

TIME TO GET REAL ABOUT ARTIFICIAL RECHARGE

New strategy gives a push for AR as a conservation technique

Artificial recharge - transferring river or dam water underground into appropriate aquifers by means of infiltration basins or borehole injection - is finally gaining some impetus in South Africa as a water conservation and storage option for municipalities.

The Department of Water Affairs and Forestry, with support from the WRC, has produced a detailed strategy on artificial recharge (AR) to encourage optimum usage of aquifers and already there's some action. Borehole injection tests (where good quality surface water is injected into heavily used aquifers) are being planned for both the West Coast District and Prince Albert municipalities and Plettenberg Bay, faced with a winter rainfall pattern and heavy summer holiday season demand, is also considering AR as a possible alternative to two other more expensive options, investing in an off-channel storage dam from the Keurbooms River or a desalination plant.

The West Coast District, which supplies Saldana Bay and Langebaan, plans to inject about 4000 m³/day into the confined sandy aquifer that has shown a significant drop in borehole water levels over the past years. With AR, they plan to restore the water levels and use the aquifer as a storage reservoir, increasing both the water supply and its long term security especially in times of drought. Prince Albert plans to inject at a rate of about 20 L/s into one of their groundwater compartments which historically has been over-pumped in summer months.

If these tests prove that AR is a viable option for both municipalities, they will be the first examples of sizeable AR in the country using the borehole injection method.

Atlantis near Cape Town and the city of Polokwane have been implementing AR for decades but they use infiltration techniques. Since most of SA is underlain by hard-rock formations, the borehole injection option is more appropriate for any extensive expansion of the technique.

Neighbouring Namibia has successfully implemented several AR schemes, including a large-scale injection project for Windhoek, and DWAF is keen that we follow suit and as part of their strategy they have now established a legislative framework, standard guidelines and a draft code of practice for the application of AR.

The new strategy document outlines all the environmental benefits of AR and details the global and Southern African history of the technique. It also provides hydro-geological maps showing the areas with the greatest potential storage volumes, which include the Limpopo, Crocodile West Marico, Lower Vaal and Lower Orange Water Management Areas, although the department believes that smaller scale opportunities exist in almost every region.

Clear criteria are also outlined for successful implementation including high quality surface water that is geo-chemically compatible with the existing groundwater and aquifer hydraulics which must allow for the recharged water to enter the aquifer rapidly and be contained within it.

There are several management and technical issues around AR and good feasibility planning and testing are essential, with the correct siting of borehole injection points being an important factor. Clogging is identified as the key problem in most schemes

around the world and methods of preventing it happening are detailed in the document along with the principles of 'safe yield' to ensure that groundwater levels are not raised or lowered beyond critical points.

Artificial recharge is a key weapon in conservation and storage in water-scarce regions and DWAF believes its possibilities should be explored wherever it is technologically, economically, environmentally and socially feasible.

DWAF's Artificial Recharge Strategy is available for downloading from their website (<http://www.dwaf.gov.za>). Go to "Documents" and two-thirds down the long list of DWAF documents, you'll find the strategy under "Other: Integrated water resource planning – National Documents"