400

APR 5 1956

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

Re: Docket No. DMEA-4072, Tungsten
Forest Home and Cold Spring
Nos. 2 and 4 Mines
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 Forest Home and Cold Spring Nos. 2 and 4 properties, 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. Mittelsdorf

Administrator

cc: Docket
Code 400
Oper. Comm.
Adm. Read. File
FT, Region 3
T. Kiilsgaard, USGS
R. W. Holliday, USBM

SPHolt/ls 3/30/56

March 30, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $36,230.00
Docket No. DMEA-4072, Tungsten
Cold Spring Tungsten, Inc.
Forest Home, Cold Spring Nos. 2 and 4 claims
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 $36,230.00 for drifting, crosscutting, and diamond drilling in the Forest Home, Cold Spring No. 2, and Cold Spring No. 4 mines.

(2) The applicant is the owner of the following patented lode mining claims, situated in the NE. ¼, sec. 7, and the NW.¼, sec. 8, T. 1 S., R. 72 W., 6th Principal Meridian, Grand Island Mining District, Boulder County, Colorado, in the central part of the Boulder tungsten district:

Claim Name	U. S. Survey No.	Area involved in Application
Cold Spring	18340	From 140 to 1070 feet measured from west end of claim
Gem	18340	Southwesterly 200 feet of claim
Forest Home	19559	From 140 to 720 feet measured from west end line of claim
Silver Light	19559	Easterly 320 feet of claim

Property rights stipulated in the application, as indicated above, comprise approximately 6 acres, and include all the workings of the inter-connected Forest Home and Cold Spring No. 2 shafts, all the working of the Cold Spring No. 4 shaft, and the westward extensions of the 4th and 5th levels of the main Cold Spring mine.

(3) The proposed program is to core drill three horizontal holes from the 5th level of the Cold Spring mine to intersect the possible downward projection of a footwall vein exposed in the old workings of the Cold Spring No. 4 shaft. If favorable conditions are indicated by this initial drilling, the applicant proposes to crosscut 100 feet to the footwall vein, then drift 620 feet southwesterly along the vein to a point about 230 feet below the Forest Home and Cold Spring No. 2 workings. If results of the initial drilling are not favorable, it is proposed to drive an alternate 5th level crosscut through the area directly beneath the Forest Home workings. The applicant proposes to explore both walls of the drift or the alternate crosscut by core drilling. Total core drilling proposed is 1,420 feet in 12 holes, with 720 feet total combined drifting and crosscutting.

(4) In the area of the Forest Home and Cold Spring Nos. 2 and 4 mines tungsten mineralization occurs as ferberite ($FeWO_4$) in northeasterly to easterly trending fracture veins in quartz monzonite and aplite. Although a limited amount of tungsten ore has been mined from the Forest Home mine, and a lesser amount from the Cold Spring No. 2 workings, the nearest exposures of the Forest Home vein to the proposed project area are all barren of tungsten ore mineralization, and the small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to believe it will do so at depth.

(5) The Field Team concludes that there is little possibility of disclosing a significant amount of tungsten ore by the proposed work, and recommends that the application be denied.

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

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

cc: Docket
Code 400
Oper. Committee
Adm. Read. File

SPHolt/lz
3/30/56

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 Report
Docket No. DMEA 4072
Forest Home and Gold Spring Nos. 2 and 4 Mines
Boulder County, Colorado
Gold Spring Tungsten, Incorporated
1036 First National Bank Building
Denver, Colorado
$36,230.60 - Tungsten

Documentation of the past history of production and of geological factors is well done and the conclusions and recommendation appear to be substantiated.

I concur in the 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 4072
Cold Spring Tungsten, Inc.
Forest Home Mine
Boulder Co., Colorado
$36,230.60 - 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 drifting and diamond drilling an area down dip from the near surface productive veins.

The estimated cost of the proposed work is $36,230.60.

The examiners conclude that, "The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization. There is no reason to believe that the structure will contain significant ore bodies in the proposed project area."

With the Field Team the examiners recommend that the application be denied.

I concur with that recommendation.

N. E. Nelson

N. E. Nelson

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

400

DEC 21 1955

dmea
4022

TELETYPE

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

To consider urtel December 16, Docket DMEA 1447, Cold Spring Tungsten, Inc., we need confirmation Operator willing to calculate royalty payments in accordance with contract Idm-254 terms. Refer ourlet December 6.

Reurlet December 16, not knowing Operator's final report had been received, we complained December 15 to Operator's president, Boris Pregel. Please express regrets to Midland.

Chairman, Operating Committee

cc: Docket
Code 400
Adm. Read. File
Oper. Comm.
T. Killsgaard, USGS
R. W. Holliday, USBM
FT, Reg. 3 - confirmation

ADMcMahon/ls
12/20/55

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 Supt., Denver Experiment Station, Reg. III

Subject: Docket DMEA 4072 (Tungsten), Cold Spring Tungsten, Inc., Forest Home 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 the Denver office.

JOHN F. SHAW

John F. Shaw

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

400

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

RECEIVED
DEC 28 1955

December 19, 1955

224 New Customhouse
Denver 2, Colorado

Memorandum

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

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

Subject: Docket DMEA 4072 (Tungsten), Cold Spring Tungsten, Inc., Forest Home Mine, Boulder County, Colorado

Enclosed is the subject application in the amount of $36,230.60. Also enclosed is a copy of the letter from the Chairman of the Operating Committee dated December 13, 1955 and attached memoranda of review of the application by the Tungsten Commodity Committee.

A field examination and suitable report are required.

E. N. Harshman

E. N. Harshman

Enclosures

HMC:ab

cc: Sec. Op. Comm. (2)
Docket 4072
Chron.

400

DEC 13 1954

dmea 4072

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. Geehan

Member, Bureau of Mines

Thor H. Kiilsgaard

Member, Geological Survey

Copy to: Docket DMEA 4037
Docket DMEA 4038
Docket DMEA 4072
Code 400 (4)
Code 400-Read. File
Operating Committee
Admin. Reading File
Thor Kiilsgaard, USGS
R. W. Holliday, USBM
Field Team, Region 3

TLChapman/WSMartin/ls
12/7/55

402

November 29, 1955

Memorandum

To: Executive Officer, DMEA Field Team, Region III,
Denver 2, Colorado

Through: Acting Chief, Branch of
Ferrous Metals & Ferroalloys

From: Commodity Specialist-Tungsten

Subject: Docket No. DMEA 402
Cold Spring Nos. 2 & 4 and
Forest Home mines
Cold Spring Tungsten, Inc.
Boulder County, Colorado
Application for exploration assistance
$36,230.60

This application proposes 100 feet of crosscut, 620 feet of drifting and 1420 feet of diamond drilling.

It is recommended that a field referral be made.

R. W. Holliday

RWHolliday/tra

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

400

IN REPLY REFER TO:

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

RECEIVED
DEC - 1 1955

November 30, 1955

Re: DMEA 4072
Cold Spring Tungsten, Inc.
Forest Home Mine
Boulder County, Colorado
$36,230.60 - Tungsten

Memorandum

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

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

Subject: Review of application.

The applicant requests assistance in exploring the Forest Home-Cold Spring No. 2 vein system by drilling, crosscutting, and drifting on a level 230 feet below the bottom level of the Forest Home mine.

The estimated cost of the proposed work is estimated at:--

Diamond drilling	1420' at $ 5.00	$ 7,100.00
Crosscutting	100' at $40.20	4,020.60
Drifting	620' at $40.50	25,110.00
		$36,230.60

The Forest Home and Cold Spring No. 2 mines are credited with the production of plus or minus 15,000 units of WO_3 (Geology and Ore Deposits of the Boulder County Tungsten District, Colorado, Geological Survey Professional Paper 245, 1953). The production came from short orebodies in a somewhat complex system of veins. Compared to the depths to which work has been carried in other Cold Spring veins in workings to the east of the Cold Spring No. 4 mine, the Forest Home-No. 2 mine is shallow,--8262 elevation at the bottom Forest Home No. 2 mine and 7900 in No. 7 level of the Cold Spring New Shaft.

A limited amount of work done under Contract Idm-279 (Docket 1107) on the bottom or 200-foot level of the Forest Home mine in 1952 failed to find ore, but 65 feet of ore was drifted in an intermediate level above the 200-foot level and probably was mined out.

Two long exploratory drifts, parallel to the proposed drift, on the No. 4 and No. 5 levels of the Gold Spring mine appear to have encountered no ore in the interval between the Forest Home and a vertical plane about 300 feet west of the Old Shaft of the Gold Spring mine. Short shoots of ore seem to have been drifted on the 75-foot level of the No. 4 mine, but no stoping is suggested. Little or no crosscutting was done from the long exploratory drifts and the proposed drilling and crosscutting would prospect the ground to the north and south of the proposed drift.

If the ore shoots in the levels and stopes of the Forest Home and Gold Spring No. 2 mines are essentially bottomed, as may be inferred from the lack of ore in the bottom levels and drill holes, there would seem to be little reason to expect to find important ore in the proposed drill holes 3-1, 3-2, 3-3, 4-1, 4-2, 5-1 and 5-2.

No specific targets other than the possible downward extensions of, as known, almost barren veins are offered in support of the long drift and diamond drill holes, 1-1, 1-2, 1-3, 2-1 and 2-2.

To my knowledge no reason is advanced for the demonstrated relative shallowness of the mines near the western margin of the granite batholith, but the hypothetical north-south section on page 13, P. P. 245, may be suggestive--if it is assumed that the western margin of the batholith has somewhat the shape hypothesized for the southern margin.

The productiveness and depth of ore of the easterly section of the Gold Spring property justify curiosity as to the depth behavior of the veins to the west, but work already done would seem to have answered some if not all of the legitimate questions.

An on the ground appraisal is needed.

Referral to the Field Team is indicated and here recommended.

NENelson:iml
G-11/30/55
cc: Director's reading, 4212
Branch reading, 4212
DMEA (3)
Docket file
R. Holliday, 3513

N. E. Nelson
N. E. Nelson

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

March 13, 1956

224 New Customhouse
Denver 2, Colorado

RECEIVED
MAR 15 1956

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4072 (Tungsten) Cold Spring Tungsten, Inc., Forest Home and Cold Spring Nos. 2 and 4 Mines, Boulder County, Colorado

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

The field examiners noted that the small northwesterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to believe it will do so at depth. The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization.

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

DMEA Field Team, Region III

By W. M. Traver
Executive Officer

Enclosures

Reviewed by
DMEA OPERATING COMMITTEE

(date)

Date Rec

MAR 12 1956

BUREAU OF MINES
Denver, Colorado

RECEIVED
MAR 15 1956

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
March 9, 1956

Memorandum

TRANSMITTED

MAR 13 1956

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman
John F. Shaw

Subject: Examination Report, Docket DMEA 4072, Cold Spring Tungsten, Inc., Forest Home and Cold Spring Nos. 2 and 4 Mines, Boulder County, Colorado

Enclosed are the original and 7 copies of a Joint Examination report by R. W. Osterstock, Geological Survey and R. L. Balmer, Bureau of Mines covering Docket DMEA 4072.

Cold Spring Tungsten, Inc. applied for exploration assistance to explore the Forest Home and Cold Spring Nos. 2 and 4 mines by diamond core drilling, crosscutting and drifting. The estimated cost of the project was $36,230.60.

The property was examined on Jan. 31, 1956 by R. L. Balmer and R. W. Osterstock. The examining team concluded that there was little possibility of discovering a significant amount of tungsten by the proposed work.

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

Enclosures

cc 7
EHHarshman
DMEA 4072
Chron.

JFS/ch

Reviewed by
DMEA OPERATING COMMITTEE

(date)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

RECEIVED
MAR 15 1956

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

TRANSMITTED
MAR 13 1956

DMEA A072

GOLD SPRING TUNGSTEN, INC.

Tarant Mona and Gold Spring Nos. 2 and 4 Mines

Boulder County, Colorado

Tungsten

Joint Engineering and Geologic Report

By

R. W. Osterstock
Geological Survey

R. L. Palmer
Bureau of Mines

Reviewed by
DMEA OPERATING COMMITTEE

March 7, 1956

(date)

DMEA 4072

COLD SPRING TUNGSTEN, INC.
Forest Home and Cold Spring Nos. 2 and 4 Mines
BOULDER COUNTY, COLORADO

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Joint Engineering and Geologic Report — Page

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Location, topographic & physical features 2
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Geology 9
Ore reserves 13
Present status of the property 13
Project proposals with costs 14
Conclusions 15
Recommendations 16

ILLUSTRATIONS

Figure — Follows Page

1. Index map of Boulder County Tungsten District, Colo., showing location of Forest Home, Cold Spring Nos. 2 and 4 mines. (Cold Spring Tungsten, Inc., DMEA 4072) 2

2. Geologic plan of Forest Home and West end of Cold Spring mines 11

DMEA 4072

RECEIVED
MAR 15 1956

GOLD SPRING TUNGSTEN, INC.
Forest Home and Gold Spring Nos. 2 and 4 Mines
Boulder County, Colorado

INTRODUCTION

Gold Spring Tungsten, Inc., 1036 First National Bank Bldg., Denver, Colo., made application for aid in a project of exploration for Tungsten at the Forest Home and the Gold Spring Nos. 2 and 4 mines in 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 and assigned Docket No. DMEA 4072.

In it's application, the Company proposed to core drill three horizontal holes southerly from the 5th level of the Gold Spring mine so as to intersect the possible downward projection of a footwall vein exposed in the old workings off the Gold Spring No. 4 shaft. If favorable results are indicated by such drilling, the Company proposes to drive a 5th level crosscut 100 feet to the footwall vein and then to drift 620 feet southwesterly along that vein to a point some 230 feet below the existing workings of the Forest Home and the Gold Spring No. 2 mines. If favorable results are not indicated by the initial drilling, the Company then would drive an alternate 5th level crosscut directly through the area below the Forest Home workings. At various intervals along either the drift or the alternate crosscut, the Company proposes to prospect both walls of the heading by core drilling. In addition to 720 feet of combined drifting and crosscutting, the proposed project would involve an aggregate total of 1,420 feet of core drilling in 12 individual holes and would cost an estimated total of $36,230.60 (Government participation 75 percent or $27,172.95).

The application was reviewed by the DMEA commodity group in Washington, D. C. and, on December 13, 1955, it 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. N. Jardine, a Company representative, and Charles Turner, Superintendent of the Gold Spring mine. The proposed project also was discussed with Elmer Hatter, a former operator of the Forest Home mine 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 Company 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 Forest Home mine and the westernmost workings of the Gold Spring mine lie in the NE 1/4 section 7, T. 1 S., R. 72 W., 6th Principal Meridian, Boulder County, Colo. The main workings of the Gold Spring mine are in the NW 1/4 of sec. 8, and a small part of the property rights stipulated in the application extend into this section. The property is located in the central part of the Boulder County tungsten district about 2 miles northeast of the town of Nederland and some 10 miles west-southwest of the City of Boulder (fig. 1).

State Highway 119, which follows Middle Boulder Creek Canyon westerly from Boulder, junctions with State Highway 160 at Nederland. The property is accessible via a county-maintained road that branches easterly from State Highway 160 about 1 mile north of Nederland. It

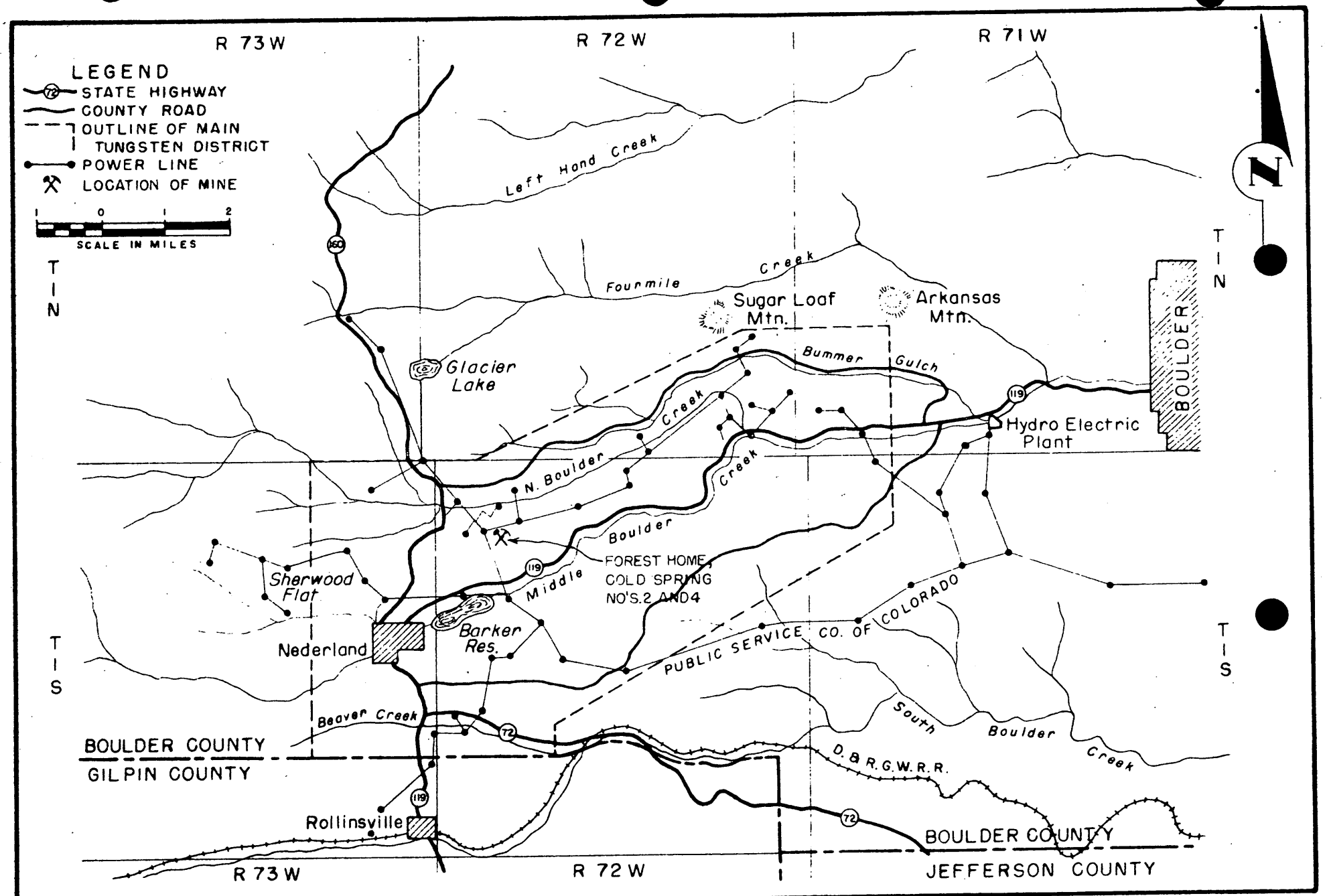

FIGURE 1 - INDEX MAP OF BOULDER COUNTY TUNGSTEN DISTRICT, COLO., SHOWING LOCATION OF FOREST HOME, COLD SPRING No's 2 AND 4 MINES. (COLD SPRING TUNGSTEN, INC. DMEA 4072)

also may be reached by a steeper mine road that turns north from State Highway 119 about 1-1/2 miles east of Nederland in the vicinity of Barker Reservoir. State Highway 119 is a paved, all weather road; State Highway 160 and the county-maintained access roads that pass the property are graveled. All are kept free of snow during the winter months.

The Tungsten district in Boulder County comprises a narrow belt 9-1/2 miles long and 4-1/2 miles wide that trends southeasterly from Arkansas Mountain, 4 miles west of Boulder, to Sherwood Flats, 1-1/2 miles northwest of Nederland. The district lies on the lower eastern flank of the Front Range, a gently rising, dissected upland that extends from the foothills near Boulder to the steeper, glaciated slopes of the Continental 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 district rise 300 to 400 feet above this level. In the western part of the area, broad valleys lie only 200 to 300 feet below the general level of the upland surface. Farther east, the valleys deepen rapidly and become steep-sided canyons.

The surface elevations in the vicinity of the Forest Home and Gold Spring mines range between 8,300 and 8,500 feet above sea level. The climate at this altitude, although somewhat severe in winter, generally permits year around mining operations. Second-growth timber suitable for mine use occurs on portions of the property; most of the mine timber, however, is purchased from local sawmills. There are no permanent streams on the property; the water pumped from the mine workings, however, generally is sufficient for the required underground

and surface operations. A hydroelectric plant of the Public Service Company of Colorado is located on Middle Boulder Creek east of Nederland. Transmission lines from this plant have been extended to most of the principal properties in the district including the Gold Spring mine.

Nederland, with a current population of about 300 is the center of mining activity in the district. It is the site of the Wolf Tongue mill, one of the major buyers and concentrators of custom tungsten ores produced in the area. Experienced mine labor usually can be secured in the community. Some housing is available in Nederland and other camps throughout the district but most mine personnel live in Boulder and drive to and from work. The nearest railroad loading facilities are those of the Denver & Rio Grande Western Railroad at Rollinsville, 4 miles south of Nederland. Boulder, a City of 25,000 population located 17 miles by highway east of Nederland, is the nearest supply center. Denver, the commercial and financial center of the region, is 35 miles southeast of Boulder.

OWNERSHIP AND EXTENT

The property rights included with the Company's application for exploration assistance comprise portions of the following patented lode mining claims:

Name of claim	U.S. Mineral Survey No.	Area involved in application
Gold Spring	18340	From 140 ft. to 1070 ft. measuring from west end line
Forest Home	19559	From 140 ft. to 720 ft. measuring from west end line
Gem	18340	Southwesterly 200 ft. of claim
Silver Light	19559	Easterly 320 ft. of claim

The above claims presently are owned by Gold Spring Tungsten, Inc. a Colorado corporation and the applicant for exploration assistance at the property. The extent and relative locations of these claims are indicated on figure 2. The property rights stipulated in the application comprise approximately 6 acres and include all the workings of the interconnected Forest Home and Gold Spring No. 2 shafts, all the workings off the Gold Spring No. 4 shaft, and the westernmost extensions of the 4th and 5th levels of the main Gold Spring mine. The Company owns most of the claims immediately adjoining the stipulated property rights except the Little Mabel claim (U. S. Mineral Survey 19631) which has the rights to a small triangular area adjoining the north side line of the Gold Spring claim. The Little Mabel claim does not have extralateral rights on the main Gold Spring vein but may include the apices of several parallel hanging wall structures that branch from that vein.

The entire Gold Spring and Gem claims already are included in the property rights subordinated under the terms of Exploration Project Contract Idm-254 (Gold Spring Tungsten, Inc., DMEA 1447X) and are subject to lien by the Government per its Certification of Discovery issued April 7, 1955. The Forest Home claim was subordinated to the Government under Exploration Project Contract Idm-579 (Tom G. Stanfort, DMA 1107). This project also was certified by the Government. In this instance, however, the Government's lien apparently is on the particular mineral deposit discovered as a direct result of the exploration project and not on the claim as a whole. Certain of the ground immediately west of the property rights stipulated in the Company's application, including the western 1,200 feet of the Silver Light claim, presently is listed under Article 2 of Exploration Project Contract Idm-2909 (Reynolds Tungsten Corp., DMEA 3807).

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 in 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 miner. The total production from the district through 1954 is estimated at approximately 1-1/2 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 Forest Home mine and the nearby and interconnected Gold Spring No. 2 mine were opened in the early nineteen hundreds. Both mines reportedly were operated during World War I and intermittently for short periods since that time. The Forest Home was reopened in 1941 by Elmer Metzer who continued operations through 1945. The No. 2 mine also was worked to a small extent during this period through the Forest Home shaft.

The Forest Home workings again were unwatered early in 1951 and work under Exploration Project Contract Idm-279 was started in August of that year. A total of 720 feet of combined drifting, crosscutting,

and raising was performed under that contract at a total cost of $21,406.40 (Government participation $16,056.30). A single, insignificant discovery was made as a result of project work. The discovery ore shoot occurred between the 1st and 2nd levels on an unnamed structure in the hanging wall of the Forest Home vein. Upon completion of project exploration, the operator attempted to mine the discovery. Stoping revealed that the ore was narrow and spotty. The deposit proved marginal and further mining was not attempted. The workings were allowed to flood in the fall of 1952. A total of 140.5 tons of hand sorted crude ore, containing 184.3 s.t.u. WO_3 and having a net value of $4,693.32 was marketed from the discovery. The Government's royalty on this production totaled $234.66.

The total recorded output from the Forest Home mine is 4,430.1 s.t.u. WO_3. The workings off the Gold Spring No. 2 shaft have produced a recorded total of 2,054.7 units.

The Wolf Tongue Mining Co., a subsidiary of the Firth-Sterling Steel & Carbide Corp., first opened the Gold Spring mine (Gold Spring No. 1 shaft) in 1906. Through 1935, when it finally was shut down by that Company, the mine produced 101,588 s.t.u. WO_3 from 14,302 tons of ore averaging 7.10 percent WO_3. The mine is the second largest producer in the district. It produced steadily except for the year 1919 and 1921-22. In 1943 the Wolf Tongue Company sunk the Gold Spring No. 4 shaft a few hundred feet west of the No. 1 shaft. A single level was turned from the No. 4 shaft at a depth of about 75 feet below the surface. A small quantity of ore was obtained from a structure in the footwall of the main Gold Spring Vein but all of the subsequent workings on the Gold Spring vein itself broke into old stopes. The total recorded, production from the No. 4 mine is 96.0 units.

In 1950, Hatmer Mines, Inc. purchased all of the Wolf Tongue properties including its custom mill at Nederland and shortly thereafter leased the Gold Spring mine to the Canadian Radium & Uranium Corp. This latter Company unwatered the workings in preparation for an anticipated exploration program. In June 1951, the lease was transferred to Gold Spring Tungsten, Inc., a Colorado corporation organized to continue exploration of the property with Government assistance. Work under Exploration Project Contract Idm-254 started in July 1951 and was completed in February 1954. The project resulted in a significant discovery and a certification to that effect was issued by the Government in April 1955. Since the completion of project work, the Company has continued to develop and mine the discovery ore shoots. Through August 1954, some 22,000 units of WO_3 having a net value of about $773,000.00 have been produced from these ore shoots. Although the Company has continued its exploration in the mine, no additional ore of any significance has been discovered.

On September 21, 1954, the same individuals that control both Canadian Radium & Uranium and Gold Spring Tungsten purchased all of the outstanding stock in Hatmer Mines. The new stockholders continued to operate Hatmer Mines as a separate unit within their organization until May 31, 1955 when it was absorbed by Gold Spring Tungsten, Inc. Since that time, Gold Spring Tungsten, in addition to operating the Gold Spring mine, has continued to lease out several of the individual mines on the former Wolf Tongue property. It has continued to concentrate all of its own production from the Gold Spring mine at the Wolf Tongue mill in Nederland as well as any custom ore it is able to buy from its lessees and other operators in the district.

The ore from the Cold Spring mine, which was discovered as a result of the recent DMEA project and which heretofore has supplied from 60 to 80 percent of the feed to the Nederland mill, essentially is depleted. Consequently, the Company has turned its attention on the other formerly productive mines on its property 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 northwest end of the Front Range mineral belt. The district is underlain by pre-Cambrian 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 pre-Cambrian 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 Forest Home mine area lies about 1,500 feet east of the crest of Hurricane Hill which is transected by the northwesterly trending Hurricane Hill "breccia reef."

Almost the entire Forest Home mine area is underlain by coarse-grained, moderately gneissic Boulder Creek granite. Old stopes near the shaft above the first level were mostly in aplite, and surface evidence suggests that part of the Cold Springs No. 2 mine workings were

also in aplite. An irregular pegmatite mass was encountered at the eastern end of the No. 1 level of the Forest Home mine. No schist or gneiss of the Idaho Springs formation is exposed in the mine.

The Boulder Creek granite which forms the host rock for most of the Forest Home ore bodies is technically a quartz monzonite. The rock is slightly porphyritic, dark gray, and coarse-grained with a primary gneissic structure made conspicuous by biotite alignment. The major constituent minerals are: quartz, microcline, plagioclase, and biotite.

The major ore-bearing structure in the proposed project area is the Forest Home-Gold Spring vein system. The area is structurally complex in that the Gold Spring vein splits up and is intersected by a northeastward-trending vein zone that lies between the strong eastward-trending Gold Spring fracture and the parallel Madeline fracture to the north. Westward from the main Gold Spring mine, in the Forest Home mine area, the Gold Spring vein trends about S. 75 degrees W. almost to the Gold Spring No. 2 mine, where it turns to a more southwesterly course and then splits. The southern branch, which trends S. 40 degrees to 60 degrees W., is evidently the main Gold Spring vein. It is present in the Gold Spring No. 2 shaft but splits into several branches southwest of the shaft. One of the northern branches is the Forest Home vein, which trends S. 75 degrees to 80 degrees W. The north or hanging wall of the Forest Home vein is broken by many fractures which show a northeasterly trend. It has been observed[1] that these fractures seem to die out downward for they are much weaker on the second level of the Forest Home mine than on the first level, and the Gold Spring vein is a well-defined

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1/ Lovering, T. S. and Tweto, O.; Geology and Ore Deposits of the Boulder County Tungsten District, Colo.; Geol. Survey Professional Paper 245, (p. 142).

single fissure on the 4th level of the Gold Spring mine directly below the Forest Home workings.

The Forest Home mine presently consists of two main levels and a sublevel about 35 feet above the lower level (see fig. 2). Except for one small ore shoot on the Forest Home vein near the surface, the production all came from minor veins or splits, and the Forest Home vein itself is completely barren in most places in the mine. It contained ore at the surface immediately east of the shaft and was stoped to a depth of about 40 feet. The ore was evidently localized where one wall of the vein was split and where the vein dipped steeply. On the first or 107-foot level, the vein flattens progressively from a dip of 83 degrees N. at the east breast to 50 degrees N. opposite the Gold Spring No. 2 shaft, the only ore mined on the vein from this level came from two small stopes in the western part. The Forest Home vein is completely barren on the second level. It is noteworthy that the main strand of the Forest Home vein exhibits intense clay mineral alteration of the granite walls, whereas the wall rocks of the numerous minor veins in the hanging wall are fresh or only slightly altered. Lovering and Tweto[2] point out that one of the major ore controls evident throughout the district is the relative permeability of different parts of the fissures. Thus a major fracture zone with considerable displacement may have developed sufficient gouge as to effectively seal off solution movement, whereas a minor fracture with little or no gouge may remain open and receptive to ore deposition. Permeability along a fracture may also be affected by the character of the wall rock which, if altered, may more easily form gouge. It would appear that a combination of these factors acted to seal the strong Forest Home vein against ore-forming

2/ op. cit. (p. 72)

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

solutions. The applicant has suggested that "fewer small veins will be found at depth but that their place may be taken by one or two stronger veins." In this highly altered area stronger veins will probably contain much gouge and thus be relatively impermeable.

About 143 feet below the 2nd level of the Forest Home a long westerly drift from the 4th level of the Gold Spring mine has explored what appears to be the downdip extension of the main Forest Home vein. A long westerly drift from the 5th level of the Gold Spring mine (232 feet below the Forest Home second level) has explored what appears to be a northerly split from the main Forest Home vein or from the main Gold Spring vein . A short more southerly drift on the Gold Spring 5th level (about 170 feet horizontally NW of the Gold Spring No. 4 shaft) may have been on the downdip projection of the main Forest Home vein. It is unknown whether any hanging wall exploration was conducted from the Gold Spring 4th level directly downdip from the most productive zone in the Forest Home mine. This portion of the Gold Spring 4th level is inaccessible; however, it is discouraging to note that no lateral exploration appears on the map thus implying that no sufficiently encouraging signs of ore mineralization exist in these workings, which would warrant continued exploration.

The bulk of the production from the Forest Home and Gold Spring No. 2 mines was derived from minor hanging wall splits of the main Forest Home vein. The ore was composed of medium-grained, crystalline ferberite in a gangue of grayish horn quartz. Although iron staining was common in the vein walls, the rock was essentially fresh. Most of the productive veins were thin, often containing no more than 1 inch of ferberite. The Forest Home is the only locality in the district where manganese minerals accompany the ore.

ORE RESERVES

There are no ore reserves of any classification existing in the Forest Home mine.

PRESENT STATUS OF THE PROPERTY

The Cold Spring No. 2 shaft has been caved for many years and has long since lost its identity on the surface. Portions of both the Forest Home and the interconnected Cold Spring No. 2 workings were open in 1945. Certain of the old workings were rehabilitated and other new workings were driven in 1951-52. Since that time, however, the mines have been flooded. It is probable that much of even the newer work is now caved and inaccessible. All of the equipment in the Forest Home surface plant has been removed. The headframe and hoisthouse are yet standing but need considerable repair. The Cold Spring No. 4 shaft is in a semi-caved condition and the workings on the single level off this shaft are no longer accessible. The No. 4 shaft has no surface plant, headframe, or other facilities.

Both the No. 1 and the No. 3 shafts of the main Cold Spring mine are open. The No. 3 or working shaft is in good repair. Many of the workings on the lower levels off these shafts, which were rehabilitated and extended during the recent DMEA project, are yet open and accessible. Portions of the old 5th and 6th level connections between the two shafts are caved and operations in the western sections of the mine must be carried out through the older No. 1 shaft. The 7th or lower level of the No. 3 shaft is connected to the 6th or lowest level of the No. 1 shaft by a raise. The Company presently is driving a 5th level crosscut which will give a working connection between the two sections of the mine. The Cold Spring mine is fully equipped and currently in production.

The old 4th and 5th levels of the mine each were extended some 850 feet southwesterly from the No. 1 shaft under the workings of the No. 4

shaft and into the area immediately below the easternmost workings of the Forest Home and Gold Spring No. 2 mines. These two levels are about 140 and 230 feet respectively below the second or lower level of the Forest Home shaft. Only portions of the 4th and 5th levels southwest of the No. 1 shaft have been opened or rehabilitated by the present operator. The final 400 feet or so of each level is caved and inaccessible.

The existing workings in the various mines concerned with in the Company's application are shown either on figure 2 of this report or on the several plates that accompany Professional Paper 245.

PROJECT PROPOSALS WITH COSTS

The project work proposed by the Company is summarized in the introduction to this report. Its extent and relative locations are shown on figure 2. The Company states that the proposed project can start within 30 days and will be completed within a period of 8 months.

A schedule of estimated costs for the proposed project work is included with the Company's application. The estimated costs in the schedule were distributed among the various proposed operations as follows:

Operation	Proposed units of work	Estimated total cost	Estimated unit cost
Core drilling	1,420 feet	$7,100.00	$5.00 per foot
Crosscutting	100 feet	4,020.60	40.20 per foot
Drifting	620 feet	25,110.00	40.50 per foot

Total estimated cost of project $36,230.60

The unit cost of $5.00 per foot for core drilling is the independent contract price only and does not include power, supervision, et cetera. The total overall unit cost for this amount of underground core drilling probably would average $6-7.00 per foot.

The estimated overall unit costs for crosscutting and drifting are excessive. In this district, comparable work is being performed with

average efficiency for costs ranging between $30.00 and $35.00 per foot. The Company's estimates for most of the operating materials and supplies shown in its schedule are high. In addition, an excessive amount of surface labor is included in the estimate.

CONCLUSIONS

The productive zone in the Forest Home mine includes the minor northeasterly-trending splits in the hanging wall of the main easterly-trending Forest Home vein. The Forest Home is itself a split from the Gold Spring vein which has been productive in the Gold Spring mine east of the Forest Home mine area. The bottom level of the Forest Home mine reveals the main strand of the Forest Home vein to be barren of ore mineralization with few ore-bearing splits in the hanging wall. Additional exploration of a structure which appears to be the downdip projection of the Forest Home vein has been conducted by a long westerly drift from the 4th level of the Gold Spring mine. No indication of ore mineralization on this level is apparent from the existing level maps of the Gold Spring mine.

The exploration program, as proposed by the applicant, involves a southerly crosscut and a westerly drift from the 5th level of the Gold Spring mine. The initial crosscutting is to be preceded by diamond drilling. The positioning of the proposed drift is based on a downdip projection of a Gold Spring footwall vein from its exposure in the Gold Spring No. 4 mine. The projection of the footwall vein from this point is not valid inasmuch as it ignores the more westerly splitting up of the Gold Spring vein. This splitting has resulted in the development of the Forest Home vein zone, which the proposed exploration program has as its objective. Thus, the westerly drift which the applicant proposes is well into the historically unproductive footwall zone of the Forest Home vein.

The small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to belive it will do so at depth.

The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization. There is no reason to believe that the structure will contain significant ore bodies in the proposed project area.

RECOMMENDATIONS

It is recommended that the Company's application for exploration assistance at the Forest Home and the Gold Spring Nos. 2 and 4 mines be denied.

400

DOCKET
Holt
Martin
Nelson
Guhon
Selfridge
Y Johnson

APR 1956

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

Re: Docket No. DMEA-4072, Tungsten
Forest Home and Cold Spring
Nos. 2 and 4 Mines
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 Forest Home and Cold Spring Nos. 2 and 4 properties, 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. Mittendorf

Administrator

cc: Docket
Code 400
Oper. Comm.
Adm. Read. File
FT, Region 3
T. Kiilsgaard, USGS
R. W. Holliday, USBM

SPHolt/ls 3/30/56

R.C.G.

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

March 30, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $36,230.00
Docket No. DMEA-4072, Tungsten
Cold Spring Tungsten, Inc.
Forest Home, Cold Spring Nos. 2 and 4 claims
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 $36,230.00 for drifting, crosscutting, and diamond drilling in the Forest Home, Cold Spring No. 2, and Cold Spring No. 4 mines.

(2) The applicant is the owner of the following patented lode mining claims, situated in the NE. ¼, sec. 7, and the NW.¼, sec. 8, T. 1 S., R. 72 W., 6th Principal Meridian, Grand Island Mining District, Boulder County, Colorado, in the central part of the Boulder tungsten district:

Claim Name	U. S. Survey No.	Area involved in Application
Cold Spring	18340	From 140 to 1070 feet measured from west end of claim
Gem	18340	Southwesterly 200 feet of claim
Forest Home	19559	From 140 to 720 feet measured from west end line of claim
Silver Light	19559	Easterly 320 feet of claim

Property rights stipulated in the application, as indicated above, comprise approximately 6 acres, and include all the workings of the inter-connected Forest Home and Cold Spring No. 2 shafts, all the working of the Cold Spring No. 4 shaft, and the westward extensions of the 4th and 5th levels of the main Cold Spring mine.

(3) The proposed program is to core drill three horizontal holes from the 5th level of the Cold Spring mine to intersect the possible downward projection of a footwall vein exposed in the old workings of the Cold Spring No. 4 shaft. If favorable conditions are indicated by this initial drilling, the applicant proposes to crosscut 100 feet to the footwall vein, then drift 620 feet southwesterly along the vein to a point about 230 feet below the Forest Home and Cold Spring No. 2 workings. If results of the initial drilling are not favorable, it is proposed to drive an alternate 5th level crosscut through the area directly beneath the Forest Home workings. The applicant proposes to explore both walls of the drift or the alternate crosscut by core drilling. Total core drilling proposed is 1,420 feet in 12 holes, with 720 feet total combined drifting and crosscutting.

(4) In the area of the Forest Home and Cold Spring Nos. 2 and 4 mines tungsten mineralization occurs as ferberite ($FeWO_4$) in northeasterly to easterly trending fracture veins in quartz monzonite and aplite. Although a limited amount of tungsten ore has been mined from the Forest Home mine, and a lesser amount from the Cold Spring No. 2 workings, the nearest exposures of the Forest Home vein to the proposed project area are all barren of tungsten ore mineralization, and the small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to believe it will do so at depth.

(5) The Field Team concludes that there is little possibility of disclosing a significant amount of tungsten ore by the proposed work, and recommends that the application be denied.

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

W S Martin

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

Docket
Holt
Martin
Nelson

March 30, 1956

MEMORANDUM

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of request for exploration assistance in the amount of $36,230.00
Docket No. DMEA-4072, Tungsten
Cold Spring Tungsten, Inc.
Forest Home, Cold Spring Nos. 2 and 4 claims
Boulder County, Colorado

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(4) In the area of the Forest Home and Cold Spring Nos. 2 and 4 mines tungsten mineralization occurs as ferberite ($FeWO_4$) in northeasterly to easterly trending fracture veins in quartz monzonite and aplite. Although a limited amount of tungsten ore has been mined from the Forest Home mine, and a lesser amount from the Cold Spring No. 2 workings, the nearest exposures of the Forest Home vein to the proposed project area are all barren of tungsten ore mineralization, and the small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to believe it will do so at depth.

(5) The Field Team concludes that there is little possibility of disclosing a significant amount of tungsten ore by the proposed work, and recommends that the application be denied.

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

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

cc: Docket
Code 400
Oper. Committee
Adm. Read. File

SPHolt/ls
3/30/56

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 Report
Docket No. DMEA 4072
Forest Home and Cold Spring Nos. 2 and 4 Mines
Boulder County, Colorado
Cold Spring Tungsten, Incorporated
1036 First National Bank Building
Denver, Colorado
$36,230.60 - Tungsten

Documentation of the past history of production and of geological factors is well done and the conclusions and recommendation appear to be substantiated.

I concur in the 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

Copy retained 400.

March 20, 1956

Re: DMEA 4072
Cold Spring Tungsten, Inc.
Forest Home Mine
Boulder Co., Colorado
$36,230.60 - 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 drifting and diamond drilling an area down dip from the near surface productive veins.

The estimated cost of the proposed work is $36,230.60.

The examiners conclude that, "The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization. There is no reason to believe that the structure will contain significant ore bodies in the proposed project area."

With the Field Team the examiners recommend that the application be denied.

I concur with that recommendation.

N. E. Nelson

N. E. Nelson

Docket

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

RECEIVED
MAR 15 1956

March 13, 1956

224 New Customhouse
Denver 2, Colorado

WSG

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Field Team, Region III

Subject: Joint Report of Examination, Docket DMEA 4072 (Tungsten) Cold Spring Tungsten, Inc., Forest Home and Cold Spring Nos. 2 and 4 Mines, Boulder County, Colorado

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

The field examiners noted that the small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to believe it will do so at depth. The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization.

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

DMEA Field Team, Region III

W. M. Traver

By W. M. Traver
Executive Officer

Enclosures

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

RECEIVED

MAR 15 1956

DMEA
Date Rec'd.

MAR 12 1956

BUREAU OF MINES
Denver, Colorado

Region III

Building 20
Denver Federal Center
Denver 2, Colorado
March 9, 1956

Memorandum

TRANSMITTED

MAR 13 1956

To: Executive Officer, DMEA Field Team, Region III

From: E. N. Harshman
John F. Shaw

Subject: Examination Report, Docket DMEA 4072, Cold Spring Tungsten, Inc., Forest Home and Cold Spring Nos. 2 and 4 Mines, Boulder County, Colorado

Enclosed are the original and 7 copies of a Joint Examination report by R. W. Osterstock, Geological Survey and R. L. Bolmer, Bureau of Mines covering Docket DMEA 4072.

Cold Spring Tungsten, Inc. applied for exploration assistance to explore the Forest Home and Cold Spring Nos. 2 and 4 mines by diamond core drilling, crosscutting and drifting. The estimated cost of the project was $36,230.60.

The property was examined on Jan. 31, 1956 by R. L. Bolmer and R. W. Osterstock. The examining team concluded that there was little possibility of discovering a significant amount of tungsten by the proposed work.

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

Enclosures

cc 7
ENHarshman
DMEA 4072
Chron.

JFS/ch

Reviewed by
DMEA OPERATING COMMITTEE
3-19-56
(2080)

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

JOINT REPORT OF EXAMINATION BY EXAMINING TEAM
REGION III

TRANSMITTED
MAR 13 1956

DMEA 4072

COLD SPRING TUNGSTEN, INC.

Forest Home and Cold Spring Nos. 2 and 4 Mines

Boulder County, Colorado

RECEIVED
MAR 15 1956

Tungsten

Joint Engineering and Geologic Report

By

R. W. Osterstock
Geological Survey

R. L. Bolmer
Bureau of Mines

March 7, 1956

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

DMEA 4072

COLD SPRING TUNGSTEN, INC.
Forest Home and Cold Spring Nos. 2 and 4 Mines
BOULDER COUNTY, COLORADO

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Present status of the property 13
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ILLUSTRATIONS

Figure — Follows Page

1. Index map of Boulder County Tungsten District, Colo., showing location of Forest Home, Cold Spring Nos. 2 and 4 mines. (Cold Spring Tungsten, Inc., DMEA 4072) 2

2. Geologic plan of Forest Home and West end of Cold Spring mines 11

DMEA 4072

COLD SPRING TUNGSTEN, INC.
Forest Home and Cold Spring Nos. 2 and 4 Mines
Boulder County, Colorado

RECEIVED
MAR 15 1956

INTRODUCTION

Cold Spring Tungsten, Inc., 1036 First National Bank Bldg., Denver, Colo., made application for aid in a project of exploration for Tungsten at the Forest Home and the Cold Spring Nos. 2 and 4 mines in 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 and assigned Docket No. DMEA 4072.

In it's application, the Company proposed to core drill three horizontal holes southerly from the 5th level of the Cold Spring mine so as to intersect the possible downward projection of a footwall vein exposed in the old workings off the Cold Spring No. 4 shaft. If favorable results are indicated by such drilling, the Company proposes to drive a 5th level crosscut 100 feet to the footwall vein and then to drift 620 feet southwesterly along that vein to a point some 230 feet below the existing workings of the Forest Home and the Cold Spring No. 2 mines. If favorable results are not indicated by the initial drilling, the Company then would drive an alternate 5th level crosscut directly through the area below the Forest Home workings. At various intervals along either the drift or the alternate crosscut, the Company proposes to prospect both walls of the heading by core drilling. In addition to 720 feet of combined drifting and crosscutting, the proposed project would involve an aggregate total of 1,420 feet of core drilling in 12 individual holes and would cost an estimated total of $36,230.60 (Government participation 75 percent or $27,172.95).

The application was reviewed by the DMEA commodity group in Washington, D. C. and, on December 13, 1955, it 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 Company representative, and Charles Turner, Superintendent of the Cold Spring mine. The proposed project also was discussed with Elmer Hetzer, a former operator of the Forest Home mine 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 Company 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 Forest Home mine and the westernmost workings of the Cold Spring mine lie in the NE 1/4 section 7, T. 1 S., R. 72 W., 6th Principal Meridian, Boulder County, Colo. The main workings of the Cold Spring mine are in the NW 1/4 of sec. 8, and a small part of the property rights stipulated in the application extend into this section. The property is located in the central part of the Boulder County tungsten district about 2 miles northeast of the town of Nederland and some 10 miles west-southwest of the City of Boulder (fig. 1).

State Highway 119, which follows Middle Boulder Creek Canyon westerly from Boulder, junctions with State Highway 160 at Nederland. The property is accessible via a county-maintained road that branches easterly from State Highway 160 about 1 mile north of Nederland. It

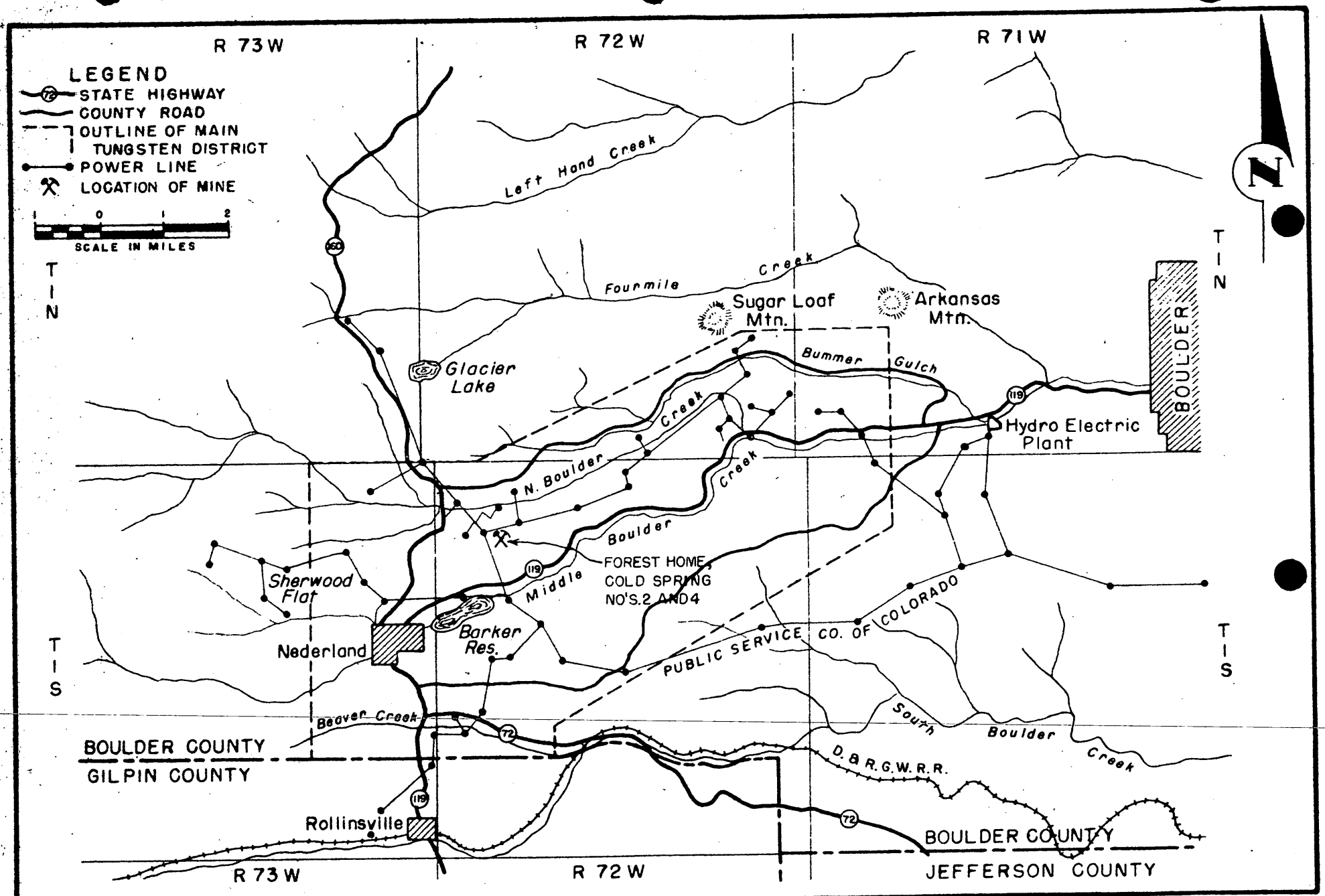

FIGURE 1 - INDEX MAP OF BOULDER COUNTY TUNGSTEN DISTRICT, COLO., SHOWING LOCATION OF FOREST HOME, COLD SPRING No's 2 AND 4 MINES. (COLD SPRING TUNGSTEN, INC. DMEA 4072)

also may be reached by a steeper mine road that turns north from State Highway 119 about 1-1/2 miles east of Nederland in the vicinity of Barker Reservoir. State Highway 119 is a paved, all weather road; State Highway 160 and the county-maintained access roads that pass the property are graveled. All are kept free of snow during the winter months.

The tungsten district in Boulder County comprises a narrow belt 9-1/2 miles long and 4-1/2 miles wide that trends southwesterly from Arkansas Mountain, 4 miles west of Boulder, to Sherwood Flats, 1-1/2 miles northwest of Nederland. The district lies on the lower eastern flank of the Front Range, a gently rising, dissected upland that extends from the foothills near Boulder to the steeper, glaciated slopes of the Continental 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 district rise 300 to 400 feet above this level. In the western part of the area, broad valleys lie only 200 to 300 feet below the general level of the upland surface. Farther east, the valleys deepen rapidly and become steep-sided canyons.

The surface elevations in the vicinity of the Forest Home and Cold Spring mines range between 8,300 and 8,500 feet above sea level. The climate at this altitude, although somewhat severe in winter, generally permits year around mining operations. Second-growth timber suitable for mine use occurs on portions of the property; most of the mine timber, however, is purchased from local sawmills. There are no permanent streams on the property; the water pumped from the mine workings, however, generally is sufficient for the required underground

and surface operations. A hydroelectric plant of the Public Service Company of Colorado is located on Middle Boulder Creek east of Nederland. Transmission lines from this plant have been extended to most of the principal properties in the district including the Cold Spring mine.

Nederland, with a current population of about 300 is the center of mining activity in the district. It is the site of the Wolf Tongue mill, one of the major buyers and concentrators of custom tungsten ores produced in the area. Experienced mine labor usually can be secured in the community. Some housing is available in Nederland and other camps throughout the district but most mine personnel live in Boulder and drive to and from work. The nearest railroad loading facilities are those of the Denver & Rio Grande Western Railroad at Rollinsville, 4 miles south of Nederland. Boulder, a City of 25,000 population located 17 miles by highway east of Nederland, is the nearest supply center. Denver, the commercial and financial center of the region, is 35 miles southeast of Boulder.

OWNERSHIP AND EXTENT

The property rights included with the Company's application for exploration assistance comprise portions of the following patented lode mining claims:

Name of claim	U.S. Mineral Survey No.	Area involved in application
Cold Spring	18340	From 140 ft. to 1070 ft. measuring from west end line
Forest Home	19559	From 140 ft. to 720 ft. measuring from west end line
Gem	18340	Southwesterly 200 ft. of claim
Silver Light	19559	Easterly 320 ft. of claim

The above claims presently are owned by Cold Spring Tungsten, Inc. a Colorado corporation and the applicant for exploration assistance at the property. The extent and relative locations of these claims are indicated on figure 2. The property rights stipulated in the application comprise approximately 6 acres and include all the workings of the interconnected Forest Home and Cold Spring No. 2 shafts, all the workings off the Cold Spring No. 4 shaft, and the westernmost extensions of the 4th and 5th levels of the main Cold Spring mine. The Company owns most of the claims immediately adjoining the stipulated property rights except the Little Mabel claim (U. S. Mineral Survey 19631) which has the rights to a small triangular area adjoining the north side line of the Cold Spring claim. The Little Mabel claim does not have extralateral rights on the main Cold Spring vein but may include the apices of several parallel hanging wall structures that branch from that vein.

The entire Cold Spring and Gem claims already are included in the property rights subordinated under the terms of Exploration Project Contract Idm-E54 (Cold Spring Tungsten, Inc., DMEA 1447X) and are subject to lien by the Government per its Certification of Discovery issued April 7, 1955. The Forest Home claim was subordinated to the Government under Exploration Project Contract Idm-E79 (Tom C. Stanford, DMA 1107). This project also was certified by the Government. In this instance, however, the Government's lien apparently is on the particular mineral deposit discovered as a direct result of the exploration project and not on the claim as a whole. Certain of the ground immediately west of the property rights stipulated in the Company's application, including the western 1,200 feet of the Silver Light claim, presently is listed under Article 2 of Exploration Project Contract Idm-E909 (Reynolds Tungsten Corp., DMEA 3807).

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 in 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 1-1/2 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 Forest Home mine and the nearby and interconnected Cold Spring No. 2 mine were opened in the early nineteen hundreds. Both mines reportedly were operated during World War I and intermittently for short periods since that time. The Forest Home was reopened in 1941 by Elmer Hetzer who continued operations through 1945. The No. 2 mine also was worked to a small extent during this period through the Forest Home shaft.

The Forest Home workings again were unwatered early in 1951 and work under Exploration Project Contract Idm-E79 was started in August of that year. A total of 720 feet of combined drifting, crosscutting,

and raising was performed under that contract at a total cost of $21,408.40 (Government participation $16,056.30). A single, insignificant discovery was made as a result of project work. The discovery ore shoot occurred between the 1st and 2nd levels on an unnamed structure in the hanging wall of the Forest Home vein. Upon completion of project exploration, the operator attempted to mine the discovery. Stoping revealed that the ore was narrow and spotty. The deposit proved marginal and further mining was not attempted. The workings were allowed to flood in the fall of 1952. A total of 140.5 tons of hand sorted crude ore, containing 184.3 s.t.u. WO_3 and having a net value of $4,693.32 was marketed from the discovery. The Government's royalty on this production totaled $234.66.

The total recorded output from the Forest Home mine is 4,430.1 s.t.u. WO_3. The workings off the Cold Spring No. 2 shaft have produced a recorded total of 2,056.7 units.

The Wolf Tongue Mining Co., a subsidiary of the Firth-Stirling Steel & Carbide Corp., first opened the Cold Spring mine (Cold Spring No. 1 shaft) in 1908. Through 1935, when it finally was shut down by that Company, the mine produced 101,588 s.t.u. WO_3 from 14,301 tons of ore averaging 7.10 percent WO_3. The mine is the second largest producer in the district. It produced steadily except for the year 1919 and 1921-22. In 1943 the Wolf Tongue Company sank the Cold Spring No. 4 shaft a few hundred feet west of the No. 1 shaft. A single level was turned from the No. 4 shaft at a depth of about 75 feet below the surface. A small quantity of ore was obtained from a structure in the footwall of the main Cold Spring Vein but all of the subsequent workings on the Cold Spring vein itself broke into old stopes. The total recorded, production from the No. 4 mine is 96.0 units.

In 1950, Hetzer Mines, Inc. purchased all of the Wolf Tongue properties including its custom mill at Nederland and shortly thereafter leased the Cold Spring mine to the Canadian Radium & Uranium Corp. This latter Company unwatered the workings in preparation for an anticipated exploration program. In June 1951, the lease was transferred to Cold Spring Tungsten, Inc., a Colorado corporation organized to continue exploration of the property with Government assistance. Work under Exploration Project Contract Idm-E54 started in July 1951 and was completed in February 1954. The project resulted in a significant discovery and a certification to that effect was issued by the Government in April 1955. Since the completion of project work, the Company has continued to develop and mine the discovery ore shoots. Through August 1954, some 22,000 units of WO_3 having a net value of about $773,000.00 have been produced from these ore shoots. Although the Company has continued its exploration in the mine, no additional ore of any significance has been discovered.

On September 21, 1954, the same individuals that control both Canadian Radium & Uranium and Cold Spring Tungsten purchased all of the outstanding stock in Hetzer Mines. The new stockholders continued to operate Hetzer Mines as a separate unit within their organization until May 31, 1955 when it was absorbed by Cold Spring Tungsten, Inc. Since that time, Cold Spring Tungsten, in addition to operating the Cold Spring mine, has continued to lease out several of the individual mines on the former Wolf Tongue property. It has continued to concentrate all of its own production from the Cold Spring mine at the Wolf Tongue mill in Nederland as well as any custom ore it is able to buy from its lessees and other operators in the district.

The ore from the Cold Spring mine, which was discovered as a result of the recent DMEA project and which heretofore has supplied from 60 to 80 percent of the feed to the Nederland mill, essentially is depleted. Consequently, the Company has turned its attention on the other formerly productive mines on its property 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 northwest end of the Front Range mineral belt. The district is underlain by pre-Cambrian 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 pre-Cambrian 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 Forest Home mine area lies about 1,500 feet east of the crest of Hurricane Hill which is transected by the northwesterly trending Hurricane Hill "breccia reef."

Almost the entire Forest Home mine area is underlain by coarse-grained, moderately gneissic Boulder Creek granite. Old stopes near the shaft above the first level were mostly in aplite, and surface evidence suggests that part of the Cold Springs No. 2 mine workings were

also in aplite. An irregular pegmatite mass was encountered at the eastern end of the No. 1 level of the Forest Home mine. No schist or gneiss of the Idaho Springs formation is exposed in the mine.

The Boulder Creek granite which forms the host rock for most of the Forest Home ore bodies is technically a quartz monzonite. The rock is slightly porphyritic, dark gray, and coarse-grained with a primary gneissic structure made conspicuous by biotite alignment. The major constituent minerals are: quartz, microcline, plagioclase, and biotite.

The major ore-bearing structure in the proposed project area is the Forest Home-Cold Spring vein system. The area is structurally complex in that the Cold Spring vein splits up and is intersected by a northeastward-trending vein zone that lies between the strong eastward-trending Cold Spring fracture and the parallel Madeline fracture to the north. Westward from the main Cold Spring mine, in the Forest Home mine area, the Cold Spring vein trends about S. 75 degrees W. almost to the Cold Spring No. 2 mine, where it turns to a more southwesterly course and then splits. The southern branch, which trends S. 40 degrees to 60 degrees W., is evidently the main Cold Spring vein. It is present in the Cold Spring No. 2 shaft but splits into several branches southwest of the shaft. One of the northern branches is the Forest Home vein, which trends S. 75 degrees to 80 degrees W. The north or hanging wall of the Forest Home vein is broken by many fractures which show a northeasterly trend. It has been observed[1] that these fractures seem to die out downward for they are much weaker on the second level of the Forest Home mine than on the first level, and the Cold Spring vein is a well-defined

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1/ Lovering, T. S. and Tweto, O.; Geology and Ore Deposits of the Boulder County Tungsten District, Colo.; Geol. Survey Professional Paper 245, (p. 142).

single fissure on the 4th level of the Cold Spring mine directly below the Forest Home workings.

The Forest Home mine presently consists of two main levels and a sublevel about 35 feet above the lower level (see fig. 2). Except for one small ore shoot on the Forest Home vein near the surface, the production all came from minor veins or splits, and the Forest Home vein itself is completely barren in most places in the mine. It contained ore at the surface immediately east of the shaft and was stoped to a depth of about 60 feet. The ore was evidently localized where one wall of the vein was aplite and where the vein dipped steeply. On the first or 107-foot level, the vein flattens progressively from a dip of 83 degrees N. at the west breast to 50 degrees N. opposite the Cold Spring No. 2 shaft, The only ore mined on the vein from this level came from two small stopes in the western part. The Forest Home vein is completely barren on the second level. It is noteworthy that the main strand of the Forest Home vein exhibits intense clay mineral alteration of the granite walls, whereas the wall rocks of the numerous minor veins in the hanging wall are fresh or only slightly altered. Lovering and Tweto[2] point out that one of the major ore controls evident throughout the district is the relative permeability of different parts of the fissures. Thus a major fracture zone with considerable displacement may have developed sufficient gouge as to effectively seal off solution movement, whereas a minor fracture with little or no gouge may remain open and receptive to ore deposition. Permeability along a fracture may also be affected by the character of the wall rock which, if altered, may more easily form gouge. It would appear that a combination of these factors acted to seal the strong Forest Home vein against ore-forming

2/ op. cit. (p. 72)

solutions. The applicant has suggested that "fewer small veins will be found at depth but that their place may be taken by one or two stronger veins." In this highly altered area stronger veins will probably contain much gouge and thus be relatively impermeable.

About 143 feet below the 2nd level of the Forest Home a long westerly drift from the 4th level of the Cold Spring mine has explored what appears to be the downdip extension of the main Forest Home vein. A long westerly drift from the 5th level of the Cold Spring mine (232 feet below the Forest Home second level) has explored what appears to be a northerly split from the main Forest Home vein or from the main Cold Spring vein. A short more southerly drift on the Cold Spring 5th level (about 170 feet horizontally NW of the Cold Spring No. 4 shaft) may have been on the downdip projection of the main Forest Home vein. It is unknown whether any hanging wall exploration was conducted from the Cold Spring 4th level directly downdip from the most productive zone in the Forest Home mine. This portion of the Cold Spring 4th level is inaccessible; however, it is discouraging to note that no laterial exploration appears on the map thus implying that no sufficiently encouraging signs of ore mineralization exist in these workings, which would warrant continued exploration.

The bulk of the production from the Forest Home and Cold Spring No. 2 mines was derived from minor hanging wall splits of the main Forest Home vein. The ore was composed of medium-grained, crystalline ferberite in a gangue of grayish horn quartz. Although iron staining was common in the vein walls, the rock was essentially fresh. Most of the productive veins were thin, often containing no more than 1 inch of ferberite. The Forest Home is the only locality in the district where manganese minerals accompany the ore.

ORE RESERVES

There are no ore reserves of any classification existing in the Forest Home mine.

PRESENT STATUS OF THE PROPERTY

The Cold Spring No. 2 shaft has been caved for many years and has long since lost its identity on the surface. Portions of both the Forest Home and the interconnected Cold Spring No. 2 workings were open in 1945. Certain of the old workings were rehabilitated and other new workings were driven in 1951-52. Since that time, however, the mines have been flooded. It is probable that much of even the newer work is now caved and inaccessible. All of the equipment in the Forest Home surface plant has been removed. The headframe and hoisthouse are yet standing but need considerable repair. The Cold Spring No. 4 shaft is in a semi-caved condition and the workings on the single level off this shaft are no longer accessible. The No. 4 shaft has no surface plant, headframe, or other facilities.

Both the No. 1 and the No. 3 shafts of the main Cold Spring mine are open. The No. 3 or working shaft is in good repair. Many of the workings on the lower levels off these shafts, which were rehabilitated and extended during the recent DMEA project, are yet open and accessible. Portions of the old 5th and 6th level connections between the two shafts are caved and operations in the western sections of the mine must be carried out through the older No. 1 shaft. The 7th or lower level of the No. 3 shaft is connected to the 6th or lowest level of the No. 1 shaft by a raise. The Company presently is driving a 5th level crosscut which will give a working connection between the two sections of the mine. The Cold Spring mine is fully equipped and currently in production.

The old 4th and 5th levels of the mine each were extended some 850 feet southwesterly from the No. 1 shaft under the workings of the No. 4

shaft and into the area immediately below the easternmost workings of the Forest Home and Cold Spring No. 2 mines. These two levels are about 140 and 230 feet respectively below the second or lower level of the Forest Home shaft. Only portions of the 4th and 5th levels southwest of the No. 1 shaft have been opened or rehabilitated by the present operator. The final 400 feet or so of each level is caved and inaccessible.

The existing workings in the various mines concerned with in the Company's application are shown either on figure 2 of this report or on the several plates that accompany Professional Paper 245.

PROJECT PROPOSALS WITH COSTS

The project work proposed by the Company is summarized in the introduction to this report. Its extent and relative locations are shown on figure 2. The Company states that the proposed project can start within 30 days and will be completed within a period of 8 months.

A schedule of estimated costs for the proposed project work is included with the Company's application. The estimated costs in the schedule were distributed among the various proposed operations as follows:

Operation	Proposed units of work	Estimated total cost	Estimated unit cost
Core drilling	1,420 feet	$7,100.00	$5.00 per foot
Crosscutting	100 feet	4,020.60	40.20 per foot
Drifting	620 feet	25,110.00	40.50 per foot

Total estimated cost of project $36,230.60

The unit cost of $5.00 per foot for core drilling is the independent contract price only and does not include power, supervision, et cetera. The total overall unit cost for this amount of underground core drilling probably would average $6-7.00 per foot.

The estimated overall unit costs for crosscutting and drifting are excessive. In this district, comparable work is being performed with

average efficiency for costs ranging between $30.00 and $35.00 per foot. The Company's estimates for most of the operating materials and supplies shown in its schedule are high. In addition, an excessive amount of surface labor is included in the estimate.

CONCLUSIONS

The productive zone in the Forest Home mine includes the minor northeasterly-trending splits in the hanging wall of the main easterly-trending Forest Home vein. The Forest Home is itself a split from the Cold Spring vein which has been productive in the Cold Spring mine east of the Forest Home mine area. The Bottom level of the Forest Home mine reveals the main strand of the Forest Home vein to be barren of ore mineralization with few ore-bearing splits in the hanging wall. Additional exploration of a structure which appears to be the downdip projection of the Forest Home vein has been conducted by a long westerly drift from the 4th level of the Cold Spring mine. No indication of ore mineralization on this level is apparent from the existing level maps of the Cold Spring mine.

The exploration program, as proposed by the applicant, involves a southerly crosscut and a westerly drift from the 5th level of the Cold Spring mine. The initial crosscutting is to be preceded by diamond drilling. The positioning of the proposed drift is based on a downdip projection of a Cold Spring footwall vein from its exposure in the Cold Spring No. 4 mine. The projection of the footwall vein from this point is not valid inasmuch as it ignores the more westerly splitting up of the Cold Spring vein. This splitting has resulted in the development of the Forest Home vein zone, which the proposed exploration program has as its objective. Thus, the westerly drift which the applicant proposes is well into the historically unproductive footwall zone of the Forest Home vein.

The small northeasterly-trending vein exposed on the surface by bulldozer trenching has not contained ore grade material, and there is no reason to belive it will do so at depth.

The nearest exposures of the Forest Home vein to the proposed project area are all barren of ore mineralization. There is no reason to believe that the structure will contain significant ore bodies in the proposed project area.

RECOMMENDATIONS

It is recommended that the Company's application for exploration assistance at the Forest Home and the Cold Spring Nos. 2 and 4 mines be denied.

Docket

DMEA
Date Rec'd

DEC 23 1955

BUREAU OF MINES
Denver, Colorado

December 20, 1955

Memorandum

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

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

Subject: Docket DMEA 4072 (Tungsten), Cold Spring Tungsten, Inc., Forest Home 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 the Denver office.

JOHN F. SHAW

John F. Shaw

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

Docket

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

RECEIVED
DEC 28 1955

December 19, 1955

22d New Customhouse
Denver 2, Colorado

WSM

Memorandum

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

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

Subject: Docket DMEA 4072 (Tungsten), Gold Spring Tungsten, Inc., Forest Home Mine, Boulder County, Colorado

Enclosed is the subject application in the amount of $36,230.60. Also enclosed is a copy of the letter from the Chairman of the Operating Committee dated December 13, 1955 and attached memoranda of review of the application by the Tungsten Commodity Committee.

A field examination and suitable report are required.

E. N. Harshman

E. N. Harshman

Enclosures

HMC:ab

cc: Sec. Op. Comm. (2)
Docket 4072
Chron.

DOCKET
DMEA 4072

Chapman
Martin
Brown
Dougin
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.

C

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. Geehan
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

Docket

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

November 29, 1955

Memorandum

WBM

To: Executive Officer, DMEA Field Team, Region III, Denver 2, Colorado

Through: Acting Chief, Branch of Ferrous Metals & Ferroalloys

From: Commodity Specialist-Tungsten

Subject: Docket No. DMEA 4027
Cold Spring Nos. 2 & 4 and
Forest Home mines
Cold Spring Tungsten, Inc.
Boulder County, Colorado
Application for exploration assistance
$36,230.60

This application proposes 100 feet of crosscut, 620 feet of drifting and 1420 feet of diamond drilling.

It is recommended that a field referral be made.

R W Holliday
R. W. Holliday

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

Docket

IN REPLY REFER TO:

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

RECEIVED
DEC - 1 1955

November 30, 1955

Re: DMEA 4072
Cold Spring Tungsten, Inc.
Forest Home Mine
Boulder County, Colorado
$36,230.60 - 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.

The applicant requests assistance in exploring the Forest Home-Cold Spring No. 2 vein system by drilling, crosscutting, and drifting on a level 230 feet below the bottom level of the Forest Home mine.

The estimated cost of the proposed work is estimated at:--

Diamond drilling	1420' at $ 5.00	$ 7,100.00
Crosscutting	100' at $40.20	4,020.60
Drifting	620' at $40.50	25,110.00
		$36,230.60

The Forest Home and Cold Spring No. 2 mines are credited with the production of plus or minus 15,000 units of WO_3 (Geology and Ore Deposits of the Boulder County Tungsten District, Colorado, Geological Survey Professional Paper 245, 1953). The production came from short oreshoots in a somewhat complex system of veins. Compared to the depths to which work has been carried in other Cold Spring veins in workings to the east of the Cold Spring No. 4 mine, the Forest Home-No. 2 mine is shallow,--8282 elevation at the bottom Forest Home No. 2 mine and 7900 in No. 7 level of the Cold Spring New Shaft.

A limited amount of work done under Contract Idm-E79 (Docket 1107) on the bottom or 200-foot level of the Forest Home mine in 1952 failed to find ore, but 65 feet of ore was drifted in an intermediate level above the 200-foot level and probably was mined out.

Two long exploratory drifts, parallel to the proposed drift, on the No. 4 and No. 5 levels of the Cold Spring mine appear to have encountered no ore in the interval between the Forest Home and a vertical plane about 200 feet west of the Old Shaft of the Cold Spring mine. Short shoots of ore seem to have been drifted on the 75-foot level of the No. 4 mine, but no stoping is suggested. Little or no crosscutting was done from the long exploratory drifts and the proposed drilling and crosscutting would prospect the ground to the north and south of the proposed drift.

If the ore showings in the levels and stopes of the Forest Home and Cold Spring No. 2 mines are essentially bottomed, as may be inferred from the lack of ore in the bottom levels and drill holes, there would seem to be little reason to expect to find important ore in the proposed drill holes 3-1, 3-2, 3-3, 4-1, 4-2, 5-1 and 5-2.

No specific targets other than the possible downward extensions of, as known, almost barren veins are offered in support of the long drift and diamond drill holes, 1-1, 1-2, 1-3, 2-1 and 2-2.

To my knowledge no reason is advanced for the demonstrated relative shallowness of the mines near the western margin of the granite batholith, but the hypothetical north-south section on page 13, P. P. 245, may be suggestive--if it is assumed that the western margin of the batholith has somewhat the shape hypothesized for the southern margin.

The productiveness and depth of ore of the easterly section of the Cold Spring property justify curiosity as to the depth behavior of the veins to the west, but work already done would seem to have answered some if not all of the legitimate surmises.

An on the ground appraisal is needed.

Referral to the Field Team is indicated and here recommended.

N. E. Nelson

N. E. Nelson

November 25, 1955
Subject: DMEA-4072
Re: Exploration Assistance
Cold Spring Nos. 2 & 4 &
Forest Home

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

Gentlemen:

The receipt of your application dated November 3, 1955, for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-4072 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

November 25, 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 - 4072 Cold Spring Tungsten, Inc.

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

11/23/85

Mr. Adams -

This application involves areas included in two certified projects - Tom C. Stanford (Idm-E79) and Cold Springs Tungsten, Inc., (Idm-E54). Therefore, suggest it be handled as a new application. Possibly work would be in area not directly related to previous work. If contract is made it can be made either as a new contract or as an amendment to present Cold Springs contract, depending upon the circumstance.

Frank E. Johnson

Leave with cy of appln that gave to dev. division dont detach.

C C.

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

224 New Customhouse
Denver 2, Colorado

November 18, 1955

Memorandum

To: Secretary to the Operating Committee, DMEA

From: Executive Officer, DMEA Field Team, Region III

Subject: Docket DMEA-1447X (Tungsten), Contract Idm-E54, Gold Spring Tungsten, Inc., Boulder County, Colorado - Application for additional DMEA aid

Enclosed are three copies of the subject application in the amount of $36,238.60. The proposed exploration includes land that was certified on February 27, 1953 as a discovery or development under the Tom C. Stanford Contract Idm-E79 and also includes land certified April 7, 1955 under the Gold Spring Tungsten, Inc., Contract Idm-E54. According to the application all of the land involved is now owned and under the control of Gold Spring Tungsten, Inc.

One copy of the application is retained in this office.

W. M. Traver

By J. W. Townsend
J. W. Townsend

Enclosures

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

November 16, 1955

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

Re: DMEA Application on
Forest Home Property

Attention: Mr. J. W. Townsend

Dear Mr. Traver:

With reference to your letter of November 10, 1955, the new Forest Home application includes property originally under lease to Tom C. Stanford (Idm-E79) which has reverted to Cold Spring Tungsten, Inc. by cancellation of the lease.

With regard to royalties on this property, we recognize that any production is subject to the Government's percentage royalty until the amount of $16,056.30 has been repaid.

Due to the fact that the former Cold Spring Tungsten, Inc. Contract Idm-E54 was on a cost-incurred basis, we prefer not to have this contract amended, but prefer to have a new contract drawn up on a unit cost basis.

Yours very truly,

COLD SPRING TUNGSTEN, INC.

Sidney S. Bell

Sidney S. Bell

SSB:bh

W.O (E54)

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

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

RECEIVED
NOV 21 1955

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

Not to be filled in by applicant

Docket No. DMEA-4072
Metal or Mineral Tungsten
Date Received 11-21-55
Estimated Cost $36,230.60
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.

(*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. Cold Spring Nos. 2 and 4 and Forest Home

(*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 8 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 November 3, 1955

COLD SPRING TUNGSTEN, INC.
(Applicant)

By Sidney S. Bell

Sidney S. Bell, Geological Engineer

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

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-President - 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) Applicant's Property Rights: The legal description of the property is as follows:

Name of Claim	U. S. Survey Lot No.	Area involved in application
Cold Spring	18340	From 140 feet to 1070 feet measuring from west end line.
Gem	18340	Southwesterly 200 feet of claim.
Forest Home	19559	From 140 feet to 720 feet from west end line.
Silver Light	19559	Easterly 320 feet of claim.

(b) Forest Home Mine and Cold Spring Number Two Mine.

The Forest Home Mine has two levels, 209 foot and 107 foot; the 107 foot level connecting with the 106 foot level of the Cold Spring Number Two Mine by a 400 foot drift trending in a northeast direction.

4. (a) Forest Home Mine and Cold Spring Number Two Mine (Continued):

On the 40 foot level, the Cold Spring Number Two Mine has 160 foot of drifting. There is a total of 1,775 feet of drifting and crosscutting, extending for 400 feet along the strike of several veins that are parallel or cross one another. There are stopes of unknown extent intermittently located along the drifts.

Cold Spring Number Four Mine:

This mine has one level about 100 feet below the surface, with a drift length of 480 feet. Ore occurs intermittently along the drift, and there is a small amount of stoping.

Cold Spring Number 1 Mine:

The fourth level of this mine extends from the Cold Spring Number One shaft as far West as the Cold Spring Number Two Mine, but it is caved to the extent of being impractical for rehabilitation.

The fifth level extends from the Cold Spring Number One shaft to a point just west of the Cold Spring Number Two Mine. This drift has been rehabilitated to a point 200 feet northwest of the Cold Spring Number Four shaft. Beyond this point, the caving is so bad that it is impractical to rehabilitate the drift.

Surface Trenching:

East of the Cold Spring Number Two shaft there has been some surface trenching done on a vein. This vein is approximately 250 feet east of the shaft, and strikes north 14 degrees east - dipping to the west 83 degrees.

The mine workings are easily accessible by paved highways from Denver to Nederland, Colorado.

(b) Past Production:

The history and production of the mines are known only imperfectly. Cold Spring Number Two is known to have produced about 2,000 units of WO_3 in ore, averaging eight and one-half ($8\frac{1}{2}$) percent WO_3. The recorded output from the two mines amounts to 10,000 to 12,000 units of WO_3, and the total output, including the production from many shallow shafts and trenches in the vicinity, is probably at least 15,000 units.

Present Production: Nil.

Ore Reserves: Unknown.

4. (c) The Forest Home shaft is on the east flank of Hurricane Hill, dipping steeply to the North, and located 1,500 feet west-southwest of the Cold Spring Mine. Cold Spring Number Two Mine shaft is 200 feet east. In 1944 the mine was almost wholly inaccessible, and the shaft almost indistinguishable at the surface. The Forest Home and Cold Spring Number Two Mines are in a structurally complex zone that trends in a northeast direction.

The workings of the Forest Home Mine are almost entirely in coarse grained moderately gneissic Boulder Creek granite. Aplite is abundant in the shafts above the first level. The granite in the walls of the Forest Home vein is intensely altered to clays for several feet, and the drifts along the vein are tightly lagged. The wall rocks of the numerous minor veins in the hanging wall of the main vein are fresh, or only slightly altered. There is a moderate amount of faulting that cannot be correctly measured, due to the uniformity of the rock, but the North wall probably moved downward and westward about 20 feet - similar to the North wall of the Cold Spring vein. The Forest Home vein itself is barren at most places in the mine, so that all of the production has come from the minor veins. The veins are in a sheeted zone six (6) inches - eighteen (18) inches wide that contains seams of medium-crystalline ferberite and a little horn quartz. Such narrow veins can be mined because of the high quality of the ferberite - a finely crystalline compact variety that contains practically no quartz - and the persistence of the seams. The Forest Home Mine is the only locality known in the district in which manganeese minerals accompany the ferberite.

The Forest Home Mine is in the midst of many productive veins, and the substantial production from short workings at shallow depth should merit a drilling program and further exploration. It seems probable that fewer small veins will be found with depth, but their place may be taken by one or two stronger veins. The widespread occurrence of ore near the surface in small veins that are almost inconsequential as fault fissures, should encourage further prospecting in the walls, particularly in the northeast part of the mine where aplite and petmatite are more abundant.

Further exploration northeast of the present workings seems warranted by the persistence of the vein zone in that direction, the productivity of veins in this zone at the surface, and by the increasing amount of aplite to the Northeast. A surface hole drilled by the Bureau of Mines 510 feet North 48 degrees East of the Forest Home shaft cut several horn quartz veins and considerable aplite. This hole was drilled South 45 degrees East at an angle of -45 degrees for 190 feet. The main Forest Home vein has been explored for only a short distance West of the shaft, and since the vein steepens westward, and also enters an area cut in by many aplite and petmatite dikes, further exploration to the West seems warranted. Similarly, several veins on the Cold Spring claim South of the Forest Home, are partly in aplite, and were productive at the surface in places and remain to be explored at depth.

4. (d) Access roads - A good gravel road runs three miles from Nederland, Colorado to the property.

Shipping distance - There is a mill in Nederland, Colorado.

Supplies - available at Boulder, Colorado eighteen miles by paved highway from Nederland, Colorado.

Residences - available at Nederland, Colorado.

4. (e) Manpower, materials, supplies, equipment, water and power are available at the site, or can be obtained immediately when required.

5. (a) Tungsten, in the form of Ferberite.

(b) Proposed Exploration:

At a point in the fifth level of the Cold Spring Number One Mine, approximately 200 feet Northwest of the Cold Spring Number Four shaft, where the caved area begins, it is proposed to set up the drill and project three horizontal holes to intersect the downward extension of the Cold Spring Number Four Mine.

Diamond Drill Hole Set-Up Number 1:

Hole 1 - South 35 degrees 30 min. East	100 feet deep
Hole 2 - South 4 degrees West	120 feet deep
Hole 3 - South 32 degrees West	160 feet deep

Depending upon favorable results from this group of holes, it is proposed to crosscut to the vein and drift West to the Forest Home Mine. Alternately, if no favorable formation is indicated by the diamond drill holes, it is proposed to drive a tunnel directly from the diamond drill set-up point in the fifth level to the Forest Home Mine, coming in on the 209 foot level drift.

Cross-cut	100 feet
Drift	620 feet

At various locations along the proposed drift, horizontal diamond drill holes will be projected to intersect the various veins in the Forest Home area.

Diamond Drill Hole Set-up Number 2:

Hole 1 - South 70 degrees East	140 feet deep
Hole 2 - South 44 degrees East	170 feet deep

Diamond Drill Hole Set-up Number 3:

Hole 1 - North 6 degrees East	110 feet deep
Hole 2 - North 47 degrees 30 min. West	130 feet deep
Hole 3 - South 21 degrees 30 min. East	100 feet deep

5. (b) Proposed Exploration (Continued):

Diamond Drill Hole Set-up Number 4:

Hole 1 - North 24 degrees West	100 feet deep
Hole 2 - South 29 degrees East	90 feet deep

Diamond Drill Hole Set-up Number 5:

Hole 1 - North 26 degrees West	100 feet deep
Hole 2 - South 26 degrees East	100 feet deep

(c) Work to start within thirty (30) days and be completed within eight (8) months.

(d) The operation will be supervised by Dr. G. C. Ridland, Denver, Colorado, 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. (a) Estimate of costs:

Independent Contract - Diamond Drilling can be contracted at $5.00/foot, plus power, supervision, etc.

1,420 feet of drilling @ $5.00	$7,100.00

(b) Labor, supervision, consultants:

Underground labor - 1 shift (2 men) @ $1.75/hour - 2560 hours	$4,480.00	
Hoistman - 1 man @ $1.85/hour - 1280 hours	2,368.00	
Surface labor - 1 shift (2 men) @ $1.60/hour - 2560 hours	4,096.00	
Geology - supervision and engineering 8 months @ $500.00/month	4,000.00	
		14,944.00

(c) Operating materials and supplies:

Drill steel	$540.00
Drill steel sharpening	100.00
Caps (.015/each) and Fuses (.0075/foot)	252.00
Powder @ $9.00 case	2,592.00
Pipe - 1 inch water - 720 feet @ $.50/ft.	360.00
Pipe - 2 inch air - 720 feet @ $.65/ft.	468.00
Pipe - 12 inch vent - 720 feet @ $1.00/ft.	720.00
Rail - 16 lb. including ties - 720 feet @ $1.50/ft.	1,080.00
Timber - including installation - 720 feet @ $2.50/ft.	1,800.00
Miscellaneous - shovels, picks, etc.	100.00

6. (c) Operating materials and supplies (Continued):

Power - motor 720 feet @ $.14	$ 100.80	
Power - water pump 720 feet @ $.23	165.60	
Power - hoist 720 feet @ $.45	324.00	
Power - compressor 720 feet @ $1.69	1,216.80	
Total Operating Materials and Supplies		$ 9,819.20

Water - available at site, free.

Fuel - not required.

(d) Operating equipment:

Hoist and bucket	$2,000.00	
Drifter and accessories	800.00	
Three cars @ $150.00	450.00	
Motor	1,000.00	
Mucking machine	3,100.00	
Compressor - 650 CFM	5,000.00	
	$12,350.00	
Above to be furnished by operator, so only 10% depreciation charged to program - For eight months		$823.00

(e) Rehabilitation and repairs: Nil.

(f) New buildings, improvements, installations: Nil.

(g) Miscellaneous:

Assaying	$250.00	
Accounting - 8 months @ $100.00/month	800.00	
Payroll taxes - including workman's compensation, liability insurance, unemployment, etc.-10% of payroll	1,494.40	
Maintenance costs (estimate)	500.00	
		$ 3,044.40

(h) Contingencies: $500.00

Grand Total $36,230.60

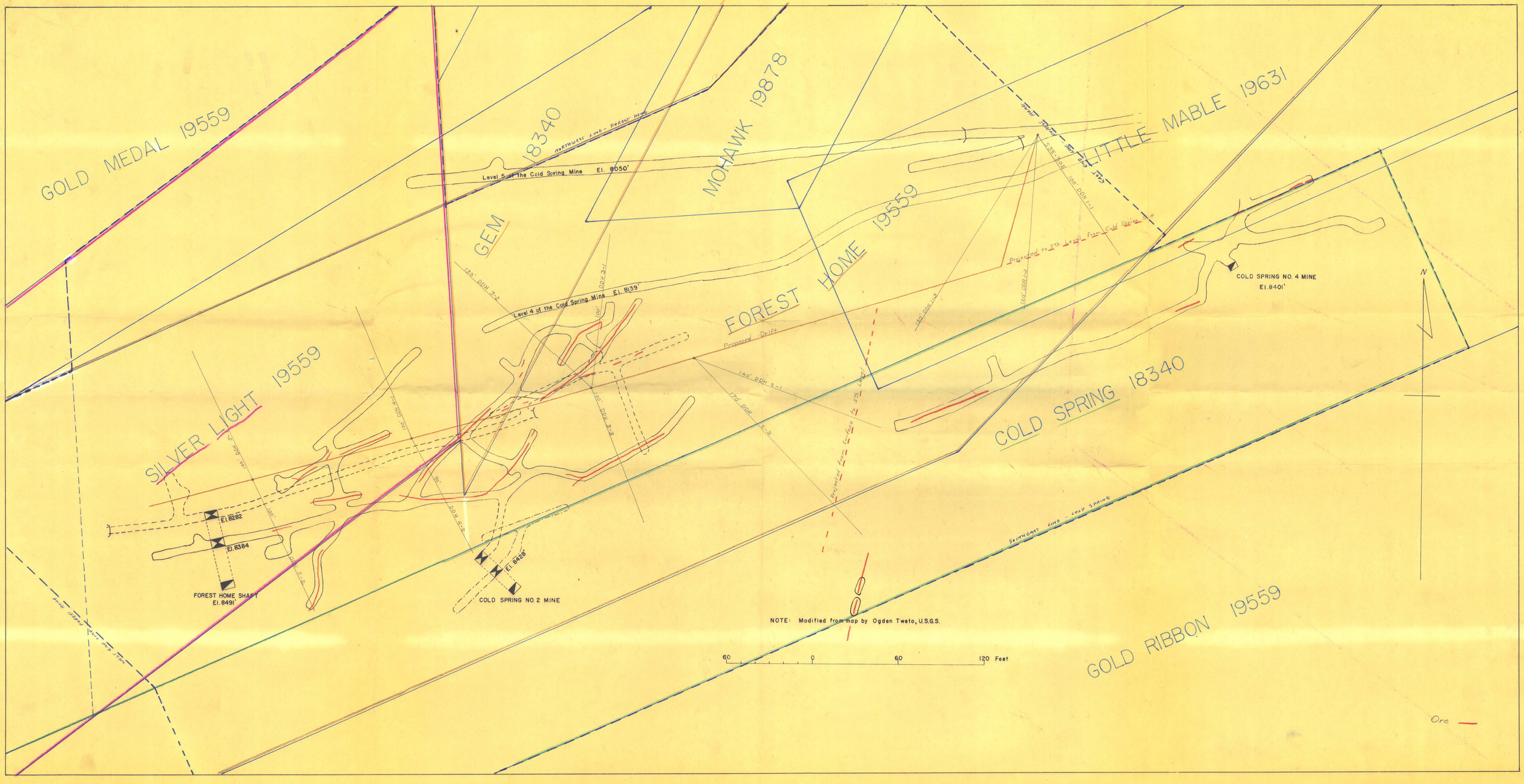
Estimate - per unit cost:

Diamond drill holes	- 1420 feet @ $5.00	$ 7,100.00
Cross-cut	- 100 feet @ $40.20	4,020.60
Drift	- 620 feet @ $40.50	25,110.00
		$36, 230.60

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

7. (a) Yes.

(b) Money.


GOLD MEDAL 19559
GEM 18340
MOHAWK 19878
LITTLE MABLE 19631
FOREST HOME 19559
SILVER LIGHT 19559
COLD SPRING 18340
GOLD RIBBON 19559
Northwest line Forest Home
Level 5 of the Cold Spring Mine El. 8050'
Level 4 of the Cold Spring Mine El. 8139'
Proposed Drift
Projected from Surface to 5th Level
Projected to 5th level from Cold Spring No. 4
Southeast line Cold Spring
COLD SPRING NO. 4 MINE
El. 8401'
El. 8282
El. 8384
FOREST HOME SHAFT
El. 8491'
El. 8428'
COLD SPRING NO. 2 MINE
NOTE: Modified from map by Ogden Tweto, U.S.G.S.
60 0 60 120 Feet
N
Ore

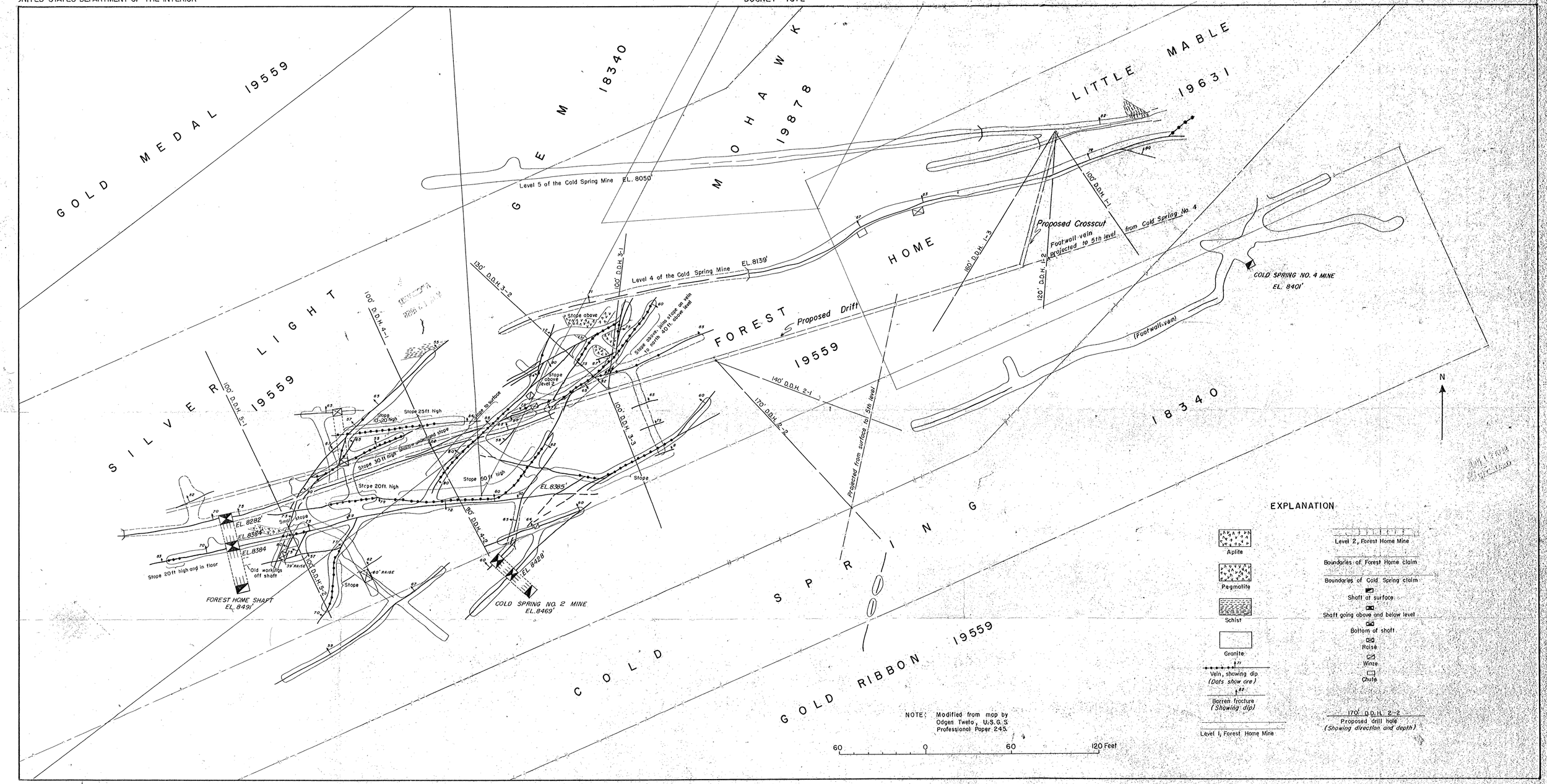


FIGURE 2.—GEOLOGIC PLAN OF FOREST HOME AND WEST END OF COLD SPRING MINES