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Producing hydromining technology for greater productivity

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EASIER OPTION Jet-pump technology is being introduced for tailings reclamation owing to the difficulty of reclaiming coarse- and high-specific gravity tailings using conventional techniques

Mining services provider Fraser Alexander is developing two technologies – a jet-pump system and an automated hydraulic remining unit – for the efficient

reclamation of gold or platinum tailings through hydromining.

Fraser Alexander technical services GM **Ross Cooper** explains to *Mining Weekly* that hydromining is site dependent and reclaims mine waste using high-pressure water to repulp tailings, which is then pumped to the process plant for retreatment.

Although jet-pump technology is not new, it has not yet been used on tailings reclamation projects, but it is now being introduced for coarse-

and high-specific gravity tailings which are difficult to reclaim efficiently using conventional hydromining techniques.

Owing to this challenge, Fraser Alexander is aiming to create a reliable jet-pump unit that can be used in combination with the dry mining of coarse or heavy tailings and is currently trialling a jet-pump system at a platinum reclamation project near Rustenburg.

“The tailings are dry-mined, screened and then tipped into a hopper with water that feeds the jet pump, which then fluidises the tailings, pumping it to the transfer pump station, thereby eliminating the need for trenches and vertical spindle pumps,” explains Cooper.

He adds that this system is to be used in zones of coarse tailings concurrently with the hydromining of fine tailings.

“Although the cost of dry mining the coarse fraction is higher than conventional hydromining, the system eliminates the costly exercise of having to mechanically haul the coarse tailings to the plant, which is current practice,” Cooper points out, noting that the technology will also be trialled at a second site prior to being included in Fraser Alexander’s service offering.

Automated Track Gun

Cooper says the company is also developing an automated hydraulic remining unit – the Automated Track Gun – which aims to reduce extreme weather-related production losses of manually operated hydromining units to a minimum and is largely suitable for hydromining projects requiring high production rates.

Although development of the standard track guns started in-house about 15 years ago, he notes that the more advanced automation was only developed this year, with the units earmarked for use at existing large reclamation projects in South Africa and South America.

“The movement of the water cannon, or track gun, is controlled

electronically through a series of programs that can reproduce the most efficient remining pattern for a specific site.”

Cooper further mentions that the automated track gun’s preprogrammed patterns can easily be tailored to a specific site’s needs.

The control unit also has a ‘learning mode’ that can be used to create a dedicated pattern based on the operator’s actions in manual mode.

Additional developments to the automated remining unit are being undertaken and comprise the installation of specialised cameras and terrain sensors, with the first camera being installed for trial at one of Fraser Alexander’s operations.

“Owing to the size of these projects, a number of units will be required to operate simultaneously; however, they will be monitored and operated from a remote control room by a single operator. This will remove all operators from the current cut face and present significant improvement in safety and cost saving in terms of labour.” ❏

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