

Geology of a new cluster of blind massive sulphide deposits discovered by Phelps Dodge Canada at Spencer's Dock on Pilley's Island, central Newfoundland

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An exploration program conducted by Phelps Dodge Corporation of Canada, Limited has resulted in the discovery of three new VMS deposits in central Newfoundland. The deposits occur in the Ordovician Robert's Arm Group, 2 to 3 km west of the old Pilley's Island Mine. The Spencer's Dock, Rowsell's Cove and Jane's Cove deposits are only partially

delineated by wide-spaced drilling but are evidently members of a larger population within a partially explored volume of altered felsic volcanic rocks. Though larger than the Pilley's Island deposits and with massive sulphide intersections up to 35 m, base metal grades to date are subeconomic. Massive and resedimented breccia sulphide facies deposits

are present, similar to the Buchans deposits, 110 km along strike to the southwest. The deposits are accompanied by a very large alteration system dominated by sericite and pyrite but also includes chlorite, silica, epidote and K-feldspar alteration facies. The distribution of alteration and mineralization within the felsic intrusive-extrusive complex was controlled, in part, by the widespread development of perlitic cracks. It is evident that a significant portion of the massive sulphide facies was deposited by replacement of glassy felsic flow material. Lithochemical alteration scores are uniformly high throughout the felsic package.

The recognition and correlation of a number of impor-

tant low-angle thrust faults has been a key element in the exploration program. The Spencer's Dock deposits occur within a south-plunging antiformal stack which occurs at the same structural horizon as a separate, but similar stack to the east which hosts the previously known Pilleys Island deposits. Within the Spencer's Dock antiformal stack, sulphide deposits occur within two of three shallowly dipping panels of felsic volcanic rocks.

The prognosis for exploration remains good with a large volume of favourable rock yet to be explored. The model employed puts the discoveries to date within the pyritic periphery of an ore-grade massive sulphide system.