QCL WATER SCIENCE

Iren

Iren Group

Inflow and Infiltration Issues

Overview

Irens Ronco Scrivia Municipal WWTP in Genoa, Italy, required performance monitoring of treatment based on organic loading. SENTRY™ sensors were located at the influent and effluent of the primary clarifiers.

The plant has an average flow rate of 5,000 m3/day and treats mostly domestic wastewater and rainwater to remove organic matter and nitrogen. The operations team wanted a way to monitor the organic load entering the plant and evaluate the efficiency of its biological treatment system.

Why SENTRY™

SENTRY™ directly measures how the biology in the treatment process will respond to influent loading. Reliable real-time monitoring of Organic Strength and Biomass Health at the influent channel supports operators in:

- Targeting manual sampling to capture data during upset conditions
- Assisting them in identifying loading trends and patterns
- Allowing them to prepare and act early on reoccurring events
- Offering data so they can optimize their process decisions during upset events to ensure a stable effluent quality in variable loading conditions

Initial Findings and Deployment

Iren wanted to evaluate the SENTRY™ system as a tool for both monitoring and operational decisions. The Iren team wanted to establish a clear relationship between the SENTRY™ signal and the other measures of organic matter that require manual sampling and lab-based analysis.

- SENTRY™ demonstrated its ability to monitor organics with a correlation to manual COD samples of 78%
- SENTRY™ monitored treatment performance equivalent to or better than ammonia which is currently used for aeration control
- SENTRY™ can be used to optimize downstream processes that require knowing organic load
- The SENTRY™ system flagged 18 biological imbalance events during the first 6 months
- Using SENTRY™ for real-time sensing empowered Iren to use data analysis techniques to discover trends in the data and develop mitigation strategies based on organic loading

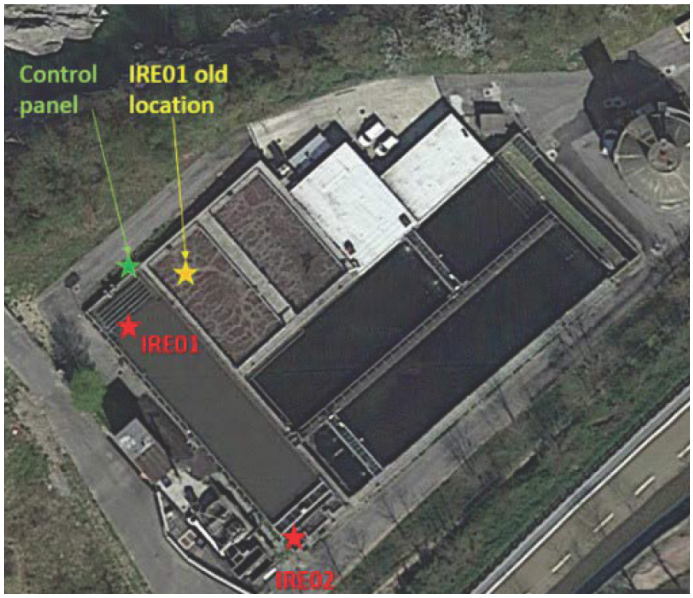

Figure 1: Ronco Scrivia WWTP, Genoa, Italy. Red stars indicate the current location of the SENTRYTM probes, the green star indicates the location of the data management panel, and the yellow indicated the previous location of IRE01 until 15 Feb, 2022. Source: Google Earth

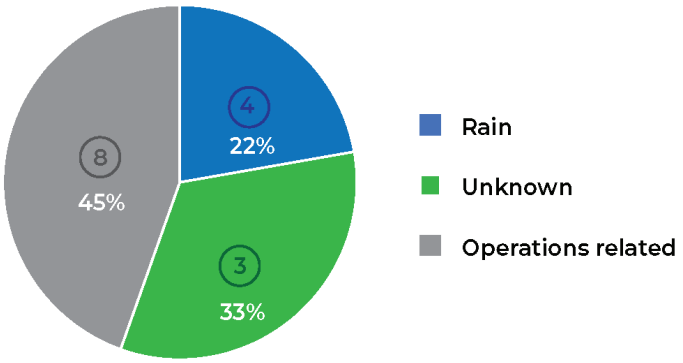

Figure 2: Distribution of 10 biological imbalance events detected by SENTRY™

Figure 3: Events D and E, of unknown nature, affected the signal at the influent of the plant

Next Steps

The facility has 2 layers of SENTRY™ protection to flag changes in organic loading in time for action

- Iren can use SENTRY™ data to deploy manual sampling during events rather than based time or volume
- Operators can capitalize on the most effective times and days for maintenance down times (during low flow or low stress times such as Saturday and Sunday evenings)
- Operators can optimize performance of the plant through aeration or sludge return during the midweek and mornings
- A difference of more than 24% between the highest peak and lowest daytime activity in the nitrification/ denitrification basin shows potential for a considerable reduction in aeration costs
- A feedforward control strategy linked to the SENTRY™ signal in the influent of the plant would reduce risk of under-aeration and could help the facility achieve aeration-related electricity costs savings by up to 20%

FOR MORE INFORMATION CONTACT:
QCL, Riverside, Forest Row Business Park, Forest Row, East Sussex, RH18 5DW
qclscientific.com info@qclscientific.com 01342 820820