GEOCHEMICAL RECONNAISSANCE SURVEY OF THE EASTERN BURLINGTON PENINSULA*

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A geochemical survey was carried out over the eastern part of the Burlington Peninsula (see map) in order to assess the base-metal potential of the area. The regional geological setting of the area has been described by DeGrace et al. (1974).

The stream sediment survey was restricted to the eastern part of the survey area, which is underlain by the Cape St. John, Paquet Harbour and Snooks Arm Groups of volcanic rocks, the ophiolitic rocks around Nippers Harbour and Snooks Arm, the Cape Brule Porphyry, the Dunamagon Granite and La Scie Intrusive Complex (see DeGrace et al. 1974). Active sediment from all streams within the survey area was collected at approximately 1000 foot intervals, above all stream intersections and from short streams flowing between lakes. A total of 987 samples were collected from 893 sites in an area of slightly less than 200 square miles. Duplicate samples were collected routinely at 10% of the sample sites to allow a quantitative assessment of sampling variance to be estimated.

Lake sediment sampling was carried out over an area of about 560 square miles, which included the area covered by the stream sediment survey, in addition to the area underlain by the northern part of the Burlington

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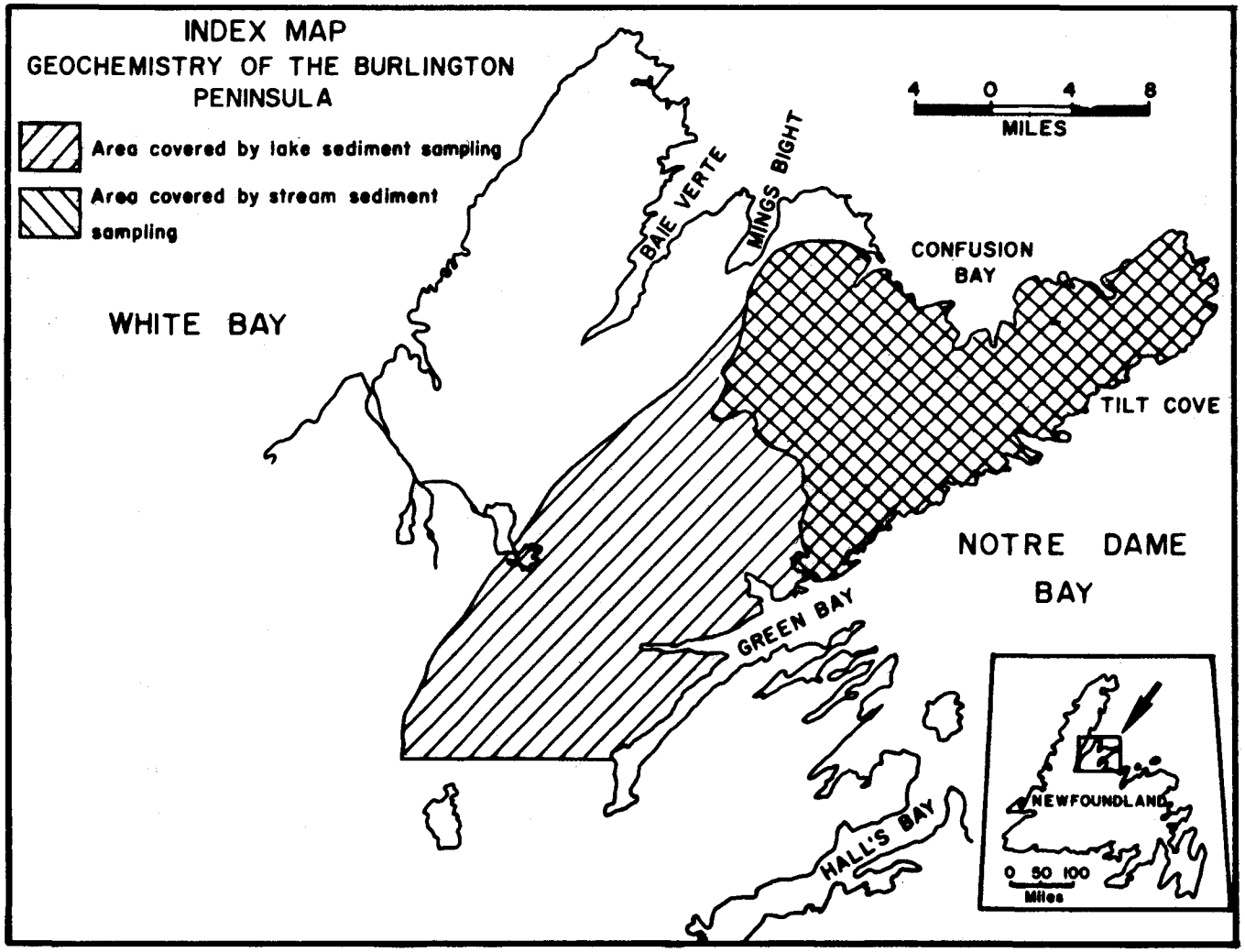

Granodiorite. Samples of organic-rich sediment were collected at a density of one sample per square mile from the central basins of lakes, using the sampling technique described by Davenport et al. (1974). Duplicate samples were collected routinely at every tenth sample site, and sites where the sediment contained high values of base metals were resampled in duplicate. A total of 670 lake sediment samples were collected.

Both the lake and stream sediment samples were oven dried, sieved to -80 mesh (<177μ), and analysed for Cu, Pb, Zn, Co, Ni, Ag, Mn and Fe by atomic absorption spectrophotometry. Organic content was estimated by determining the loss on ignition (L.O.I.) of the samples.

The lake and stream sediment results are presently being statistically analysed, to assess the extent to which the distributions of the ore metals are influenced by physical and chemical features of the drainage environment. Physical features which may influence metal concentrations would include lake water depth, lake area, vegetation, topographic relief, and stream depth and width. Scavenging of ore metals by oxides and by hydroxides of Mn and Fe, and sorption by organic matter may also greatly modify ore-metal distributions, and thus mask the reflection in the drainage sediments of ore-metal distributions in bedrock. Preliminary statistical analysis of the stream sediment data shows that Pb, Zn, Co, Ni and Ag are strongly correlated with Mn and Fe, and that Pb is quite strongly correlated with L.O.I. (organic content). Similar results are expected for the lake sediment data, and thus linear regression

will be carried out to remove these effects of coprecipitation and sorption, to allow a more accurate definition of the ore-metal distributions in bedrock. A further aspect to be investigated is to determine how the background and threshold levels of the ore metals vary in drainage sediments over the different rock types in the area. By taking these variations into account it is hoped that the confidence with which any particular anomaly may be related to the presence of mineralization will be greatly increased.

Statistical analysis of the data from this area is essential before any realistic interpretations may be made from the ore-metal distributions. Data will be released on open file as soon as sufficient statistical analysis has been carried out to allow a useful interpretation of the data.

References

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