United Utilities uses the SENTRY™ monitoring platform to **optimize loading capacity** and **energy efficiency** of the **Activated Sludge Process.**

> "**SENTRY** is **quick and easy to install** and boasts an intuitive dashboard to display it's graphical representation of real-time data. This has provided us with **a whole new level of insight into our site performance**, which our graduate team are utilising to study efficiencies in our activated sludge process."
>
> United Utilities Business Manager

United Utilities
helping life flow smoothly

SENTRY was installed by United Utilities in an activated sludge wastewater treatment plant, with the key goal of using it to monitor treatment performance while they gradually increased organic loading for the facility.

The facility was tasked with receiving additional sludge filtrate from a number of nearby treatment plants.

The key for the operations team is to be able to maximize their ability to take this additional organic load while maintaining suitable treatment from the ASP.

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SENTRY™ sensors were installed at key influent and aerobic basin locations with real-time data going to a web-based dashboard with three key findings:

- The treatment facility is able to handle the additional organic load received from other treatment facilities. The sludge centrate increased microbial activity (as measured by MET) in the wastewater prior to ASP but has had modest impact on MET in the ASP effluent. Organic loading continues to be increased gradually while SENTRY Microbial Electron Transfer (MET) alerts provide operations real-time monitoring of performance.
- Large precipitation greatly reduces influent microbial performance. This is due to infiltration and inflow into the collection system reducing organic strength. The ASP effluent is largely unimpacted by the events recorded to date, suggesting the system has ample retention time and good hydraulic characteristics.
- MET readings are shown to correlate to dissolved oxygen, providing a reliable, robust measure of aeration efficiency. A pattern between dissolved oxygen and MET is demonstrated, with increasing MET corresponding to falling dissolved oxygen concentrations and decreases in MET resulting in rapid increases in dissolved oxygen. This is interpreted as higher MET representing periods of higher biological action that rapidly consumes dissolved oxygen.

Data trending and opportunities for process optimization.

The SENTRY platform can be used as part of a process optimization strategy for ASP systems. The United Utilities team have started to integrate the MET trending as a key input for aeration optimization. Historical data sets were generated and provided aggregated weekly trending insights.

A visual output shows that there is a clear daily and weekly pattern generated at the influent monitoring location. The influent sees significantly higher sustained microbial activity from Sunday night into Tuesday with a much lower MET on Saturday *(Figure 1)*.

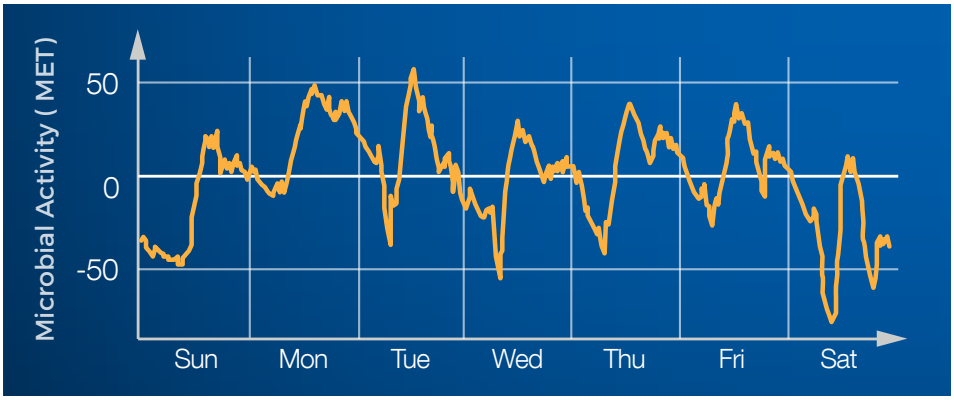

Figure 1. Weekly MET trend from the decomposition of the ASP influent monitoring location.