# Mineralogy of the supergene Cu-Pb-Zn Bou Skour deposit (Anti-Atlas, Morocco)

Julien POOT 1*, Remi STANUS 2, Augustin DEKONINCK 2, Mohammed EL AZMI 3, Lhou MAACHA 3, Mohammed BOUABDELLAH 4 & Johan YANS 1

*1 Department of Geology, Institute of Life-Earth-Environment (ILEE), University of Namur, Namur, Belgium. 2 Laboratoire G-Time, Département Géosciences, Environnement et Société, Université Libre de Bruxelles, Brussels, Belgium. 3 Managem Group, Casablanca, Morocco. 4 Laboratoire des Gîtes Minéraux, Hydrogéologie & Environnement, Oujda, Morocco*

The Cu-Pb-Zn Bou Skour deposit is situated in the Eastern part of the Anti-Atlas belt, approximately 50 km to the east of Ouarzazate city, in the Sidi Flah – Bou Skour inlier. The deposit is divided into five ore bodies referred to as, from north to south: "Panther," "Chaigne," "Anne Marie," "Chapeau de fer," and "Patte d'Oie." The latter is economically the most attractive ore body with copper-bearing sulfide mineralization occurring in the Cryogenian to Ediacaran andesitic to granodioritic rocks, locally intruded by a series of rhyolitic and doleritic dyke swarms.

Subjected to atmospheric conditions, sulfide-bearing mineralization undergoes rapid oxidation through weathering processes generating secondary mineralization depending on (i) pH-Eh changes, (ii) enriched metals in the fluid, and (iii) the involved neutralization minerals (carbonates or silicates). In the Bou Skour deposit, the primary assemblage mostly consists of chalcopyrite, pyrite, galena, sphalerite, arsenopyrite and tennantite/tetrahedrite. The resulting acidic fluids derived from the oxidation of primary sulfides are neutralized by gangue minerals such as dolomite, calcite, and chlorite. This, combined with the large diversity of primary mineralogy, results in a diverse secondary mineral assemblage consisting of (i) secondary sulfides (chalcocite, covellite/digenite/djurleite), (ii) sulfates (brochantite), (iii) arsenates (duftite, olivenite), (iv) silicates (hemimorphite, chrysocolla), (v) carbonates (azurite, malachite, smithsonite) and (vi) Fe-Mn oxides. The different parts of the weathering profile are not clearly defined, the different levels merge and overlap.