

DESCRIPTION OF SILICA GOSSANS IN SERRA GERAL GROUP BASALTS, CAMPO GRANDE, MATO GROSSO DO SUL, BRAZIL.

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ABSTRACT: The presence of silica gossan in the Serra Geral Group (Paraná volcanic province) has wide implications for the occurrence of hydrothermal mineral deposits in Brazil and neighbouring countries. We investigated a hexagonal structure in the Campo Grande region of Mato Grosso do Sul, Brazil, near geographic coordinates 739058E / 7739813N (Datum SIRGAS 2000). The observation of satellite images followed by field work and a scintillometric survey of the structure, allows us to characterize a silica gossan with abundant calcite, which is located in the “EMBRAPA Gado de Corte” property. The region is dominated by flat-lying, Cretaceous Serra Geral Group basalts. Four basaltic lava flows dominate the plateau of Campo Grande and eight more are present in the escarpment of the Serra de Maracaju. Hydrothermal structures are present along MS-080 highway and quarries in the city, particularly sandstone dikes and sills, basalt-sandstone breccias topped by sandstone flows and covered by a new basaltic flow. Also present are interconnected, mm- and cm-sized quartz geodes. Mineralization is mostly calcite, which occurs in two phases; the first fills amygdaloids and the second covers columnar joints. The EMBRAPA silica gossan has brown-reddish color at the surface, no sulfides, large volume of clay minerals (possibly smectite), lacks vegetation (clearing in the forest or savanna), and is saturated with water. The silica gossan is a topographic low (556 m) in the surrounding low-lying plateau (560 m). In the rainy season, the silica gossan is covered by water. The scintillometric survey used a GR-110 exploranium model, leading to the measurement of gamma-ray emission rate in an area of 400 x 500 m, stations 50 m apart. The surveyed polygon has the coordinates 739450E-7739650N and 738900E-7740050N. The software *Oasis Montaj*® (*Geosoft Latinoamérica*) was used for the generation of radiometric contour maps. Counts per second are 55 cps in the silica gossan and 81 cps in the surroundings, showing the presence of a negative anomaly over the silica gossan. This anomaly is comparable to silica gossans over amethyst deposits in the Los Catalanes gemological district (Uruguay) and the Ametista do Sul, RS (and Entre Rios, SC) mining districts. The origin of the silica gossans is related to complex events of hydrothermal alteration in the Cretaceous by low-salinity fluids enriched in silica, water and CO₂. This fluid emanated from the Guarany aquifer at 150 °C, altered and mineralized the basalts and other volcanic rocks. The intense Quaternary weathering of the mineralized rocks highlighted the silica gossan structure at the surface. It is here demonstrated that the silica gossans are prospective guides for hydrothermal deposits of amethyst (agate, gypsite and calcite) geodes and native copper occurrences in the volcanic group. The description of newly-found silica gossans, situated 1,500 km to the northwest of the mineralized districts, indicates the strong possibility of new hydrothermal deposits in the large Serra Geral Group, Paraná volcanic province. Mato Grosso do Sul may host some significant, new deposits.

KEYWORDS: HYDROTHERMAL DEPOSITS, SILICA GOSSAN, SERRA GERAL GROUP, PARANÁ VOLCANIC PROVINCE.