



INDUSTRY
Water &
Wastewater



PROCESS TYPE
Continuous
Processing



ANALYTICS TYPE
Asset
Analytics



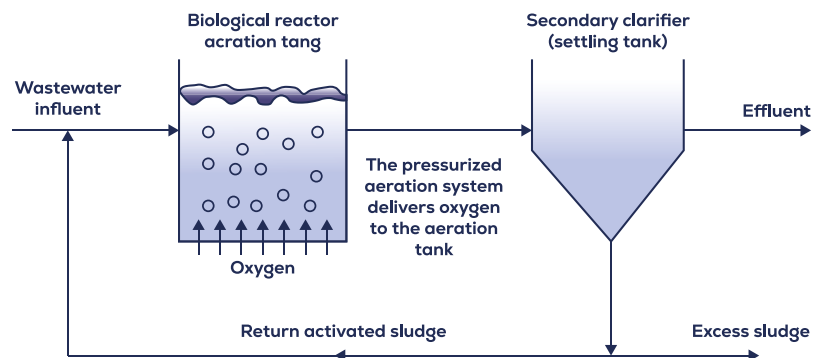
KEY OBJECTIVE
Predict Maintenance
Schedules

Overcoming High-Input Variances for Condition-Based Maintenance.

BACKGROUND

The biological wastewater treatment step is the largest energy consumer of all process steps at a municipal wastewater treatment plant. The treatment is a complex interaction, which can be very sensitive to change of pH, oxygen concentration in the water, and temperature. Process experts at a European wastewater treatment plant wanted to improve their maintenance schedule for the aeration elements of biological wastewater treatment. Because the aeration elements suffer from fouling, they need to be cleaned regularly. Oxygen concentration decreases when aeration elements are fouled, and the treatment no longer works efficiently.

The goal was to transition to maintenance planning from a time-based schedule. However, the high variance of variables made it difficult to have a clear indicator.



The basic principle of Activated Sludge Process.

In the biological reactor, the pressurized aeration system delivers oxygen for the bacteria. A low concentration of Oxygen is one factor which can lead to a high concentration of nitrite.

CHALLENGE

Wastewater treatment plants must overcome high-input variances of incoming wastewater, which can vary depending on the time of day, the time of year, and weather conditions. Engineers need the information associated with those changes to schedule planned maintenance. However, getting a clear indicator that the aeration elements of the biological treatment needed to be cleaned was extremely difficult.

SOLUTION

Approach

- Build tags in TrendMiner to correspond with oxygen concentrations over time
- Create a dashboard in DashHub that allows process experts to see all the oxygen concentrations across the various aeration elements
- When the oxygen concentration drops during the nitrification process, then the aeration elements needed to be cleaned

RESULT



- Engineers had a full view of the aeration elements and their corresponding oxygen concentrations during the nitrification process
- Process experts used the monitor in DashHub to determine when aeration elements needed to be cleaned based on their oxygen concentration levels
- The monitors allowed engineers to take a “just-in-time” maintenance approach that saved money in maintenance and energy costs

TRENDMINER FEATURES USED



DATA VISUALIZATION MODES

TrendMiner offers various visualization modes for analyzing time series data. Besides the common time trend, time series data of multiple tags can be shown in a stacked mode for specific time sequences or can be grouped together in a “swim lane”. For multivariate analysis, our software offers a multi scatter plot that shows tag histograms and multiple histograms of each pair of the selected tags.



PREDICTIVE MAINTENANCE

Traditional predictive maintenance with the use of data models is often time consuming and isolated from the subject matter experts. By using and thus analyzing the information within the time series data, process experts can assess every asset for performance and predictive maintenance.



TAG BUILDER

TrendMiner's tag builder allows the creation of time series data through the use of formulas on and aggregations of the tags. The results of these tags can be visualized just like any other tag. The tag builder can also be used for importing time series data via a CSV file.



CAPTURE EVENTS OF INTEREST

Specific occurrences can be captured as events and labeled automatically, based on monitoring alerts for saved search patterns, fingerprints, and rules. The captured events can be used to monitor how often these events happen and even to prevent and control overall production performance.

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