eMalahleni Water Reclamation Plant

eMalahleni Local Municipality
Anglo American plc

www.angloamerican.com

Project Background

Location: Africa, Republic of South Africa, Mpumalanga/eMalahleni

Date project established: October 2007

eMalahleni is a municipality of 510,000 people in a water-stressed region of north-eastern South Africa. It is one of the fastest growing urban areas in the country, and has faced considerable difficulties in meeting increasing demand for drinking water.

The city lies within the Olifants River Catchment – one of the regions in which Anglo American has also been working with internationally recognised research institutions to develop long-term climate models. The results, projected up to 2050, suggest that there is potential for a reduction in mean annual rainfall in this area. Water shortages - or flooding as a result of extreme rainfall events - could have serious implications for one of the most economically dynamic areas of South Africa.

Anglo American's Thermal Coal workings in the area around eMalahleni, however, contain approximately 140,000 megalitres (Ml) of water - a figure that is rising by over 25 Ml a day.

Too little water on the surface is a problem for communities. Too much water underground is no less of a problem for a mining company.

So Anglo American's Thermal Coal invested a decade of research and development into mine water treatment technology. This was aligned with the central government's mine closure and rehabilitation strategy, and the employment, development and environmental requirements of local authorities. The research involved a partnership with South Africa's power utility, Eskom, and all of the major mining houses in the Highveld coalfields.

Anglo American subsequently established the eMalahleni Water Reclamation Scheme to treat the

water from its local operations, and that from a nearby, disused mine owned by another mining company. The scheme was commissioned in 2007, and Anglo American put in place the infrastructure needed to deliver the treated water directly into the municipality's system.

The scheme treats mine water from current active mining operations. But it will remain in operation well beyond the conclusion of active mining, to sustainably manage environmental needs and make drinking water available to the local community into the future.

Mitigation and/or Adaptation

The city of eMalahleni is licensed to take 75 Ml of water a day from the local Witbank Dam. However, it needs, and abstracts, 120 Ml a day, which has a negative impact on communities downstream of the city. By 2030, the municipality's water demand is forecast to be 50% higher at 180 Ml/day.

The Anglo American reclamation plant currently treats 30 Ml a day. Some of this is used in our own mining operations, but the bulk of it supplies 12% of the city's daily water need. In July 2011, the company approved investment to increase treatment capacity to 50 Ml a day, and this second phase should be operational before the end of 2013.

The second phase has been designed to manage water from five coal mines, some of which have already reached the end of their life. This includes mines owned by a competitor mining company. Anglo American is moving beyond seeking solutions purely for its own mines, and is looking at a holistic way of dealing with the water problems of the entire region.

The reclamation plant provides flexibility for the eMalahleni community and a degree of water security as it seeks to address long-term climate adaptation risks from altered precipitation.

To date the water reclamation plant has treated 30 billion litres and supplied 22 billion litres to the eMalahleni Local Municipality.

But as part of its holistic examination of water in the region, Anglo American has been working with internationally recognised research institutions to develop long-term climate models for the Olifants River Catchment – within which the city lies. The results, projected up to 2050, suggest that there is potential for a reduction in mean annual rainfall in this area, highlighting the importance of prudent water management in the catchment.

Social Benefits

The construction of the plant created almost 700 temporary jobs, two-thirds of which were filled by people from the local community. It now has 57 permanent employees - almost all of whom are local.

The plant wants to be a zero waste facility. A daily by-product of the water reclamation is 200 tonnes of gypsum-based solids, and this has been successfully used to make bricks. So far, 66 affordable homes have been built from the gypsum waste for employees and it is hoped that it will soon be expanded to a total of 300 residential units. In addition, it offers an opportunity to further stimulate local employment through the establishment of a community-based enterprise that will manufacture and distribute these gypsum-based products to local builders.

And – of course - the local community has access to an additional source of drinking water for

60,000 people.

A register was tracked during the project construction and operational phase to document the percent of local labour employment.

The second benefit is the increase in the number of people that now have access to clean drinking water. The percentage of people without drinking water has been reduced from 14% to 2%, aiding the provincial government in meeting one of its Millennium Development Goals to ensure that no household goes without a potable, reliable and predictable water supply.

Potential for Scaling-up of project

The project is currently being expanded into its second phase, which will increase output by 2013 from 30 Ml to 50 Ml a day, with a peak capacity of 60 Ml a day.

The site – and the project – has the potential for a third phase.

Potential for Replication of project

The project is replicable and is being examined by six of Anglo American's ten Thermal Coal operations.

It has already been replicated by a private mining company, Optimum Coal Holdings, who commissioned a 15 Ml a day plant in June 2010 to the east of eMalahleni. Four other projects in the Witbank Coalfields are in various stages of project development based on the same model as the eMalahleni plant.

Mines other than coal are also looking to replicate this model.

Considerable know-how has been developed as a result of this project with Anglo American recently asked to provide input to government on a national desalination strategy.