

### **Patchy-Wormy Textures in Lithocaps: Examples from Bantug, Philippines and La Zanja, Peru**

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Patchy-wormy textures, also known as “gusano” textures (worm in Spanish), occur at the base of several lithocaps around the world. These textures were first recognised in the Yanacocha district, Peru, during the 1990s. Further research has highlighted that these textures are a common feature rather than a rarity across lithocaps around the globe. Patchy-wormy textures have been reported at Yanacocha, La Zanja, Caspiche, Oyu Tolgoi, Bantug, and Tampakan. The lithocap at Bantug in Negros, Philippines, extends over ~7 km by ~8 km. As yet, no ore-grade mineralisation has been discovered at Bantug. The lithocap at La Zanja in the Yanacocha district extends over ~20 km by ~33 km; it hosts several high-sulfidation orebodies and porphyry targets. Patchy textures in both lithocaps are characterised by amoeboid-like clots, 1 to ~5 cm diameter, of fine-grained, white to pink coloured clay and sulfate minerals. They occur in a grey, dull, quartz groundmass. Pyrite is ubiquitous in patchy features at La Zanja and Bantug, and enargite is common at La Zanja. Wormy textures at both lithocaps are characterised by ~1 cm thick, wavy veins of grey-dull quartz. SWIR spectroscopy, SEM-EDS, and XRD analyses of patchy features revealed the presence of alunite, pyrophyllite, APS minerals, diaspore, zunyite, quartz, pyrite, and enargite. APS minerals commonly occur at the core of alunite crystals of <50 µm. Alunite, APS minerals, along with diaspore, zunyite, pyrite and/or enargite crystals, occur in a fine-grained pyrophyllite groundmass. SEM-CL analyses on quartz groundmass from patchy features revealed they are made of sub-rounded quartz crystals <50 µm in diameter, and show complex concentric zonation patterns within individual grains. SEM-CL analyses of wormy quartz veins revealed zoned euhedral features distinctive from the groundmass quartz. Mineralogical and geochemical variations in patchy-wormy textures in lithocaps may indicate vectors towards heat sources and potential mineralised centres.