

The Pilgangoora Lithium-Tantalum Deposit – Geological Overview and Evolution of Discovery

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Abstract

The Pilgangoora lithium-tantalum pegmatite deposit with a total resource of 226 Mt grading 1.27% Li₂O and 116ppm Ta₂O₅, is a globally significant hard-rock lithium-tantalum deposit. The deposit is located in the East Pilbara Terrane of the northwest Pilbara Craton in Western Australia. The Northwest Pilbara Craton is one of the world's major lithium-tantalum provinces with large scale lithium-caesium-tantalum bearing pegmatites located at Mt Francisco, Wodgina, Pilgangoora and Strelley.

Pegmatites bearing columbite-tantalite at Mt. York were first described in government geological surveys in 1906 (Miles et al., 1945). Subsequent interest in the pegmatites focussed on their tin and tantalum mineral potential, with small scale hardrock, eluvial and alluvial mining, chiefly in the period 1947-1978 (Ellis, 1950; Blockley, 1980). Larger scale alluvial and eluvial mining of tin-tantalum was carried out over 1978-1982 and 1992-1996 by a number of junior companies. In May 2014, Pilbara Minerals acquired the Pilgangoora Project for its lithium potential and has since drilled over 1950 holes for approximately 160,000 metres.

The Pilgangoora pegmatite intrusions crop out in a well exposed greenstone belt, with little weathering at surface. Exploration drilling programs along with detailed geological mapping of the Pilgangoora tenement group has provided a better understanding of the geological setting of the fractionated pegmatite intrusions within the East Strelley greenstone belt. This work has led to the recognition of some valuable exploration criteria that may be applied locally to locate additional resources and, longer term, more strategically to review other pegmatite fields across the Pilbara region.