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Coal beneficiation by means of conventional flotation treating the size range of + 0.5mm - 1.4mm

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ABSTRACT

Tshikondeni Coal has utilized froth flotation to treat the fine fraction of the feed to plant since the early 1980's. The latest plant in use was commissioned in 1996 treating the – 1.4mm material in Wemco Smart Flotation Cells. Various problems were experienced floating the + 0.5mm material which initiated improvement projects over a period of 13 years to improve the recovery of this fraction.

New conventional froth flotation technology was developed by a company named Ultimate Flotation for the copper industry. Great successes have been achieved recovering copper from slurry ponds in various countries in Africa.

The Ultimate flotation technology was tested in the Tshikondeni flotation plant and proved to be a viable option as replacement flotation cells. The main aim of the project was to replace the first three flotation cells in each module with Ultimate flotation cells and to increase the percentage recovery of the + 0.5mm – 1.4mm size range with at least 5%. The recovery increase achieved in this fraction after installation amounts to 8.1%, with a saving in energy consumption of 47%. It is recommended that the fourth flotation cell be replaced with an Ultimate Flotation Cell. Cell number five and six can be removed from the circuit.