

Continuous Improvement of the Carrapateena Grinding Circuit

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Commissioning of the Carrapateena copper concentrator began in late 2019 and the nameplate capacity of 500 tph was achieved rapidly in Q1 2020. Having achieved the nameplate capacity, site personnel worked through a comprehensive sequence of operational improvements to debottleneck the plant towards 5.6mtpa.

Carrapateena engaged Hatch to support the grinding circuit improvement activities which included analysis of a full grinding survey and to develop a site-specific model of the SABC circuit to investigate and validate opportunities for increasing throughput rates. The review also informed optimisation of the SAG and ball mill lifter and liner designs for the conditions in the Carrapateena circuits in consultation with the mill liner manufacturer.

The project identified various opportunities to increase throughput. These included: increased power utilisation, optimising SAG parameters such as mill filling, ball load and mill speed, and increased pebble production rates amongst other recommendations. The lifter and liner designs for the SAG and ball mills were optimised in parallel to realize the full potential of the Carrapateena circuits. These initiatives were implemented by the site team and in combination with the other flowsheet debottlenecking activities, the new target throughput of 650 tph (20% increase) has been achieved. The work highlights the synergy of process simulation and detailed lifter-liner studies to provide not only an optimal solution but also allow streamlined implementation.

Following the successful implementation of the recommendations, Hatch was then requested to support the site via analysis and evaluation of existing concepts for possible plant upgrade options to allow throughputs above 1000 tph.

This paper provides an overview of the journey of the Carrapateena circuit which has achieved commissioning, ramp up, optimisation and a clear pathway for expansion in its short operating history.