

Benefits of Online Plant and Water Quality Monitoring for Sustainable Plant Operations

at Gympie Regional COUNCIL'S GOOMERI WTP

Gympie Regional Council (GRC) spans across 6,898 sq. kms with an approximate population of 50,000 people. The rural town of Goomeri within GRC has about 600 residents and 250 dwellings and is significant in terms of its character, strong community and well known as a transit destination for campers and visitors alike. It is very important for the Council to ensure optimum health of its residents by providing safe drinking water and manage its water treatment and supply operations in a sustainable way. The Council included an upgrade of the Goomeri water treatment plant (WTP) in its planning scheme in 2013 to achieve this objective.

Project Scope

The Goomeri WTP can treat up to 10 L/s and comprises of a clarifier and two sand filters for primary treatment followed by biologically activated carbon filtration by way of secondary treatment and finally a softener to remove hardness from its bore water supply. The softened water is disinfected using ozone and chlorine dosing before being stored in its two storage tanks for distribution to the community. The plant doses 10% sodium hypochlorite to disinfect the treated water and maintain adequate residual chlorine in the distribution lines for safe consumption. The dosage varies depending on the flow, raw water quality and effectiveness of treatment processes. Hence it is imperative to monitor the performance and water quality at each treatment step to enable prompt operator interventions and optimise the effectiveness of the disinfection process.

Gympie Regional Council has a dedicated but small team of operators that travel to significant distances in order to operate various water and sewage treatment plants spread across the region. Hence it becomes important to ensure reliable plant performance data is obtained in real time to manage resources effectively. The Council was looking to implement a solution that will enable real-time and remote monitoring of the Goomeri WTP performance and final water quality in order to manage its plant operations in a sustainable way in terms of its chemical consumption and operations management.



Goomeri Water Treatment Plant

End user:
Client: Gympie Regional Council
Order date: March 2019
Completion: May 2019
Xylem's role: System Integrator and Solutions Provider
Xylem scope: Manufacture, Supply, Installation, Commissioning and Training of Remote Monitoring of Process and water quality.
The scope of supply included:
• [Digital pH, turbidity and conductivity sensors](#) in Primary clarifier
• [Digital turbidity sensor](#) - Pre and Post sand filters
• Digital pH, turbidity, [conductivity sensors](#) - Post Softener
• Free residual chlorine sensor - Reagent-free [FCML 412 N](#)
• Multi-parameter controller - [2020 3G](#), MIQ/C6 and MIQ/PS
• Sensor cables - SACIQ
• Analogue Chlorine Controller - [CI 298](#)
• Modem, installation accessories, cable trays, conduits

Solution

Xylem was asked to offer a real-time online and remote monitoring solution to monitor Goomeri WTP performance and final drinking water quality. A complete solution was offered to the Council including provision of electrical power, supply, installation, commissioning and training on the operation and maintenance of the sensors. A modem with data sim card were integrated to enable web based plant and water quality monitoring Xylem's free IQ SensorNet web platform. A stainless steel flow cell encompassing turbidity, pH, conductivity and free chlorine was fabricated and installed for final water quality monitoring. A separate flow cell for turbidity monitoring post sand filters was also fabricated. pH, conductivity and turbidity sensors were installed directly in the primary clarifier for raw water quality monitoring.

"A reagent-free and sensor based approach for plant and water quality monitoring instrumentation provides a simple, reliable and cost-effective solution to Customers"

Result

A free chlorine sensor with PID controller will enable Council operators to optimise their sodium hypochlorite dosing by setting up a control loop between the dosing pump and concentration feedback thus reducing excessive dosing and savings in operational costs.

The online sensors for raw water quality monitoring and post sand filters ensures continuous real time plant performance data thus allowing operators to have their finger on the pulse at all times.



Final drinking water quality monitoring system using Xylem's pH, free chlorine, turbidity and conductivity sensors



Raw water quality monitoring - using pH, turbidity and conductivity sensors suspended directly in the clarifier using a 3-sensor holder and swing mounted assembly on the handrail.



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