

CANADIAN SUPERIOR EXPLORATION LIMITEDLOU CLAIM GROUPby Richard Overstall
Dec/70REPORT ON GEOLOGICAL MAPPING AND SOIL GEOCHEMISTRYINTRODUCTION

This report deals with a continuing exploration programme by Canadian Superior Exploration Limited.

Previous work, both by the owners and Canadian Superior, has been concentrated on the copper-molybdenum showing at the west end of Louise Lake. This work has included a reconnaissance soil geochemical survey, some 16 line miles of induced polarisation survey and 6,632 feet of diamond drilling.

The present programme was initiated to provide basic geological and geochemical information unobtainable at the time of the drilling and I.P. survey due to snow coverage. Although the soil sampling was confined to the I.P. grid the geological mapping was extended to include the whole claim group with the hope that further mineralised areas may be discovered.

SUMMARY

The altered and mineralised zone lies in a complex of folded and faulted acidic pyroclastics and feldspar porphyry intrusions. As described in the drill programme report (May, 1970), the focus of the zone appears to be a feldspar porphyry sill intruded into the core of a WSW plunging anticline of flows-tuffs and agglomerates. Further localisation of the mineralisation and alteration occurs along an ESE trending low angle thrust. The zone is remarkable for the intense and widespread argillic alteration.

The lithology of the acidic volcanics suggests they may be the extrusive equivalents of the porphyry and hence of probable Late Cretaceous or Early Tertiary age. Their distribution, along the Coal Creek-Louise Lake valley with Hazleton group andesites outcropping to the south, may reflect some ancient structurally controlled depression. A post-mineralisation fault occurs along the same axis.

Two further centres of alteration and pyrite mineralisation were discovered in the course of the field mapping. Neither carried detectable copper or molybdenum on surface.

The geochemical survey confirmed the reconnaissance results that no anomalous soils occur away from the known copper mineralisation and its glacial spread.

GEOLOGYProduction

In the period from July 30 to September 8, 1970 a total of 20 days were spent on the mapping programme. Rock exposure is poor due to the heavy glacial overburden and thick timber cover. Both east and west of Louise Lake a series of large swamps further restricts outcrop. The rock seen is usually on the steepest sides of the numerous hummocky hills of the area.

Main Rock Types

1. Volcanic Rocks - A two-fold division has been proposed for these rocks on the basis of composition.
 - (a) Older Volcanics (Intermediate). Largely andesitic in composition this unaltered sequence is predominantly of flows with some tuffaceous horizons. Typical rock is well exposed in the Bud Lake area where the cliffs are of a green-grey to purple-grey finely porphyritic andesite. Bedding and cleavage are absent.
 - (b) Younger Volcanics (Acidic). Besides the compositional difference in this group, pyroclastic material predominates over extrusive. Their distribution within the claim group appears to be restricted to a zone about half a mile wide, north of and parallel to Coal Creek and the north shore of Louise Lake. The rock was mainly seen in the drill core from the mineralised area described in the May 1970 report on that programme. The only change would be the re-interpretation of the very fine grained rock as flow material rather than a tuff. The predominance of pebbles of flow material and feldspar porphyry in the agglomerates would suggest a genetic relationship between the pyroclastics and the porphyry intrusions.
2. ^{Sedimentary} Intrusive Rocks - These were mainly seen in the core of DDH A and consist of interbedded grits, sandstones, arkoses, red and green mudstones with minor conglomerates and sedimentary breccias. The surface mapping revealed only one other outcrop, that of red mudstone in Coal Creek S.W. of the main drilling area. The sedimentary rock locations are within the area of the younger volcanics and the two may well be contemporaneous.
3. Intrusive Rocks - Acidic intrusions mainly underly the northern half of the claim group. On the map they are divided into feldspar porphyries and latites although this division is not well defined, particularly when the rocks are altered. Quite probably there are more than two genetically related intrusive types.
 - (a) Feldspar Porphyry - This is the main mass of rock outcropping north of Louise Lake. All outcrops are sericitised to a greater or lesser degree. The fresher rock is dark grey with abundant feldspar phenocrysts, the matrix being a fine grained aggregate of quartz and sericite. Disseminated pyrite is present in varying amounts.

The stock to the east of Louise Lake is a feldspar-biotite porphyry.
 - (b) Latite - This term has been applied to a number of rocks with fine-grained buff to pink matrices and phenocrysts of feldspar, quartz and biotite in proportions varying with location.

A pink latite with rounded quartz and rotten feldspar phenocrysts occurs in bluffs at the west end of Louise Lake and as a sill within the drilled area. In the vicinity of Bud Lake the latite is rich in biotite phenocrysts. All exposures of the rock even those adjacent to and within the mineralised zone are unaltered compared to the porphyries. In some cases this may be the only distinction.

Structure

The dominant structure within the claim group is an E.N.E. trending fault zone along Coal Creek and the north shore of Louise Lake. The evidence of this exists in the I.P. profiles, aerial photograph lineations and drill core (DDH A). Other major lineations are indicated on the geological map although their significance is not known.

The structure of the mineralised zone is interpreted solely from drill hole data and is as described in the report on that programme.

Mineralisation and Alteration

Throughout the claim group the porphyry rock and the Younger Volcanic rocks are strongly altered. Even the freshest looking outcrops are sericitised to a large degree and often the rock is essentially a quartz and sericite aggregated with only ghosts of the original fabric remaining.

Apart from the original showings two other centres of more intense alteration were noted.

- (a) On the north shore of Louise Lake opposite the two small islands. The steep bluffs of porphyry above the road are only moderately altered but tuffs exposed in the road cut and in lakeside outcrops show intense argillic alteration and, in places, strong disseminated pyrite mineralisation. However, no other sulphides and only the rare quartz and carbonate vein were seen. This is an area of high I.P. response (zone A₂ of McPhar) which could well be explained by the pyrite noted above.

Two samples of the more altered tuffs gave the following assays:

<u>Sample No.</u>	<u>Location</u>	<u>Cu%</u>	<u>Mo%</u>
301	108E, 79N	Tr.	0.01
303	116E, 76N	0.01	Tr.

- (b) About 2,500 feet east of Louise Lake the cat road runs around a small outcrop knoll some 200 feet in diameter. The rock is a very intensely altered feldspar-biotite porphyry looking very like that of the main showings. The surface outcrop seen is quite leached and the numerous fractures carry only limonite and a dark mineral that could well be tourmaline.

Four soil samples from around the base of the knoll gave the following analyses:

<u>Sample No.</u>	<u>Cu ppm</u>	<u>Mo ppm</u>
1	8	4
2	7	7
3	5	12
4	15	3

The molybdenum values are all anomalous for this claim group.

SOIL GEOCHEMISTRY

Production

Between July 29 and August 12, 1970 a total of 19 man days were spent taking 673 soil samples at 100-foot intervals along the I.P. grid lines. Analyses were for copper only. A threshold value of 45 ppm Cu was calculated using the formula Threshold = Mean + 2.5 standard deviations.

Results

The main feature of the geochemical pattern was the expected high over the known copper mineralisation and the elongation of the anomaly S.W. down Coal Creek. This agrees well with the results obtained both by Mastodon Highland Bell and our own reconnaissance survey.

Of note is the occurrence of anomalously low values in the area of the anomalously high ones; hence within the general area of high copper soils over known mineralisation, the values range from 3 ppm Cu to 889 ppm Cu.

One of the objects of the geological and geochemical investigations was to determine whether the geochemical spread from the showing down Coal Creek represented a transported anomaly or further bedrock mineralisation. On lines 20E and 28E the high copper values occur in soils overlying unaltered and unmineralised volcanics so some form of glacial smearing is the most likely cause.

The I.P. chargeability zone with the altered volcanics on lines 100E, 108E and 116E has no geochemical expression for copper. However, much of this zone does lie under the lake. The highly altered and fractured outcrop east of Louise Lake was not covered by the soil sampling grid.

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