

Geochemical Characteristics of Copper Mineralization and Exploration History at the Otavi Mountainland, Namibia

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Japan Organization for Metals and Energy Security (JOGMEC) and Nexa Resources S. A. have conducted exploration of Cu-Pb-Zn resources since 2015 in the Otavi Mountainland, the Damara Belt, the Republic of Namibia. The project is located in the Northern Platform of the Damara Belt, the Neoproterozoic Pan-African mobile belt, in between the Congo and the Kalahari Cratons of Archaean and Proterozoic age. The Damara Belt comprises the Damara orogen together with the Kaoko and the Gariep Belts (Hoffman, 1976; Coward, 1981; Miller, 1983). The Otavi Mountainland is known for the endowment of base metal deposits in association with silver. Ore minerals are hosted in carbonate rocks at the Tsumeb and Kombat deposits, or siliciclastic rocks at the Tschudi deposit (Weatherly Mining Namibia, 2016), and those mineralization styles have been historically classified as Mississippi Valley-type or more generally, stratiform type deposits (Kamona and Günzel, 2007).

Ten years of exploration activity, including satellite image analysis, airborne geophysical surveys, soil geochemical survey, and drilling, revealed the existence of copper mineralization in the style of structurally-controlled calcite-quartz veins. In the early campaigns of exploration, soil geochemical survey worked effectively by extracting copper and lead anomalies, while zinc, silver, and arsenic are also good indicators of mineralization. In a high-grade zone of drill cores, chalcocite, bornite, native copper, and chalcopyrite are the major copper minerals, and they are hosted within diamictite layer or at a boundary of diamictite and dolomite in the Target 13 and 14 areas. Weathering zone after pyrite and chalcopyrite is observed in the surroundings of high-grade mineralized zone.