BUREAU OF LAND MANAGEMENT

MINERAL PATENT APPLICATION

for the

TITAN GROUP

by

KENNAMETAL, INC.

in

MINERAL COUNTY, NEVADA

UNITED STATES DEPARTMENT OF THE INTERIOR

(2720) 6000 0022

Form 3820–1
(February 1968)
(formerly 4–802)

Serial Number
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(MS-4773A)

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DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

State of Nevada

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MINERAL REPORT

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LANDS INVOLVED

Mount Diablo Meridian

T. 13 N., R. 32 E.,

secs. 1, 2, and 12 (within)

FOR U.S. GOVERNMENT USE ONLY

July 3, 1969
(Date)

By H. W. Mallery*

Technical Review Robert Webb 1-15-71

*District Geologist, Carson City, Nevada

Management Review
Leonard L. Lamm
Chief Resource Mgr.
1-22-71

GPO 841-153

NOTE

This report is the result of a mineral examination or geological investigation and should not be construed as being a geological or engineering report for appraisal purposes or for purposes other than that which the report was written.

No mineral report shall be released for inspection unless authorized by the Chief, Division of Lands and Minerals Program Management and Land Office.* (BLM Manual 3825.19A)

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ABSTRACT

A moderately-sized domestic corporation whose principal interests are in tungsten products has applied for patent to 16 lode claims. The claims encompass scheelite deposits owned by the applicant from which tungsten ores have been mined. The property, known as Nevada Scheelite, is not presently in operation. The geology both in general regional relationships and in local detail compares very favorably with other areas in the world known to contain similar ore deposits. It is concluded that 4 of the claims are valid and patentable; the remaining 12 do not have sufficient showings of valuable mineral to be placed in this category.

INTRODUCTION

On January 30, 1967, Kennametal, Inc., a Pennsylvania Corporation whose Nevada operations are known as the Nevada Scheelite Division, filed an application for patent under the general mining laws to approximately 295 acres of public land in Mineral County, Nevada. The application (N-856, MS-4773 A) comprises sixteen lode mining locations encompassing a block of land within secs. 1, 2, and 12, T. 13 N., R. 32 E., MDM.

The claims are identified as the Titan, Titan No. 1, Ma Parker, Viking's Daughter, Duke, Princess, Turtle, Tungsten, Tungsten No. 1, Don, Blanco, Blanco Nos. 1 and 2, Gussie L., Blue Bell, and Lead Mountain; cover open mountainous terrain; are located about 36 miles airline north-northeast of Hawthorne, Nevada; lie at an elevation ranging from about 5000 ft. to 5700 ft. above sea level; and, are situate at the south end of the Sand Springs Range. The lands contain scattered shrubs common to arid terrain of this elevation in Western Nevada, are untimbered, and except for surface facilities related to their operation (mining and metallurgical plant and camp) are unoccupied. Access is via a paved road running southerly from Highway U. S. 50 at a point near Frenchman's Station east of Fallon, Nevada, or by a number of graded roads from Gabbs to the east, Hawthorne to the south or Schurz to the west (see index map, following).

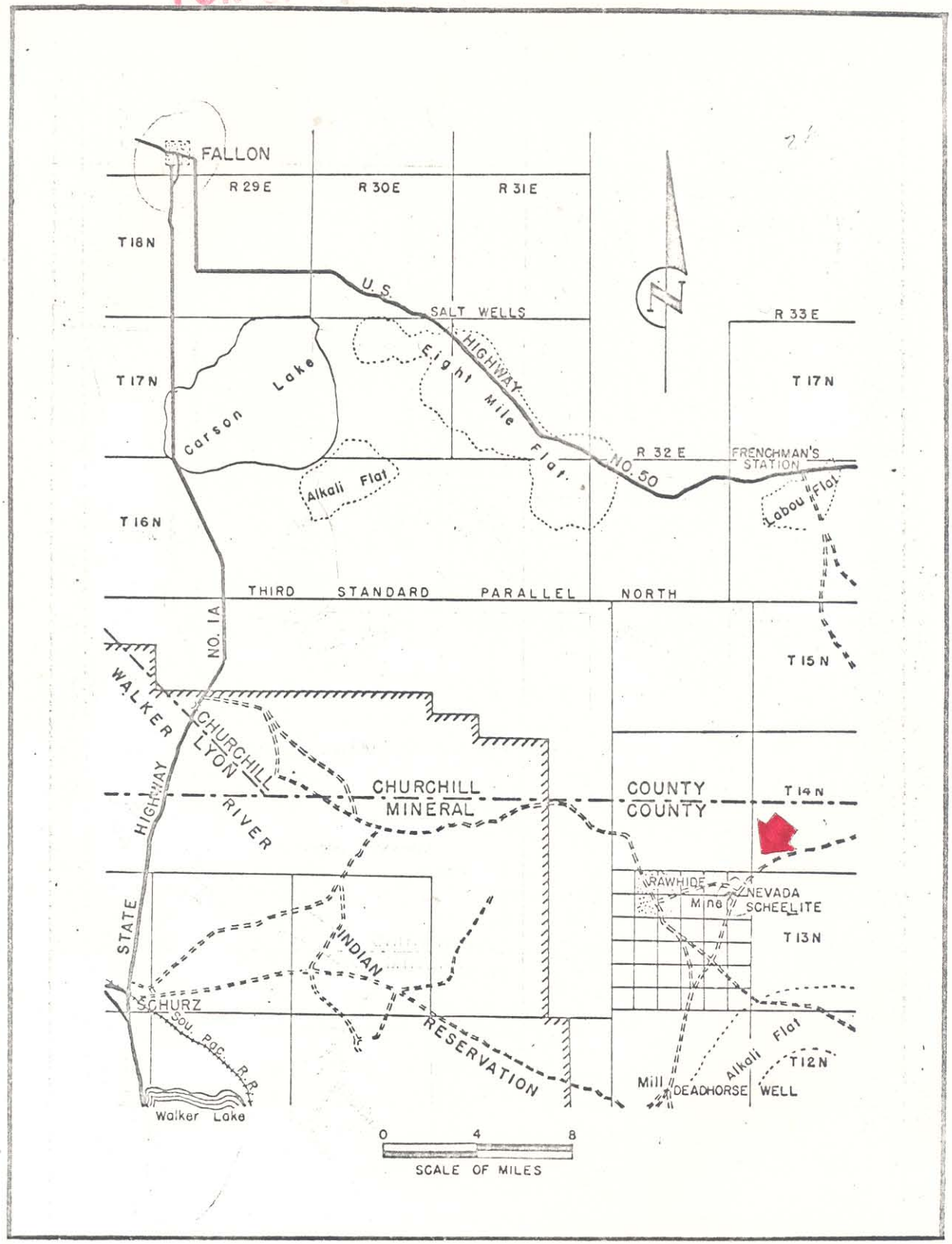

Figure 1. - Location map, Nevada Scheelite, Inc., Mineral County, Nev.

(from RI 4681, USBM)

The Corporation asserts that tungsten-bearing ore deposits have been discovered and its records indicate about $9,000,000 worth of tungsten was mined from some of these claims between 1951 and 1957. Prior to this, Nevada Scheelite, Inc., operated the property from about 1939 to 1951--the original discovery was made in 1930 and initial mining began in 1936 by one Oscar L. Mills. (Tungsten was produced during the 1936-1951 period but its total dollar value is not known.) After cessation of active mining in 1957, the Corporation continued development work for about another year. Since that time, although there has been no production, the mine has been maintained and kept dewatered. On July 20, 1967, W. M. Stoll, Vice-President of Kennametal, said that the Company might get back into mining once again as it definitely appeared feasible to do so. He added: "We probably shut down prematurely in 1957 when GSA removed the price support; we may have been able to have kept on going."[1/]

This report covers the examination of the mining locations concerned and was made at the request of the Nevada Land Office Manager. Its purpose is to record and summarize pertinent aspects of the geology, mineralization, and related engineering considerations--data which served in part in the formulation of the writer's opinion regarding

1/ Personal communication.

the validity of the individual claims comprising this application.[1/]

The examination began July 11, 1967 in the presence of E. M. Colwell, Kennametal's local Manager of Operations. Most of the time the writer worked alone although Mr. Colwell was usually available for consultation, and upon several occasions either he or his assistant, Jack Clark, or both, accompanied him, and on other occasions Peter Galli, District Geologist, or Joel Montgomery, Project Geologist, or both, of Union Carbide Corporation, participated in the examination.[2/] A total of twenty-one days were spent on-the-ground in surface and underground work. (The work was spread over a period of 14 months at the request of the applicant in order to give it time to effect discovery on all of the claims.)

The claims were identified by reference to the plat of mineral survey No. 4773 A; to maps supplied by the applicant; and to corners set on-the-ground by the mineral surveyor. (USGS topographic quadrangle maps have not been published for the area containing the mine.

1/ This examination represents a continuation of detailed geologic studies and investigations of other nearby lands or mining locations in particular, and of Western Nevada and Eastern California generally, by the writer over the past six years.

2/ This Corporation had a lease-option agreement with the applicant and was engaged in an evaluation of the property during 1968.

Army Map Service aerial photographs identified as VV HY M 4 AMS 26Nov56 160, frames Nos. 695-697; BLM photos "N-3 1-122 and 1-123,"[1/] and the 1:250,000 AMS maps, Reno and Walker Lake, provide the best coverage available to date.)

The field and laboratory work consisted of:

1. A reconnaissance-type survey of the geology of the area.
2. A semi-detailed geological survey of the claims.
3. An examination of each of the alleged discovery points, and other workings.
4. An examination of the 200-, 400-, and 500-foot levels of the mine.
5. An examination of the records of the Corporation (reports, maps, sections, drill logs and core, etc.), and of the literature pertaining to the geology and mineralization of the mine, claims and area.
6. Obtaining samples for confirmatory assay purposes.
7. Periodic review of the results of Union Carbide's drilling program then in progress on the claims.
8. An examination of each mining location to ascertain if the corners were set as described in the field notes and to establish that the discovery workings or drill holes were located substantially as indicated.

GENERAL GEOLOGY

The Federal Bureau of Mines, the U. S. Geological Survey, and the Stanford University Department of Geology mapped and studied the tungsten occurrence and general geology at the Nevada Scheelite Mine in

1/ Dated "8-7-66".

the 1940's.[1] Later, (in 1961) the Nevada Bureau of Mines mapped and conducted geophysical investigations in the Sand Springs Range for the Atomic Energy Commission.[2] Although this project did not actually include the Nevada Scheelite Mine Area, it provides modern geological and geophysical data concerning the lithology and structure of the general environment in which the mineralization occurs.

The writer has had access to most of these reports and maps and has examined a multitude of mine maps and drill records belonging to the subject Company. The following resume' of the general geology of the area and claims incorporates both work done by others and his own current research.

Regional Geology

The Sand Springs Range, a prominent north-trending Basin Range topographic element, is composed mainly of a Cretaceous granodioritic intrusive. The range is bordered on the north and south by older Mesozoic metamorphic rocks and is flanked to the east and west by wide,

1/ R. I. 4681, U. S. Bureau of Mines, April 1950, is the only published account on this work.

2/ Geological, Geophysical and Hydrological Investigations of the Sand Springs Range...., Nevada Bureau of Mines, 1962.

gravel-filled valleys. Locally, both the pluton and the metamorphics are overlain by Tertiary and Quaternary volcanic rocks.

Numerous aplite-pegmatite dikes cut the intrusive, and andesitic dikes and masses intrude or cut the granodiorite, metamorphic rocks, and aplite-pegmatite dikes. The andesite dikes and other rock types may be cut by rhyolite dikes. All of the dikes are apparently prevolcanic and appear to be genetically related to the main intrusive.

The Range has been uplifted along a series of high-angle, northeast and northwest-trending faults. These faults offset the metamorphics, the granodiorite and the volcanics, and in a few cases, Quaternary alluvium and various types of dikes.

In the vicinity of the mine, at the south end of the Range, a northwest-trending belt of metamorphic rocks extends across the Range. The foliation and original bedding of the rocks in this zone are parallel, both striking northwest and dipping vertically. An upper unit of gray to white, recrystallized, dolomitic limestone extends the entire length of the belt. Below this lies a middle unit of andesite breccia and flows, and a lower unit of phyllite, shale, and hornfels.[1/] The metamorphic sequence apparently forms the western limb of a south-plunging anticline.

Little wall rock alteration is associated with the aplite-pegmatite

1/ Because the geological relationships are not clear, this sequence may not be correct.

and andesite dikes. In contrast, many of the rhyolite dikes and adjacent wall rocks contain disseminated pyrite, and are bleached, argillized and iron stained. Similar alteration occurs along some of the faults, some of the joints in the intrusive and in the volcanics, and to a lesser extent, in the metamorphics. North and west of the mine there are large areas of highly altered rocks--rocks believed to represent members of the two lower metamorphic units--and some intrusive rocks best described as diorite.

Contact-metasomatic tungsten deposits occur in the metamorphics--in most cases in metalimestone--at both ends of the Range. The mineralization consists of scheelite and powellite along with garnet, diopside, calcite, quartz, epidote and other tactite minerals in small irregularly shaped replacement bodies.[1/] Occasionally small scheelite-bearing quartz veins cut the tactite and adjacent rocks.

Mine Geology

The Federal Bureau of Mines (op. cit., page 4) states:

> "The mine area is underlain chiefly by metavolcanic rocks, andesites, basalts, and tuffs of undetermined thickness, in which there is an interbedded stratum of limestone which has maximum thickness of 500 feet....The rocks have been intruded by a granite stock that crops out over an area of 1 square mile and by numerous small granitic dikes and sills. Tactite bodies, locally up to 50 feet thick,

1/ Tactite is a hornfelsic rock composed essentially of garnet and epidote.

occur along contacts between granite and limestone....Volcanic rocks of Tertiary age locally intrude and overlie these rocks. In places all rocks are either silicated or silicified.

"....Granite contacts are for the most part sharp. However, in the vicinity of the mine post-granite faulting along soft oxidized tactite zones generally has obscured the contacts. Three sets of pre-granite faults are recognizable in the district, trending east, northeast, and northwest. Of these, only one northwest fault has direct bearing on the ore deposit. This fault, which has displaced the limestone 350 feet horizontally, locally controlled the emplacement of the granite....

"Scheelite, the ore mineral, occurs in tactite along the contacts between limestone and granite. Associated with it are the usual minerals of tactite--garnet, epidote, diopside, wollastonite, quartz, calcite--and oxidation products. Pyrite is locally abundant, and in places a small amount of chalcopyrite or copper carbonate occurs. The scheelite contains an average of 0.5 percent of molybdenum.

"In general the granite contacts follow the limestone beds, which in the vicinity of the mine are essentially vertical. The tactite is usually narrow, seldom exceeding 15 feet in width....

"In places, mainly along concordant contacts between granite and sedimentary rocks, the granite is separated from the limestone by hornfels as much as 40 feet thick. In some of these places, alteration of the adjacent limestone to tactite has not taken place; in other areas the hornfels has not prevented the formation of tactite.

(Above the 200-foot level the oxide ore)"....is mainly a porous limonitic tactite made up of garnet, epidote, diopside, and limonite, often with some quartz, calcite, wollastonite, and pyrite....Much of the ore is stained green by copper carbonates, and isolated drill cores were found that assayed 5.4 percent copper. The general mine-run ore, however, contains less than 0.6 percent copper.

(Below the 200-foot level the unoxidized ore)"....contains

a high percentage of sulfides, chiefly pyrite and chalcopyrite. Some of these appear to be primary sulfides formed simultaneously with the tactite; others occur as narrow bands of sulfides cutting the tactite."

Summarizing, the Nevada Scheelite Mine is located where a tongue of granodiorite nearly 1,000 feet wide extends westward from the principal stock into a belt of marble. Tungsten, molybdenum, copper and gold are the only valuable constituents known to be present. The ore bodies consist of a series of moderately dipping (to the E), steeply raking (to the N), shoots of varying widths and irregular shapes. The shoots are the largest where the contact locally changes direction abruptly or where cross faulting is strongest. If present, the surface expression of the mineralization at depth is manifested by exposures of tactite, some of which is iron-, copper-, or tungsten-bearing.

The mine is located where structural conditions are very favorable for the occurrence of this type of ore deposit, and where within a large area surface indications of tungsten mineralization are the strongest. The dominant controls of mineralization appear to be the attitude and configuration of the contact, and the existence of faults--the mineralization occurring mainly where the contact changes direction from nearly north-south to east-west.

It is difficult to assess the significance of the strongly altered rocks northwest of the mine but the hydrothermal phenomena exhibited

there could indicate the possible presence of economic mineralization at depth even though more direct reflections, such as tactite, are lacking at the surface.

DEVELOPMENT AND MINERAL VALUES

The applicant and its predecessors have produced tungsten and molybdenum from surface pits and trenches, and from an underground mine. The Nevada Scheelite Mine workings consist of vertical 3-compartment shaft about 415 feet deep, an inclined shaft about 575 feet long (which services the lowest level in the northern part of the mine), a total of over 7,000 ft. of drifts and cross-cuts on six levels, numerous back-filled square-set stopes, and timbered raises.

Facilities on the claims consist of a 100-125 ton-per-day (TPD) mining and milling plant, a tungsten carbide-producing pyrometallurgical establishment, laboratories and offices, and a camp (including a school) in which about 100 people currently reside. The mine workings are confined to three claims--the Don, Tungsten and Turtle; the surface facilities to six claims--the Blanco, Bluebell, Don, Lead Mountain, Tungsten No. 1, and Turtle.

After production was curtailed in the 1950's, the Company, with United States Defense Minerals Exploration Agency (USDMEA) assistance, drilled a number of holes and continued underground exploration on the lowest (500) level in the northern part of the mine. This

program outlined a 40,000 ton ore body located above and below the 500 level which to date has not been extracted. This ore body contains about 60,000 units of tungsten (as WO_3) worth $2,580,000 at present metal prices, and 0.6 and 0.7 percent molybdenum (as MoO_3) valued at $941,200.[1/]

Union Carbide Corp., a major domestic producer of tungsten, drilled on the property from the surface and underground during most of 1968. Much of the drilling was directed toward confirming the existence of the ore body known to be present on the 500 level and consequently no new ore bodies, per se, were discovered but the reserves at the north end of the mine were enlarged to 75,000 units ($3,225,000 worth of tungsten.)[2/]

The ore bodies--mined or unmined--contain principally scheelite, a calcium tungstate mineral. In the area of the mine scheelite-bearing tactite is typically dark brown in color, ranges from finely to coarsely crystalline in texture, is composed mainly of an aggregate of garnet and epidote, frequently contains inclusions of white quartz

1/ Eng. and Min. Journal, February, 1969.

2/ Union Carbide's agreement terminated early in 1969. It is understood that their goal was to outline 200,000 units of WO_3 and as this was not accomplished within the time permitted, they allowed the option to expire.

or calcite, may be stained with blue or green copper carbonate minerals, and is very hard and dense. Tactite usually occurs at or near the metalimestone-granodiorite contact and because of its superior hardness commonly stands out in relief above the surrounding rocks. Occasionally small knots or blebs of tactite occur in the metalimestone at distances remote from known granodiorite, usually in association with fault structures.

The tactite in which the ore occurs has been oxidized to a depth of about 200 ft. below the surface. In the oxidized zone tungsten occurs in limonitic masses--which represent oxidized tactite--as a ferro-tungstite mineral along with other oxides and carbonates of copper. Below this zone the tactite is relatively fresh and carries some pyrite and chalcopyrite in addition to scheelite and powellite(?).[1/] Observations underground disclose that the mineralization is concentrated 1) within relatively wide zones of tactite, 2) in association with faults and fractures, and 3) is localized where changes in strike or dip of the contact are most pronounced.

Except for the one ore body on the 500 level no ore is known to exist unmined within the developed area.

1/ The molybdenum either occurs in scheelite or in powellite, a calcium-molybdenite mineral, or both. (No molybdenite has been identified in the ores and powellite may not be present either.)

Description and Evaluation of Individual Claims

In essence the following is an attempt to capsulize the salient features of each mining location for which patent is requested:

BLANCO

Rocks exposed on the surface of the Blanco lode include metamorphosed volcanics and limestone, diorite, and in the extreme south portion thereof, granodiorite. Structurally, in general, the metamorphics dip steeply to the E and strike nearly due N. Granodiorite occurs in the hanging wall and the metavolcanics in the footwall of the bed of metalimestone.

The official discovery point is situate near the north end line of the claim but Mr. Colwell did not contend for values in the old, small workings located there. Rather, he designated a point near the SW corner of the claim. Here metalimestone and tactite were exposed and the granodiorite contact (see map) was only a short distance away to the S. Mr. Colwell said that on a previous night he and Mr. Clark had "lamped" this area (with an ultra-violet light source) and that this was one of several "spots" which indicated scheelite values.

The point referred to consisted of a vertical face in white metalimestone upon which an area had been outlined with yellow paint (see photo nos. 1 and 2.) 1/

Photo No. 1. View, looking N. 75° E., showing outcrop of metalimestone at point designated for discovery on Blanco. Tactite is exposed over the lower portion of the ledge between the two short boards seen in the picture. Note character of terrain.

1/ The paint was sprayed at night marking places where scheelite fluorescence was observed.

Photo No. 2. Close-up view, looking S. 50° E., showing point sampled on the Blanco (cf. photo no. 1). Note paint-outlined area (surrounding head of pick above racksack) and sharply demarcated zone of tactite along portion of face below end of pick handle.

Sample No. 270368-HWM-1 consisted of a 7-pound chip sample of tactite taken from within the area outlined with paint. The sample was cut by Mr. Clark with the writer and Mr. Colwell observing. The zone sampled extended for 1.3 ft. in a horizontal direction, 0.5 ft. vertically, and averaged about 0.3 ft. in depth.[1/] (The total area outlined with paint was 1.8 ft. in maximum dimension.)

1/ Across structure.

The area sampled lay about 2.4 ft. above the sill and about in the center of the tactite zone on the nearly vertical face. The sample was labeled to run for gold (Au), silver (Ag), copper (Cu), tungsten (as WO_3), and molybdenum (as MoO_3).

The tactite zone achieved a maximum thickness of 1.0 ft., was 17 ft. in over-all length and 4 ft. in maximum height. No minerals of value were seen here or at several other nearby occurrences of tactite. This exposure was the largest of all seen in the area.

Laboratory examination of this sample disclosed the presence of an estimated 1.5 percent WO_3 as scheelite occurring as a tiny to small-sized disseminations in pale brown, fine-grained, relatively fresh garnet tactite. No other minerals of value were observed.[1/]

Chemical analysis and fire assay of this sample revealed the existence of the following:[2/]

Au	0.01 ounces per ton
Ag	0.1 " " "
WO_3	1.24 percent [3/]
MoO_3	0.05 "
Cu	tr.

1/ Microscopically and fluoroscopically by the writer at Carson City, Nevada.

2/ By H. M. Ochs, Chemist and Spectrographer, at Denver, Colorado.

3/ The applicants laboratory reported the presence of 1.33 percent WO_3 in their split of this sample.

Evaluation

The Blanco lode lies immediately to the west of the Don upon which lies the major portion of the Nevada Scheelite Mine. Mine workings exist within 120 ft. of the Blanco but none actually enter it. The important metalimestone-granodiorite contact lies mainly to the east (on the Don) but because of an abrupt change in strike, this contact is exposed across the southerly portion of the Blanco. Here are found several zones of tactite, on of which was designated as the discovery point and sampled (see map).[1/]

The ore-bearing contact dips sharply to the east--away from the Blanco--in the vicinity of the mine and apparently also at the south end of the Blanco. As no ore is known to occur more than a few tens of feet away from this contact, however, there is little likelihood for the existence of tungsten deposits except in the south end of the claim.

The probable presence of valuable mineral deposits has not been demonstrated on this claim although the one sample indicates the existence of ore-grade tungsten values. The sample, however, was obtained from a relatively narrow (0.3 ft.) width and over a very restricted area at a limited tactite exposure situate about 100 ft laterally from granodiorite. The questions logically are, then, 1) what is

1/ Sample point (1)

the nature of the contact at depth, and 2) does this occurrence indicate the potential presence of more extensive mineralization at depth. In this instance, the writer is reluctant to assume that based upon the mineral showings described and the lack of hard geological data that a prudent man would be encouraged in developing this claim without further exploration. Discovery, therefore, has apparently not been effected on this, the Blanco lode, as of this date. 1/, 2/

BLANCO NO. 1

The Blanco No. 1 lode is underlain by metavolcanics, metalimestone, and diorite. In general, the metamorphics dip to the S.

The official discovery point is an old cut driven S. 40° W., 12 ft. into a steep hillside. The cut measures 6 ft. in width and has a 7 ft. face. Dioritic rock is exposed in the cut and on the adjacent hillside. A N. 50° E.-striking fault zone, which dips 60° NW, is exposed in the working. The fault zone is tight and but slightly stained with iron oxides. No quartz veins, silicified zones, or valuable minerals were seen.

1/ It should be noted that mineral showings over what ultimately developed into the Nevada Scheelite Mine were also relatively sparse and limited, however.

2/ Company data indicates a diamond drill hole (DDH-6) tested the contact in this area at depth but no mineralization was encountered.

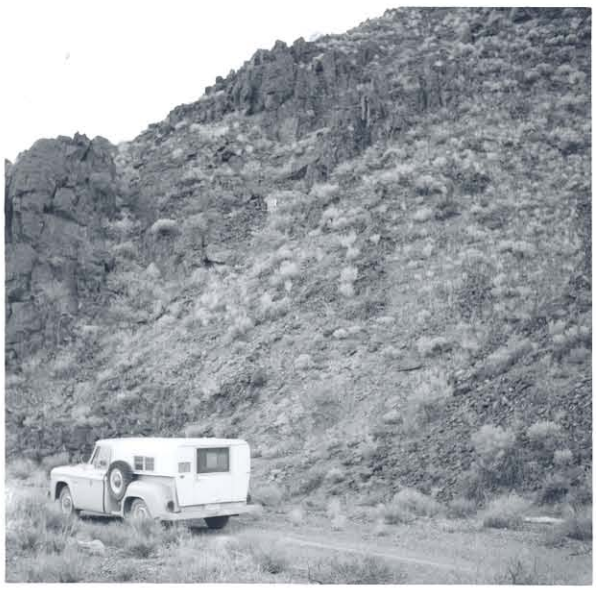

Photo No. 3. View, looking S. 5° E., showing northern portion of the Blanco No. 1 and the location of the official discovery (slight working situate immediately to the right of the truck). Rocks exposed are diorites.

Mr. Colwell said that this working didn't look especially promising but that he would lamp it to see if it merited sampling. A few weeks later he said that the best showing on the claim was a small outcrop of tactite located near the SE corner of the claim. Here he designated a small paint-outlined rock (1.2 ft. by 0.85 ft. in size) which projected 0.9 ft. above the surface of the ground. From this small knob of tactite Mr. Clark obtained a 9½ pound sample--nearly half of the entire outcrop--which was labeled 270368-HWM-2 (see photo No. 4).[1/]

1/ Sample point (2)

Photo No. 4. View, looking S. 70° W., showing point sampled on the Blanco No. 1. The outcrop of tactite lies behind and below the geologic pick and immediately to the left of the sample bag.

The sample consisted of chips obtained from an area 0.8 ft. square 1/ and 0.5 ft. in depth. The small knob of tactite was contained in metalimestone and was one of a number of similar other exposures nearby.

Laboratory examination disclosed the presence of an estimated 2 percent WO_3 as scheelite as small- to medium-sized disseminations in pale brown, fine-grained, slightly oxidized, garnet-tactite and silicated limestone. No other minerals of value were observed.

1/ Across structure.

Chemical analysis and fire assay revealed the following:

Au	0.02 ounces per ton
Ag	0.2 " " "
WO_3	0.42 percent[1/]
MoO_3	0.03 "
Cu	tr.

Evaluation

The Blanco No. 1 lies some 700 ft. or more west of the mine and does not contain the important contact zone although granodiorite is exposed very close to its SE corner (see map). Neither ore nor ore-grade values have been found within this claim. The closest mineralization lies some 500 ft. to the N at the "Glory Hole" on the Viking's Daughter lode.

What lies below the surface is unknown with the certainty but in all probability granodiorite does at depth. Whether this is in contact with the metalimestone or not, and whether valuable tungsten deposits may have been created or not is, however, not a probability. Therefore, as a prudent man would hardly be warranted in developing this claim on the basis of presently available geological data, discovery has apparently not been effected on this, the Blanco No. 1 lode, as of this date.

1/ The applicants assay indicated 1.60 percent.

BLANCO NO. 2

The Blanco No. 2 lode is underlain by metalimestone and metavolcanic rocks.[1/] In general these units dip to the S.

The official discovery point is an old cut driven S. 20° E., in overburden on a steep hillside and is located as indicated on the attached map. The cut is 12 ft. in length, 7 ft. in width, and has a face 6 ft. in height. On March 26, 1968, Mr. Colwell stated that he and Mr. Clark had been unable to find evidence of valuable mineralization on this claim. Thus, no smaples were obtained.

Evaluation

The Blanco No. 2 lies some 1300 ft or more west of the mine and about 500 ft. SW of the nearest known mineralization, that of the "Glory Hole" on the Viking's Daughter lode. The nearest granodiorite is a small outlier located near the SE corner of this claim.

The last paragraph of the Blanco No. 1 evaluation section applies to this claim as well as it does to the Blanco No. 1. Discovery, therefore, has apparently not been effected on the Blanco No. 2 as of this date.

BLUE BELL

The Blue Bell lode is underlain by metalimestone and granodiorite; it also contains a small outcrop of the metavolcanics. Structurally,

1/ The northern portion is in conflict with the Titan lode, which is older.

dips in the metalimestone are mostly to the SE.

The discovery consists of an old cut driven N. 10° E., 14 ft. into a hillside. The cut is 7½ ft. in width and achieves a maximum vertical face of 6 ft. The cut lies immediately to the north of a granodiorite contact and exposes tactite and light gray-colored crystalline limestone. Some of the tactite, where oxidized, is stained with green copper carbonate. The tactite occupies 3 to 4 foot-wide, steeply dipping, N. 80° W.-trending fault zone. The cut is located substantially as indicated on the map of the claim (see map and photo no. 5).

Photo No. 5. View, looking N. 5° E., of discovery cut on the Blue Bell lode. Note geologic pick and rucksack for scale.

Sample 070268-HWM-2 was obtained from this working by Mr. Colwell and the writer. 1/ The sample weighed 5 pounds, consisted of tactite, and was chipped from an area 1.5 ft. in vertical dimension, 0.9 ft. in horizontal dimension, and averaged 0.1 ft. in depth. 2/ The sample extended from the sill upward in the right hand (NE) corner of the cut. Mr. Colwell had not lamped this cut but he said he was going to as he did not realize that the showing here looked so good.

Laboratory examination disclosed only one or two tiny flecks of scheelite and some fluorescent calcite in the sample which consisted primarily of a fine-grained aggregate of partially oxidized tactite (garnet, minor epidote, sparse malachite, and quartz). No other minerals of value were observed.

Chemical analysis and fire assay revealed the following:

Au	0.12 ounces per ton
Ag	1.1 " " "
WO_3	0.02 percent 3/
MoO_3	0.01 "
Cu	1.1 "

The next day Mr. Colwell asked to re-sample this claim because of the poor showing obtained in the first sample. This time Mr. Colwell, with Mr. Clark and the writer observing, obtained 6 pounds of selected specimens from across the entire lower-half of the face of the cut.

1/ Sample point (3)

2/ Across structure.

3/ The applicants assay indicated 0.00 percent.

The "sample" consisted of brown tactite, each piece being lamped by Mr. Clark before it was bagged: the bag was labeled 080268-HWM-1.

Laboratory examination disclosed the presence of considerable quantity of scheelite--estimated at 0.75 percent WO_3--in a fine-grained aggregate of slightly oxidized garnet-quartz-calcite-epidote tactite.

Chemical analysis and fire assay revealed the following:

Au	0.02 ounces per ton
Ag	0.1 " " "
WO_3	0.66 percent 1/
MoO_3	0.04 "

Evaluation

Obviously, the second sample was hardly representative inasmuch as it was "selected" in every sense of the word but it does serve to illustrate very well the variation in values which can be obtained from two similar-sized bags of rock collected from the same outcrop and containing nearly identical appearing pieces of tactite.

Mr. Colwell stated that two diamond drill holes (DDH) had been drilled a number of years ago in the northern portion of the claim;

1/ The applicants assay indicated 1.37 percent.

that some tungsten had been found on the contact at depth; but, that "it wasn't worth going after or even drilling further at the time." (He and the writer searched for the collars to the holes but were not successful in locating them.) It appears, therefore, that although tactite occurs at several points on this claim and the claim contains about 1600 ft. of the significant contact no ore is known to be associated with it. (The nearest known mineralization is some 750 ft. to the NE at the mine).

Thus although the surface manifestations are favorable, and tungsten is known to occur in some of the tactite zones exposed, the probable existence of a valuable mineral deposit has not been demonstrated. Therefore, discovery has apparently not been effected on the Blue Bell lode.

DON

The Don lode is underlain by granodiorite and metalimestone, the contact of which dips steeply to the E.

The main shaft is located on this claim as are the original and greatest portions of the Nevada Scheelite Mine workings. A large quantity

of tungsten and molybdenum had been mined from this claim down to the 400-foot level. The values occurred in tactite at or close to the contact which extends indefinitely in depth below the 400 level.

Evaluation

Although no major unmined ore bodies are known to exist above the 400-level, strong tungsten mineralization was observed on the 200-, 300-, and 400-levels, and in all probability development at depth would disclose the presence of additional deposits of valuable minerals.

Mine records indicate that to date approximately 200,000 tons of ore have been removed from the Nevada Scheelite Mine. As approximately 175,000 units of tungsten were obtained from this, the over-all grade apparently averaged 0.87 percent WO_3.[1/] Ores of this tenor at present metal prices would bring $33.67 per short ton assuming 90 percent extraction in the milling process. The mill feed also contained about 0.6 to 0.7 percent molybdenum, or $19.55 worth per ton assuming again 90 percent recovery. The ore, then, has a total value of $53.22 in terms of current metal quotations.

As the current cost of mining ($28.60), and milling ($12.15), including general administrative and overhead costs, is estimated to

1/ Known reserves at the north end of the mine average 1.5 percent WO_3.

approximate $40.75 per ton of ore milled,[1] it appears that ores similar in character and tenor to those previously mined would have value in the market place at the present time.

Discovery, therefore, has apparently been effected on the Don lode as it is the writer's opinion that this claim has not been worked out and in view of the existing mine and surface facilities, and the currently relatively high price for tungsten ($43.00 stu WO_3) and molybdenum ($1.81 per lb. MoO_3)[2], it would be economically feasible to initiate further development in the foreseeable future. (There is sufficient spread between the market price, $53.22, and the cost of production, $40.75, to cover transportation charges of concentrate from the mine to the applicants refining plant at Fallon, a distance of about 65 miles via excellent roads.)

DUKE

The Duke lode is underlain by altered and unaltered metavolcanic rocks and a portion of a dioritic intrusive. It is a fractional claim covering a triangular-shaped piece of ground lying between the Blanco No. 1, Princess, and the south side lines of the Viking's Daughter

1/ Based on cost analyses by the U.S. Bureau of Mines (R. L. Lowrie, Denver Office of Mineral Resources, personal communication, 1969), with modifications by the writer, for a 125 TPD mine and mill.

2/ E. and M. J.; op. cit.

and Titan (see map).

The discovery consists of an old open cut driven N. 20° E., 13.5 ft. into a hillside. The cut measured 9 ft. in width and developed a face 5.5 ft. in height. The cut exposed overburden--bedrock was not seen in place (see photo No. 6).

Photo No. 6. View looking N. 35° E., showing discovery cut on the Duke. Note absence of bedrock, and pick in center of photo for scale.

Concerning this working Mr. Colwell remarked: "I don't see any rock exposed here - I don't know why this is a discovery - let's see if we can find another working on this claim." After a careful search of the small area within this claim disclosed nothing significant, Mr. Colwell said that he would look further and would try to find something. Later on, however, he admitted that there were no showings on

the claim. Thus, no samples were obtained.

Evaluation

The Duke lies between the mine proper and the "Glory Hole" on the Viking's Daughter, which is the site of the closest known granodiorite, metalimestone, and tungsten mineralization.

What lies below the surface on the Duke is unknown with certainty but in all probability granodiorite does at depth. Whether metalimestone is present or not and whether valuable tungsten deposits exist or not is, however, not a probability. Therefore, as a prudent man would hardly be warranted in developing this claim on the basis of presently available geological data, discovery has apparently not been effected on this, the Duke lode, as of this date.

GUSSIE L.

The Gussie L. lode is underlain by metalimestone and contains a few very small outcrops of granodiorite. Structurally, dips in the metalimestone are mostly to the SE.

The discovery is an old cut driven due E, is 8 ft. long, 3 ft. wide, and has a 6-foot high face (see map and photo No. 7). The cut exposes a faulted 2-foot wide vertical dike of granodiorite bordered by tactite and brown, altered metalimestone. This zone achieves a maximum over-all width of 5.5 ft., contains both fine-grained zones of

garnetization and very coarse-grained crystalline garnet, and includes small masses of white quartz. The wall rocks, and rocks in the vicinity, are white, fine-grained metalimestone. The tactite appears to be concentrated on the left, or north side, of the dike while the right wall exposes mostly altered (silicated) metalimestone. The dike consists of sheared and badly broken granodiorite which strikes

Photo No. 7. View, looking S. 80° E., showing discovery cut, and in the foreground the discovery monument, on the Gussie L. Note rucksack for scale at the mouth of the working, exposures of the metalimestone to the left of the working, and general nature of the terrain which is typical of much of the land encompassed by the group of claims.

E-W. No minerals of value, or copper staining, was seen in rocks in place or on the dump.

Mr. Colwell designated this working, which is located substantially as shown on the map, as the discovery point on this claim, and to confirm the existence of a valuable mineral deposit he chipped a 3 pound sample of the best looking tactite from the upper left corner of the face. The sample was obtained over a vertical distance of 2.1 ft., a horizontal distance of 0.5 ft.,[1/] and averaged 0.2 ft. in depth. He said that he had only been up to the working once before and had never lamped it but that the material selected looked as good to him as anything he could see in the cut or vicinity. The interval sampled topped at a point 1.1 ft below the top of the face and consisted of tactite lying immediately adjacent to the granodiorite dike.[2/]

The sample was labeled 070268-HWM-1. Laboratory examination disclosed the presence of an estimated minus 1 percent WO_3 as scheelite occurring as small, disseminated fluorescent particles in a fine-grained aggregate of brown garnet-calcite-quartz-epidote tactite. No other minerals of value were observed.

1/ Across structure.

2/ Sample point (4)

Chemical analysis and fire assay revealed the following:

Au	0.03	ounces per ton
Ag	0.2	" " "
WO_3	0.15	percent 1/
MoO_3	0.01	"
Cu	0.5	"

Evaluation

The Gussie L. is the most southwesterly of the group of claims and lies 1300 ft. or more distant from the closest known mineralization, that of the mine proper. As with the adjoining Blue Bell, this claim also straddles a tongue of granodiorite although much less of the intrusive is exposed within it. Mr. Colwell commented: "This ground deserves drilling" and added that he was going to bring Union Carbide's geologists up to show it to them in hopes that they would drill in the area.

Basically, the comments on page 26 concerning the Blue Bell also apply to this claim; i.e., although the geology is favorable and tungsten showings exist, the probable presence of a valuable mineral deposit has not been demonstrated. Therefore, discovery has apparently not been effected on this, the Gussie L. lode.

LEAD MOUNTAIN

The Lead Mountain lode covers metalimestone and granodiorite in nearly equal quantities. Structurally, dips in the metamorphic unit are generally to the SE.

1/ The applicants assay indicated 0.40 percent.

The discovery consists of an old shaft sunk in metalimestone. The shaft is 6 ft. by 8 ft. in size at the collar, and 3.5 ft. deep (see photo no. 8). The working exposes bleached and recrystallized limestone in which jointing and fracture patterns suggest the presence nearby of a N. 75° E-trending, vertically dipping, fault. In the extreme SE corner of the shaft there is a small occurrence of tactite in association with one of the fractures .

Photo No. 8. View, looking S. 80° W., showing the official discovery point (immediately to the right and beyond the discovery monument) on the Lead Mountain. The view looks westerly across terrain underlain by metalimestone, lands encompassed by the Lead Mountain, Blue Bell, and Gussie L. lodes.

Mr. Colwell remarked: "I don't know why they called this the discovery. There is nothing here but limestone." He then suggested the other

working shown on the map (located near the E side line of this claim) for discovery purposes. At this cut and shaft he stated: "To be perfectly frank with you, I have never been here before but let's look around."

This shaft is very old, is 4 ft. by 6 ft. inside timbers at the collar, and was filled with debris to a point 3.5 ft. below the surface. No rock was exposed in this working. The nearby cut was 45 ft. long on a low, sloping bluff. Here iron-stained tactite and granodiorite were exposed. Mr. Colwell chipped a 5.5 pound sample from the face of the cut over a 14 ft. horizontal interval and a 2.5 ft. vertical interval beginning at a point 8 ft. N of the S end of the cut.[1/, 2/] The face of the cut was 7 ft. in maximum height and the zone sampled extended across its middle portion. He said that because he had never lamped this exposure he really didn't know what was there (see photo no. 9).

1/ Sample point (5)

2/ Depth sampled averaged 0.1 ft. (across structure) on this and the succeeding sample.

Photo No. 9. View, looking N. 20° W., showing cut sampled on the Lead Mountain lode. Mr. Colwell appears for scale. The sample bag lies about in the center of the zone sampled.

The sample was labeled 070268-HWM-3 and laboratory examination disclosed some scheelite occurring as tiny, disseminated "shines" in a fine-grained aggregate of moderately oxidized garnet-quartz-calcite tactite.

Chemical analysis and fire assay revealed the following:

Au	0.01	ounces per ton
Ag	0.2	" " "
WO_3	0.03	percent[1/]
MoO_3	0.02	"

At a later date Mr. Colwell said that he and his assistant had lamped this working, had found two zones that "lamped well," and would like to re-sample it.

The face of the cut displayed two areas outlined with yellow paint and from these two areas Mr. Clark obtained a 5-pound chip sample. The two areas lay 2.5 ft. apart vertically in about the center of the working. Each outlined area was a little less than 1.0 ft. in diameter. The resulting sample was labeled 250968-HWM-1.

Laboratory examination disclosed the presence of sparse scheelite--estimated at less than 0.5 percent WO_3--in a fine-grained aggregate composed primarily of garnet-rich silicated limestone.

Chemical analysis and fire assay revealed the following:

Au	tr.	
Ag	0.3	ounces per ton
WO_3	0.27	percent[2/]
MoO_3	0.038	"

1/ The applicants assay indicated 0.07 percent.

2/ The applicants assay indicated 0.40 percent.

Evaluation

The favorable contact zone very nearly bisects this claim from E to W but significant showings of mineralization are sparse or nonexistent. The tactite exposure sampled apparently lies within a NW-trending shear zone and although its environs are covered with alluvium or mill tailings it is presumed that this point is at the metalimestone-granodiorite contact. Adjacent to this cut someone a long time ago sunk a shaft which according to the size of its dump was probably several tens of feet deep. Apparently only limited values, if any, were exposed and the working was abandoned.

The nearest known mineralization from this working is some 500 ft. to the SE--off of the subject claims--where some scheelite has been mined.[1/] The Nevada Scheelite Mine lies about 1000 ft. to the N, or about 400 ft. N of the nearest part of this claim.

As the probable existence of a valuable mineral deposit, in the writer's opinion, has not been demonstrated, discovery has apparently not been effected on this, the Lead Mountain lode.

1/ At the Hooper No. 1 working (see map).

MA PARKER

The Ma Parker lode contains metalimestone, granodiorite, and altered and unaltered metavolcanic rocks. Structural relationships are not clear but it appears that the stratified units strike nearly E-W and in places are either vertical in attitude or are overturned and dip steeply to the N. The alteration referred to consists primarily of a modification from a dark-colord, hard rock to a light-colored soft, conspicuously iron-stained material. The resulting rock is largely composed of sericite, quartz, clay minerals and pyrite. The alteration has been attributed to Tertiary vulcanism.[1/]

The discovery working consists of an old cut driven N. 20° W. a distance of 16 ft. to a sloping 9.5 ft. face in highly altered metavolcanics; the working averages 8 ft. in width. The working, which was very old and displayed no evidence of recent work, is located substantially as shown on the attached map (see photo no. 10).[2/]

1/ K. Krauskopf, U. S. Geological Survey unpublished report, 1943.

2/ This cut is the one located closest to the NW corner of the claim.

Photo No. 10. View, looking N. 20° W., showing discovery cut on the Ma Parker. Note condition of working. Pick appears for scale just below center of photo.

As can be seen in the photo the uppermost 2.5 ft. of the face exposed a silicified zone which lay on flat-lying nonsilicified, altered metavolcanics. The underlying rocks displayed evidence of being in a strong fault zone which appears to strike N. 25° W. and dip 15° SW.

No minerals of value were seen in the working; the silicified zone was tight and not vuggy; the rocks were only slightly to moderately

iron-stained. Mr. Colwell remarked: "I don't see anything worth sampling here."

Two other workings exist on this claim (see map). Each was very old. Mr. Colwell said he saw nothing worthy of further examination at the one situate in metavolcanics NW of the discovery point,[1/] and of the one situate SW of the discovery point: "This is an altered zone. I wouldn't bet there were values in this but there may be values below." He added: "We would be wasting our time to take a sample of this." In contrast to the two other workings, this third one was in metalimestone and consisted of a cut and inaccessible adit. A few fragments of tactite lay on the dump but no minerals of values were seen. Mr. Colwell remarked: "I haven't done much on the claims since we checked them for posts a long time ago. I would like to come back here tonight (with a UV lamp). I didn't know there was limestone and granite on this claim."

Several months later he admitted that they had been unable to find any showings on this claim; thus, no samples were obtained.

Evaluation

The Ma Parker is the northernmost claim in the group and lies about

1/ This is not the location of the discovery working; the discovery point, or monument, is about 250 ft. E of the discovery working.

1200 ft. NW of the mine but the "Glory Hole" mineralization is only 200 ft. away to the S. Metalimestone and granodiorite are exposed in its extreme SW corner and the former over a small area near its NE corner.

Although granodiorite probably underlies the favorable metalimestone at depth what the conditions are, and whether valuable mineral deposits have been created, is a matter of conjecture at this time. Therefore, as a prudent man would scarcely be warranted in developing this claim on the basis of presently available geological data, discovery has apparently not been effected on this, the Ma Parker lode, as of this date.

PRINCESS

The Princess lode includes dioritic and granodioritic intrusives, altered and unaltered metamorphics, and metalimestone. The lithologic series on this claim also includes a heretofore undescribed type, a unit which apparently represents silicated sedimentary rocks[1/]--the oldest of the three recognized metamorphic formations in the area (see attached map). Structurally, the two metalimestone units strike northeasterly and dip steeply to the NW or vertically.

1/ Identified as hornfels.

The official discovery point is near the S end line of the claim but Mr. Colwell did not contend for values in the old, small workings located there. Instead, he designated an outcrop of tactite in the NW portion of the claim (see attached map).[1/] Here tactite was exposed intermittently over a total linear distance of about 300 ft. at what is essentially a metalimestone-metavolcanic contact although a limited quantity of granodiorite also occurs in the vicinity. Mr. Clark said that he and Mr. Colwell had previously found scheelite in the tactite by lamping at night, and he pointed out two areas where the best showings were. At this point tactite was exposed over an interval 80 ft. long and up to 10 ft. in true width (see photo no. 11).

1/ The Princess lode was located prior to the conflicting Viking's Daughter.

Photo No. 11. View, looking N. 20° W., showing exposure of tactite (the rocky outcrop) on the Princess lode. Note rucksack for scale just left of center of photo.

The tactite appeared to terminate against a cross fault at its southwesterly end, and to pinch out into metalimestone at its northeasterly end. The tactite displayed manifestations of "relict bedding," i.e., preserved original sedimentary features (indicating somewhat less than intensive replacement of the host material). The areas designated for sampling were within the strongest tactitized

zones along the entire outcrop but no valuable minerals were seen at any point.

Sample No. 260368-HWM-1 consisted of 13 pounds of tactite obtained by Mr. Clark from the areas designated. Each area had been outlined with yellow paint and each was about 1.5 to 2.0 ft. in maximum dimension on the near vertical outcrop. Approximately equal weight of sample was taken from each area. The areas were located 23 ft. and 40 ft. respectively northeasterly from an old cut situate near the southwesterly end of the tactite outcrop.

The sample taken from the southerly area was chipped from the zone 0.6 ft. in vertical and horizontal [1/] dimension, and to an average depth [2/] of 0.25 ft. The remainder was obtained by chipping the northerly area over a 0.5 ft. horizontal distance, [2/] a 0.8 ft. vertical distance, and to an average depth [1/] of 0.4 ft.

The metalimestone-tactite contact here strikes N. 75° E. and dips steeply to the NW. The areas sampled lay well within the mass of tactite but represent very restricted widths in terms of the overall width of the outcrop (see photo no. 12). [3/]

1/ Along structure.

2/ Across structure.

3/ Sample point (6)

Photo No. 12. Close-up view, looking N. 5° W., showing the southerly sample point. Note limited extent of area sampled--the small fresh area lying immediately below the head of the pick. View looks across structure.

Laboratory examination of this sample disclosed an estimated 0.5 percent WO_3 as tiny, disseminated particles of scheelite in brown, very fine-grained, garnet tactite rock and silicated limestone. Some calcite and epidote were present. Oxidation was very limited.

Chemical analysis and fire assay revealed:

Au	tr.	
Ag	tr.	1/
WO_3	0.16	percent
MoO_3	0.005	"
Cu	tr.	

Evaluation

Although the Princess lode lies approximately half-way between the mine and the "Glory Hole," contains at each of its ends favorable rock types, and the tactite zone is impressive in comparison with the meagre showings on most of the claims previously described, hard evidence is not available for the probable existence of valuable mineral deposits at depth within this claim.

Many factors enter into the creation of tactite and its mineralization. When found tactite generally occurs marginal to intrusive granitic rocks in limestones or other calcium-rich rocks. All tactite deposits do not contain scheelite but where present it usually is restricted to certain zones within the tactite. Where these zones are wide and strongly mineralized ore bodies are formed.

Tactite is notably irregular in width, character, and scheelite content as a result of the structural environment and chemical relationships

1/ Applicants assay indicated 0.37 percent.

which produce it. From an evaluation point of view, the most significant of these are the attitude and configuration of the contact, the existence of faults and fracture systems in this zone, and the composition and distribution of reactive minerals in the host rock.

It is not believed, therefore, that a prudent man would contemplate actual development on this claim without first having the benefit of further and encouraging exploration data concerning the extent and mineralization of the tactite at depth. This being the case, discovery has apparently not been effected on this, the Princess lode, as of this date.

TITAN

The Titan lode covers largely altered and unaltered rocks of the metavolcanic sequence, but a small area of metalimestone outcrops in its extreme southwestern corner. Included within this claim are also three minor occurances of diorite. In general, the trend of the stratified units appears to be E-W.

This claim, the Blanco No. 2 and the Duke conflict but as the Titan is the oldest, the overlapping portions belongs to it. The Titan also conflicts with a very small area with the Blanco No. 1, which is older.

The official discovery point on this claim is an old working in

metavolcanics as shown on the plat of its mineral survey.[1/] No minerals of value were seen here or at other points on the claim.

On March 26, 1968, Mr. Colwell stated that they had been unable to find evidence of valuable mineralization on this claim. Thus, no samples were obtained.

Evaluation

The Titan lode lies generally westerly from the "Glory Hole," which is the closest known site of mineralization, and about 1500 ft. NW from the mine. The extreme easterly portion of the claim is covered with alluvium and so it is not known what lies under it but it may well be that the nearby metalimestone and granodiorite both do at depth. However, there is no evidence for the probable existence of valuable mineral deposits exposed on this claim and thus discovery has apparently not been effected as of this date.

1/ This working consists of an open cut 30 ft. long and an adit 110 ft. in length which exposes a wide fault zone.

TITAN NO. 1

The Titan No. 1 lode contains mostly altered and unaltered meta-volcanic rocks although granodiorite occurs along a portion of its northern boundary and, perhaps, near its SE corner. In general, the trend of the stratified units is E-W.

The discovery working consists of an old cut driven N. 85° W. into low hill.[1/] The working measured 14 ft. in length, 8 ft. in maximum width and had been developed to a 6.5 foot face. The working was very old; there was no evidence of recent work (see photo no. 13).

Photo No. 13. View, looking N. 85° W., showing discovery working on the Titan No. 1. Note geologic pick for scale in center of photo.

1/ It is situate as shown by the designation "Disc." (discovery) on the attached map.

The working exposes a N. 10° E-striking fault zone. This structure dips vertically, is several feet in width, is on the contact between gray metalimestone (to the W) and metavolcanics (to the E), and contains a number of iron-stained quartz veinlets, one of which achieved a maximum width of 1.0 ft. As the immediate wall rocks were badly fractured their orientation could not be determined.

The metalimestone exposed at this point is not very extensive as nearby outcrops exposed facies of the metavolcanic sequence.

Significant quantities of valuable minerals were not seen and Mr. Colwell decided that this point was not worthy of a sample. Later on, he remarked that they had been unable to find evidence of valuable mineralization on this claim. Thus, no samples were taken.

Evaluation

In view of the above, a prudent man would hardly commit time and money to the development of this claim without first engaging in further prospecting and exploration. Therefore, as of this date discovery has apparently not be effected on the Titan No. 1 lode.

TUNGSTEN

The Tungsten lode is underlain principally by granodiorite, and at depth metalimestone.

The discovery working is located substantially as shown on the attached map and consists of an old cut driven N. 45 ° E., 14 ft.

into a steep granodioritic hillside. The cut averages 5.5 ft. in width and has been developed to a 6-foot high face (see photo no. 14).

Photo No. 14. View, looking N. 45° E., showing discovery working on the Tungsten.

A quartz veinlet 0.3 ft. in maximum width occurs within a fault zone in the working. To the N, the veinlet terminates abruptly against a fracture; to the S it narrows rapidly and finally pinches out within a few feet. The fault and veinlet strike N. 10° W. and dips 20° SW. Some iron oxide and copper carbonate staining was seen scattered along fracture surfaces in the working.

Nearby exposures, which are almost continuous in nature on the

steep hillside, are of granodiorite. At depth, however, in the mine the favorable metalimestone contact is encountered on the 400- and 500-foot level, and the only known ore reserves in the area lie within this and an adjoining claim. Parenthetically, this is an excellent example of a situation in which surface geology and mineral showings are unequivocally negative with respect to the occurrence of valuable mineral deposits, but of which, in fact, ores do exist at depth, the presence of which could at best only be inferred at the present state of geological knowledge.

Because of the existence of known ore at depth no samples were taken on the surface.

Evaluation

As this claim contains a considerable quantity of tungsten and molybdenum mineralization at depth, discovery, in the writers opinion, has been effected. (The comments concerning economic feasibility--Don lode, page 28-also apply to this claim.)

TUNGSTEN NO. 1

The Tungsten No. 1 lode is underlain by granodiorite.

The discovery working is located substantially as shown on the attached map and consists of an old cut driven due S for 11 ft. into a steep hillside. The cut averages 5 ft. in width and has been developed to a 6.5-foot high face (see photo no. 15). The working

disclosed broken granodiorite cut by a number of narrow (less than 0.1 ft.) fault slips of various orientations; one mass of white quartz 2.5 ft. long and 1.2 ft in maximum width; and, a few narrow quartz stringers. Some iron oxide staining was seen on fracture surfaces. The quartz and stringers appeared to lie within a zone which strikes due N and dips 35° W.

Photo No. 15. View, looking S. 55° W., showing discovery point on the Tungsten No. 1. Cut extends to the left of rucksack and geologic pick.

Mr. Colwell made no contentions for discovery at this point. Instead, he designated a point situate 770 ft. S. 7° W. from the NW corner of the claim (see map). Here, on a large expanse of exposed granodiorite, he had outlined with yellow paint an area approximately 1.8 ft. in diameter, the lower portion of which was about 3.0 ft.

above the bottom of the ledge.

From within this area Mr. Clark chipped a 5 pound sample for confirmation of discovery on this claim. The sample was labeled 270368-HWM-3 and consisted primarily of white quartz obtained from a narrow vein which was associated with a fault zone. The fault striked N. 15° W. and dipped 55° SW. The veinlet striked N 40° W., dipped 50° SW, and averaged 0.5 ft. in width. The sample was obtained over a 1.2 ft. horizontal distance, 1.0 ft. vertically, and averaged 0.3 ft. in depth.[1,2/] No minerals of value were seen in the veinlet or in the fault zone (see photo no. 16).

Photo No. 16. View, looking easterly, showing site sampled on the Tungsten No. 1. Geologic pick rests at point sampled.

1/ Across structure.

2/ Sample point (7)

Laboratory examination disclosed practically no fluorescence although there was an occasional shine of a pale yellow mineral, probably scheelite. No opal or calcite were detected. The sample consisted of a fine-grained aggregate of fresh to moderately oxidized quartz, and some brown garnet.

Chemical analysis and fire assay disclosed the following:

Au	0.32 ounces per ton
Ag	3.6 " " "
WO_3	0.01 percent 1/
MoO_3	1.95 "
Cu	0.2 "

Company records indicate two under-ground diamond drill holes penetrate this claim. Both were drilled from the 400 level on the adjoining Don lode. DDH 4-268A drilled at a minus 4° in September 1954 was 107.0 ft. in length. The outermost 53.5 ft. was within the Tungsten No. 1--it cut barren granodiorite. DDH 4-399A drilled at a plus 28° (log not dated) was 147 ft. in length. The outermost 57 ft. was within the Tungsten No. 1--it also cut barren granodiorite.

Evaluation

Although there is a possibility that metalimestone also occurs at depth below the 400-level under this claim, and that the contact may also be mineralized (as on the Tungsten lode), there is no good evidence for this available.

1/ The applicants analysis indicated 0.00 percent.

The sample obtained on the surface "runs good" in precious metals and molybdenum but it was obtained from a narrow quartz veinlet--one of many such occurences known in the pluton, some of which were mined for gold.[1/] These veins and veinlets vary in width and lateral extent and are a phenomenon commonly occurring in the hoods of plutons such as the one existing in the Nevada Scheelite Mine area.

In regard to economics, assuming that the total average width of the veinlet (0.5 ft.) is mineralized to the same extent as that sampled (0.3 ft.), and assumming that the veinlet has continuity, and assumming that the veinlet is evenly mineralized through its extent, and utilizing current market prices for gold ($42.76) and silver ($1.98)[2/] this occurence has a theoretical value of $2.60 per ton over a 4 ft. mining width. This obviously is far less than the cost of necessary mining, milling, and related expenditures and a prudent man would hardly contemplate engaging in development thereof. (For comparative purposes, at the largest gold mine in North America--that of the Homestake Mine in South Dakota--despite the benefits of an amortized, very large investment and the economics of a large scale operation, current costs approach $12.00 per ton.)

1/ Those that were, however, never developed into large scale operations and none have been economic for many years.

2/ E. & M.J.; op. cit.

As the probable presence of a valuable mineral deposit has not been demonstrated, discovery on the Tungsten No. 1 lode has not, in this writers opinion, been effected.

TURTLE

The Turtle lode contains metamorphic units including limestone, and granodiorite. The metalimestone strikes in general northeasterly and dips steeply to the SE.

The inclined shaft is situate on this claim as are portions of the deepest mine workings. The company, with DMEA and recently Union Carbides assistance, has outlined substantial ore in the northern portion of the mine on this and the adjoining Tungsten lode.

Evaluation

In view of the above it is this writers opinion that discovery has been effected on the Turtle lode. (The comments concerning economic feasibility--Don lode, page 28--also apply to this claim.)

VIKING'S DAUGHTER

The Viking's Daughter lode includes a large area of metalimestone, some granodiorite, altered and unaltered metavolcanics, a portion of a dioritic intrusive, and a surface working which has produced some tungsten.[1/] Structurally, the metamorphics trend nearly E-W and dip

1/ The conflicting Princess is older, the Duke is younger.

vertically or nearly so.

The discovery on this claim consists of an open pit measuring 75 ft. in diameter and 39 ft. in maximum depth. A short adit penetrates the northeasterly wall of the working from its lowest level. The opening is known as the "Glory Hole", is situate about 2,000 ft. NW from the mine, and was worked in the late 1930's. Production, according to old reports, was about 3,000 tons of ore, averaging between 1 and 2 percent WO_3, but the size of the working and dump and nature of the mineralization suggests that perhaps another 1,000 tons or so was removed in addition thereto.

Photo No. 17. View, looking N. 65° E., showing "Glory Hole" on the Viking's Daughter.

The mineralization is located at the south border of a small

granodiorite outcrop. The working exposes some granodiorite, metalimestone, tactite, and a number of strong fault zones. Very little, if any, ore is left in the walls of the pit and because of debris accumulated in its bottom, nothing could be seen below the horseshoe-shaped zone which contained the original tungsten-bearing tactite. (Possibly a limited tonnage or ore remains in the bottom but the irregular configuration of the tactite does not allow a reliable estimate of reserves to be made.)

With Messrs. Clark and Colwell, the writer lamped the adit and found a good zone of fluorescence at a point 3.5 ft. out from the face of the working.[1/]

From the point described, and at the request of Mr. Colwell, the writer cut a 9½ pound sample across the back catching it on a sample sheet laid on the sill. The cut was normal to the trend of the working, averaged 0.2 ft. in width and depth, and was 3.3 ft. in length: It was a channel-type sample cut across the entire width of the back at this point. The sample was labeled 080268-HWM-2.[2/]

Laboratory examination disclosed a considerable quantity of scheelite, estimated at 0.75 percent WO_3, occurring as pale-yellow, tiny, disseminated particles in a fine-grained aggregate of moderately

1/ The adit was found to have been driven N. 48° E., 36 ft. into tactitized metalimestone, was 4 ft. by 6 ft. in size, and was not timbered.

2/ Sample point (8)

oxidized quartz-garnet-epidote tactite and silicated limestone.

Chemical analysis and fire assay revealed:

Au	tr.
Ag	tr.
WO_3	0.28 percent 1/
MoO_3	0.01

Later, Mr. Colwell said that he would like to re-sample the showing on this claim as he was disappointed in the low values detected in the sample described above. Thus, from the NW corner of the "Glory Hole" at a point about 30 ft. NW from the portal to the adit, Mr. Clark chipped a 7-pound sample of tactite at random from within an area outlined by yellow paint. The area outlined was about 3 ft. in vertical extent, 2 ft. horizontally, and was centered about 5 ft. above the sill. 2/ Mr. Clark said that this area "lamped good" at night. The sample was labeled: 250968-HWM-2.

Laboratory examination disclosed the presence of fairly abundant, disseminated, yellow, medium-grained scheelite, and considerable disseminated, pale yellow, very fine-grained scheelite observable only under magnification. No calcite or opal was seen.

The sample consisted primarily of medium-grained garnet and silicated

1/ Applicants analysis indicated 0.53 percent.

2/ Depth sampled averaged 0.1 ft.

limestone, all moderately oxidized. Scheelite content was estimated at 1 percent WO_3.

Chemical analysis and fire assay revealed:

Au	tr.
Ag	0.2 ounces
WO_3	0.89 percent 1/
MoO_3	0.042

Evaluation

Technically, the working on this claim is not a glory hole, it is an open pit. It is dry and has not held water in the past. It is readily accessible from the mine by road and could be easily worked by relatively low-cost open pit methods provided there was a mill in being at the mine to receive the ore.

Records indicate that the working bottoms in ore but that production ceased when the ore shoots at the mine were discovered and attention was diverted to developing that source. If this is the case there could well be another 1,000 to 2,000 tons, or more, of 1 percent rock in the bottom of the pit although no direct evidence (drill core, etc.) is available. Therefore, although the matter of "discovery" on this claim may be debatable, it is the writers opinion that discovery has been effected; i.e., a prudent man would expend time

1/ Applicants analysis indicated 1.23 percent.

and money in development with reasonable expectation of being able to extract sufficient ore to compensate him for the effort involved.

* * * * *

Sampling Considerations

It should be clearly borne in mind in evaluating the significance of the numerous samples obtained during this examination that most, if not all, were hardly what could be categorized as representative. Rather, they consisted principally of selected fragments in a few instances, to samples of restricted areas or zones in most cases. Even so, persual of the results indicate usually minimal mineral values were detected, values which obviously would be of a much lesser magnitude if cuts sufficiently long to be representative of minimum mining widths has been obtained, i.e., four feet across structure.

As preliminary investigations indicated that considerable doubt existed as to the validity of many of the claims, the writer choose to permit the applicants representatives to do most of the sampling (in his presence) and to obtain samples where they desired[1/] as the burden of proof of discovery was upon them.[2/] In essence the applicant

1/ Provided the sample sites could be identified in regard to specific claims, and the sites sampled could be described with relationship to geological structures.

2/ ". . .when a Government mineral examiner testifies that he has examined the exposed workings on a claim, that he has taken mineral samples from points suggested by a representative of mining claimant as demonstrating the best values found on the claim, and that he has found no evidence of the existence of a valuable mineral deposit, a prima facie case of no discovery has been made. . ." (emphasis added): U.S. v. Mrs. Frances Swain, A-30926

was only being given every opportunity to disclose the basis for its contentions that a valid discovery had been effected on each claim in the group.

Laboratory Procedure and Interpretation of Analyses

Each of the samples obtained were carefully bucked and split by the writer in the laboratory at the mine. Mr. Clark usually assisted in this operation and took custody of the split of each offered to the Corporation. (He generally immediately scanned the splits with an ultra-violet lamp and then delivered each to their chemist for analysis.) The writer retained a split for further examination and analysis. Up to this point the samples had been in the possession of the writer at all times. At Carson City the Government's splits were examined microscopically for mineralogic and petrographic details, and under ultra-violet excitation before being submitted for analysis.

Absolutely exact analyses of low value samples of many ores are difficult to obtain. In such materials values are generally erratically distributed and even the most conscientious and skillful analyst can not weigh from the pulp two or more charges containing exactly the same ratio of values to gangue. Thus, it is very infrequent that analyses of samples of low grade ores duplicate each other, or that two or more samples of the same material are reported to contain identical values. (In actual practice very large samples--sometimes thousands of tons--may have to be obtained, and each has to be run

many times in order that an average value may be established for the whole.)

It will be noted that although some of the applicants and Government's sample analyses did not correlate very closely, others compared very favorably and most all supported a generally low tenor of mineralization. In interpreting the sample analyses it should be remembered that tungsten is considered to be an element difficult to analyze by classic wet chemical methods. Problems arise especially with low-grade ores because of the time required (days), the necessity for using a large sample, and the fineness of grind required. Further, if molybdenum is present it tends to bring tungsten assays up, i.e., more tungsten appears to exist than is actually present. There are other methods of analysis, however, and the writer choose to have his samples run spectrophotometrically, a method having a reputation of great accuracy. In contrast, the applicant's laboratory utilized the older, titration-type method.

Because of the spread of some of the sample values, the writer submitted splits of two samples to a third laboratory for analysis. Ledoux and Company (Teaneck, N. J.) was chosen for two reasons. Foremost, because it enjoys the reputation of being the best commercial laboratory in the United States, and second because the applicants representatives have stated that this was the firm they depended upon for umpire analyses when such were required in their business transactions as buyers and sellers of ores and concentrates.

The following table presents the results of these three analyses:

Sample No.	Applicant	Government 1/	Ledoux
	(percent WO_3)		
250968-HWM-1	0.40	0.27	0.16
250968-HWM-2	1.23	0.89	0.73

This comparison illustrates that although both "check" analyses (those run by Ledoux) are less than either of the other two, they are closer to the governments than to those of the applicant to the government to a significant degree; the governments are 69 and 22 percent higher, the applicants 150 to 68 percent respectively. (If this were an umpire analysis situation, according to convention the government's assays would be accepted as the settlement assay and the applicant would have to pay the entire cost of the umpire analyses.)

The chart which follows this page summarizes the assay data and expresses the results in terms of minimum mining widths (4 feet) so that meaningful comparisons can be made of the data acquired.

A spectographic analysis was made of a composite of the first 5 samples taken in order to determine what elements might be present in addition to those specified. The analyses did not detect any unusual elements or significant quantities of any valuable elements. 2/

1/ These samples were run by H. M. Ochs, a chemist and spectographer at Denver, Colorado. His laboratory has an excellent, world-wide reputation for independent assays and analyses.

2/ Samples composited: 070268-HWM-1, 2, and 3
080268-HWM-1 and 2

CLAIM	SAMPLE NO.	WEIGHT (in pounds)	WIDTH CUT (in feet)	VALUE (WO_3+MoO_3)	VALUE IN TERMS OF 4-FOOT MINING WIDTH	COMMENTS
BLANCO	270368-HWM-1	7	0.3	$ 55.13	$ 4.15	Irregular mass of tactite; definite width exposed but not clearly associated with a vein structure.
BLANCO NO. 1	270368-HWM-2	9.5	0.8	19.15	3.83	Very small mass of tactite; no vein structure seen.
BLUE BELL	270268-HWM-2	5	0.1	1.22	0.03	Tactite occurs in a strong 3 to 4-foot wide fault zone of known attitude.
BLUE BELL	080268-HWM-1	6	(selected specimens)	29.83	- -	Sample was not cut, per se.
GUSSIE L.	070268-HWM-1	3	0.5	6.81	0.85	Tactite is associated with a strong 5.5-foot wide fault zone of known attitude.
LEAD MOUNTAIN	070268-HWM-3	5.5	0.1	2.01	0.05	Tactite occurs in a contact zone of known attitude.
LEAD MOUNTAIN	250968-HWM-1	5	0.1	13.06	0.33	As above.
PRINCESS	260368-HWM-1	13	0.38 1/	7.24	0.69	Large mass of tactite; definite width exposed; occurs within a contact zone of known attitude.
TUNGSTEN NO. 1	270368-HWM-3	5	0.3	74.89	5.63	Quartz vein in a fault zone; attitude of both known.
VIKING'S DAUGHTER	080268-HWM-2	9.5	3.3	12.40	10.24	Large mass of tactite; adit appears to cross-cut structures.

1/ Average of two widths.

CLAIM	SAMPLE NO.	WEIGHT (in pounds)	WIDTH CUT (in feet)	VALUE (WO_3+MoO_3)	VALUE IN TERMS OF 4-FOOT MINING WIDTH	COMMENTS
VIKING'S DAUGHTER	250968-HWM-2	7	0.1	$ 39.72	$ 0.99	Sample was not cut, per se.

ECONOMIC CONSIDERATIONS

As tungsten and molybdenum concentrates are bought and sold in the open market, quotations reflect supply and demand. The price for each is, however, influenced to varying degrees by the General Services Administration national stockpile policies, but E. and M. J. forsees no substantial change in their posture in the predictable future.

E. and M. J. reports that the short- and medium-term tungsten supply-demand situation continues to give promise of remaining in relative balance with prices fairly steady, and that over-all the market for tungsten should allow the industry to grow normally. Regarding molybdenum, it states that despite market fluctuations in other metals the price of molybdenum has remained stable and that this stability should encourage further use of it in future developments.

An analysis of the economic feasibility of the applicants tungsten-molybdenum deposits has been developed in the evaluation section of the description of those claims containing known mineralization.

SUPPLEMENTAL DATA

The applicants mine and surface improvements, including the limited exploratory work (cuts, underground openings, and diamond drilling) done on the group of claims far exceeds the required minimum expenditure of $500 per claim, or $8,000 for the group of 16 claims

(see photo no. 18).

Photo No. 18. View, looking southwesterly, showing camp and surface facilities. Headframe to main shaft (on Don lode) is to the right; milling and processing buildings at center and left; offices, houses, dormitory, commissary, and school in background.

The Notice of Patent and the Mineral Survey plats were posted in a prominent place on the claims (on a bulletin board adjacent to the main door to the mine office building), and the claims are plainly monumented with white wood posts set in mounds of rock, each bearing a carved identification.

Map of Claims

The applicant supplied a property map illustrating the configuration

of the claims for which patent is requested. The writer utilized this map (see attachment) as a base upon which to present, in simplified form, the following:

a) Geology of the claims,

b) Vertical projection of the underground workings (operating levels only),

c) Location of collar to Inclined Shaft, and

d) Location of sample sites.

CONCLUSIONS

I. It is concluded that 4 of the 16 lode mining locations in this application are valid claims as defined by the general mining law, and that the remaining locations are apparently invalid.

II. It is concluded that the subject lands are mineral in character.

Factors which bear upon the question of discovery, i.e., determination as to whether or not a deposit of valuable mineral exists within each claim of this group are:

1. An examination of the actual showings of valuable mineral and consideration of their relationship to each other and to the geology of the claims.
2. A comparison of the geology and mineralization to that of other places in the world at which ore deposits similar to those declared have been discovered are known to occur.

3. The location of the claims relative to geology, known mineralization, and mining operations, if any, in the area.
4. A consideration of supporting data, if available, such as geochemical or geophysical surveys.
5. An analysis of economic factors involved.

Each of the factors is discussed below.[1/]

The applicant has discovered an ore deposit lying within the subject groups of claims and through a surface and underground drilling program has outlined and sampled it in considerable detail. Copies of each of the numerous diamond drill logs have been examined. These logs describe stratigraphy, mineralogy, structural conditions, mineralization, and present data derived from analyses of mineralized sections of the core. The writer has not been able to personally log or inspect the total footage obtained but he has examined practically all of the core obtained over the past year and has observed the drilling and subsequent processing of some of it. The writer has also examined and sampled showings on each claim where these have been designated for discovery purposes.

Contact metamorphic zones are not uncommon throughout the world and often significant deposits of a variety of valuable minerals are contained therein. The subject deposit is within a contact

1/ Factors which bear upon a mineral character determination are essentially those enumerated as "2" through "5".

metamorphic aureole, is best categorized as contact-metasomatic in genesis, and is very similar in this respect to most all of the important tungsten deposits occurring in the Far West, including North America's largest, the active Union Carbide Corporation Pine Creek Mine in Inyo County, California. Bateman, 1/ in referring to contact metasomatic deposits as a class, offers the following significant observations:

> ". . . . .They contribute to the world's mineral production and supply many of the uncommon mineral products. The deposits generally consist of several disconnected bodies. They are mostly small as compared with "porphyry coppers," or sedimentary deposits. They are vexatious deposits to exploit because of their relatively small size, their capricious distribution within the contact aureole, and their abrupt terminations. Like the scattered plums in a plum pudding, they are difficult to find; they exhibit few "signboards" pointing to their presence, and costly exploration and development are necessary to discover and outline them. Their development must be undertaken with caution, and the optimism attendant upon mining such concentrated and often rich bodies frequently gives way quickly to disappointment upon the sudden termination of the ore body "

The claims are located within an area generally considered to be favorable for the occurrence of tungsten. The subject deposit is intimately related to a granitic pluton with which other metallic mineral deposits are known to occur--including tungsten--within a few miles radius. None, however, are being worked at the present time.

1/ Bateman, A. M., Economic Mineral Deposits, 2nd Ed. (1959), p. 90.

Union Carbide conducted a seismic geophysical survey of the mine area in hopes to be able to determine the gross structural characteristics of the 'granite-limestone' contact below and beyond that which is exposed in the underground workings. The results of this survey were used to guide their drilling program at the north end of the mine in order to minimize drilling and to expedite evaluation. The writer did not have an opportunity to examine the raw geophysical data but he was aware of their interpretation, and the subsequent drilling supported it quite well.

Economic factors have been considered and resolved favorably with respect to the applicant. The writer sees no bar to the development of certain of the subject claims at sometime in the foreseeable future assuming no drastic change in projected existing economic conditions.

Tungsten or tungsten-bearing materials are used extensively in military and nuclear applications, in the machine tool industry, in aircraft and space vehicles, and in the electrical industry. In addition to being an essential alloy metal it is widely used in various chemical compounds. It's principal characteristics, however, are its high melting point and hardness.

While Nevada and California have been the largest tungsten-producing states (each about equal in tonnage), Nevada probably has the greatest potential for increased production in the future. In terms of present U. S. consumption, sufficient domestic resources

for long-term requirements (beyond 1980) are not known to be available.

RECOMMENDATIONS

Each of the lode locations has been carefully considered and it is the writers opinion that discovery, per se, has not been established on most of the claims; is questionable on a few; but, has been unequivocally effected on still others.

I. It is recommended that patent issue to the following lode mining locations, these being claims upon which discovery has been effected by virtue of known existence of tungsten-molybdenum ores. These showings have been carefully analyzed pursuant to the "prudent man fule" and are deemed adequate to qualify as a discovery under the law:

Tungsten

Turtle

II. It is recommended that patent issue to the following lode mining locations although it is the writer's opinion that discovery, per se, has not been so clearly demonstrated as for those enumerated above:

Don

Viking's Daughter

III. It cannot be recommended that patent issue to the following claims at this time: 1/

Blanco
Blanco No. 1
Blanco No. 2
Blue Bell
Duke
Gussie L
Lead Mountain
Ma Parker
Princess
Titan
Titan No. 1
Tungsten No. 1

Should action be necessary against any of the 12 locations listed in Category III, it is suggested that the appropriate charge is that discovery 2/ has not been made within each of these lode mining locations, or any of them, as required by law. 3/

Respectfully submitted,

H. W. Mallery

sgd - 25 May 70

1/ See the Evaluation Section of each individual claim's description for the reasons for this conclusion.

2/ Discovery being the existence of a deposit of a sufficient quantity and quality of a valuable mineral.

3/ Charges should not be made against the mineral character of these claims, as such could not be sustained in view of the generally mineralized nature of the area encompassed by the claims.

ADDENDUM

Since the report was written several developments have taken place.

1. The pyrometallurgical plant has been moved to a site approximately ten miles N of Fallon, Nevada, and the camp at the mine has been evacuated. Only a watchman remains.

2. The only equipment left on the premises is a diesel-powered motor-generator set which appears to be in good condition, an old track-type front-end loader which is in poor condition, and parts of three jaw crushers, all of which have seen considerable service. The numerous buildings range from good to poor in condition.

3. Mr. Colwell stated (on April 6, 1970) that Standard Slag Company was examining the property and that perhaps a joint operating venture would result; and, that Mr. Clark had resigned from the position he had held. He added that there was nothing new for the writer to see or to examine.

4. Re-examination of a suite of representative specimens of the "diorite" indicates that although the origin of this rock-type is not clear, metadiorite is probably more descriptive than diorite. Thus, the term metadiorite should be substituted in the text wherever diorite is

used; the map which accompanies this report reflects this change.

5. Tungsten remains at the price stated in this report. Molybdenum is currently quoted at $1.91 per pound, or $0.10 higher (5.2 percent) than the figure used in the computations herein.

April 15, 1970

H. W. M.

6000 0022 (2770)

NEVADA SCHEELITE CLAIMS
GEOLOGIC MAP

MINERAL COUNTY, NEVADA

1" = 200' 200' Aug. 1969

(Base from company map dated 1966)

FOR U.S. GOVERNMENT USE ONLY

N

1/4 COR.

651.25'

MA PARKER

TITAN NO. 1

TITAN

KING'S DAUGHTER

GLORY HOLE

DUKE

PRINCESS

TURTLE

INCL. SHAFT

TUNGSTEN

BLANCO NO. 2

BLANCO NO. 1

BLANCO

VERT. SHAFT

DOM

TUNGSTEN NO. 1

GUSSIE L

BLUE BELL

LEAD MOUNTAIN

HOOPER No. 1

T. 13 N. R. 32 E. SEC. COR.

SW 1/4 SEC 1
NW 1/4 SEC 12

1/4

SE 1/4 SEC 1
NE 1/4 SEC 12

LEGEND

GENERAL

- Road
- Drainage
- Ridge line
- ⑤ Working sampled
- × ① Point sampled
- Geologic contact

GEOLOGY

- Granodiorite
- Metalimestone
- Tactite
- Metadiorite(?)
- Hornfels
- Other metamorphics
- Altered zones
- Alluvium

UNDERGROUND WORKINGS

- 100 Level
- 200 "
- 300 "
- 400 "
- 500 "

USDI-BLM/HWM