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CANADIAN SUPERIOR EXPLORATION LIMITED

LOU GROUP

PROGRESS REPORT ON DIAMOND DRILL PROGRAMME TO APRIL 31st, 1970

INTRODUCTION

The Lou group consists of 170 claims located approximately 20 miles west-northwest of Smithers and 28 miles south of Hazelton in the Omenica Mining Division. The group is owned by Leitch Mines Ltd. and was optioned to Canadian Superior Exploration Limited under an agreement dated October 15th, 1969.

The claims are situated on both sides of a northeast trending valley and surround Louise Lake. The terrain is of small, fairly steep, forested hills ranging in elevation between 3,000 feet and 4,000 feet above sea level.

A logging road from Smithers comes to within 8 miles of Louise Lake with a winter cat-road branching off to the property itself. Air access is either by fixed or rotary wing aircraft to Louise Lake.

SUMMARY AND CONCLUSIONS

This report deals with a diamond drilling programme carried out in the winter and spring of 1970 to prospect some copper mineralised bedrock at the west end of Louise Lake. The results from an I. P. survey and a limited soil geochemical survey were used as guides in siting drill-holes.

Sixteen holes of some 350 feet vertical depth were drilled about the showings. They revealed a complex of highly altered bedded volcanics and intruded feldspar porphyries mineralised with tennantite, chalcopyrite and molybdenite with rare amounts of other base metals. One hole was also drilled elsewhere on the property for assessment purposes. The mineralised and altered zone appears to dip to the northwest below and beyond the drilling limits.

The lateral near surface limits of the mineralisation seen in the original showings have been defined by the programme and all major I. P. targets of moderate depth in the vicinity have been tested. Deeper drilling, particularly to the northwest would probably reveal further copper mineralisation. However the liklihood that the grade seen so far will improve to economic levels is too remote to make further expenditure justifiable.

WORK PREVIOUS TO DRILLING

The property was staked by the optionors in 1968 following outcrop and silt geochemical indications of copper mineralisation at the west end of

Louise Lake. During the following year surface trenching exposed a 1,600 feet by 800 feet area of altered rock with low copper and molybdenum values. At the same time I. P. and soil geochemistry surveys gave positive results over the same zone. However, the anomalies were not closed, particularly to the southwest. Reconnaissance geological mapping indicated pyroclastics intruded by small monzonite stocks.

Canadian Superior took over management of the property in the fall of 1969, too late for detailed geochemical or geological work on the showings. However, preparatory to drilling, I. P. work was extended over a 12,000 feet by 6,000 feet area on North-South lines 800 feet apart. This was surveyed by McPhar Geophysics whose final report is not yet to hand. The known zone over the showings was confirmed as being about 3,500 feet long and 800 feet wide trending and plunging west south-west. A second zone of similar trend and proportions was discovered 1,000 feet to the north and east. In addition, both resistivity and frequency effect results indicate a northeast trending fault to the south of the main anomalies and continuing along the north shore of Louise Lake.

DIAMOND DRILLING

Production

From January 30th to March 27th, 1970 seventeen BQ size holes were drilled for a total length of 6,632 feet of which 475 feet was through overburden. Including moves, but not mobilisation or demobilisation, the drilling rate was about 40 feet per shift. Cost per foot of the contract was about $11.50.

Casing was left in all holes except DDH #A for possible future deepening. All the drill core has been stored in open boxes in a rack on the north side of Louise Lake.

Drilling Pattern

DDH #A was drilled at the north-east end of Louise Lake largely for assessment work purposes.

On the showings the first five holes were sited to test the highest copper grades recovered from the trenches. These were also in an area of high chargeability. A combination of vertical hole with 45° holes north and south from the same set up was drilled in case mineralised fractures had a preferential dip which was found not to be the case.

The subsequent eleven holes were drilled to intersect possible continuation of the mineralisation encountered in the initial drilling and also to investigate I. P. anomalies of the original trenches. These later holes were in the vicinity

located at the corners of an 800 feet square grid.

GEOLOGY

Rock Types

Most of the rocks encountered were a bedded sequence of altered pyroclastics probably belonging to the Hazelton group of Jurrasic age. These have been intruded by a feldspar porphyry, also highly altered, whose shape and attitude is difficult to interpret.

Sediments encountered in DDH #A overlie some unaltered tuffs and porphyries which could be correlated with the similar rocks of the main area. These may represent part of the Bowser Group or one of the Hazelton sedimentary horizons.

Later minor felsite and dolerite intrusions occur in the mineralised zone.

Volcanic Rocks

The volcanic sequence is largely of fine grained tuffs and agglomerates with a few beds of coarser tuffs and micro-agglomerates. Within the drilling area then are coloured pale greys and greens by the alteration minerals.

The agglomerate pebbles are of fine tuff and feldspar porphyry in about equal proportions with a small number of chert and fine grained unidentified rock. They are generally rounded to well rounded and are of low sphericity with a tendency to be flatter in one plane. In a few instances there is an alignment of this flat plane with the bedding plane of interbedded tuffs. The pebbles are quite tightly packed in a matrix that was once probably a coarse tuff but is now a sericite/quartz aggregate.

The commonest tuff is a medium to fine grained saccharoidaly textured rock, homogeneous and featureless. Quite distinct is a very fine grained tuff of light buff colour that often exhibits bedding planes defined by subtle textural and colour variations or fine dark pyrite disseminations.

Coarse grained tuffs and micro-agglomerates may be more common than the logs presently indicate as they are virtually indistinguishable from the feldspar in the altered state.

Intrusive Rock

Easily the most important intrusive is the feldspar porphyry. Within the area drilled it is associated with the most intense alteration and

faulting. This, with the widely spaced drilling pattern, means its original shape, attitude and composition are largely unknown. Texturally, it is a medium grained porphyritic rock, with kaolin and/or sericite phenocrysts - pseudomorphs after feldspar. No visible trace of ferro-magnesian minerals remains. In rare cases intrusive contacts with the volcanics are seen indicating a sill-like form.

In the more northerly drill holes a purple to buff felsite with quartz penocrysts occurs probably as a sill between 4 and 15 feet thick. It does not appear to be as highly altered as the porphyry or volcanics and may be post - or inter-mineral.

A 7 feet dolerite dyke was intersected in DDH #1.

DDH #A Sequence

This hole was drilled some 6,000 feet east of the main showings for assessment work purposes. It was angled ot 45° to the south, mainly to achieve sufficient footage on two adjacent claim groupings but also to investigate a strong linear detected on aerial photographs.

The main sequence was sedimentary; interbedded grits, sandstones, arkoses, red and green mudstones with minor conglomerates and sedimentary breccias indicating rapid, near shore deposition with contemporaneous tectonic activity. The sediments overlie intermediate(?) tuffs and tuff breccias with acid intrusions all of which are included within a major fault zone. This latter sequence may be an unaltered equivalent of the rock in the main mineralised area.

It is tentatively concluded that the fault is a high angle thrust from the south.

Structure

There are no well defined marker horizons within the volcanic sequence. Nevertheless correlations between holes have been attempted and a dome structure is most likely. It is assymetrical, being elongated in a west-southwest direction with drillholes 3 and 5 approximately along its axis. The southeast side appears more steeply dipping.

Of the numerous linear structures seen on the airphotographs, only one, the above mentioned thrust, has in any way been explained. Although not intersected in the main drilling, its position is well established by the I. P. data.

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In drillholes 1, 2 and 3 a section of pyritic shaley material with accompanying highly altered and fractured volcanics and porphyry dips at about 40° to the north on the north south section. Although most likely a fault feature, it could possibly be sedimentary. It continues only weakly to adjoining sections.

Alteration and Fracturing

All rocks penetrated in the main drilling area were altered to a certain extent. The type of alteration and fracture filling shows a concentric zonal arrangement. From the outside in, it is:

1. Quartz-sericite-kaolin replacement of rock minerals
2. Pyrite stockwork
3. Quartz stockwork
4. Carbonate and/or potassic-filled fractures and replacement
5. Siderite veins and patchy blebs

All alteration types continue to the innermost zone increasing in intensity.

The quartz-sericite-kaolin phase tends to become increasingly sericitic towards the centre. The kaolin is particularly noticeable on late fracture zones.

Pyrite is ubiquitous. It occurs as fine to coarse grained disseminations in the volcanic rocks sometimes in bands parallel to the bedding. The stockwork bears a more obvious relationship to the concentric zoning, increasing both in thickness of veins and their frequency towards the centre. Sulphur assays from DDH's 1, 2 and 3 show that the pyrite content ther ranges from 2% to over 6% by volume. There are at least two ages of pyrite filled fractures - the later having the steeper dip.

The quartz stockwork is more or less restricted to a central zone intersected by drillholes 1 to 6. There are at least three generations of veining, the earliest probably pre-alteration. The latest set usually carries pyrite and, rarely, carbonate and/or orthoclase in its core, cuts most pyrite veins and appears more widespread than the earlier stockworks.

Somewhat more restricted than the quartz is the carbonate and/or potassic alteration which occurs as blebby replacements and veins. The siderite mineralisation has approximately the same distribution and form of occurence but is more easily seen due to the red colour. At this stage the rock is most altered and is accompanied by strong quartz and pyrite stockworks. Its original nature is near always unrecognisable.

Economic Minerals

Tennantite and to a lesser extent chalcopyrite and molybdenite are the minerals of possible economic interest. Other minerals associated in rare amounts are stibnite, sphalerite, bornite and cinnabar.

The tennantite is difficult to identify in the hand specimen due to its colour and fine grained occurence. The more common situations are:

1. Small blebs in carbonate veins
2. Fine disseminations in the more highly altered rock
3. Associated with pyrite and carbonate in the centre of late stage quartz veins.

Chalcopyrite is relatively rare as occasional veins or blebs. In one fifty foot intersect in drill hole #5 a rich blebby stockwork of chalcopyrite and molybdenite occurs in a sericite rock.

Smears and blebs of molybdenite in pyrite veins are all through the mineralised zone but except in the above case they do not reach economic grades.

Of passing interest is the minor stibnite and molybdenite mineralisation in distinctive dark grey quartz veins associated with the felsite sil in the northern part of the drilling grid. There was no evidence in either the mineralogy or the distribution of metal values to suggest any supergene enrichment.

Grade

All drill core, except drillhole #A, was split and divided into 10 feet sections for assay. All samples were assayed for copper. In addition, holes 1, 2, 3, 5 and 6 were assayed for molybdenum and silver and drillhole #8 for molybdenum and antimony. Composite samples of approximately 50 feet length were made of samples from drillholes 1, 2 and 3. These were retested for copper, silver, mercury, antimony and arsenic.

Copper was the only metal that consistently registered in the assays. Molybdenum was rarely above the trace or 0.01% level except in the rich section of drillhole 5 (50 feet of 1.00% Cu; 0.94% Mo) mentioned under mineralisation.

By taking the average of all copper assays in each hole, a general distribution for the metal was found. The two best holes were DDH #3 (0.256% Cu) and DDH #5 (0.298% Cu) over 350 feet vertical depth. From this axis the grade falls off to the extent that all the holes 800 feet away are less than 0.1% Cu.

Mineralisation Control

The axis of the higher copper grades runs parallel to the main I. P. and geological trends with the highest grades coinciding with the highest chargeability on the southern zone. The other I. P. anomaly showed no interesting values(DDH's 10 and 11) and must be attributed for the moment to a higher pyrite content in the volcanics.

Like the alteration, the copper mineralisation appears to be locally controlled by the low angle fault especially on section 60+00E(DDH's 1,2 & 3) with the larger high angle structure to the south possibly having a regional significance. As such, then it dips below and beyond the drilling depth to the northwest. It is quite likely that deeper holes in this direction would intersect further mineralisation. But unless the grade improves severalfold, and there is no indication of this, it will not be worthwhile to prospect further on those lines.

R. J. Overstall.

Smithers, B. C.
May 4, 1970