

REPORT DESCRIBING  
PRELIMINARY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS  
OF PERMITS 1164, 1165 AND 1166 AND OF  
SELECTED TARGETS IN THE AREA OF MUTUAL INTEREST  
WITHIN NTS 42N AND 42O

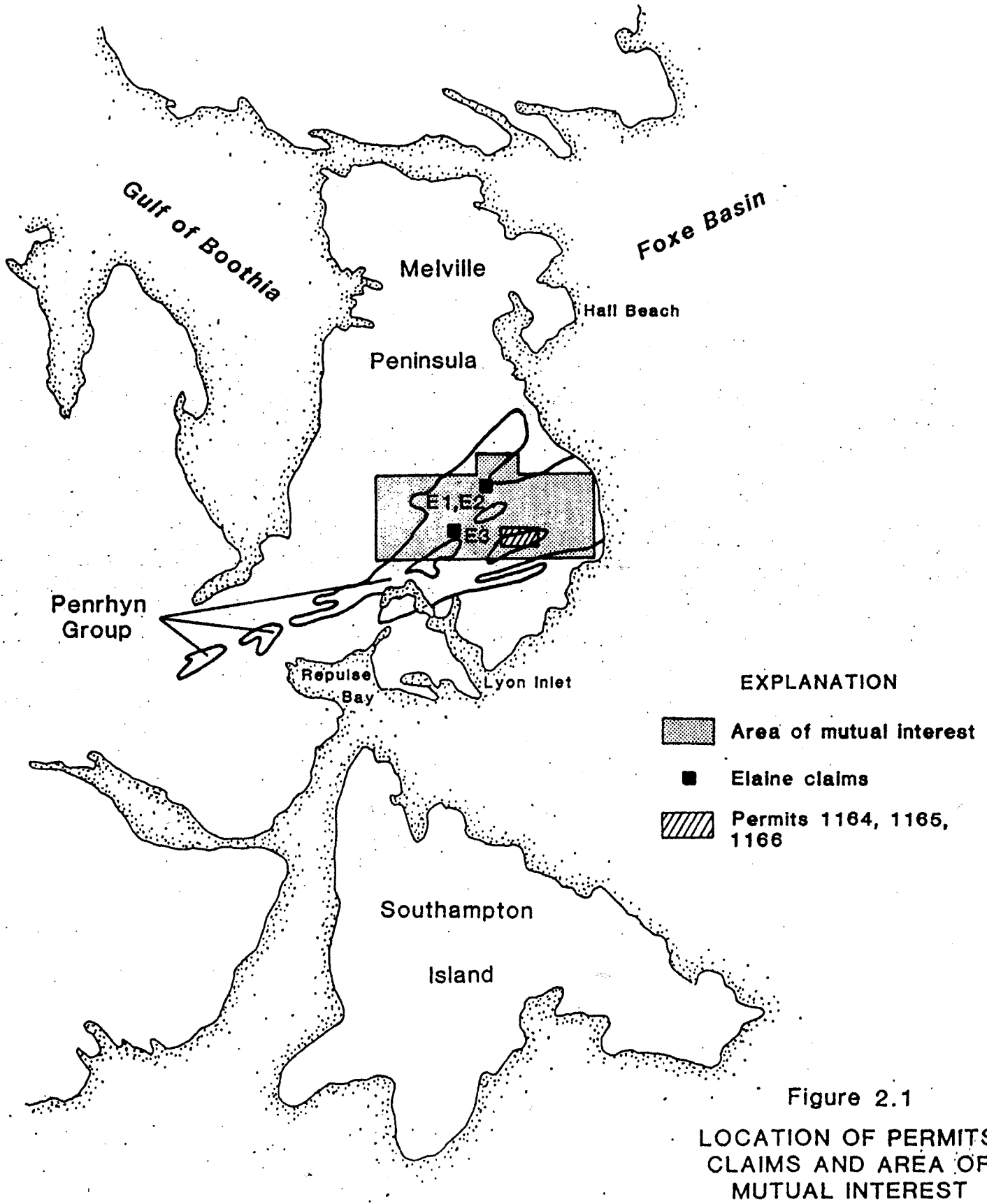
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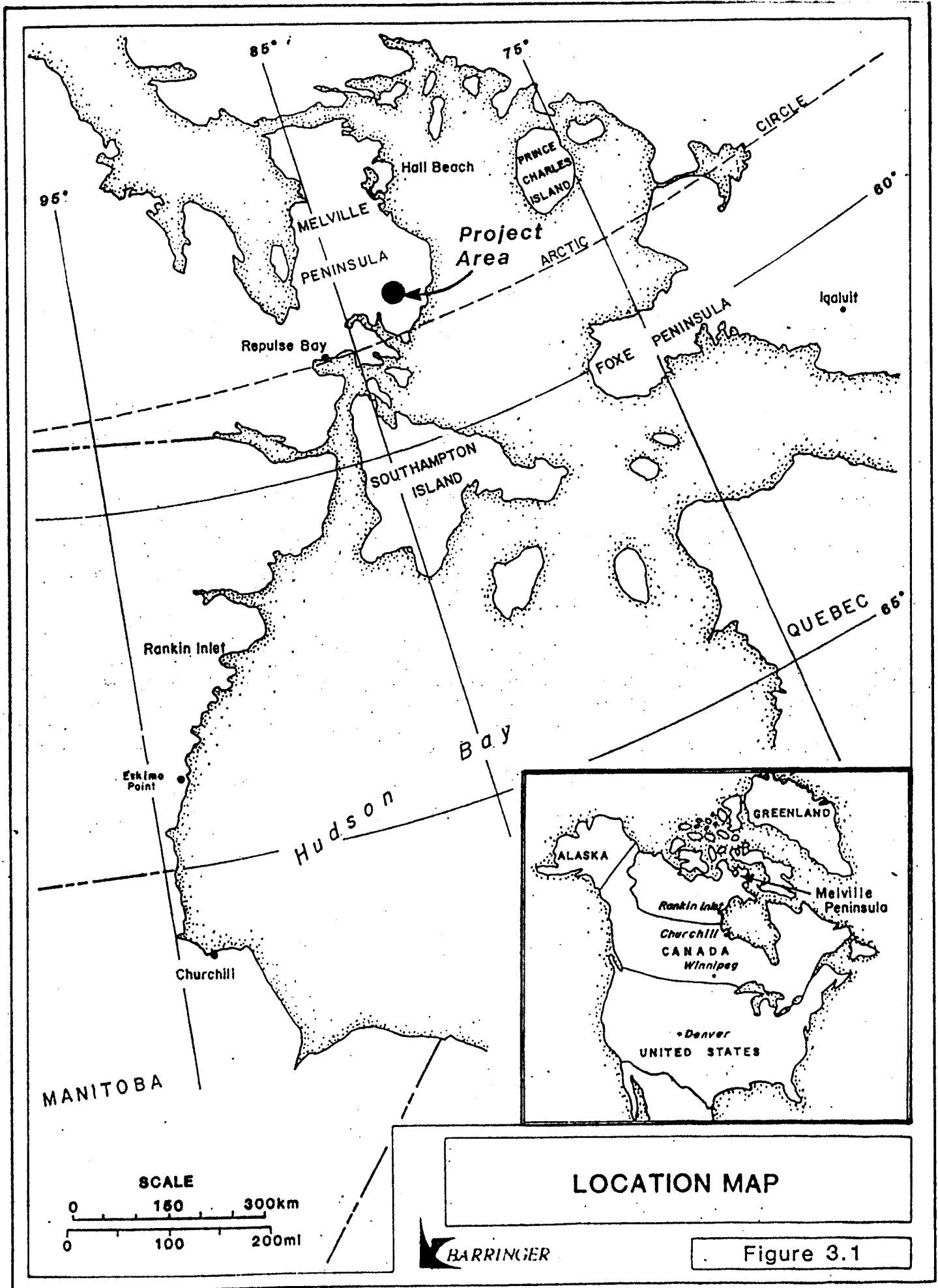
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LOCATION MAP

Figure 3.1

## 1. SUMMARY

An integrated mineral exploration program has been completed by Barringer Geoservices over part of the Melville Peninsula, NWT where Aphebian Penrhyn Group rocks locally host intense limonitic gossans. This report details the field investigations carried out between August 19 and September 15, 1989. Many of the gossans, areas of rusty weathering, and strong copper-nickel-zinc lake sediment geochemical anomalies are within exploration permits 1164, 1165, and 1166 currently held by Borealis Exploration. Because of lateness in the field season preliminary exploration focused on the permit areas, with a more reconnaissance-type survey of targets within the larger Area of Mutual Interest. The field program confirmed the earlier geological concepts and proved numerous occurrences of widespread base metal mineralization in a geological environment similar to that hosting large, economic sulfide deposits elsewhere.

The occurrence of ultramafic rocks within the granite-gneiss correlates with the original intense magnetic anomaly and supports the presence of a larger ultramafic at depth. In addition, mafic intrusives occur as lenses and bodies within the metamorphic Penrhyn rocks and have been mapped at three of the six grids in the permit area. These occurrences of mafic and ultramafic rocks confirm the original concept and emphasize the Ni-Cu potential of the permit area.

Eight targets, six within the permit area and two in the Area of Mutual Interest, were selected for initial detailed evaluation based upon a combination of 1) anomalous lake sediment geochemistry, 2) interpretation of existing airborne magnetic and electromagnetic data, 3) examination of geological structure revealed by the processing of satellite imagery and air photo interpretation followed in the field by, 4) geological mapping and prospecting, 5) soil and rock geochemical sampling, and 6) ground electro-magnetic (GENIE) surveys. As a result of this integrated exploration a number of potential drill locations have been defined within these targets.

Within Grid 1, a strong Cu-Ni-Zn soil anomaly about 200 meters long displays a close spatial relationship to a gossan and a steeply dipping EM conductor. A mafic intrusive lens was noted in the adjacent marbles. The correlation of these parameters suggests the presence of a concealed base metal sulfide concentration within the high grade metamorphic rocks.

Although a gossan in Grid 2 is closely associated with a large soil Cu anomaly, the geophysical expression is ambiguous. However, the folding and shallow plunge to the east may indicate potential sulfides in depth to the east of the grid.

High Cu-Ni-Zn values, detected in sulfide mineralized sericite schist float from Grid 3 suggests that this rock type could be the source of some of the soil and lake sediment anomalies in the area. However, strong coincident northwest trending geochemical and geophysical anomalies in the southern part of Grid 3 are presently not explained and may relate to concentration along a structural zone. Mafic intrusive lenses were noted in the marble outcrops on the southern boundary of this grid.

A similar association between geology, geochemistry, and geophysics exists on Grid 4 where disseminated pyrite and pyrrhotite occur in various quartz-rich phases of a quartz-biotite schist. The relatively high nickel values suggest the presence of mafic rocks.

The geochemistry on Grid 5 shows higher nickel values throughout the sampled area correlating with a sulfide-bearing amphibolite body. A weak conductor crosses the area surveyed and may indicate a deeper massive sulfide body.

A narrow but strong gossan zone occurs on grid 6 associated with a strong conductor. The relatively high Ni and Zn values in the southwest section of this grid suggest the occurrence of mafic rocks.

Very strong soil geochemical Cu-Zn anomalies with locally high Ni, as well as geophysical conductors on Grid 7 correlate with known gossan outcrops. This area is known to host subsurface base metal sulfide bodies previously identified by diamond drilling carried out by Aquitaine in 1972. The surface weathering and overburden conditions appear to be very different at this location compared to the permit area.

Because the general exploration concepts and potential of the area have been verified by the work covered in this report it is recommended that a major, integrated exploration program be mounted in 1990. Geology and geochemistry should be combined with deep penetration geophysics, either from the air and/or on the ground and should be followed by drilling.