

A new tool emanating from WRC-funded research can assist in the monitoring, management and communication of water quality on direct reclamation of municipal wastewater for drinking purposes.

Background

Water scarcity is recognised as a major challenge for countries on a worldwide basis in their endeavour towards sustainable life for humankind and the environment. Existing water sources are increasingly coming under stress due to growing water demand on a global scale.

Water resource managers and planners have been forced to consider alternative source of water, including desalination of brackish and seawater, water reuse and rainwater harvesting. Water reuse has become an attractive option for water augmentation due to improvement in efficiency of treatment processes over the last few years, reduced costs and the fact that this water source is readily available and in close proximity to the point of application.

In South Africa, there has also been a lot of interest recently in direct water reclamation (direct potable reuse). Water reclamation plants that have been constructed as a result of water shortages include: Beaufort West (direct potable reuse or DPR), George (indirect potable reuse or IPR) and Mossel Bay (reuse for industrial purposes).



The Beaufort West water reclamation plant is one of the handful currently operating in the country.

Direct potable reuse options in Durban (eThekweni Municipality), Port Elizabeth, Cape Town and Hermanus are at an advanced stage.

In this regard, water reuse for potable purposes involves the reclamation of wastewater for drinking purposes after it has been extensively treated by a number of treatment processes to produce water that is safe for human consumption.

In this WRC-funded project, a guide was developed that incorporated the following:

- A description of the status of water reuse for potable purposes
- A database of direct and indirect potable reuse potential of towns in South Africa
- Standardised terminology for water reuse
- Water quality monitoring programmes and guidelines comprising constituents and parameters that will require monitoring.

Guidelines

Monitoring systems are proposed for the three key components of a potable reuse plant, namely raw water monitoring, operational and control monitoring and compliance monitoring. The monitoring makes provision for early detection of deteriorating incoming raw water quality, rapid changes in the raw water quality, maintenance of treatment barriers in the plant through setting of operational alert levels for the various unit treatment processes in the plant, and compliance of the final water quality with adopted local and international norms and standards.

Because the final water at issue in this study is produced from reclaimed wastewater, the guide places the focus on health-related constituents and parameters, which, for the larger part, have not yet been included in local water quality standards.

Conclusions

The success of a DPR scheme depends on five

important elements:

- A reputable specialist team to accompany the project from design to implementation
- A robust treatment training
- A proven treatment technology with a good record
- Water quality monitoring
- Good communication at all levels and between all stakeholders
- Continued training and research.

The study concludes that with good technologies, personnel and communication protocols, barriers and monitoring systems in place, direct and indirect potable reuse is becoming increasingly attractive as a water source.

The successful implementation of IPR and DPR schemes depends strongly on the expertise of design and monitoring teams and the availability thereof in the particular region. A good example is the management of brine streams, and addressing the technological and economic challenges that are evident in this regard.

In the design of monitoring programs, information about the water quality should be clearly communicated to the consumer as well as with the water service provider. A good monitoring program will allow the water quality manager to convince all stakeholders about the true reflection of water quality in the system.

Professional and care in managing water reclamation plants is of the utmost importance. Trust from the public in drinking water provision is paramount. Internal lines should be open, the public happy and the critics (media or specialists) convinced that they can trust the water service provider to rectify a situation, should something go wrong.

Further reading:

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