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# PRELIMINARY REPORT OF THE SOIL- AND STREAM-GEOCHEMICAL SURVEYS OF THE FLORENCE LAKE GREENSTONE BELT, EASTERN LABRADOR[1]

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## INTRODUCTION

In 1994, the Geological Survey selected the Archean Florence Lake greenstone belt as the focus of a multi-disciplinary study involving geological mapping, geochemical surveys, mineral-deposit studies and surficial mapping. The purpose was to aid the planning, and conduct of mineral exploration, in this area by providing additional data and a better understanding of the geological setting. This brief report outlines the geochemical surveys conducted during the summer of 1995; results of these geochemical surveys will be released later this year. Separate reports on the geological mapping (James *et al., this volume*), mineral deposit studies (Miller, *this volume*) and surficial mapping (Batterson, *this volume*) are also published here.

## REGIONAL GEOLOGY

The surveyed area is within the Hopedale Block of the Nain province in NTS map areas 13K/10, 13K/14 and 13K/15. It is underlain mostly by rocks of the Florence Lake Group – mafic to intermediate, and minor felsic, volcanic rocks and associated ultramafic and volcaniclastic rocks (Figure 1). Several small occurrences of sulphide mineralization, mostly pyrite, but some containing copper and nickel sulphides including the Baikie (Ni) showing, are known to occur in rocks of the Florence Lake Group. The group is preserved as several belts that have their greatest thickness and linear extent in the Florence Lake area. A group of similar, but generally more mafic rocks, the Hunt River Group, lies to the north and west. Both groups have been intruded by dominantly tonalitic and granodioritic rocks of the Kanairiktok Plutonic Suite and regionally metamorphosed to greenschist to amphibolite facies. A small area underlain by Paleoproterozoic rocks (quartzofeldspathic and mafic schists of the Ballet Pond schists) was also sampled. They are regarded by Ermanovics (1993) as being derived from Archean protoliths.

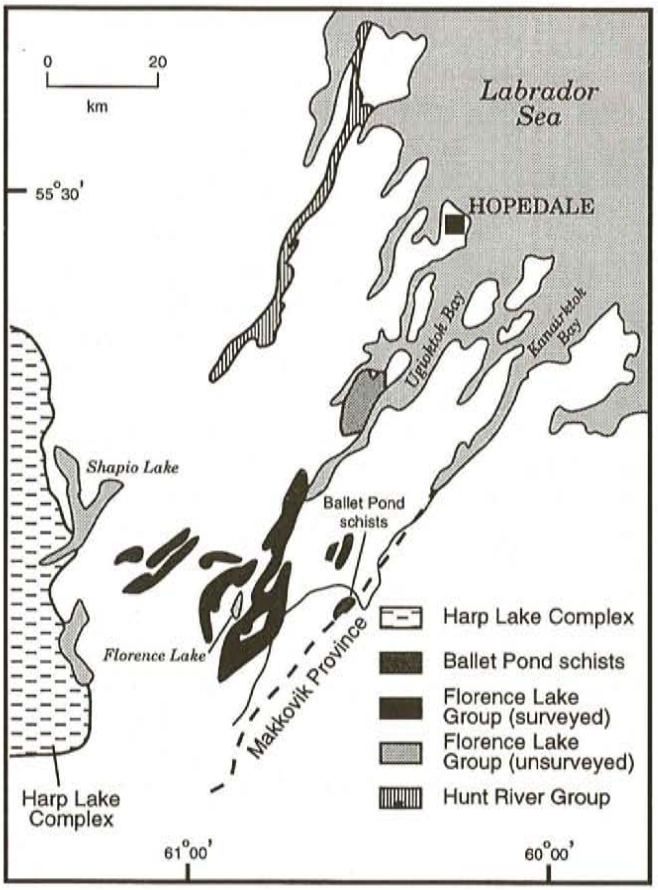


**Figure 1.** *Locations of surveyed areas (geology after Ermanovics, 1993).*

## SURFICIAL GEOLOGY

Much of the area is overlain by a thin till veneer deposited by a dominantly northeasterly ice flow; glaciofluvial and glaciomarine deposits up to several tens of metres thick occur in some of the major valleys. Most of these occur below about 125 m elevation. Geochemical surveying

[1] Hopedale multidisciplinary project: exploration geochemistry

likely would be ineffective below this elevation except in areas, particularly valleys, where the land surface was still ice covered.

## REGIONAL GEOCHEMISTRY

The entire area has been surveyed as part of the Labrador regional lake-sediment geochemistry program (Friske *et al.*, 1993a). In addition, NTS map areas 13K/10 and 13K/15 were resampled at higher density because of their perceived high-mineral potential (Friske *et al.*, 1993b). Results of these two surveys revealed anomalous levels of nickel and copper as well as scattered high lead, zinc and gold values.

## SAMPLING AND ANALYSIS

Geochemical sampling was designed to identify areas of Florence Lake Group rocks enriched in base metals or gold. Approximately 680 soil, 170 stream-water (± stream-sediment) and 28 rock samples were collected. Glacial flow from the southwest is likely to have developed geochemical dis-persion trains trending northeasterly from any mineralized zones. Where possible, soil sampling was conducted along lines oriented at approximately right angles to glacial flow to maximize the likelihood of intersecting any dispersion trains. In several areas where the volcanic belts are very narrow and oriented nearly parallel to ice flow, this sampling strategy was impossible and sampling was conducted along the belt-axis or along what was regarded as the down-ice margin. Generally, soil samples were collected from the B-horizon at 200-m intervals along lines spaced 1 km apart. Additional, high-density sampling was done over an area of known nickel mineralization to provide orientation data. Stream waters were collected in purified, 250 mL nalgene bottles particularly in areas unsuitable for soil sampling due to lack of till cover or extreme topographic relief. In some cases, stream sediment was sampled at the same site. Samples of typical bedrock as well as outcrops of sulphide mineralization discovered during the field work were sampled as well.

Soil and sediment samples were air-dried in the field, further dried in the laboratory and sieved to < 180 μm in preparation for analysis. Water samples were analyzed for conductivity in the field lab, filtered to remove < 0.45 μm suspended material, acidified and returned to St. John's for detailed analysis. Rock samples have been pulverized. Soil, sediment and rock samples are being analyzed presently for a large suite of elements including gold and base metals. Similarly, waters are being analyzed for a smaller suite that will include base metals.

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