

## Ecological infrastructure Case study 6

Restore degraded wetlands to allow them to act like kidneys in the landscape, so that they can do the final 'polishing' as we endeavour to clean up water polluted by mining, industry, municipal sewage works and agriculture.



# Before and after: cleaning up the Zaalklapspruit



### ZAALKLAPSPRUIT WETLANDS, MPUMALANGA

*Healthy wetlands are an invaluable ally which can clean water contaminated by mining, industrial effluent, sewage, and agricultural runoff. Documenting the restoration of the degraded Zaalklapspruit will show a healthy wetland getting back to work.*



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**T**he Zaalklapspruit wetland, west of Witbank (eMalahleni) in Mpumalanga, is the site of an important experiment documenting how effective wetland rehabilitation can be, using the combined forces of the Council for Scientific and Industrial Research (CSIR), Working for Wetlands, and the South African National Biodiversity Institute (SANBI).

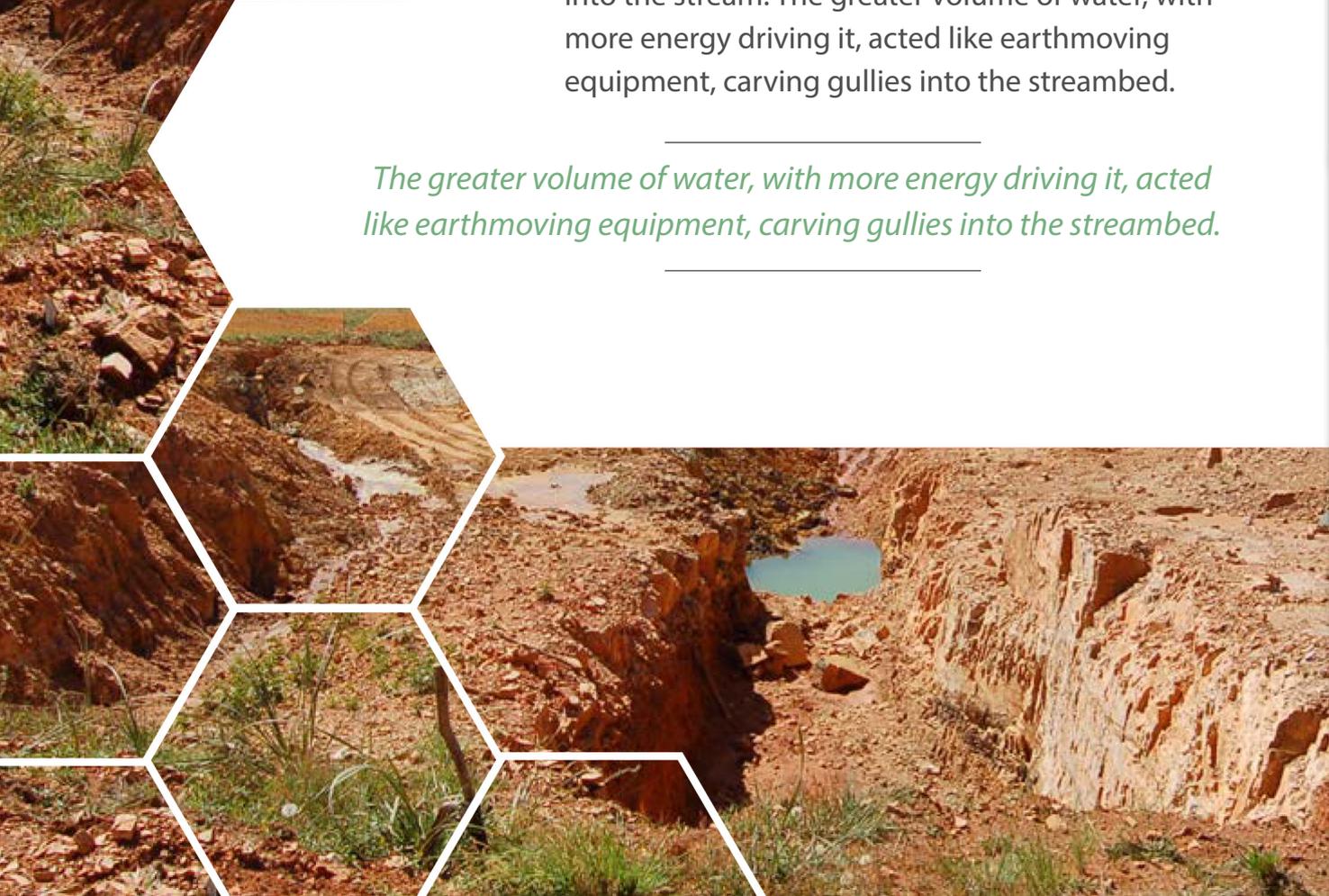
The area being rehabilitated was once a floodplain, with a small stream meandering through it. During the rainy season, the stream would burst its banks and diffuse the tremendous energy of the storm waters rushing into the system. The water would swell into a wide, shallow pond which would slowly trickle-feed downstream over time.

But farmers cut drainage canals into the floodplain to dry it out so they could use it for agriculture. Mining activity and runoff from roads also increased the volume and speed of water flowing into the stream. The greater volume of water, with more energy driving it, acted like earthmoving equipment, carving gullies into the streambed.

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‘Now the stream has cut so deep that the water is canalised,’ says ecological infrastructure director at SANBI, John Dini. ‘Instead of flooding outward and slowing down, the water rushes down the gully, cutting deeper and deeper, while the floodplain remains dry.’

**T**his means that the wetland can’t scrub the dirty water clean the way it normally would.

The rehabilitation process is attempting to lift the floor of the stream, using gabions and various other structures built into the bottom of the gully to slow the water and diffuse its energy, eventually allowing the natural flooding processes to take place once more.

‘It’s a bit like putting a plug back in the bath,’ explains Dini.

Arno de Klerk from the CSIR says that baseline surveys were done in 2013 and the site will be monitored over the coming years. The main aim is to see how the plant and animal life recover over time and how the wetland’s pollution cleaning services are restored, resulting in improved water quality.

Already, some preliminary findings show that the wetland is reducing the acidity of the water in the system. Water flowing into the wetland has a pH of about 4, the equivalent of swimming pool acid, but by the time it flows out of the wetland, it’s balanced to an almost drinkable pH of 6.7.

It’s early days yet, but if all goes according to plan, the Zaalklapspruit wetland will be a poster child for wetlands and how important they are in this mining-dependent economy.



## Doing the final polishing

SANBI's John Dini explains that every wetland has a breaking point, and that there's only so much of the cleaning processes it can be expected to carry before it buckles under the pressure. Even though wetlands are good at cleaning up polluted water, they need our help as they're expected to keep up with the higher flow of water and pollution which we dump into these systems.

'Every system has a breakthrough point,' he explains, 'where the wetland becomes so saturated that eventually whatever is coming in, it will simply flush right out again, causing the pollution to wash further down into the river system.' Even a restored Zaalklapspruit can only be expected to carry so much of the burden of cleaning up the pollution in water from mines, industry, sewage works and farmers.

Every sector should take responsibility for cleaning polluted water as much as possible, before releasing it into the environment.

*'Every system has a breakthrough point, where the wetland becomes so saturated that eventually whatever is coming in, it will simply flush right out again, causing the pollution to wash further down into the river system.'*

The wetland should only be expected to do the final polishing, saving millions of rands, which downstream municipalities and industry would otherwise have to incur in cleaning polluted water.

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