Hybridized Chromite-bearing Ultramafic Rocks in the Black Label Hybrid Zone of the 2.7 Ga Black Thor Intrusive Complex, McFaulds Lake Greenstone Belt, Ontario, Canada

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The Black Thor Intrusive Complex (BTIC) is an ultramafic to mafic, sill-shaped, layered intrusion that is composed primarily of dunite, lherzolite, olivine websterite, websterite, and chromitite overlain by lesser mela- to leucogabbro, and anorthosite. After emplacement but before complete crystallization, a Late Websterite Intrusion (LWI) reactivated the feeder conduit and transected the basal part of the BTIC, including the Black Label chromitite horizon. All rocks have been metamorphosed to lower greenschist facies, but igneous minerals are preserved in some parts (particularly in the LWI) and relict igneous textures are well preserved. Logging of selected sections of 39 drill cores shows that semi-concordant intrusion of LWI magma and incorporation of inclusions produced a 1-10 m thick marginal zone of heterogeneous, interfingering brecciation defined as the Black Label hybrid zone (BLHZ). The BLHZ contains variably sized (0.01-2m, rarely > 5m) dunite/lherzolite/chromitite inclusions with subangular to amoeboidal geometries, sharp to diffuse contacts, and local patchy disseminated to patchy net-textured Fe-Ni-Cu-(PGE) sulfide mineralization. The core of the LWI is typically an inclusion-free, medium-grained, orthopyroxene-rich adcumulate with accessory chromite or olivine; however, inclusion-rich intervals of the LWI contain more olivine and chromite produced by disaggregation and partial assimilation of BTIC ultramafic rocks. There are two types of hybrid groundmass containing: 1) xenocrystic olivine, and 2) xenocrystic chromite and olivine in varying proportions. Geochemical signatures of the hybrid rocks reflect the partial assimilation and brecciation of chromitite/lherzolite/dunite sequences. Similar Th-U-Nb-Ta-LREE patterns suggest that the LWI is related to the BTIC, presumably representing a more fractionated magma from deeper in the system. Further characterization of the hybrid rocks is in progress, and will help to establish the range and variability of processes that led to the genesis of associated Fe-Ni-Cu-(PGE) sulfide mineralization and chromitite dilution.