

## **ARD management required**

One of the key problems faced by the South African mining industry is government's lack of capacity to properly regulate acid rock drainage (ARD), which is arguably one of the greatest threats to the sustainable development of South Africa's mineral wealth, Nico Bezuidenhout, Golder Associates environmental technology business unit leader, noted in a presentation at a recent International Mine Water Conference. He says that a general lack of ARD skills and capacity within government make the enforcement of ARD management practices difficult, often resulting in the inconsistent application of standards and authorisation requirements. As a result, mining companies often self-regulate when it comes to ARD management, using industry norms and standards as guidelines. While research and development in South Africa has led to significant advances in the treatment of ARD, namely active treatment systems such as neutralisation using limestone, sulphate removal using sulphate-reducing technology and mine water desalination technology, Bezuidenhout comments that the path forward for ARD management in South Africa would necessitate the collaboration of mining companies (which are the primary drivers for the prevention of ARD), the communities around their operations, the regulators and the consulting community.

Bezuidenhout's research assesses South Africa's ARD management practices and how they can be improved through the acceptance and implementation of the International Network for Acid Prevention's (INAP) Global Acid Rock Drainage (GARD) Guide. The GARD Guide, which summarises international best practices in ARD management, aims to assist the mining industry in providing high levels of environmental protection, assist governments in the assessment and regulation of affairs under their jurisdiction and enable the public to have a higher degree of confidence in the implementation of ARD prevention plans and practices. Bezuidenhout compares current ARD assessment and management practices in South Africa to the best practices outlined in the GARD Guide, which is available for free on the INAP's website. He says that the comparison is not meant to be comprehensive, but highlights the key differences in practices and opportunities for using the guide to improve ARD assessment and management in South Africa.

For example, chapter four of the GARD Guide poses five typical ARD-related questions that should be asked during environmental characterisation studies:

- Is ARD likely to occur and, if so, what type of drainage is expected?
- What are the sources of ARD, how much ARD will be generated and when?
- What are the significant pathways that transport contaminants to the receiving environment/receptors?
- What are the anticipated environmental impacts of ARD release to the environment?
- What can be done to prevent or mitigate/manage ARD?

Bezuidenhout notes that these are commonly asked during environmental characterisation studies conducted in South Africa, but that the difference comes in with regards to the data and information that the answers are based on. The key differences in ARD management relate to characterisation and prediction, prevention and mitigation, treatment and overall ARD management.