 2000' @ $1.50/ft.		3,000.00
Pipe (including fitting)		
water - 1"	3,000 ft. @ $.50/ft	1,500.00
air - 2"	3,000 ft. @ .65/ft	1,950.00
vent -12"	3,000 ft. @ 1.00/ft.	3,000.00
Power (electric) 10,000 KWH/mo. for 15 mo. 150,000 KWH @ .033 mills/KWH		4,950.00
Water - no charge		-0-
Fuel - none required		-0-
Powder (crosscutting & drifting) 1700' @ 3.60/ft plus raising 600' @ $2.40/ft.		7,560.00
Caps and fuses - drifting and crosscutting 1700' @ .35/ft plus raising 600' @ .25/ft.		745.00
Drill steel- including price of sharpening - crosscutting & drifting 1700' @ .92/ft. plus raising 600' @ .75/ft.		2,014.00
		$ 28,919.00

(d) Operating Equipment

Hoist	$ 2,500.00
Hoisting cable	200.00
Drifters (2)	1,400.00
Stopers (2)	1,000.00
Water pump	1,000.00
Compressor	5,000.00
Mucking machine	3,800.00
Haulage Motor	5,000.00
Cars - 4 @ $100.00	400.00
Skip	130.00
	$20,430.00

Depreciation - 10% per annum 2,043.00

COLD SPRING TUNGSTEN, INC.
1036 First National Bank Building
Denver 2, Colorado

6. (con't.)

(e) Rehabilitation and Repairs - (Fourth Level for 255'

Rail - 16 lb.	255' @ 1.50/ft.		$ 382.50
Water Pump Line	255' @ .05/ft		12.75
Labor			
miners (8)	800 hrs. @ $1.80		1,440.00
surface men(4)	400 hrs. @ 1.80		720.00
hoistmen (2)	200 hrs. @ 1.85		370.00
Pipe - including fittings			
water 1"	255' @ .50/ft		127.50
air 2"	255' @ .65/ft		165.75
vent 12"	255' @1.00/ft		255.00
Timbering	255' @1.50/ft		382.50
			3,856.00

(f) No new buildings, improvements, or installations.

(g) Miscellaneous

Maintenance			
Air Compressor	$ 25.00 per mo.		
Hoist	10.00 " "		
Pump	15.00 " "		
Drills	5.00 " "		
Mucking machine	10.00 " "		
Motor	15.00 " "		
Hoisting Cable	10.00 " "	$ 90.00	
Assaying		25.00	
Accounting		100.00	
	15 mos. x	$ 215.00	3,225.00
Workmen's Compensation - employers liability insurance $2.79 per $100.00 of payroll			2,168.00
Payroll Taxes			7,773.00
			$ 13,166.00

(H) Contingencies
Items not considered above 1,000.00

Grand Total $128,180.00

ESTIMATE - per unit cost:

2	Diamond drill holes	800' @ 5.00/ft	4,000.00
	Rehabilitation	300' @ 21.50/ft	6,480.00
	Raising	600' @ 43.17/ft	25,900.00
	Crosscutting	550' @ 54.00/ft	29,700.00
	Drifting	1150' @ 54.00/ft	62,100.00
		Grand Total	$128,180.00

COLD SPRING TUNGSTEN, INC.
1036 First National Bank Building
Denver 2, Colorado

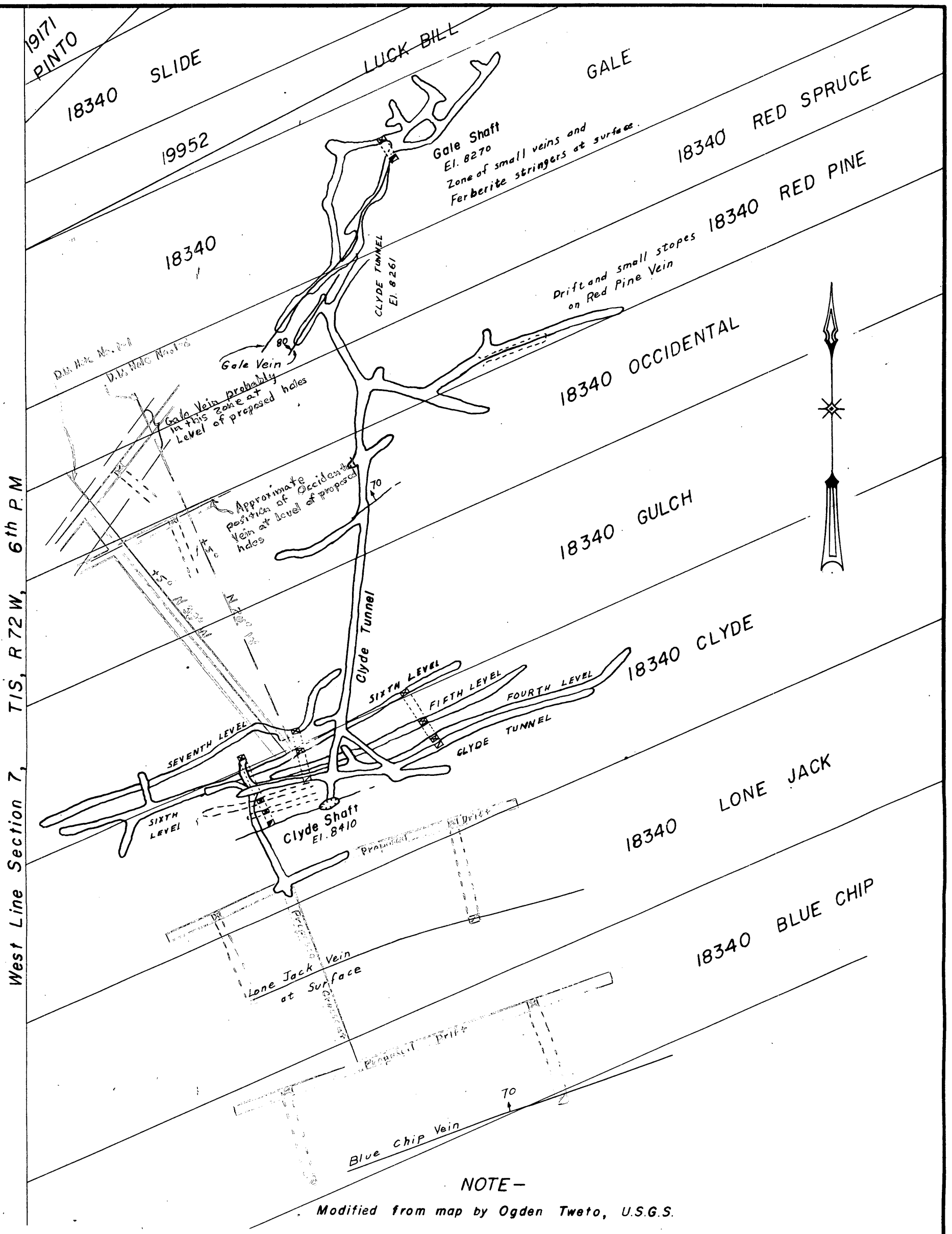
7. (a) Yes, prepared to furnish share of cost.

(b) Furnish share of costs with money.

OFFICIAL BUSINESS

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

Defense Minerals Exploration Administration
U. S. Department of the Interior
Interior Building
Washington 25, D. C.



NOTE—

Modified from map by Ogden Tweto, U.S.G.S.

SCALE 1" = 100'

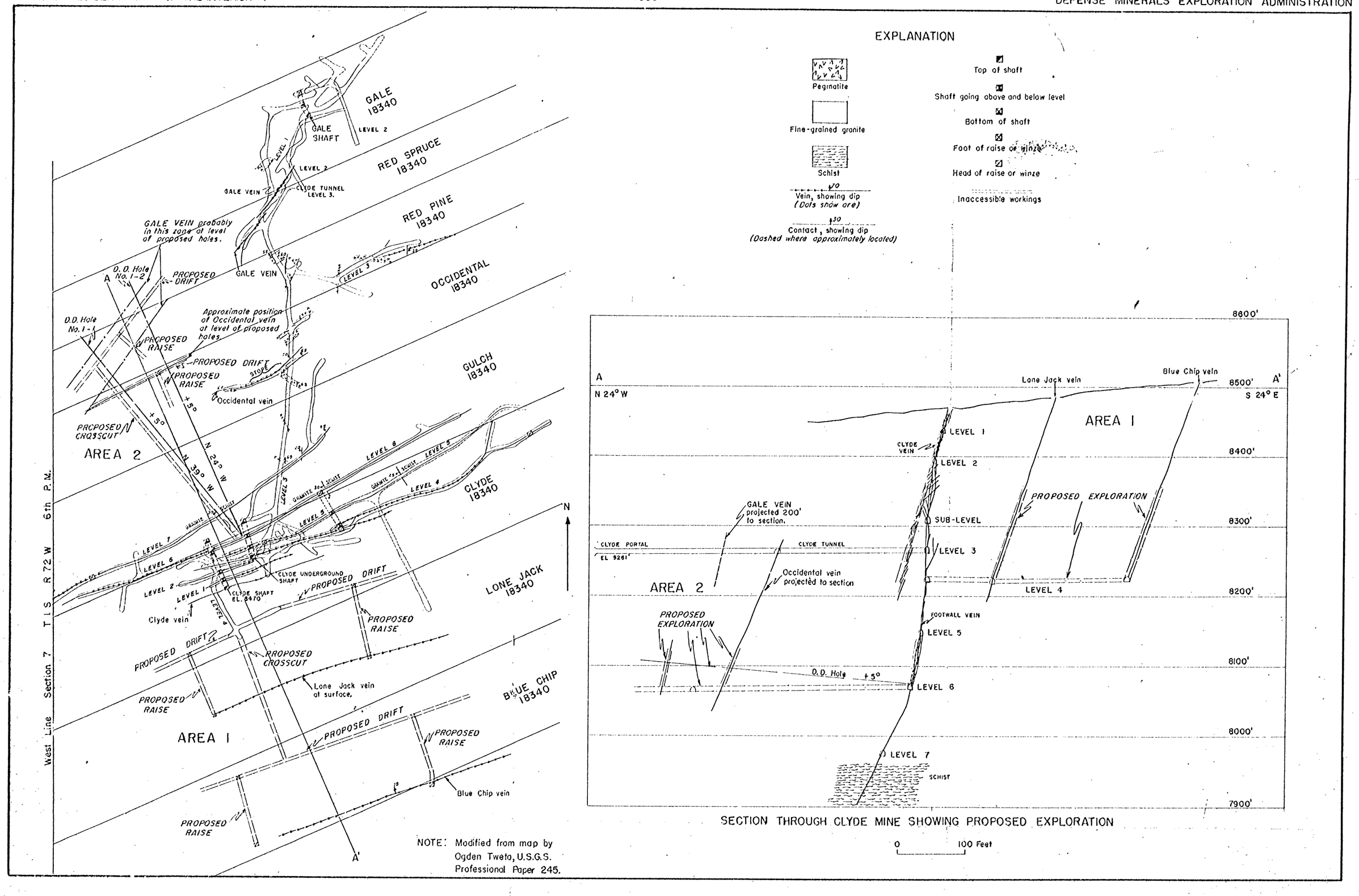


FIGURE 2. - GEOLOGIC PLAN AND SECTION OF THE CLYDE MINE