

WATER CONSERVATION AND DEMAND MANAGEMENT OPTIMIZATION

Non-revenue water loss is a major challenge for Johannesburg Water (JW). Leak detection was manual and data collected was not effectively integrated across the relevant sectors for accurate information on usage and easy leak detection. Relying on users/residents to report leaks was not ideal and the existing leak detection devices covered a short range, hampering fast detection if a leak was further away.

Johannesburg Water engaged UJ-PEETS, Boffin & Fundi (B&F) and Epitome Engineers to find an optimal solution – balancing water conservation vs demand using the industry 4.0 benchmarks for data exchange, technologies and automation in the corporate space. B&F offers integrated solutions in revenue optimisation, information technology and engineering solutions. Based on this expertise, they were tasked to provide IT solutions for water loss management using the technology available in South Africa. This included advanced leak detection and implementing the automated leak detection monitoring system.

Using data of water losses from previous years, two pilot test areas were identified in Midrand. GIS files were uploaded onto B&F's Aquaduct system – a portable device providing 24/7 water pipe network monitoring and leak detection. Sensors were installed at identified unmetered and metered sites in the pilot areas and monitored over a period of five months.

Several leaks were immediately detected in the areas monitored and GIS coordinates passed on to Johannesburg Water for repairs to be carried out. The architecture and measures implemented to manage water leakages, losses and balancing proved to be fast, accurate and effective in supplying automated integrated data to Johannesburg Water

Managing Director of Boffin & Fundi, Tebogo Nkosi, holds a BCom Economics and Masters in Business Leadership degrees, holding this position since 2008. The company provides services to local and provincial government and retail sectors. Not only does Nkosi manage this innovative operation, she is a member on the Economic Advisory Panel of the Premier of Gauteng.

How did you become interested in Engineering?

I am an entrepreneur and naturally the infrastructure build space provides ample opportunities. Our business organically grew into the engineering space from being a meter reading company to operation and maintenance of water reticulation, then gradually into bulk water infrastructure installation. A key component for us has always been adopting technology into any service we offer, hence our acoustic leak detection solution.

How challenging are you finding it to work in what is perceived to be mainly a male field?

Boffin & Fundi is a family business and I have always worked with my father since the start of my working career and in later years my brothers joined the business. The mentorship and support that I have received from my Father made me understand my environment to ensure success.

With an ever-increasing population in the cities the demand for water intensifies. As water is a crucial but limited resource it is essential for cities to look at methods via research, development and innovations to balance conservation of water vs demand and increase revenue. The automated leak detection pilot successfully aided in enhancing a smart city infrastructure, building an integrated data collection framework for this process through supporting SME within the ambit of UJ's 4th Industrial Revolution.

UJ-PEETS is funded by the Technology Innovation Agency to enable technology innovation support for SMEs promoting circular green technology solutions.