



## **CONTACT INFORMATION**

Mining Records Curator  
Arizona Geological Survey  
1520 West Adams St.  
Phoenix, AZ 85007  
602-771-1601  
<http://www.azgs.az.gov>  
[inquiries@azgs.az.gov](mailto:inquiries@azgs.az.gov)

The following file is part of the

Arizona Department of Mines and Mineral Resources Mining Collection

## **ACCESS STATEMENT**

These digitized collections are accessible for purposes of education and research. We have indicated what we know about copyright and rights of privacy, publicity, or trademark. Due to the nature of archival collections, we are not always able to identify this information. We are eager to hear from any rights owners, so that we may obtain accurate information. Upon request, we will remove material from public view while we address a rights issue.

## **CONSTRAINTS STATEMENT**

The Arizona Geological Survey does not claim to control all rights for all materials in its collection. These rights include, but are not limited to: copyright, privacy rights, and cultural protection rights. The User hereby assumes all responsibility for obtaining any rights to use the material in excess of "fair use."

The Survey makes no intellectual property claims to the products created by individual authors in the manuscript collections, except when the author deeded those rights to the Survey or when those authors were employed by the State of Arizona and created intellectual products as a function of their official duties. The Survey does maintain property rights to the physical and digital representations of the works.

## **QUALITY STATEMENT**

The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

02/28/90

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: COCHISE QUEEN

ALTERNATE NAMES:

COCHISE COUNTY MILS NUMBER: 698

LOCATION: TOWNSHIP 22 S RANGE 24 E SECTION 25 QUARTER C  
LATITUDE: N 31DEG 29MIN 18SEC LONGITUDE: W 109DEG 57MIN 28SEC  
TOPO MAP NAME: BISBEE - 7.5 MIN

CURRENT STATUS: RAW PROSPECT

COMMODITY:

COPPER  
GOLD LODE  
SILVER  
LEAD

BIBLIOGRAPHY:

ADMMR COCHISE QUEEN FILE

Exhibit <sup>"B"</sup> <sub>15</sub> of Lewis Springs

R E P O R T  
UPON THE PROPERTY  
OF THE  
COCHISE QUEEN COMPANY.

---

I N D E X.

Page	1	Geographical position, Property, Title.
"	2	Geology.
"	3	Shear Zone.
"	5	Ore Occurrence.
"	6	Ore, Present Development.
"	8	Future Development, Machinery Equipment Needed, Fuel.
"	9	Timbers, Roads, Ore Market.
"	10	Water, Remarks.
"	11	Supplemental Sheet.

R E P O R T  
UPON THE PROPERTY  
OF THE  
COCHISE QUEEN COMPANY.

\*\*\*\*\*

GEOGRAPHICAL POSITION.

This property is situated in the northwestern part of the Mule Mountains, in the Warren Mining District, Cochise County, Arizona, on the northwestern slope of Juniper flat area of the eruptive granite as shown by the U.S. Geological Survey of the Bisbee Quadrangle, about one and one-half miles from the Bisbee and Tombstone wagon road, and about fifteen miles from Lewis Springs on the El Paso & Southwestern Railroad.

PROPERTY.

This property consists of nine (9) full mining claims and one fractional claim; as follows: Box Canyon No. 1, No.2, No. 3, No.4, No. 5, No. 6, No. 7, No. 8, No. 9, No.10. The full size claims are all fifteen hundred (1500) feet in length, by six hundred (600) in width, approximately twenty (20) acres each. The fractional claim is of about twelve (12) acres in area.

TITLE.

This property is held under the U.S. Laws governing the location of mining claims. All necessary work has been done to hold title. A discovery of mineral in place has been made upon each claim.

## GEOLOGY.

In the U.S. Geological Survey of the Bisbee quadrangle there are large areas designated as eruptive granite, such as Sacramento Mountain and Juniper flat. It is and around Sacramento Mountain that the great mines have been found at Bisbee, such as the Copper Queen, Calumet & Arizona, Superior & Pittsburg, and Shattuck. The Cochise Queen Property lies on the northwestern slope of the Juniper Flat area of the Eruptive Granite. This eruptive granite is a coarse granular crystalline rock composed of quartz, feldspar, lime soda spar, and hornblend. The Mule Mountains are the result of an isolated upheaval of the eruptive granite that occurred during the earlier part of the carboniferous period, having no connection with any other mountain range. Near the northwestern part of this property there is a vent of a large volcanic vent part of which extends down into the property and which forms what is locally known as the Box Canyon. This vent is now choked and filled with a mass of granodiorite. By the upheaval of the eruptive granite great masses of the overlying metamorphic and sedimentary formations were upturned, faulted, fractured, and destroyed, leaving exposed large areas of eruptive granite, schist, quartzite, and lime. Erosion subsequent to the upheaval having been a large factor also in denuding the underlying formation. Some portions of the northwestern end of this property is now covered with a granite breccia. Lying upon this breccia is a highly silicious tuffa, both breccia and tuffa having been expelled from the vent during its activity. The tuffa now has the appearance of a gray and brown quartzite, yet some portions evidently of more basic composition resembles a basalt. The last outbreak of this volcanic vent was a flow of granodiorite, which solidified within the vent, thus filling and choking it.

This granodiorite is of a fine even texture but greatly crushed and fractured. The breccia is only exposed locally near the vent, and in some of the canyons adjacent to the vent. Vast areas of the tuffa yet covered the northwestern portion of the Mule Mountains. Throughout the eruptive granite occur many intrusions of granodiorite in the form of irregular masses and continuous dikes. The granodiorite while of later origin was derived from the same source as the eruptive granite. The granodiorite has intruded into the eruptive granite in a comparatively liquid form. The line of contact between the granodiorite and eruptive granite showing no signs of a molten condition, however, the two rocks having almost the same chemical composition, the contact shows no sign of chemical reaction. The healing or filling of the opening in the eruptive granite by the granodiorite intrusions has left weak zones throughout the main mass of eruptive granite. In later faulting and shifting of the main mass of the mountain has been along the zones or lines showing much granodiorite. The granodiorite beyond question has played no small part in the enrichment of the veins, ledges and zones of the eruptive area.

#### SHEAR ZONE.

At some period after the main mass of the Juniper Flat area of eruptive granite had solidified pressure from below caused a shifting of the formation, this shifting or faulting was vertical large masses of the mountain being raised to considerable height above other parts. This shifting resulted in the forming of veins and zones of fracture or shear zones along the line of shifting, where the movement has been of limited extent the fracture shows one continuous fissure or vein with places of more and less crushing and openings.

Within the openings more or less ore is found. When the shifting of the formation has been of greater extent, and longer duration, there occurs a number of parallel fractures making a system of veins or shear zones. At many points some of these fractures unite into one, but the whole intervening mass of rock between the parallel fractures presents a highly altered appearance with many small fractures crossing in all directions. All these small fractures carry ore. In fact, it is this mass of veinlets that cause the whole intervening mass of rock between the parallel fractures to be low grade ore which is valuable as a concentrating ore. The condition of this property is that of a shear zone. There has been a condition of shifting of the formation continued over a considerable period resulting in a shear zone of large extent, the width varying from one hundred feet, in some places, to two hundred feet in others, and throughout this entire width bodies of ore will be found. The condition as given above is liable to mislead one not conversant with such occurrence, causing one to suppose the formation to be cut up into a large number of veins having no relation to each other, while, in fact, they are a system of a shear zone. At points along the zone where the fractures have not followed a regular or a comparatively straight line much crushing of the intervening rock has taken place, the crushed rock having its texture so destroyed that it had been easily acted upon by the infiltrating mineral laden solutions to such an extent that this mass of crushed rock is now low grade ore, but valuable as a concentrating product. When the zone reaches that part of the property adjacent to the volcanic vent the zone alters its course or strikes a few degrees to the north and becomes much wider to the fact that the filling of the vent is a mass of crushed and jumbled rock.

The zone itself assumes a highly crushed ununiform condition with very little degree of regularity. This condition continues for some five or six hundred feet when the zone again becomes regular. Near the northwesterly end of claim No. 3 the zone passes out through the side of the canyon. The side of the canyon presents an almost perpendicular wall up through which the zone can be plainly traced. After passing out of the side of the canyon the zone becomes more regular and the country assumes a comparatively level condition, and ore of good grade shows close to the surface.

#### ORE OCCURRENCE.

The ore occurs within the shear zone both in bodies to more or less extent, and as said before, small veinlets crossing the zone filling in all directions. We can look for bodies of high grade ore within the large masses of low grade ore. It is an accepted theory that the mineralization of Sacramento Mountain, and the surrounding formation at Bisbee has been derived from circulating aqueous solutions, which solutions have obtained their mineral contents from the eruptive rock, and that the precipitation of the then present metallic salts has been accomplished by their contact with ascending gasses. The ascending gasses finding their way through cracks and fissures in the formation. Further or later alteration of the first metallic salts, such as iron, copper sulphide or chalcopyrite, is shown within the limits of the zone of oxidation. Owing to the hardness and the insoluble silicious character of the formation through which this zone occurs the zone of oxidation has only reached shallow depth. For this same reason the copper values which may be almost entirely removed close to the surface through leaching by meteoric waters will be unaltered at a very shallow depth.

## ORE.

The Ore is an argentiferous lead sulphide, chalcopyrite, and bornite, carrying varying amounts of gold and silver, enclosed in a quartose gangue. Close to the surface the lead and copper sulphide have become oxidized to some extent to lead and copper carbonates, but this altered condition can be looked for only for a short distance down. The ore will be an ideal concentrating material owing to the great difference in specific gravity between the gangue and metallic contents. The gold and silver contents are carried entirely within the lead and copper contents of the ore. The ore occurring as it does within the masses of crushed rock throughout the zone, no one can with any degree of accuracy predict to what extent the mineralization will attain when depth is reached.

## PRESENT DEVELOPMENT.

There has been but a limited amount of development done upon the property, very little as to what the surface indications would warrant. Near the easterly end line of claim No. 1 there has been open cuts made across a body of quartz five feet wide. Throughout the quartz, copper carbonate and lead sulphide occurs. An average sample of this quartz gave copper 1.5%, Silver 85%. North of these cuts about ten feet an open cut running lengthwise with the vein has been made which is eight feet wide by twenty feet in length; this whole cut shows small veins of mineral with considerable fluor-spar. Two hundred and twenty five feet northeasterly from this work a short tunnel was driven into the zone twelve feet in length through low grade ore. In the breast of this tunnel fourteen inches of fair grade galena ore was encountered. The ore was followed down some twenty five feet. There is quite an amount of this ore now on the dump, and a good streak of ore shows in the shaft on both sides.

This ore gave by general sample 12% lead, 12 oz. in silver, and \$1.60 in gold. One Hundred feet north of this last work, and in the zone, some high grade copper carbonates are exposed. At this point the zone is about one hundred and fifty feet wide. At a point two hundred and fifty northeasterly from this last named point a shallow opening has been made upon a body of ore five feet wide which gave by general sample \$6.00 in value in copper, lead and silver. At a point two hundred and fifty feet northeasterly from above opening a shallow shaft was put down twelve feet in depth, which shows two feet of ore. An average sample of which gave Copper 3% silver 8 oz., gold \$1.50. At a point one hundred and eighty nine feet south of this shaft a tunnel has been started to crosscut this ore, which it will do at a depth of one hundred and thirty seven feet. This tunnel will no doubt open a body of good ore.

About the center of claim No. 2 a tunnel was driven into the zone a distance of three hundred feet. Thirty feet in from the entrance four feet of ore was passed through, which gave by general sample \$12.00 Copper, silver and gold. From this ore on in to the breast there were a number of streaks of ore passed through of the same character as the first body, but they were of limited extent. The ore in this tunnel is more highly oxidized than at any other part of the claims. Near the northeasterly corner of claim No. 3 a shaft ten feet deep has been put down in a body of quartz three feet wide that shows considerable copper glance.

This is all the development work that shows ore.

#### FUTURE DEVELOPMENT.

The tunnel which has been started on claim No. 2 should be continued on into the ore body which it will cut at a depth of one hundred and thirty seven feet. The ore body should be explored such ore as can be shipped should be extracted, and sent to the smelter. The low grade ore extracted should be placed on the dump to be later concentrated. All the ore of milling grade should be blocked out. Drifting should be started northeasterly along the zone with crosscuts where the appearance of the zone warrants it. A shaft should be put down at the point of claim No. 1 where the quartz is exposed five feet wide. A tunnel should be driven from the bottom of the canyon along the zone into the side where the zone leaves the canyon. Crosscuts should be made in this tunnel at such points as the appearance of the zone warrants.

#### MACHINERY EQUIPMENT NEEDED.

Owing to the crystalline character and hardness of the rock within the zone hand drilling should be done away with, and the property at once equipped with power drills. There should be an air compressor placed upon the property of sufficient capacity to operate at least four air drills. This air compressor should be located at some convenient point in the canyon and the air conveyed to such points as it is needed in pipe lines. Owing the scarcity of fuel distillate engines should be used. The demand for this class of power has become so great of late years that this power has been brought to the highest degree of efficiency. All necessary blacksmithing outfits should be placed upon the property.

#### FUEL:

All fuel except that which is now upon the property , which is but a limited supply, must be brought from Bisbee,

or some point on the El Paso & Southwestern Railroad. The cost of which is such that distillate will be found much more economical.

#### TIMBERS.

Owing to the Character of the formation, as spoken of in a previous heading, very little timbering will be necessary. What few timbers will be needed can be obtained from Bisbee or from the property. There is about thirty acres of the property covered with a heavy growth of small oak, which will do for stulls, lagging, and fuel for the boarding house.

#### ROADS.

Wagon roads can be built to any part of the property where they shall be needed, at very little cost. A good wagon road of about one per cent grade runs from the property to Lewis Springs, on the E.P. & S.W. R.R., about fifteen miles distant.

#### ORE MARKET.

There is a convenient market for all classes of ore close at hand, either at Douglas, 48 miles distant, where the Copper Queen Consolidated Mining Company has a large smelter and purchases all classes of copper ores, or at El Paso, Texas, some 200 miles distant, where the American Smelting & Refining Company operate a large custom smelter and purchase all classes of ores. The freight rate from Lewis Springs, the shipping point on the E.P. & S.W. R.R., to El Paso, is one and one half dollars per ton. The wagon haul from the mine to the railroad would be \$1.50 per ton.

WATER.

Plenty of water can now be obtained from a spring on the property. There will be more water than is needed when the ore zone shall have been penetrated with the tunnel now being driven.

REMARKS.

From my examination of this property I am convinced that with the proper development and economical management this property can be placed among the large mined of the country, the element of chance being more eliminated than in the ordinary prospective mines. As all mines are but developed prospects we cannot look for any paying proposition at the start, only in very rare instances. While no prediction can be made as to the extent of tonnage that can be obtained after the property shall have been opened the showing warrants the expenditure of the money necessary to open property as recommended. Owing to the natural advantages, the very favorable topography of the country, the fact that the other values than the Copper are found, and also the fact that timbering can almost be dispensed with, I have no hesitancy in recommending this property as a first class mining venture. The property can be very quickly opened by tunnelling, which is the cheaper method by far. While this property is not in the same formation as most of the mines at Bisbee, it is in the eruptive formation from which values were extracted and carried into the lime and it was by this formation the precipitating gasses were formed that caused the disposition of the ores at Bisbee, therefore, with proper physical conditions in this formation we can with a great degree of certainty look for ore in this formation. The amount of of which ore can only be limited by the degree or conditions occurring to receive it.

Respectfully submitted.

O. H. Zane