The semi-arid land of the Jequitinhonha valley, Eastern Brazil: structural controls of water wells yield in fractured igneous and metamorphic rocks

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The medium sector of the Jequitinhonha valley represents a semi-arid land in Eastern Brazil, where annual rainfall is less than 1,000mm, and evapotranspiration rate exceeds the precipitation rate by 200 to 900mm. Wells in fractured metamorphic and igneous rocks are the main source for underground water. Specific yields for those wells fall into a wide range, from 0.002 to 45m^3/h/m. The structural framework of the region is the key factor controlling well yield, as discussed hereafter.

Geological units display a NNE trend comprising neoproterozoic metasediments and granitoids. Metasediments intruded by unfoliated granitoids, predominate at the central and western portions of the region, while foliated granites crop out at the eastern sector. The relief is dominated by table lands, and some of them are covered by flat-lying Cenozoic sediments. Neotectonic processes reactivated structures generated during the Brasiliano Orogeny (*ca.* 600-520Ma), resulting in morpho-structural compartments limited by large faults and fractures oriented NNE-SSW and NNW-SSE, and also by minor ones oriented N-S and E-W.

Well yield data, combine with structural and drainage pattern studies allowed the delimitation of the main underground water reservoirs, which are associated to structures generated and/or reactivated during the neotectonic processes. Highest specific yields are constrained by NNW trending lineaments.