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GEOLOGICAL STUDY AND MINING POTENTIAL  
OF THE PYRAMID MINING DISTRICT  
JONES-KINKEAD AREA

by

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## SUMMARY

Although the Pyramid Mining District is easily accessible to Reno and well known in local mining circles, no thorough study of its overall potential or serious exploration work has been conducted in this area in recent times, particularly in viewpoint of possible leach in place operations.

Mineralization in this area has a very unique quality of being highly acidic, and consequently acid, a major expense in normal leach operations, will not be needed here. Cost of producing copper cement from this area once installations have been set up should average between 8¢ and 10¢ a pound.



## LOCATION -

Area under study is located in the Pyramid Mining District, Washoe County, Nevada, T. 23 N., R. 21 E., Sections 15, 16, 21, 22, and 23.

Mineralization occurs in the Northwest foothills of the Pah Rah Mountain Range, and is observed up to the elevation level of around 5,400', above which is a cover of Quaternary basalt, and down to the approximate elevation level of 4,400', below which is alluvium.

## GENERAL GEOLOGY -

Lithology is composed of the Hartford Hill volcanic ash flow formation of late Miocene Age intruded in places by volcanic plugs and small irregularly-shaped bodies of the Kate Peak dacite porphyry formation of Pliocene Age. There are also some minor N. W. trending dikes of intermediate composition of undetermined age.

### Hartford Hill Formation -

This formation is principally composed of a series of ash flows, though considerably altered and metamorphosed in places. Crystalline content ranges from facies containing almost 50% phenocrysts (plagioclase and orthoclase in about equal amounts) and often resembling a hypabyssal rock, to nonporphyritic welded tuffs. There are some minor



sedimentary facies, a product of erosional intervals between successive ash flows. The Hartford Hills formation in this area has a fairly constant bedding dip of around 20 degrees to the East and jointing parallel to the strike and perpendicular to the dip. A very characteristic feature of this formation are propylitized pumice relics.

There are two main types of alteration. First is bleaching and kaolinization resulting from acid meteoric water, the acid being derived by oxidation of indigenous pyrite. The second is hydrothermal alteration and metamorphism causing intense propylitization and recrystallization.

#### Kate Peak Formation -

This intrusive porphyry can be seen in places cutting across mineralized veins placing it at a later age. Mineralization and the Kate Peak rocks frequently occur in close proximity to each other. This is not the result of mineralization resulting from the Kate Peak but rather that both intrusives are confined to the same zones of weaknesses.

#### VEIN DEPOSITS -

Veins in this area tend to be prominent, feldspathic in composition and numerous. Average width is around 20', though in most cases mineralization is mainly confined to the hanging wall. The sulphide content on and near the surface



have been thoroughly oxidized and leached. A typical vein will show massive goossan on the hanging wall with at least some black bladed boxwood indicating original enargite content. The rest of the vein will show rust streaks indicating veinlets and disseminations of pyrite.

#### UNDERGROUND VEIN EXAMINATION -

The underground vein structure can be observed in the Jones-Kinthead Mine and the Burrus Mine. Both are similar in character. The ore occurs in shoots along the vein. In the Jones-Kinthead, the shoot averages 400' in length and rakes to the Southeast. The ore is still open on the south east end of 3rd and 4th levels. In the Burrus, the shoot is around 200' long. Mineralization is confined to the narrow enargite zone down to around the 150' level, at which point the vein "fills up" with mineralization consisting of a cupiferous marcasite probably of supergene origin. The copper content readily converts to copper sulfate on exposure to moisture and air. Metallurgical tests show copper content approximately 85% water soluble.

The best width of the Jones-Kinthead deposit is between the 300' and the 400' levels where ore width is in excess of 20'. It pinches going down to the 500' level where width varies from a few feet to 13 feet. Sampling done by myself and



Andrew J. Zinkl, mining engineer from Prescott, Arizona, and optionee of property, averaged .87% copper from the 300' level to the 500' level. We were unable to reach the 200' level to sample as the ladders in the main shaft will have to be repaired. According to hearsay, ore becomes richer but narrower going from the 300' level to the 200' level. As all stoping in past mining operations (direct shipping ore) was done between the 200' and 300' level, it could be conjectured this is the highest grade area. Also, according to hearsay, there were pockets of supergene silver ore just below water table level (around 200' level) which ran quite high.

The Burrus Mine is narrower, but higher grade than the Jones-Kinhead Mine. According to Frank Pethick who operated the Burrus Mine for a while, he shipped five carloads of ore averaging 4 1/2% copper and 10 ounces of silver per ton. Though I have not sampled the Burrus yet, from casual observation grade appears to continuously improve with depth.

#### PROPOSED JONES-KINHEAD PRODUCTION -

Mr. Zinkl plans a leach in place operation to extract the water soluble copper from the mine workings of the Jones-Kinhead. Plans call for injecting water into the top workings and then drawing the solutions out from the bottom 500' level crosscut adit. He estimates 200,000 tons of copper ore at



17.7 pounds of copper per ton. Production cost will be extremely low (est. 8¢ per pound copper produced) as no acid will be needed for the leaching.

Some of this tonnage is conjectural as he is calculating up to the 200' level which we have not sampled yet and only about 2/3 of his tonnage figure can be positively assumed. I expect recoverable copper content might be higher, assuming that the area between the 200' and 300' level is the highest grade. Proposed production will be at the rate of 5 tons per day of copper. Minimum estimated profit potential is \$400,000 derived over a 1 1/2 to 2 year period of time.



### JONES-KINKEAD EXPLORATION POTENTIAL (18 patented claims) -

There is a mine tunnel 1,200' S. E. of the main Jones-Kinead shaft which intersects the main vein. We have not been in this tunnel to examine because of cave and water. The mine water has a high copper content and the dump shows some good copper mineralization. According to hearsay good copper was encountered in these workings.

On the surface, the vein composed of heavy gossan can be traced from the main shaft to where this upper tunnel intersects the vein. At about this point, however, the vein is displaced by a cross fault where it continues along the Perry Creek claims. From the above observations, the inferred ore reserves would be about 3 1/2 times that already blocked out or about 10 million pounds of recoverable copper.

Another promising area within the Jones-Kinead group is at a point 1/2 mile South-East of the main shaft where there is a Breccia-Stockwork zone with good gossan with approximate dimensions of 400' by 800'.

### BURRUS EXPLORATION POTENTIAL (3 claims) -

The mineralization as shown in the Burrus mine shows a central core within the vein of massive enargite but with a surrounding halo of copper sulphate mineralization extending out into the country rock. This copper sulphate mineralization becomes more pronounced with depth. Drilling might easily prove up another leach in place situation.



There is also potential for limited mining of direct shipping ore.

PERRY CREEK CLAIMS (9 claims) -

There are two main interesting features on this group. First, the continuation of the main vein runs through this property for a length of 4,500' at which point it terminates as it runs into a dacite intrusive. The vein here has a high gossan content and good width which varies from around 10' up to around 100'.

There is a very large potential in a breccia-stockwork zone of rough dimensions of 1,800' by 1,500' displaying considerable gossan. There is 500' tunnel cutting through this structure exposing sulphate zones mainly of gypsum with some copper and iron sulphates. This zone of observation is still in the leached zone with most of the original copper having been transported to yet a lower depth. The surface rocks in this zone in spite of being leached away shows at least some silver (low of .8 oz. to high of 2.6 oz. so far).

Also of importance to the overall picture is that there is also brecciation and general mineralization, though to a lesser extent, between the two brecciated zones previously mentioned, giving an overall mineralized belt of roughly 4,000' by 1,500' and likely is a product of an underlying intrusive.

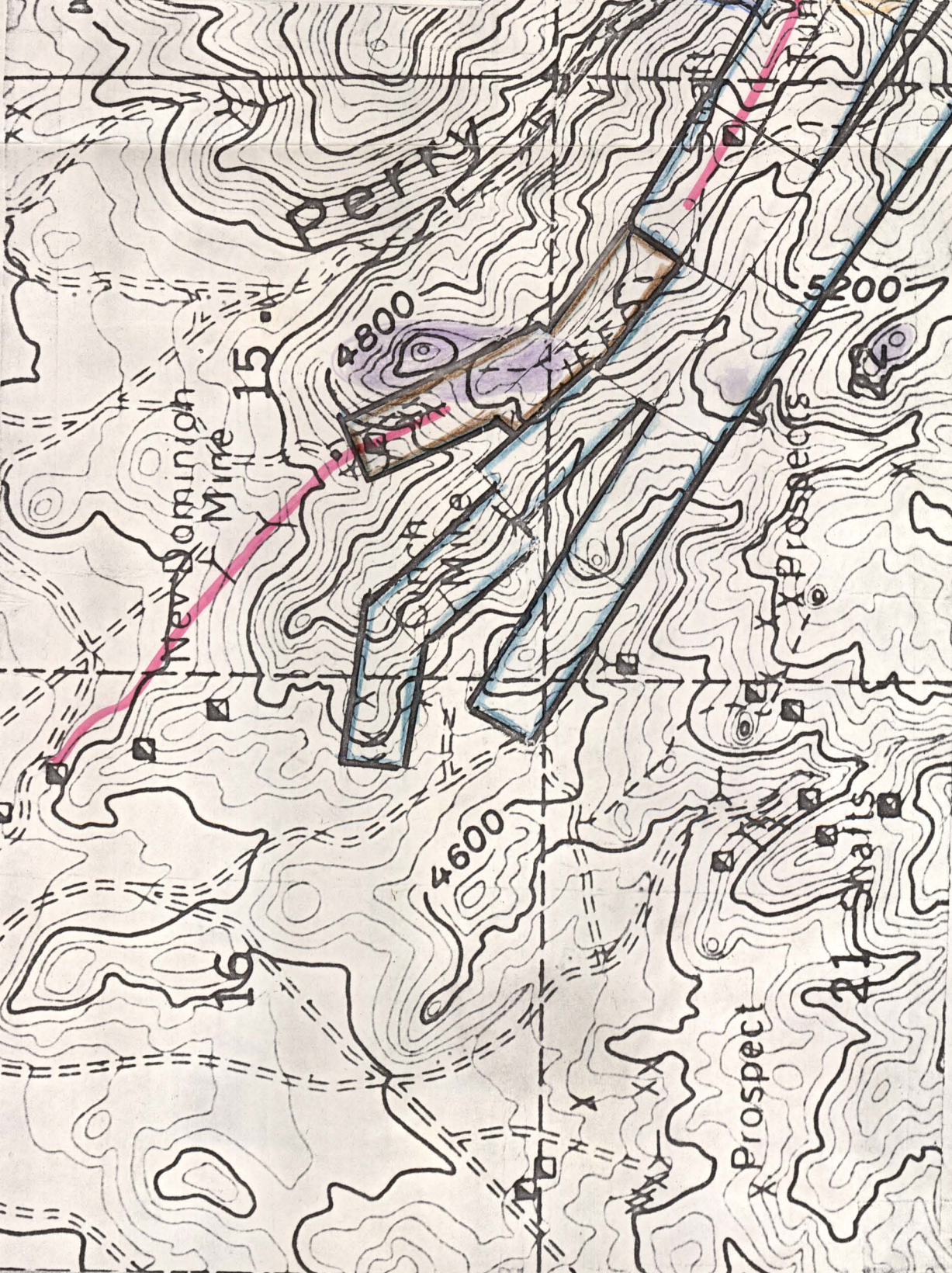
This report respectfully submitted by

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T. 23 N., R. 21 E. Pyramid Mining District, Washoe County



Jones-Kinhead Property (Zinkl option)  
Jones Kinhead Mill Site  
Burrus Property  
Moore Property

Vein structure  
Kate Peak Intrusive  
Granodiorite Intrusive  
Breccia Zone

Map compiled by Wm Moore      Scale 1" to 1320'      10/21/66