

AMD still poses a threat

By [Karen King](#)

4 Jan 2019

The discovery of minerals in South Africa in the late 19th century - including the discovery of diamonds in 1867 and gold in 1886 - played a fundamentally influential role in the first wave of industrial revolution of the country. Fast forward to present day and mining is still a major contributor to the local economy, having achieved a [gross domestic product \(GDP\) average of R233 949.76m from 1993 to 2018](#).



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Though perhaps a truer reflection of the contribution of mining activities is one that also takes into account the toll of these activities on the natural environment and the sustainability interventions required to restore the natural environment.

Acid mine drainage

Acid mine drainage (AMD), for example, is still a serious, long-term environmental issue faced in the country. In fact, the Federation for a Sustainable Environment highlights that one of the main issues associated with mine residue deposits in South Africa is AMD and that an estimated 1.6-million people live in informal settlements next to mine residue deposits, the majority of which are radioactive. Where research indicates that long-term exposure to AMD-polluted drinking water can lead to cancer, decreased cognitive function and mental retardation in fetuses.

The problem is centred around the Witwatersrand old mining area - where considerable AMD damage has occurred in the Wonderfonteinpruit, Tweelopiespruit, Tudor Dam and Robinson Lake areas. Depending on the area in which AMD is occurring, the water may contain high levels of salts, sulphate, iron, aluminum, cadmium, cobalt and radioactive elements. Notwithstanding the current short-term treatment of AMD, millions of litres of neutralised AMD, containing elevated levels of sulphate, which renders the water unfit for any use, still flow into streams connected to both the Vaal and Crocodile Rivers and groundwater systems, which continues to have devastating consequences for communities and the natural environment in these areas.

Stressed water supplies

However, the sense of urgency to address AMD has possibly been intensified by the water security dilemma and the need to prevent further contamination to the country's already stressed water supplies.

To put this into context; South Africa is classed as the 30th driest country in the world and it has a high within-season variability of rainfall and uneven distribution of rainfall. This means that even during a good year of average rainfall the country's water resources are already stretched in some regions – and the direness of the arid situation has certainly been exacerbated by extreme weather conditions in recent years.

It's important to note though that there is no short-term solution to adequately address the AMD issue. Rather, long-term solutions that are underpinned by principles of sustainability are critical to addressing existing contamination – as well as interventions to prevent future contamination.

To mitigate against AMD potentially contaminating water resources, surface water flowing toward the pollution sources should be diverted, water seepage and groundwater infiltration into the site should be prevented and acid-generating waste placement needs to be controlled. Additionally, there needs to be greater market understanding and recognition that polluted water can be a resource - and is not a liability – if it is appropriately treated.

Legislation

Ultimately, the responsibility to oversee and govern the entire process sits with government departments and there has been progress towards addressing the AMD issue. For instance, the country's environmental policies centred on mining and polluted water are far better today than in the past – aimed at driving shared accountability and collaboration between government and industry.

Within the legislative framework, older abandoned AMD-generating mines are now controlled under the National Water Act (No 36 of 1998), General Notice 704, the Mine Water Management Policy and the 2015 Regulations for the Financial Provision for Prospecting, Exploration, Mining and Production Operations. Also, within this legislation, for currently operating mines the onus to develop, own and operate an AMD treatment facility falls on the mine as well as the financial provisions for latent and residual impacts including the pumping and treatment of extraneous or polluted water. Additionally, to be fully compliant, new mines will need to look at including suitable financial provisions for such interventions in their closure plans, which will need to be in place from commencing with operations.

While the effects of AMD can never be entirely reversed and addressing the issue and treating AMD will be a complex and expensive undertaking, AMD remains a prolific threat to the South African environment and the water systems of the major affect areas. There are sustainable solutions that can be implemented and will help to restore the natural environment - and increased collaboration between Government and the mining industry is critical to balancing shared responsibility and ensuring adequate funding and support are being committed to AMD treatment.

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