

Carrapateena Crusher Station One – optimisation and excavation

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ABSTRACT

Carrapateena is a copper-gold sub level caving operation located in the Gawler Craton, South Australia. In order to support a rapid production ramp up of the sub level cave to 4.25 Mtpa over 18 months, it was decided that Crusher Station One be placed above the first production level. Rapid and precise excavation was required in order to allow installation and commissioning of crushing infrastructure prior to production requirements exceeding the capability of a trucking fleet.

The 9 m wide, 24 m high, 35 m long chamber is located primarily in the Lower Woomera Transition and the Upper Whyalla Sandstone units of the cover sequence and was subject to detailed geotechnical analysis that supported design and planning to ensure safe and efficient top-down excavation of the chamber. The chamber is designed to house a 54/67 ThyssenKrupp dual tip gyratory crusher, with a nameplate throughput of 1,250 t/h.

This paper outlines the rationale for the location of the crusher, geotechnical analysis and basis of ground support design, design and scheduling of the chamber and supporting excavations as well as the operational outcomes and lessons learned. Contributions from mining operations, planning, geotechnical and infrastructure teams enabled the Crusher Station One excavation to be completed on schedule, with opportunities taken for underground mining and infrastructure to work safely in parallel to deliver crusher station infrastructure on schedule. Installation of crusher infrastructure was ongoing at the time of writing.