

# Focus on CSIR Research in Water Resources

CSIR Natural Resources  
and the  
Environment  
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## CSIR Groundwater Group research into Mine Closure Strategies

All mines have a finite lifespan. In the past South African mines were often simply abandoned when the ore was finished, with little consideration for post-mining environmental conditions. The consequences of this approach, both in terms of environmental degradation and the public's perception of the mining industry have often been severe. However, community expectations and the current legal framework in South Africa are such that the environmental responsibilities, and the financial implications that accompany these, remain with the mine lease holder until a closure certificate is issued by the Department of Minerals and Energy (DME).

In terms of mine planning, this represents a fundamental shift as mine plans must now extend beyond the operational phase (i.e. post-life-of-mine). The potential social, financial and environmental benefits of this shift are significant, these extending to the community, mining houses, and regulatory authorities, alike.

The CSIR Groundwater Group is currently working on innovative ways of managing the impact of mine closure, in particular the decant of polluted mine water. Radon isotopes are being used to determine where mine water is contributing to surface water flows, which helps to identify sources of pollution and assists with the critical issue of the apportionment of responsibility between mining companies. The Group is also studying the hydrogeological properties of mine dumps (waste rock is dumped at the surface as a slurry) in order to better understand the movement of water and pollutants through these dumps and find ways to reduce environmental damage.



*Abandoned open-cast gold mine near Johannesburg with acidic, iron rich polluted water leaching into it.*



*Discharge of large quantities of polluted water, which needs to be managed sustainably.*



*Taking pH measurements at a site polluted by mine water near Johannesburg.*

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