# Finlay Screens improve efficiencies and save water for J Smit Delwerye

**Removing the sand from alluvial diamond mining gravel has brought about much needed savings in water usage for a diamond miner's operation in the arid Northern Cape.**

Prior to this water was sourced from a major river every day but this has been reduced to only one day a week. The question arises, how did he do it?

Jacobus Smit owns a beef feedlot and farms exotic game species on land near to Schweizer-Reneke in the North West Province. He also mines alluvial diamonds, although this is done on land his company, J. Smit Delwerye, owns in the Northern Cape. His sons, Johan and Marco, are in the business with him.

Johan, a graduate with B.Com Law and MBA degrees, spoke to us about the alluvial diamond mining side of the business. "After my father bought some land for breeding cattle, which happened to have mining rights, we started mining diamonds on a small scale," he says. "This was in the Londen area between Bloemhof and Schweizer-Reneke and surprisingly we got heavily involved to the extent that we contracted to Namakwa Diamonds for a six-year period until 2013."

Along the way J. Smit Delwerye assembled a fleet of earthmoving machines, of which one was a Bell B25C Articulated Dump Truck (ADT), which played a big role in hauling the company's diamond bearing gravels and overburden.

Asked why his father had chosen the make and models, Johan says: "I can remember him saying that these machines had proven longevity due also to the excellent backup service we received from Bell Equipment in Wolmaransstad, and it was indeed so as we had run them well past 20 000 hours."

The Smits worked much ground in the North West Province until in early 2015 they acquired land and mining rights at Windsorton, between Barkly West and Kimberley in the Northern Cape. They brought along a Bell B25D and two Bell B30D ADTs, all of which had been bought new. The former is approaching 28 000 hours without the engine being opened and the latter each boast hours nearing the 25 000 hour mark. A pre-owned Bell B40D ADT was acquired through Bell Equipment's Customer Service Centre in Kuruman with Sales Representative, Rickus Erasmus, doing the honours.

"We do appreciate the longevity we've enjoyed from our Bell ADTs but probably more important for this new site was the equipment we had to employ to counter the change in geology we were to experience," Johan says. "Because there is so much sand in this area coupled with reef rock - a type of shale found near to rivers such as the Vaal River - we've had to buy two Finlay Screens and we were pleased that these too are sold and maintained by Bell Equipment on whose solid technical backup we've come to rely."

Smit Delwerye first bought a Finlay 883+ Heavy Duty Screen, as they were confident its steel belts could negotiate the many big rocks they were expecting. Fed from its 7-cubic metre hopper, the Finlay 883+ would separate out material larger than 80mm, that between 40 and 80mm and create 'pay-dirt' of minus 40mm.

"We then also bought a Finlay 694+ Dual Power Screen which is ideal for the Windsorton site as it can be run on either diesel or electric power," Johan explains. "Running the machine on electrical power is a real advantage as the site gets very dusty due to the fine sand and this dust then does not affect the electric motor. Another big plus for this Finlay 694+ Dual Power Screen is that running it off the same power generator that powers the plant or Eskom power, means a huge saving in fuel as the electrical power is already supplied at a fixed cost."

The Finlay 694+ Dual Power Screen receives the minus 40mm material from the Finlay 883+ Screen and screens out the sand which is smaller than minus 3,5mm.

"On the Windsorton site we're working through many old mining sites that were worked years ago and our gravels are situated at very shallow levels with little overburden to remove and stockpile for later rehabilitation. There is subsequently a lot of sand to contend with but these Finlay Screens really have the measure of it. On average we'll screen 1 680 tonnes per shift and of that a massive 72% goes to our four 16-foot pans, which shows the screens' efficiency."

"Another upshot of this efficiency is that we can now use closer circuits on our pans, which saves us water. We used to fill our process water reservoir from the nearby Vaal River every day but due to us taking the sand out of the gravel using the Finlay 694+ Dual Power Screen, we now only draw water for the pans on a Monday. This equates to using the water we used for one pan before, on four pans now, which is really eco-friendly."

Johan and his team have been impressed with the fuel burn of the Finlay Screens. The Finlay 883+ Heavy Duty Screen returns average fuel figures of 10,4 litres to the hour and the Finlay 694+ Dual Power Screen averages 14,2 litres.

*Johan Smit of J Smit Delwerye.*

"To further improve the efficiency of the Finlay 883+ Screen we've fitted an optional external air filter to counter the dust and air filters on both machines are cleaned at the start of every shift," Johan says.

All oversized material along with the sand is hauled back to the mining area that is rehabilitated continuously. This sees the Bell ADTs running full on both legs of their haulage. The sand that is removed by the Finlay 694+ Dual Power Screen has proved to be an ideal growth medium for both 'Bloubuffel' and 'Borseltjie' grass types which are planted in accordance with the mine's environmental management plan.

The Smits view the saving in water as an unexpected bonus, which proves that modern technology has a positive role to play in responsible mining techniques.