

Realtime monitoring cuts pollution risk at Scottish Water site.

Live monitoring and collaborative problem-solving prevent over-pumping and protect the environment.

The background

When a strategic Scottish Water pumping station had to be taken out of service unexpectedly, the utility faced the risk of over-pumping. Working with Xylem and its Avensor service, the team used real-time insights to resolve the issue and return the station to full operation.

The challenge

Scottish Water and Xylem were carrying out planned maintenance at St Nicholas Sewage Pumping Station in St Andrews, a large site which receives flows from five upstream stations. The scope included replacing an inlet gate valve and non-return valve (NRV), along with pump impellers and wear plates.

During the works, engineers found the isolation valve was not sealing, allowing pressure to backflow. This meant the NRV could not be replaced without fully draining the line. Attempts to reseal the flanges failed as the pressure had badly damaged the gasket.

Tankering was not viable due to high inflows exceeding available capacity, leaving the station reliant on its standby pump. Without a quick solution, costly and disruptive over-pumping would have been required – with any failures potentially impacting St Andrews golf course.

The team instead developed a solution to restrict flows from the five upstream stations using their available storage while the rising main was drained and the NRV replaced. This approach required real-time monitoring of the five stations. Crucially, two of the assets were equipped with Xylem's Avensor monitoring system, providing live data on levels and asset health.

The solution

Avensor is a digital service that provides alerts and data-driven insights from a device connected to pumping stations or other assets. Once a modem is installed, Avensor collects and analyses data to give a complete overview of all connected operations, including trends and alerts, via the web and a mobile app.



Pumps and associated equipment inside the dry well at St Nicholas Sewage Pumping Station in St Andrews.

Client

Scottish Water

Xylem's role

Xylem provided engineering expertise and real-time Avensor monitoring to help Scottish Water safely manage flows, replace a failed NRV and avoid costly over-pumping.

Insights from Avensor allowed engineers to remotely monitor conditions and attend sites only when necessary to pump water in a controlled manner.

The remaining three stations were monitored through periodic site checks. With this intelligence in place, St Nicholas SPS was safely shut down, the rising main fully drained and the NRV replaced.

Throughout the operation, teams worked collaboratively, adapting plans in real-time. As a result, Scottish Water asked Xylem to quote for additional work onsite.

The results

- St Nicholas SPS returned to full operational status without the need for over-pumping.
- Significant cost and time savings achieved by avoiding additional mitigation measures.
- Environmental risk reduced, with controlled flows preventing pollution events.
- Minimal disruption to Scottish Water operations despite the complexity of the site.
- Demonstrated value of Avensor, providing real-time intelligence at a critical moment.

This project highlights how Xylem's engineering expertise, rapid problem solving and digital monitoring technology can resolve unexpected issues on complex assets. It also demonstrates the wider value of Avensor, enabling operators to make informed, timely decisions that mitigate pollution risk and deliver better outcomes.

Mike Kelly, Scottish Water's wastewater networks team leader, said: "This was a complex job on a busy terminal pumping station. Having live information available allowed our team to manage incoming flows safely, respond quickly and keep the wider environment protected while the work was completed. Working closely with Xylem, we were able to restore the station to full operation, avoiding the cost and disruption associated with temporary over-pumping."

"By giving Scottish Water the insights needed to make quick decisions, we were able to fix what could have been a serious situation."

Mark McCullagh, Xylem's Scotland South project manager



New non-return valve installed at St Nicholas Sewage Pumping Station.



Real-time monitoring and control equipment used to track conditions at one of the pumping stations feeding St Nicholas Sewage Pumping Station.