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REPORT ON THE MINERAL PROPERTIES
OF VIKING MINES LTD., N.P.L.
LOCATED IN THE COWICHAN LAKE AREA
OF THE VICTORIA MINING DIVISION OF B.C.
Apr. 13/57 J.P. Etwell, P. Eng/

PROPERTY FILE

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REPORT ON THE MINERAL PROPERTIES OF
VIKING MINES LTD., N.P.L., LOCATED
IN THE COWICHAN LAKE AREA OF
THE VICTORIA MINING DIVISION OF B.C.

INTRODUCTION

This report covers a description of the mineral properties held by Viking Mines Ltd., N.P.L., 240-180 Seymour Street, Kamloops, B.C. The report includes a summary and evaluation of the exploration work being carried out by the company, together with recommendations for continued work.

The writer first examined the property on October 25th, 1966 and a subsequent visit was made on March 29th, 1967, to review the results of the exploration work.

LOCATION AND ACCESS

The Viking property consists of a three square mile base metal concession from Canadian Pacific Oil and Gas Ltd., which lies on the flank and ridge of the mountain to the east of Robertson River, with the center of the area being about three miles south of Mesachie Lake Post Office. The terrain is steep and rugged with elevations ranging from about 800 ft. on the west side to over 3,000 feet in the southeast part.

Access to the property is by way of highway #16 east from Cowichan Lake, and then by a logging road built up Robertson River and through the west side of the concession. From this road the company has recently constructed a number of bulldozer roads to provide access to the different known mineralized areas on the property.

Most of the west slopes of the property have been logged bare in recent years, but there are still areas covered with fairly heavy timber. The climate is typical of the B.C. coastal areas with rain or snow in the winter depending on the elevation.

A location map showing the surveyed boundaries of the mineral concession, and the original eight located claims is included with this report. The claim boundaries were surveyed by S.R. Leggatt, B.C. Land Surveyor.

PROPERTIES

The property consists of eight located claims as follows:

<u>Name</u>	<u>Record No.</u>
Viking #1 to #5, incl.	14132 to 14136, incl.
Viking #13	14144
Viking #15	14146
Viking #17	14148

The position of these claims in relation to the land concession is shown on the location map included with this report.

EARLY HISTORY

There is no record of the earliest prospecting and work in the area, but there are remains of an old cabin at the 2000 foot level, and a small cut has been opened up over a narrow quartz vein, presumably in search of gold values. This work probably dates from the early 1900's.

More recently prospecting and development was done on the copper showings, and the following is quoted from the Minister of Mines Report for 1955 when the property was known as the Lorry group.

"This group of claims held by location is 3 miles south of Mesachie Lake P.O. Copper Ridge Silver Zinc Mines Ltd., leased the property and underground work was carried out under the direction of W.S. Ellis. An adit at 2500 foot level of elevation was driven to trace the downward extension of a quartz-chalcopyrite showing. The adit was driven in a northeasterly direction for 270 feet in length. Ten diamond drill holes were drilled for a total of 545 feet".

In the Minister of Mines Report for 1956 there is mention of preparation being made to mine the high grade chalcopyrite ore from the adit. There is no mention of the amount of ore extracted or its copper content.

REGIONAL GEOLOGY

The area is mainly underlain by basaltic to andesitic flow rocks termed the Franklin Creek volcanics, and classified as being of Triassic age. The basalts vary from a dense, fine-grained type to amygdaloidal. The lighter colored rocks (andesitic) are both prophyritic and non-prophyritic. Intermixed with the flow rocks are volcanic tuffs and

and breccias and some limestones.

The flow rocks have been fractured and faulted in many directions and have also been intruded by quartz feldspar porphyry stocks or large dikes, and also by rhyolite dikes. In the area between mineral zones #1 and #2 there are numerous narrow quartz stringers striking generally to the north with a dip to the east.

ECONOMIC GEOLOGY AND MINERALIZATION

Prospecting to date has disclosed five areas of copper mineralization all located within the Viking claims. The general location of these areas is shown on the composite map accompanying this report and designated as Zones #1,2,3,4 and 5. They are of two distinct types, Zone #1 and #2 being vein type mineralization in well defined shear in the volcanics, while Zone #3,4, and 5 are areas of mainly disseminated mineralization in the basalts and related rocks. The characteristics of each zone are discussed in more detail in the following paragraphs.

ZONE #1

This is a mineralized fault zone striking northwest and dipping at about 60° to the east. On the surface the hanging wall of the fault can be traced by a steep, rocky bluff. Malachite stain and copper mineralized float can be found in the slide material down slope.

The adit mentioned in the section under Early History has been driven on this fault zone at the 2,000 foot elevation for a distance of 270 feet. It has been recently cleaned out and was examined by the writer on March 31st. The mineralized part of the fault as exposed in the back of the drift consists of a sinuous quartz vein averaging about 4 inches in width and heavily mineralized at intervals with chalcopyrite. A small amount of the vein has been stoped above the drift at one point, and the floor has been taken up below. There are reports that the vein was widening and the mineralization improving below the level, but this could not be checked as the cut below drift level was filled with water.

On the surface, above the adit, near the final post of Viking #1 and #2, trenching has revealed an area of fractured volcanics with veins and masses of quartz and chalcopryrite. This appears to be part of a parallel shear zone to the one on which the adit has been driven. A grab sample taken by the writer assayed, 7.65% Cu., with 0.90 oz. Ag.

ZONE #2

This consists of a north-south striking shear in andesitic flow rocks which outcrops on a steep bluff about 350 feet to the northeast of the adit portal at an elevation of 1,780 feet. The face of the bluff has been opened up by blasting and has exposed a well fractured shear zone dipping about 80° to the east. Mineralization consists of quartz stringers with pyrite, chalcopryrite and some bornite as disseminations, small blebs, and fracture fillings. Malachite is present as surface alteration. Two samples taken across the fresh cut over a width of 6 feet assayed 4.60 and 1.05% Cu., with 0.50 oz. Ag.

Between #1 and 2 zones there are a series of narrow quartz veinlets having a north-south strike; some of these showed some malachite staining.

ZONE #3

This zone is located in Viking #3 claim and is centered about 1,200 feet to the northwest of Zone #1. The surface rocks of the area are a dark basaltic type, and a fairly strong magnetic influence was noted during the prospecting of the area.

The area has been covered by a magnetometer survey, a geochemical survey and also with an M-scope, lines being laid out in an east-west direction on 100 foot spacing and readings at 50 foot intervals. The composite map accompanying this report shows the anomalous areas produced by these three methods of exploration. Separate maps of the magnetometer and M-scope survey marked "Detail A" are also included.

The principal magnetic anomaly extends from station 145 south to a point between stations 95 and 96 with its greatest intensity centered at station 101. This anomaly is flanked to the east by a magnetic low. The M-scope and geochemical anomalies appear to correlate fairly well with this magnetic anomaly.

Copper stain and mineralized volcanics have been found in prospecting the area of Zone #3, and bulldozer stripping has revealed one pod of magnetic basalt fairly well mineralized with chalcopyrite. On the basis of these findings, Zone #3 has been selected as the first target for diamond drilling.

Zone #4

In this area stripping has exposed basaltic rocks which are well fractured and slightly magnetic. Pyrite and chalcopyrite occur as fracture fillings and disseminations.

Zone #5

The area examined consisted of a prominent outcropping of amygdoloidal basalt, the amygdules being filled with calcite. Disseminated chalcopyrite and bornite was present in all samples examined. Recent mapping of this area, (see Geology - Detail "B" which accompanies this report) shows this rock type and mineralization to be quite extensive, and justifies further exploration.

CURRENT EXPLORATION

Exploration on the property by the company has consisted of (a) Bulldozer stripping in conjunction with road building, (b) Trenching, (c) A magnetometer survey, (d) An E.M. survey conducted with an M-scope, (e) Soil sampling, (f) An S.P. survey, (g) exploratory diamond drilling. Maps showing the results of the different surveys accompany this report.

Diamond drilling to date has consisted of seven short holes drilled from stations in the adit for a total of 547 feet, and two surface holes, one of which, S-2 is shown on the composite map. The holes drilled from underground produced very poor core recovery and the results were inconclusive. The surface hole S-2 which was drilled to a depth of approximately 350 feet at a shallow depth to test out the magnetic and EM anomaly of Zone #3 cut a series of slightly to moderately magnetic basaltic type rocks containing some bands and fine disseminations of chalcopyrite and pyrite. Complete logs and assays of this core have not yet been received.

SUMMARY AND CONCLUSIONS

The Viking Mines property located to the east of the Robertson River in the Cowichan Lake area of Vancouver Island is underlain mainly by a series of volcanic and related rocks of Triassic age. These rocks have been intensely sheared and faulted and are cut by numerous quartz veinlets and stringers and

hve also been intruded by rhyolite dikes and sills, and quartz porphyry sills.

Copper mineralization has been noted in a number of areas within the property and consists of tow principal types. (a) vein type deposits of chalcopyrite and quartz which floows well defined shear zones, and (b) disseminated chalcopyrite and bornite associated with amygdoloidal basaltic lavas and volcanic breccias, in areas where there has been considerable fracturing and faulting. It is the writer's opinion, that while the first type of deposit may result in some pods and shoots of high grade material, the best possibilities for large tonnage exist in the disseminated zones.

The magnetometer survey conducted over two blocks of the claim area has produced one anomalous zone of hgih magnetic intensity and a member of other areas of moderate intensity. It is considered that the areas of moderate magnetic intensity can be accounted for by the magnetic basalts noted in the regional mapping; but the high magnetic anomaly in Zone #3 (15,000 gammas) may be due to a large pod of magnetite which has not yet been encountered by the preliminary drilling. It is interesting to note that stripping in the area did uncover a small pod of magnetite carrying considerable copper values.

The M-scope survey has also produced several anomalous areas. This instrument, however, has very little depth perception, and it is felt that the area should be covered with a now E.M. survey using horizontal loop equipment which would be sensitive to mineralization to a depth of at least 180 feet.

In general it is considered that the exploration work carried out on the property to date has disclosed a number of interesting zones of copper mineralized zones of sufficient size to be capable of developing into large tonnage orebodies. Furthermore, only a small part of the mineral concession has been mapped and prospected to date, and there is ample room for other significant deposits to exist within the same regional geological formations.

Recommendations for continued work are as follows:

RECOMMENDATIONS

1. The areas now mapped as Detail 'A' and 'B' should be covered with and E.M. survey using horizontal loop equipment with sensitivity to at least

180 feet. (This work has already been contracted).

2. Confirmed anomalies when evaluated with the previous magnetometer and soil surveys should be tested by diamond drilling.

3. Regional prospecting and mapping should be carried out stage by stage to cover the remainder of the claim area, to be followed up by magnetometer and E. M. surveys over selected areas.

ESTIMATE OF COSTS

The following estimates of costs may be used for budgeting purposes. Actual expenditures will depend on an assessment of each phase of the program as it progresses.

1. E.M. survey over areas 'A' and 'B' estimated maximum of 20 line miles @ \$100.00 per line mile.....	\$ 2,000.00
2. Continued regional prospecting and mapping, allow.....	4,000.00
3. Further E.M. and magnetometer surveys over prospected area, allow.....	5,000.00
4. Trenching and stripping	5,000.00
5. Diamond drilling of confirmed anomalies, allow 6,000 feet @ \$9.00 per foot, all inclusive.....	54,000.00
6. Transportation, maintenance of crew, administration, etc.....	5,000.00
7. Engineering, assaying, etc.....	<u>5,000.00</u>
TOTAL.....	80,000.00

J.P. Elwell, P. Eng.,
Consulting Mining Engineer

C E R T I F I C A T E

I, JAMES PAUL ELWELL, of 4744 Caulfeild Drive, West Vancouver, B. C., do hereby certify that:

1. I am a Consulting Mineing Engineer residing at 4744 Caulfield Drive, West Vancouver, B. C. and with an office at 929 - 510 West Hastings Street, Vancouver 2, B. C.
2. I am a graduate in Mining Engineering from the University of Alberta in 1940, and am a Registered Professional Engineer in the Province of British Columbia.
3. I have no personal interest, directly or indirectly, in the peoperties examined or in Viking Mines Ltd., N.P.L.
4. The findings in the report are the result of a personal examination of th property made by me October 25th, 1966, and March 29th, 1967.

DATED at Vancouver, B. C. this 13th day of April, 1967.

James Paul Elwell, P. Eng.