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DETAILED GEOLOGY, HEBECOURT PROPERTY

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14 July 1959

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NEALON MINES LIMITED

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General

This report, and the accompanying map, deal with a survey of only two limited sections of the Hebecourt township property of Nealon Mines Ltd., The larger and more important of these sections lies in the north central part of the property, includes an area about 2800 feet long and 600 feet wide and covers the best mineralization discovered. The other section is a small one to the east in which two quartz veins with sulphides have been found.

The purpose of the survey was to make a detailed investigation of the outcrops in the designated areas with a view to determining the relationships between the geological factors, petrology, structure and mineralization. It was hoped that the discovery of these relationships would assist in the planning of a program of exploration by diamond drilling; this it has done.

Petrology

In the area surveyed only six different rock types were recognised; these are, in probable order of their emplacement, flow breccia, pillow lava, granite, feldspar porphyry, basic dyke and diabase dyke. The breccia and pillows are a small part of a broad series of volcanic rocks found in the area. The flow breccia is trachytic in composition being formed of angular fragments of mostly trachyte, averaging about two inches across, in a fine-grained matrix; the distinctive appearance of the fragments is readily recognised, especially on lightly weathered surfaces, such as cliff-faces and under the moss. The pillow (elipsoidal) lava is also mostly trachytic, the elipsoids vary in size, up to six or eight feet long; some, especially near the contact with the breccia, have been fragmented, but an occasional distinctive pillow-rim can be found on a cliff-face or under the moss. The other rocks are all of igneous origin and have intruded the earlier volcanics. The granite is fine grained near the contacts, other wise coarse; it is usually the greyish, biotite type. The feldspar porphyry is a fine-grained intrusive rock with many white feldspar phenocrysts, averaging 1/8 inch in diameter, scattered through a very dark basic rock. The basic dykes are also a fine-grained intrusive of andesite-diorite composition and green colour; they show cross-cutting relationships with all the other rocks except the granite and diabase, they strike north-eastward. There is one diabase dyke, it

intrudes the granite in the northwest part of the area, it is probably more correctly designated as gabbro since it lacks diabasic texture.

Structure

The important structural geology is that of the volcanic rocks. The volcanics, probably before the intrusives' arrivals, were tightly folded and left in a nearly vertical attitude. They were later, probably during the intrusions, further folded and faulted. We now find the breccia and pillows lying with steep dips to the west and striking north east, except where this has been changed by subsequent folding. The most impressive and significant of these later folds is found in the southwest part of the main area where the volcanic series have been bent sharply around to form a tight fold with its axis striking about north 50 degrees east and plunging to the southwest. The volcanics were also faulted, two of these faults were recognised in the area; they are roughly parallel, about 100 feet apart, have about the same strike as the volcanics and extend from the quartz veins on the north to the sulphide zones on the south.

Economic Geology

Two significant types of mineralization have been found on the property. One is of quartz with sulphides, including chalcopyrite, along narrow shear zones and veins running through the volcanics and the granite. These veins and zones have widths of a few inches up to two feet and have given good assays in copper. The other type is of sulphides occuring in zones in the volcanics. The sulphides include pyrite, pyrrhotite and chalcopyrite and are accompanied by strong chloritization. This mineralization is mainly of the replacement type and seems to have favoured the volcanic breccia, particularly along the fault near the nose of the later fold. Good assays in copper have been obtained from this sulphide mineralization.

Conclusions

The cuprous quartz veins and shears occur along faults with about the same strike as the volcanics, cutting through the volcanics and the granite. If enough of them could be found close together they would make copper ore. The sulphide zones occur in the volcanic breccia near the axis of a later fold along one of the faults. These sulphide zones carry copper and could make copper ore if found to be extensive enough, which they could be. The veins and sulphide zones seem to be connected by the same faulting.

Recommendations

It is recommended that several holes be drilled to test the sulphide zones. These holes should be spaced at 100-foot intervals, north eastward along a line parallel with the volcanics beginning near picket 23 north on line 21twest. About eight 250-foot holes would be required. The quartz veins in both the east showing and near the north boundary should also be tested with at least one hole each.

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