# High-resolution Hg chemostratigraphy of the Paraná Igneous Province (PR, Brazil)

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In order to exploit water from the Guarani Aquifer System for human consumption, six boreholes were drilled through the volcano-sedimentary pile of the Paraná Basin. They reached 600 to 1,600 meters in depth, crossing the Serra Geral volcanics and also the sedimentary rocks above (Caiuá and Bauru groups) and below (Botucatu and Rio do Rasto formations) these lavas. Rock chips collected during drilling were composed to represent 8 meters depth, totaling 687 samples. They were grinded (<200#), digested with aqua regia and analysed by ICP-MS (Low Detection Limit = 10 ppb Hg). Statistically anomalous Hg values were recognized mainly in the base of the volcanic pile and also in the top of the sedimentary rocks underneath it (Figure 1).

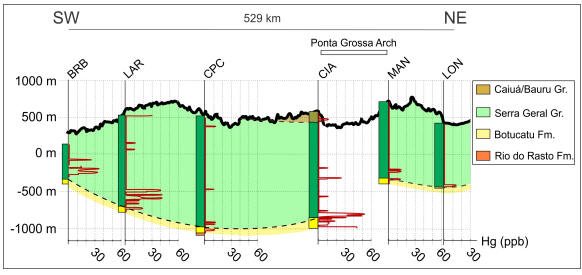


**Figure 1**: Hg chemostratigraphy of the Paraná LIP.

If the presence of Hg was due to the volcanic activity, then high concentrations of this element should be expected throughout the volcanic pile. Considering the basin as a complex volcano-sedimentary system, we suggest that these high Hg contents would be partially associated to the contamination of the tholeiitic magma as it ascended though the sedimentary rocks, especially the black shales and coal seams of the Palermo and Irati formations. Hydrovolcanic events would transport fragments from these sedimentary rocks to form volcaniclastic deposits, which are interspersed with basaltic lava flows. As the volcanic pile thickens, the volcaniclastics gradually become composed by former basaltic and reworked breccia fragments. This implies that the lowermost rocks would be more contaminated than the uppermost ones, regardless of whether they are LTi-LP or HTi-HP lavas. This may explain why the higher Hg contents are mostly present near the base of the Serra Geral Group.