STREAM SEDIMENT ORIENTATION SURVEY FOR GOLD MINERALIZATION UNDER SEMI-ARID CONDITIONS, NORTHEAST OF BRAZIL

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Gold in the Borborema Structural Province of Northeast of Brazil occurs in specific sites of a regional shear system. Discovery of new deposits depends on the application of optimized exploration surveys. In this regard, a stream sediment orientation survey was carried out. Eleven stations were sampled in duplicate along a 3000m stream. Mineralization occurs at the headwaters as Au-sulfide-bearing quartz veins.For each sample, sediments were dry-sieved on site to collect 12 liters of -2mm material composited from 3 to 5 high energy points at each station. In the laboratory, samples were dry sieved to obtain the -0.500+0.180mm, -0.180+0.106mm, -0.106+0.063mm and -0.063mm fractions, which were analyzed for Au and associated elements. Except for sporadic, isolated values above the 5 ppb detection limit, Au was not detected in fractions coarser than 0.063mm. Gold in this fraction shows a downstream dispersion pattern with a decrease of Au values from 40-55 ppb to 5ppb over a distance of ~1.3 km as the abundance of -0.063mm material increases. Downstream dispersion patterns are also observed for As, Cu, Pb, Zn, Co and Cd in fractions -0.180+0.106mm, -0.106+0.063mm and -0.063mm, but the anomalies extend at least 3km downstream to the limit of the sampled drainage.It seems that retention of fines in the drainage basin as a result of limited stream discharge can hinder development of long dispersion trains for Au. This may increase importance of pan concentrates and pathfinder elements in exploration surveys.