Geology and Geochemistry of an Emerging Copper – Gold Discovery in the Autonomous Region of Bougainville, Papua New Guinea

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Operations at the world-class Panguna porphyry copper-gold mine on Bougainville Island were tragically halted by civil war in 1989; a moratorium on mineral exploration ensued until 2015. EL02, the first metals exploration license under that act, was granted to a landowner company called Isina Resource Holdings (IRHL). Island Passage Exploration (IPX) is IRHL's technical and finance partner.

IPX and IRHL began exploration in March 2024. The team utilizes prospecting, mapping, geochemistry, geophysics, infrared spectroscopy, and micro-XRF to explore this highly prospective new district along the Bismark Volcanic Arc. This approach has identified numerous drill targets for vein-controlled and porphyry copper-gold mineralization. Early results are extraordinary, including channel samples of 8.0 metres averaging 57 g/t gold and 1.4% copper.

The license is partially underlain by the Isina Monzonite complex (4.82 – 7.43 Ma). Most of the remaining area is within the Miocene Toniva formation, a composite of volcanic sediments, lavas, and limestones.

Stream sediment sampling has been instrumental in target delineation. Local social awareness specialists lead geologists into remote areas, sometimes encountering artisanal vein mining. Quartz-sulphide veins occupy persistent structures (>3 km) in the Toniva formation while mineralized crossing structures enhance width and grade. Vein-related silicification and argillization overprint regional propylitic alteration. The dominant pathfinder elements with the precious metals and copper are bismuth and tellurium.

Explorers have also developed drill targets within the intrusive complex, where strong copper, gold, and molybdenum occur in rocks and soils. Intrusive rocks of varying composition exhibit widespread propylitic alteration with localized phyllic, argillic, and advanced argillic alteration. Magnetic and radiometric data correlate with geochemical targets near the margin of the intrusive complex. Some magnetic intrusions resemble the Panguna porphyry in scale and character.

The high-grade veins and copper-molybdenum-gold targets of porphyry-scale provide for some of the most outstanding drill targets these authors have encountered.