Variable Influent. Predictable Outcomes.™

How using real-time VFA monitoring saves money & time by reducing manual sampling & preventing digester upsets

Location: Sleeuwijk, The Netherlands
Partner: Haskoning
Type of Plant: Municipal wastewater treatment plant (WWTP)
Location of Sensors: On the recirculation line – Compartment 1 of the Ephyra® Digester
Problem Statement: Traditional pH and lab-based VFA tests are labour-intensive, inconsistent, and delayed insights when it came to the health of their digester
Outcome: Saving up to $35,000/year by reducing manual sampling (and the associated lab technician time) and anywhere from $175,000 to $405,000 per prevented digester upset event

Overview:

The Sleeuwijk Wastewater Treatment Plant (WWTP) in the Netherlands serves a population of approximately 200,000 residents. To stabilize sewage sludge and enhance digestion performance and biogas recovery, the plant had employed the Ephyra® digestion process which consists of three interconnected compartments, each with a volume of about 800 m^3. It treats roughly 8,700 tons of total suspended solids (TDS) per year. The Ephyra tank (excluding the post digester) has a hydraulic retention time of approximately 7.5 days.

Problem Statement:

Haskoning was looking for a reliable way to monitor the biological health of the Ephyra Digester in real time. Traditional monitoring tools such as pH measurements and volatile fatty acid (VFA) laboratory analysis give limited information; pH offered only lagging indications of instability while lab-based VFA testing was labour-intensive and time-consuming.

To overcome these limitations and gain continuous insight into digester performance and stability, Haskoning partnered with SENTRY™ to implement a real-time consumable VFA monitoring solution to identify process imbalances as they happen and improve overall digester performance.

Figure 1: A SENTRY real-time VFA monitoring sensor installed on the recirculation line of the Ephyra digester.

Deployment Experience:

As shown in Figure 1, the Haskoning team installed a SENTRY sensor on the recirculation line of compartment 1 of the digester to monitor biological activity and the availability of VFA in real time.

Test Results and Values:

In June-July 2025, the operations team conducted trials by adding primary sludge to the digester to evaluate its effect on digester performance and biological activity.

Following the addition of primary sludge, the SENTRY monitoring system immediately detected an increase in consumable VFA, confirming in real time that the added biodegradable carbon is effectively degraded and can aid in increasing biogas production. The direct, in-situ signal demonstrated the SENTRY sensor's sensitivity to feedstock variation and enabled operators to validate process performance dynamically, without reliance on delayed indicators such as biogas yield or periodic laboratory analyses.

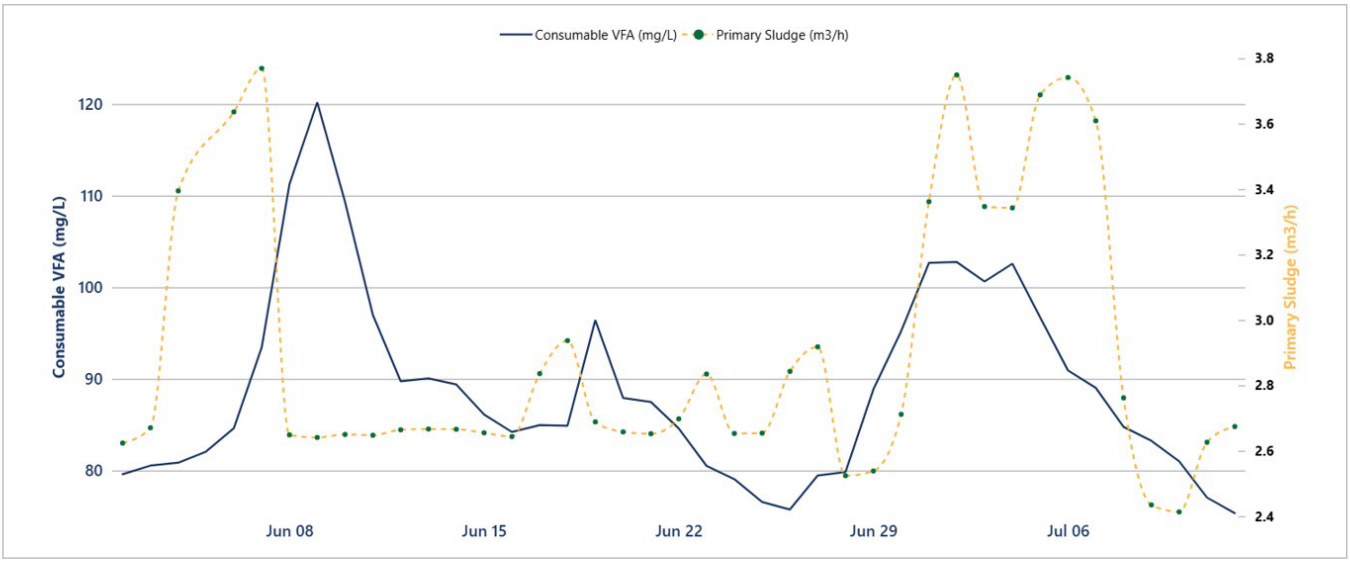

Figure 2: The SENTRY web dashboard monitoring the digester's consumable VFA in real time as primary sludge was added

Final Outcomes:

SENTRY successfully detected changes in VFA levels each time primary sludge was added to the digester providing a real-time indication of process changes. This demonstrated SENTRY's ability to continuously track digester health, flag imbalances early, and give operators the insight needed to maintain stable and efficient digestion performance.

The successful outcome highlighted SENTRY's value as a proactive monitoring tool, helping operators make data-driven decisions and enhance digester resilience and output. Customers like water authorities also benefit by:

- **Saving over $10,000/year by reducing 80% of manual sampling**
- **Freeing up approximately 130 technician hours per year worth over $20,000**
- **Saving $175,000 to $405,000 for early detection and prevention of digester performance issues and each upset event**

Visit the SENTRY website to see how other AD facilities are using our sensors to optimize digester performance for just a few dollars a day!