

2022 / CASE STUDY

Mango Becomes Operations Monitoring Must-Have for South Africa's Silulumanzi Water Utility

Overview

With a 30-year concession agreement to deliver water and sanitation management services for 450,000 residents of the City of Mbombela, Silulumanzi, a subsidiary of South African Water Works (SAWW), needed a reliable and scalable SCADA system to efficiently manage and operate its vast distributed coverage area. With South Africa's water shortages, the daily delivery of nearly 120 million liters of safe drinking water to the City of Mbombela residents means water conservancy is a top priority that requires top expertise, systems, and sustainable practices with minimal environmental impact. For the last five years, working with South Africa-based process control solutions provider, Vanguard Projects (a Radix IoT partner in Africa), Silulumanzi has integrated browser-based Mango OS IoT software platform into its existing connected systems for heightened operational efficiency. Now the entire Silulumanzi team can tap into Mango's customized dashboard for real-time data, via their mobile phones, and actionable analytics on all their water reservoirs and operations plants spread across nearly 520 sq.km.

“Using Mango has helped us save up to 100 hours a week. We have less fuel cost and wear and tear on our vehicles since now we don't drive out to sites unnecessarily—with driving distances between 10 to 80 kilometers each way that can extend to 250 kilometers covering the area we're responsible for.”


Colin Thatcher
Silulumanzi's Operations Manager



About Silulumanzi

Since 1999, when Nelspruit Transitional Council established water services as part of a Public Private Partnership (PPP), Silulumanzi, a subsidiary of South African Water Works (SAWW), has been a provider of quality water and sanitation services in the municipality City of Mbombela—which in siSwati language means a lot of people in a small space. The utility company delivers nearly 120 million liters of safe drinking water to approximately 450,000 residents on a daily basis.

Silulumanzi's management team, Brain Gear Investments shareholders, and its almost 350 employees with top industry expertise, are all South African. As the recipient of the prestigious Platinum Blue Drop and Green Drop awards from the Department of Water and Sanitation, the company is ISO accredited for safety & health, environment, and quality management systems. Committed to transforming the City of Mbombela into the "Ultimate Destination" Silulumanzi's corporate social responsibility initiatives have played an active role in local communities' economic empowerment through developing skilling projects to alleviate unemployment and enrich the growth of the local economy.



“Mango has become almost the Bible for our field team—they carry it on their mobile phones and every couple of minutes of every day and night they’re monitoring reservoir levels of the sites they manage and use the data from Mango to mobilize their teams to the particular areas in need of attention. There’s definitely a world of difference from what we had before.”

Colin Thatcher
Silulumanzi's Operations Manager

“Mango is the best product we’ve seen— if there are better ones, we haven’t seen them or they’re not being sold.”

Approach

Previously, problems triggered a call from the site operator reporting a problem. A dispatched field worker would drive to the site, assess the problem, then drive back to the home office to get the necessary equipment and return to the site for repairs. **Now with Mango, operators know if a problem can be remotely remedied—if not, before leaving their base, field workers have a clearer indication of what the problem is and the specific equipment they may need.**

Since Silulumanzi sells or provides bulk water to areas outside of the Concession, regular monitoring of major water sites to determine raised water levels and the health of the pipes is a critical part of their business continuity on behalf of their bulk customers. While there's "adequate, 48-hour storage in reservoirs" for water deliveries, Thatcher says delivery disruptions from pipe breaks downstream affecting their two large bulk water and sanitation suppliers are mitigated immediately, thanks to Mango. The heightened pro-activeness means getting to the source of the problem, repairing the leaks, and resuming water service for their customers—preserving Silulumanzi regular operations.

Senior Instrumentation Technician, Bennette Silaule, reviews his Mango dashboard on his mobile throughout the day for real-time visual of the "health of the equipment" and water sites to make sure water pumps are operating. When he notices pumps have stopped pumping, he's also able to determine if it's because the reservoirs are full or because of other problems.

"Monitoring some areas is very complex since we experience pipe breaks downstream and need to secure water flow for our bulk customers from the reservoirs. With Mango, we actually manage and monitor pump stations and in the event of pipe breaks, we can notify our bulk customers and shut down their pump stations to minimize water waste out of the reservoir. And they can now quickly inform the customers they provide water for of the problem," says Thatcher.

Before Mango, Thatcher says the inability to monitor the systems resulted in "very reactive" mode and "always being a couple of hours behind." Now his field workers are immediately alerted to potential problems.

Instead of the field service team waking up middle of the night and driving 50 kilometers each way to check on sites, they now tap into their Mango dashboard from the comfort of their home and determine if the situation warrants a site inspection or can be remedied remotely. This ability for pro-active and predictive maintenance has helped eliminate major risks before they unfold.

"Mango has made life much easier: instead of getting up every morning to go through all the alarms or not know what is wrong, I just look at the dashboard on my mobile and get a full view of our sites."

Bennette Silaule
Senior Instrumentation Technician

Results

With a significant increase in the number of customers supplied, existing plants don't yet have the capacity to pump as efficiently to meet the daily water needs of the large population in the coverage area. This requires rigorous monitoring of the reservoirs for the water volumes which ultimately allows Silulumanzi to determine whether they can supply water to customers or need to pre-warn residents by issuing bulletins and announcements at the local radio stations and using social and other digital platforms.

Commonly used "Water shifting" — using valves to move water around the network to provide intermittent water supply — leaves most residents deprived of a 24-hour water flow. Water flow and availability are budgeted regularly.

Thatcher and Silaule are developing a pilot energy conservancy dashboard with Vanguard Projects' help. The customized Mango dashboard will provide operational perspective to help determine the utility company's second largest cost—electricity.

"With Mango, our team is more proactive."



"Salaries are obviously our first largest cost. We've installed equipment at the main water treatment plant in Mbombela (capital city) to monitor exactly how much water is pumping at any time of the day, and the power used to do the work."

Colin Thatcher
Silulumanzi's Operations Manager

While still in development, plant operators record the flow meter on clipboards which they later, back at the office, enter it on an excel spreadsheet which eventually provides management information on exact meter readings and amount of water pumped.

"This helps us tremendously with predictive maintenance—since we see how many kW we are currently consuming, what the daily flow was for each day, and the daily power usage, and so on. While still in progress, the Mango dashboard provides real-time data on when pumps stop working and on load reduction," Thatcher says previously all this information was available at the end of each month after they tallied all the recordings.

Conclusion

With the customized energy conservancy Mango dashboard planned to be in full operations at their Mbombels Water Treatment Works site by mid-February 2022, Silulumanzi team will have access to real-time water conservancy measures. It will provide major savings on “time of use tariffs” where certain hours of the day tariffs on water fluctuate between medium and high. Based on the success of this first phase it is planned to roll out the initiative to other key sites during 2022. Using Mango to monitor power consumption provides Thatcher and his team the critical overall view of their daily operations and awareness of upcoming risks to plan for preventative measures. It also allows Silulumanzi utility company to guarantee efficiency and reputational integrity to sustain their concession agreement.

Thatcher highly recommends Mango to his partner businesses and other local municipalities.

“Showing what Mango can do is the best recommendation I can offer another business. I just take out my mobile phone and show them what we have and what we can do, and how it saves money and time and how the platform can be customized.”

Colin Thatcher
Silulumanzi’s Operations Manager

“Life has become a lot easier for us since we incorporated Mango.”

Working closely with Vanguard Projects to develop the Mango platform, Thatcher’s recommendations have sold the concept to other municipalities and local city councils which have integrated Mango into their systems. Since power is one of the largest costs for most municipalities, Mango offers tremendous benefits as the power saving and power monitoring platform.