## Hydro Hoisting: A New Approach

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## ABSTRACT

Transporting broken rock out of mines involves vertical transport using either trucks or batched conveyances in shafts and represents a significant capital cost in developing the roadways or shafts and operating costs to lift the ore and conveyance out of the mine and return the conveyance again. Hoisting capacity limits mine production and is therefore key to mine economics and profitability.

Hydro hoisting offers an alternative to either conventional truck or winder-driven hoisting. By installing slurry piping in small-diameter, raise-bore drilled holes, it is possible to avoid sinking shafts for hoisting.

Current hydro hoist methods, using either high-lift positive-displacement slurry pumps or displacement chamber-systems, depend to some extent, on the ability of valves to tolerate some solids present when operating. This increases maintenance costs and reduces reliability when valves leak and cannot perform as required. A new approach to hydro hoisting is presented that is designed to ensure that the valves always close in clear-water, thereby overcoming the issue hampering conventional approaches.

This new approach involves a vertical, 3-chamber arrangement that is fed with dry crushed-rock, and delivers a medium density slurry into a vertical pipe column. This arrangement is energy efficient, limits wear and can hoist rock 1500 m or more.

This paper describes the new approach to hydro hoisting explaining the key features, operating principles and performance parameters.