



CASE STUDY

Liquid-phase H₂S sensor provides new insights at treatment plants

Despite causing severe odor, corrosion, and worker safety issues, H₂S is still a neglected process parameter at wastewater treatment plants (WWTPs). This case study examines how two of Veolia's French subsidiaries; Klearios and Société des Eaux de Marseille (SEM), gained new insights into the H₂S challenges at two WWTPs. These insights were obtained using a novel sensor for real-time monitoring of H₂S in untreated sewage.

Background

H₂S is a major challenge in wastewater collection systems where it causes odor and corrosion issues. If the H₂S challenge isn't mitigated, all of these problems are transported to the wastewater treatment plant (WWTP), where H₂S also poses a significant worker-safety concern. Finally, studies have found that H₂S inhibits biological wastewater treatment processes. Yet despite the severity of the issues caused by H₂S, it is still largely a neglected process parameter. Existing measurement solutions are unable to provide a dynamic overview of the true H₂S challenge. This lack of information limits the plant operators capabilities to fully optimize the H₂S management at the WWTP.

Challenge

Two Veolia subsidiaries in France wanted to achieve a better understanding of their H₂S challenges. At Saint-Nazaire in Western France, Klearios wanted a better overview of H₂S in the plant's combined inlet to see how the existing H₂S treatment could be



Two SulfiLogger™ sensors were permanently monitoring dissolved H₂S in the raw sewage at two influents at the wastewater treatment plant in Cassis.

optimized using sensor data. And at Cassis in Southern France, SEM wanted to map H₂S from two separate inlet sources - a pressurized line and a gravitational line.

Setup

Three SulfiLogger™ H₂S sensors were installed directly in the raw wastewater at the inlets of the two plants in a 'gatekeeper'-like setup. A single sensor was installed at the combined inlet at the

Industry

Wastewater

Business needs

- Overview of H₂S challenge at WWTP
- Locate source of H₂S challenge

Solution

Liquid-phase H₂S sensors installed at the inlet(s) of two WWTPs in France.

Benefits

- Full, dynamic overview of H₂S concentrations in sewage from the collection system
- Profile of separate H₂S impacts from multiple inlet sources
- Proactive and data-driven approach to H₂S management
- Improved worker safety

WWTP in Saint-Nazaire, while two sensors were installed at the two influent sources at the WWTP in Cassis.

All sensors were connected to a cloud based IoT solution, which provided detailed graphs of the H₂S development over time.

Results

In both cases, it was possible to achieve a full, dynamic overview of how H₂S impacted the plants. These insights enable future H₂S mitigation activities to be started on a fully informed basis. To track the root cause of the issues, the operators could also initiate further measurement campaigns upstream in the collection system.

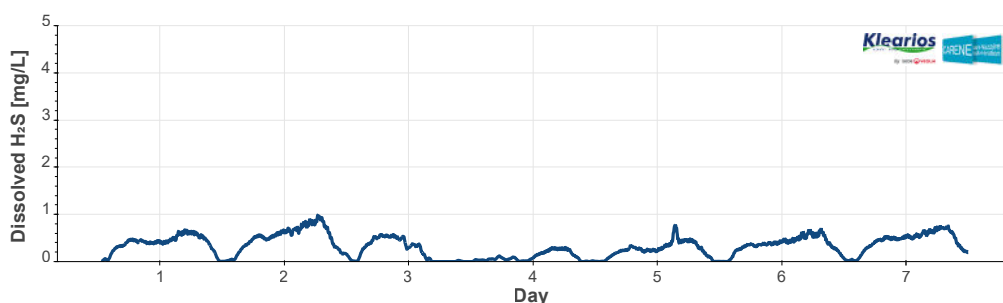
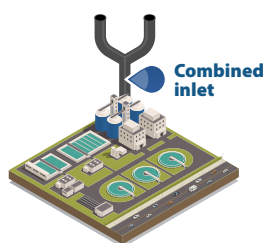
At the Saint-Nazaire plant, Klearios gained insights into the plant's combined inlet (blue), which showed regular patterns with varying daily peaks between 0.2 and 1.0 mg/L H₂S.

At the Cassis plant, two different H₂S profiles were observed from two influent sources. The H₂S profile from the pressurized system (blue) followed a predictable pattern with consistently low H₂S levels below 0.4 mg/L, while a different profile was observed at the gravitational line (red), where frequent and irregular spikes above 5 mg/L were observed. The flow rate was significantly lower than in the pressurized line, indicating that the effect of the spikes would be less visible on the plant's combined inlet.

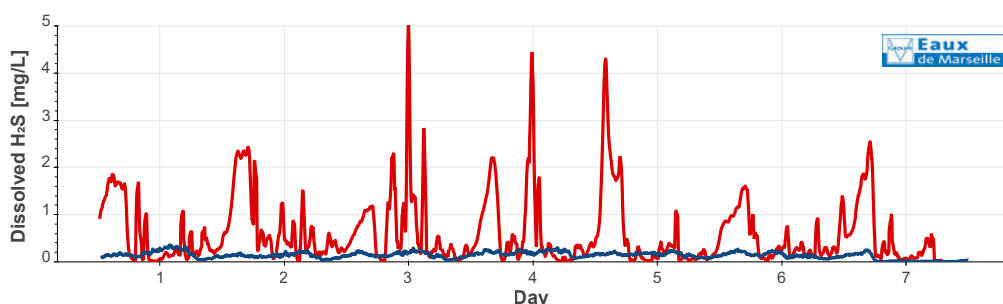
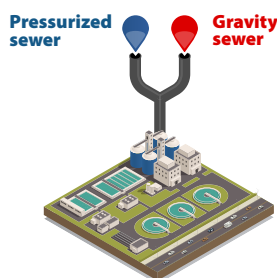
Perspectives

H₂S remains a neglected, dangerous, and expensive parameter at the WWTP. Although WWTP operators possess all the tools and techniques needed to mitigate the unwanted gas, readily available data is needed to optimize the effectiveness of the chosen H₂S mitigation activities. The SulfiLogger™ H₂S sensor delivers this knowledge by providing a true, reliable and dynamic overview of how H₂S impacts the WWTP.

Saint-Nazaire WWTP



Cassis WWTP



Why is H₂S a problem at the treatment plant?

- H₂S causes rotten-egg **odors** affecting quality-of-life for nearby residents and staff.
- H₂S induced **corrosion** significantly reduces the lifespan of valuable plant assets.
- H₂S **inhibits treatment processes** and is a problem in biogas production.
- H₂S is a **worker safety concern** causing several undesirable health effects. The gas is potentially lethal at concentrations above 500ppm.

