

## Stratigraphy of the Black Label Chromitite Horizon, Black Thor Intrusive Complex, McFaulds Lake Greenstone Belt, Ontario

K. Mehrmanesh<sup>1</sup>, C.S. Spath III<sup>1</sup>, H.J.E. Carson<sup>1</sup>, C.M. Lesher<sup>1</sup>, M.G. Houlé<sup>2,1</sup>

<sup>1</sup>Mineral Exploration Research Centre, Department of Earth Sciences, Goodman School of Mines, Laurentian University, Sudbury, ON, Canada; <sup>2</sup>Geological Survey of Canada, Québec, QC, Canada

### Abstract

The Black Thor Intrusive Complex is a semi-conformable sill-shaped intrusion that can be subdivided into: 1) a *lower ultramafic series* of basal olivine websterites and lherzolites, interlayered dunites and lherzolites with minor interstitial chromite, and overlying websterites, 2) a *middle ultramafic series* characterized by a basal chromitite horizon (Black Label), olivine websterites, lherzolites and dunites, and an upper chromitite horizon (Black Thor), and 3) an *upper ultramafic to mafic series* of websterites, mela/meso/leucogabbros and lesser anorthosites. A late websterite intruded the lower and middle ultramafic series and locally brecciated the Black Label chromitite horizon. Black Label and Black Thor are similar in many respects, but Black Thor is more continuous and contains more chromite in individual layers. The late websterite disrupts the central portion of Black Label producing a marginal heterolithic breccia zone, comprising clasts of dunite-chromitite-lherzolite within a matrix of hybridized olivine websterite-lherzolite. Clast geometries and contact sharpness vary from amoeboidal to subangular, and sharp to embayed, depending on clast lithology and proximity to the pyroxenite core. Six representative boreholes from the least-disrupted NNE and SSW parts of Black Label have been selected for initial studies of chromitite textures and layering. Chromitite-bearing rocks have been subdivided on the basis of texture and abundance of chromite, and are dominated by 6 main facies: 1) massive chromitite, 2) semi-massive chromitite and 3) matrix-textured chromitite, both containing pseudomorphed olivine patches, 4) net-textured chromite in altered lherzolite, 5) heavily-disseminated chromite in lherzolite, and 6) lightly-disseminated chromite in lherzolite. Many of the zones are dominated by net-textured, semi-massive, and massive chromitites, but of the textures heavily disseminated and lightly disseminated are most abundant. The contacts between chromitite layers and interbeds have been classified as sharp, graded, diffuse, flame and load, and irregular. Although many of the chromitite seams exhibit more than one type of contact, sharp lower contacts with graded upper contacts are most common. It is not yet clear, however, whether individual beds or groups of interbeds within the non-brecciated parts of the Black Label horizon can be correlated along strike or with depth.