

GEOCHEMISTRY

18. GEOCHEMICAL STUDY, LOUVICOURT TOWNSHIP,
QUEBEC (32 C/4)

Project 670097

R. G. Garrett

As part of a study to investigate the application of geochemical prospecting methods in the environment of the Canadian Shield a six-week (January-February) field program was undertaken on the Louvicourt Township property of Naganta Mining and Development Co., presently under option to Soquem, approximately 12 miles east of Val d'Or, Que.

The glacial overburden, consisting of glaciolacustrine sediments overlying a till of local origin, was sampled at 100-foot centres over, and in a down-ice direction from, the suboutcrop of a pipe-like orebody. The pipe is composed of a chalcopyrite-sericite assemblage and subcrops over an area some 250 feet by 75 feet. The pipe lies within a sphalerite-bearing pyritiferous zone approximately 1,400 feet long which trends at 060 degrees.

A screw-feed diamond-drill was used to sink 34 holes to an average depth of 38 feet. The holes were NX cased and samples were taken ahead of the casing with a split-spoon sampler. At each site an AXT core of approximately 3 feet was taken to verify that bedrock had been reached. Prior to drilling a shallow seismic survey had been undertaken in order to estimate the probable thickness of overburden (see also H. A. MacAulay, this publication).

A mobile laboratory was established in Val d'Or and the minus 80 mesh fraction of all samples was analyzed colorimetrically for Cu and Zn after a potassium pyrosulphate fusion. It is of note that a microwave oven was used for sample drying and proved very satisfactory. Batches of 12 wet samples each weighing approximately one half pound could be dried ready for sieving in 12 minutes.

The glaciolacustrine sediments overlying the deposit have a uniformly low metal content, 10 ppm Cu and Zn. However, marked dispersion patterns exist in the underlying till. A threshold of 30 ppm Cu was established for the area. An anomalous pattern overlies the cupriferous pipe and extends some 300 feet in the down-ice direction in the minus 80 mesh fraction of the till. There is evidence that the anomalous values climb through the till and that 300 feet down-ice the maximum values in the minus 80 mesh fraction are some 3 feet above bedrock, whilst at the bedrock interface values are of background level. Both clastic and saline dispersion patterns are present, the former being related to the glacial history of the area, and the latter being related to the present hydrologic regime. A limited number of heavy mineral concentrates made of casing washings revealed the presence of pyrite, chalcopyrite and sphalerite.

Further laboratory studies are planned in which the geochemistry of the heavy mineral and other fractions will be studied in detail.

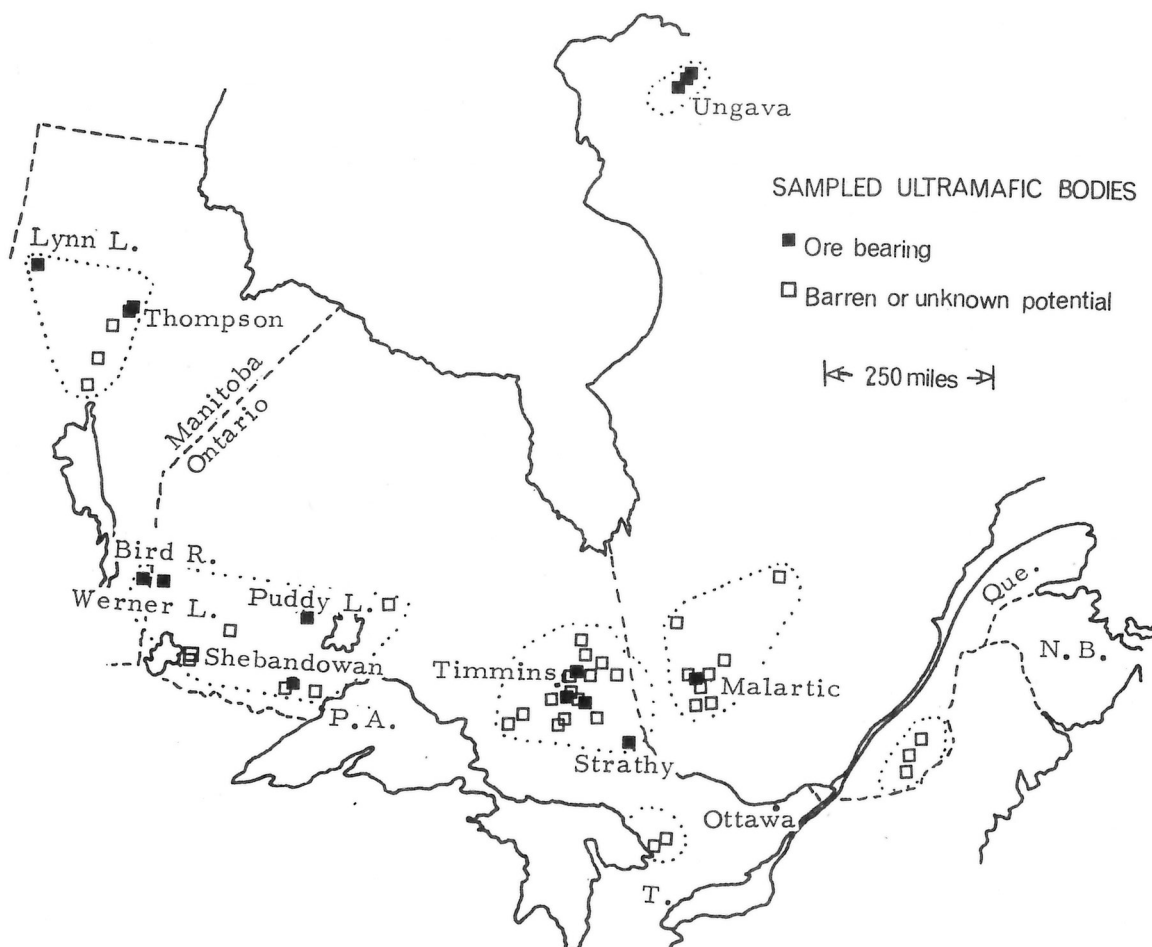
The detection of anomalous geochemical patterns in basal till could become a more widely used detailed exploration tool. The method might have great applicability in ranking geophysical anomalies before expensive diamond drilling programs are commenced. However, the ultimate success of the method depends greatly upon the design and manufacture of a portable and cheap (<\$2.50/ft) sampling tool.

19. THE GEOCHEMICAL COMPOSITION OF ULTRAMAFIC
ROCKS AND ITS RELATION TO THEIR
CONTAINED MINERAL DEPOSITS

Project 680061

G. Siddeley

This study is being undertaken to determine ore-bearing potential in ultramafic rock bodies on the basis of their geochemical content. Over 50 ultramafic bodies (Fig. 1) are represented by 830 samples which have been individually analyzed for up to 23 major and trace elements. The data are presently being processed. Preliminary findings show that the most



favourable ore indicators in ultramafic rock are Ni, Cr, Cu, S, and possibly Zr, these elements generally being enriched throughout an ultramafic body associated with ore, though their greater statistical variability may also help to distinguish between ore-bearing and barren types. Different enrichment 'levels' of the above elements are present in individual ore-bearing bodies; thus, at Werner Lake, nickel in peridotites away from ore averages 0.35 per cent (this project), but elsewhere average nickel values for ore-associated ultramafics may approach the average for ultramafic rock as a whole (0.24%).

Several ore-bearing bodies have significant chemical differences from those considered barren for this project. In cases where there is no apparent difference, an explanation may lie with the mechanism of ore deposition (fault control or very local marginal reactions). Several bodies with unknown potential were also sampled, and the resultant data suggest that in perhaps three cases, there is more of a chemical affinity to the ore-bearing type rather than the barren type. Further exploration in these areas may be warranted.

Statistical treatment (multiple discriminant analysis and Bayesian decision theory) will be applied for more vigorous testing.