# City of *Kelowna* remote $H_2S$ monitoring and dosing control

By Mike Gosselin, Wastewater Operations Manager, City of Kelowna

## Background

Hydrogen sulfide ($H_2S$) causes severe problems in collection systems when wastewater is pumped over long distances. To limit rotten-egg odours and to mitigate premature asset deterioration, utilities often add neutralization agents to the wastewater. However, without remote, real-time data of the $H_2S$ concentrations in the wastewater, the optimal chemical dosing rate remains unknown. This lack of information causes under or overdosing and time-consuming optimizations.

## Challenge

Leachate from the City of Kelowna's solid waste facility is treated onsite and ultimately discharged into the sanitary system. This by-product contributes to $H_2S$ levels downstream in the sanitary system. The wastewater operations department wanted to optimize the dosing of nitrate salt to reduce the consumption of chemicals and to mitigate potential $H_2S$ related odor and corrosion issues in the collection system.

## Solution

A small, self-contained dosing system was installed consisting of a sensor which was able to provide remote, real-time $H_2S$ levels that did not require outside power or a confined space entry to install, and a peristaltic dosing pump. In this setup, a SmartCover $H_2S$ sensor level data was used by the City of Kelowna's Source Control team as a dynamic control input for the peristaltic dosing pump. By measuring the $H_2S$ levels at the first manhole coming out of the leachate pond and integrating temperature and precipitation data, the utility was able to quickly detect changes in the composition of the wastewater and thereby allow the fast reacting chemicals to be added in just the right quantity. The dosing rate was simply proportional to the $H_2S$ level data being remotely received. Operators could now review $H_2S$ level data and adjust dosing levels all without having to roll a truck.

## Results

With real-time $H_2S$ data, operators can now review and remotely control dosing levels, the consumption of chemicals was optimized, and all downstream $H_2S$ problems were fully mitigated since only negligible $H_2S$ levels were observed.

With a constant dosing strategy, even using twice the daily amount of chemicals used for the sensor-controlled dosing strategy, the dosing was unable to fully neutralize the $H_2S$ spikes.

Without any dosing, hazardous levels of $H_2S$ were observed on this sanitary line creating odorous conditions and corrosion issues would persevere.

## The pitfalls of constant dosing

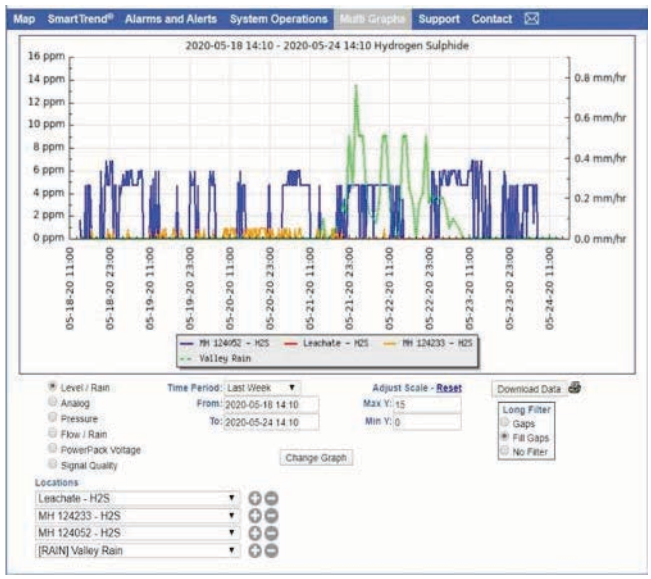
Constant chemical dosing – is a simple but inefficient approach to $H_2S$ mitigation. The fundamental shortcoming of this strategy is that $H_2S$ concentrations are a dynamic variable – not a constant. As the composition of the wastewater changes, a constant dosage is typically excessive throughout long periods of the day while incapable of fully neutralizing the effects of $H_2S$ spikes. The constant dosing strategy also fails to account for shifts in the magnitude of $H_2S$ variations caused by factors including pump operation settings, varying seasonal temperatures and heavy precipitation.

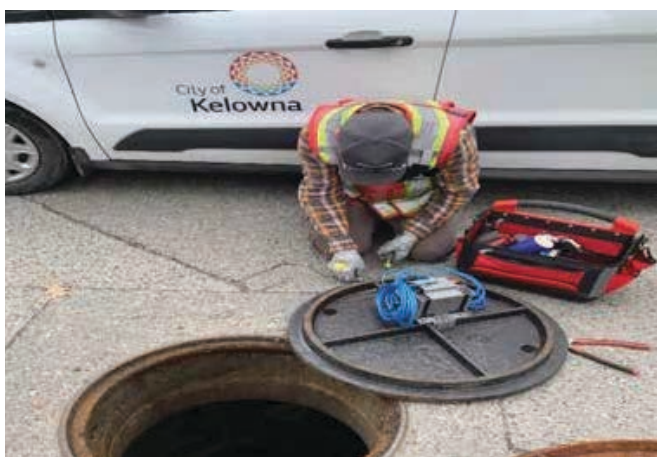
## Savings potential

The real-time $H_2S$ sensor-controlled dosing strategy has reduced overall costs, minimized the impact of corrosion, and reduced the number of odor related complaints – all while using less chemicals that contribute nitrogen to the waste stream. This case has proven that a dynamic, sensor-controlled dosing strategy can enable utilities to optimize the effectiveness of $H_2S$ management activities.

***"Real-time availability of hard data has been a major improvement for closely managing our $H_2S$ levels."***

***-Mike Gosselin, Wastewater***

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