CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

The following file is part of the Grover Heinrichs 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.

BOVARD, MINERAL CO. Walker Lake Sheet.

Sources: F.C.Lincoln, 1923, 149-151.

F.C.Schrader,1913, Alunite in Patagonia,Arizona,and Bovard, Nevada, ECON.GEOL. vol.8,752-767.

F.C.Schrader,1914, Alunite at Bovard, Nev. USGS Bull.540,351-356.

W.O.Vanderburg,1937, Reconn.of mining districts in Mineral Co.,USBM Inc.Circ.6941,55-58.

D.C.Ross, 1961, Geology and mineral resources of Mineral Co., Nev.Bur.Mines Bull.58, 80. Also Table 6.1

REGIONAL SETTING

Structure:Unknown;may be on NW fault zone.

Production Belt: On W edge, National-Mina high-production belt.

Lithology: In NW-trending volcanic field,45 mi.long, 3 mi.+ wide.

LOCAL GEOLOGY

Country Rock: Post-Esmeralda (Miocene-Pliocene) volcanics,including latite,rhyolite,and probably andesite.

ORE DEPOSITS

Golden Pen: Quartz vein 3-8' wide,separated from walls by alunite 3" to 1 ft.thick. Enriched ore extended 250 ' below surface.

Lone Star: Geology like Golden Penn,except rhyolite also present. On Golden Penn vein,which dips steeply NE (hence strikes NW);locally to 100 ft.thick,though with much included wall rock.

Randall Group: Quartz veind in sheared andesite (?).Some silver alloyed with gold,some as ceragyrite and argentite.Rich ore in lenses in iron- and manggnese-stained qtz gangue. Gold:silver ratio 1:30.

Production: Ross,one version,$99,000;another version,$199,000. Vanderburg, $363,128;recovered value per ton $52.70. $208,338 from gold and silver,$151,119 from copper, $3771 from lead. Average grade of 6891 tons ore shipped 4.3% Cu. Accoring to Bull.37,Nevada metal and mineral production,total production in Au,Ag,Cu,Pb was $176,000.

~~BOVARD (RAND) ADDENDUM~~

CONCLUSIONS

Golden Penn vein appears to bea strong,persistent feature, quite likely a fault; it strikes NW,parallel to that of major faults in the region. Elevation of camp about 5600';the volcanic Gabbs Valley range rises to 6600' 4 miles to the SE,and to 7400' 9 miles to the SE. Bovard looks favorable.

BOVARD (RAND) ADDENDUM

Source: Unpublished report on the Carson Sink area,Nevada.F.C.Schrader. Field work 1911-1920.

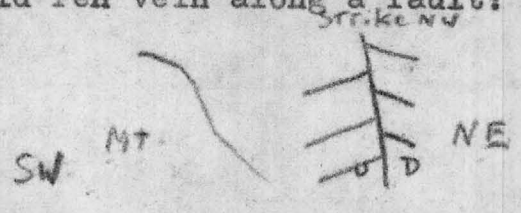
237 Country rock andesite,trachyte,rhyolite. Exposed section is 2000' thick. District contains late tertiary gold-silver veins;most important are the Gold Pen,and Nevada Rand mines.

238 The veins are mostly contained in a NW fracture zone or fissure system 5 miles long,and 100' to 1000' wide. Both veins and rocks dip NE.The veins contain tabular sheets of alunite;walls show propylitic alteration.

The vein filling is mainly quartz and crushed or brecciated wall rock,mostly rhyolite or andesite. Some fragments are silicified. Some of the quartz is pseudomorphic after calcite or other spar. Some adularia is probably present.

Although the veins are good-looking and extensive,they are too low grade and the ore shoots are too erractycally distributed for profitable mining. They belong to the large,comparatively barren type in the volcanic fields of W U.S.

244. Gold Pen vein along a fault:



CONCLUSIONS

Even if erosion has exposed the Gold Pen vein at the optimum horizon,where it is low-grade,large low-grade veins occur at Pachuca, San Dimas,Fairview,and even on the Comstock. If promising fractures can be found in the higher surrounding country,the district might be worth exploring.

MEMORANDUM FOR EDWARD WISSER January 14, 1966

Outline Report
Geology of the Bovard District
Mineral County, Nevada

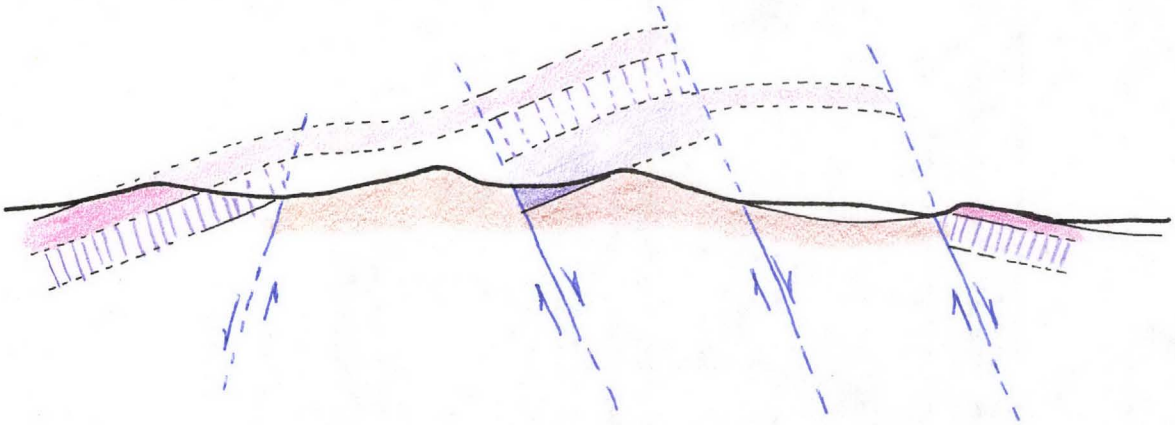
ROCKS OF THE DISTRICT

Oldest rock in the district is the Mesozoic granodiorite. Overlying the granodiorite unconformably is a bleached and altered quartz eye rhyolite. Lying conformably on the quartz eye rhyolite is a variably altered quartz latite. In the southeastern portion of the district, a medium to coarse grained equigranular quartz latite appears to be intruding the quartz eye rhyolite and may be the source of the quartz latite flows. Overlying these early acid flows and ignimbrites with slight unconformity is a hornblende andesite porphyry. Except where it flanks veins, this andesite is fresh.

The Nevada Bureau of Mines' Mineral County report shows no granodiorite in this area. However, the granodiorite shown on the accompanying map is a coarse grained and equigranular rock. Alteration, or more probably, weathering has softened all minerals except quartz, but the original composition appears to have been two feldspars, hornblende, possibly biorite and accessory quartz. This granodiorite has a jointing trend that is somewhat parallel to the volcanic bedding and from a distance appears to be bedding. This jointing however is very steep, approaching vertical in some places. The Mineral County report dates the volcanic rocks as post-Esmeralda. However, the similarity of the quartz eye rhyolite to the Hartford Hill formation and the similarity of the hornblende andesite to the lower Kate Peak formation, along with their relation to the Mesozoic granodiorite, suggests a pre-Esmeralda age. I have no way of dating these rocks other than an intuitive feeling, but then neither do the writers of the Mineral County report.

STRUCTURE OF THE DISTRICT

There are two prominent fault systems in the district. One, a northwest trending system, probably is related to the Walker Lane and the other, an east-west system is of perhaps earlier origin. Southwest of the Range Front faults, bounding Bovard Ridge, volcanic rocks dip fairly uniformly southwest. Northeast of the Range Front faults, what volcanic rocks that there are dip northeasterly. Thus we have a situation somewhat as shown below.



Section A-A'
1" = 1 mi
← SW

In the above cross section, the two southwesternmost faults need not exist to explain the outcrop pattern since the quartz eye rhyolite and perhaps the quartz latite are ignimbrites and are probably resting on an irregular pre-Tertiary surface. Thus these acid volcanic outcrops may be erosional remnants of a rather irregular volcanic pile. The andesite is probably more regular in its thickness and appears to show a domal structure, broken and accentuated by the Walker Lane faults.

The small granodiorite outcrop in the stream bottom near the southeast end of the district is of doubtful validity. In this stream bottom a few narrow granodiorite outcrops occur between the stream gravels and the soil mantle covering the hillsides. There is a moderate amount of granodiorite in the stream gravels here but there are no granodiorite outcrops upstream that could be shedding this material into the stream gravels.

GEOLOGIC HISTORY

At the close of the Mesozoic or early Cretaceous period there was probably developed a terrain of moderate relief, perhaps due to movement on the east-west fault system. On this terrain there was laid down a fairly thick section of rhyolite and latite ignimbrites, probably with an irregular thickness. Following deposition of these ignimbrites, Walker Lane faulting probably commenced along with further movement on the east-west faults. A topography of gentle relief was developed by further erosion and/or the accumulation of ignimbrite. On this surface the andesite was deposited. The domal structure in the andesite may be in part an original feature

caused by flow downward and away from an extrusive center along the Walker Lake faults just northeast of the main Bovard ridge. The dome may also be entirely a post-depositional feature caused by folding and faulting along a northwesterly trending axis that is a part of the general Walker Lane structural complex. I think it is probably a combination of both original and subsequent activities.

Following the deposition of andesite, further movement took place along the Walker Lane and the east-west fault, elevating the entire Bovard Ridge with the northwest block being elevated relatively higher than the country to the southeast.

ORE DEPOSITS

All ore deposits and related alteration are long faults of the Walker Lane system. At the Green Sphinx mine the hanging wall is andesite while the footwall is quartz eye rhyolite. Just north of the Green Sphinx mine an unnamed mine has quartz latite on the hanging wall and quartz eye rhyolite on the footwall. The Green Talc mine as well as one other propsect are entirely quartz eye rhyolite. It thus appears that all the volcanic rocks of the district are involved in ore deposition and that ore deposition followed the extrusion of the andesite. Alteration in the acid ignimbrites is so widespread that it is difficult to determine what is strictly epithermal alteration.

DESCRIPTION OF THE DEPOSITS

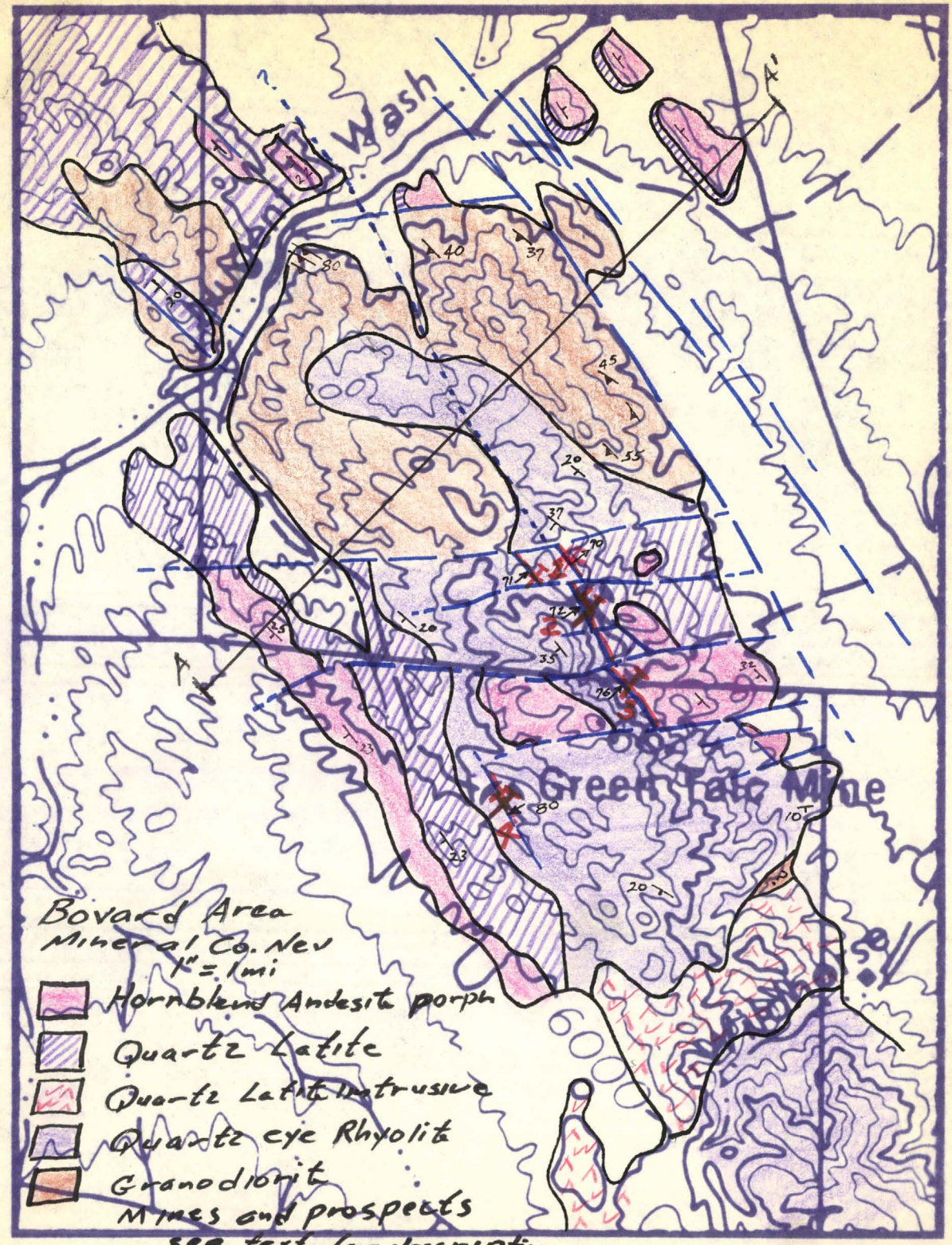
1. Two shallow prospect shafts and two parallel faults. Each is about six feet of gouge and rubble flanked by unknown width of alteration. Mineralization is iron oxide and minor quartz, badly crushed and rubbled.

2. This mine appears to have the most extensive development. The vein proper is six to eight feet of gouge and breccia, very weak iron oxide and moderate amounts of white, opaque, highly crushed quartz. Alteration widths are again indeterminate.

3. Green Sphinx Mine (visited by us last spring) appears to be fairly extensive and is developed by a vertical shaft. Recent dozing has exposed the vein north and south of the shaft. The vein is six feet of gouge and rubble with heavy iron stain. In a prospect pit south of the shaft there is moderate amount of smashed brecciated, white opaque quartz. The quartz fragments are covered with manganese oxide. In some of these prospect pits there is, at the footwall, six to eight inches of brown, coarse grain manganocalcite. Alteration in the hanging wall andesite is about three or four feet of a sericite kaolinite mixture flanked outward by 20 feet of kaolin.

4. Green Talc Mine is developed by a vertical shaft. Vein is six feet of gouge and rubble, meager iron staining. Quartz is scarce and is white and opaque, with extreme crushing and brecciation. Alteration of the quartz eye rhyolite is indeterminate.

E. H. Lindsey


Wash
Green Tate Mine
A
A'
Bovard Area
Mineral Co. Nev
1" = 1mi
Hornblend Andesite porph
Quartz Latite
Quartz Latite Intrusive
Quartz eye Rhyolite
Granodiorite
Mines and prospects
see text for description