



## GRUNDFOS Hydrogen Sulphide Solution

Grundfos **Hydrogen Sulphide Solution** eliminates hydrogen sulphide problems in a challenging pumping main at Danish water utility company Mariagerfjord Vand A/S, providing **70% savings** on chemicals in the area.

The smell of hydrogen sulphide from a manhole used to be a major problem for Mariagerfjord Vand A/S. The problem was located in a challenging pumping main in the city of Hobro, but a joint project with Grundfos has now solved the problems with smell, corrosion and a hazardous working environment. The operational costs for chemicals have decreased by **70%** in the system. The **Grundfos Hydrogen Sulphide Solution** has lowered chemical costs to approximately **5 cents per cubic metre** of wastewater, and the customers no longer call to complain about the smell on a nearly daily basis.

Until recently, residents in a neighbourhood in the city of Hobro, Denmark, were plagued by the smell of hydrogen sulphide. The odour problem came from manholes outside the city where a pumping main transports wastewater. The production of hydrogen sulphide in the pressurised pipes was so significant that concentrations of up to 500 ppm were measured in the manholes. In addition to the serious odour problems, hydrogen sulphide corrodes the concrete pipes and creates a potentially hazardous working environment for the operational staff.

“Not a day went by without customer complaints, and they were quite justified as it was really bad. Even though we tried adding lots of iron sulphate, we could not solve the problem with hydrogen sulphide”

*Operational Manager  
Brian Frost,  
Mariagerfjord Vand A/S*

### FULLY AUTOMATED SOLUTION MEASURES HYDROGEN SULPHIDE LEVELS

Hydrogen sulphide problems can be hard to predict, which makes them hard to solve. The presence of hydrogen sulphide depends on many factors, including temperature, the composition of the wastewater, and retention time in the pipes, and when and for how long the manhole pump is running. An ideal solution to hydrogen sulphide problems must be based on actual operational conditions in order to deal with this unpredictability, and this is precisely the approach that has led to the Grundfos Hydrogen Sulphide Solution.

The heart of the Grundfos Hydrogen Sulphide Solution is an advanced control algorithm, installed in Grundfos Remote Management (GRM). GRM receives signals from a gas phase logger installed in a manhole. The gas logger performs a measurement once every 15 seconds and sends measurements to GRM. Based on the data received, the solution automatically calculates the correct dosing amount of iron sulphate. The Grundfos Hydrogen Sulphide

Solution algorithm constantly adapts the amount of iron sulphate to the current demand in the pumping main, and the staff at Mariagerfjord Vand A/S no longer need to control dosing manually. GRM warns Brian Frost and his colleagues in case of problems, and the staff can access the internet based system at any time to view operational status and make any necessary adjustments.



*When hydrogen sulphide is detected in the manhole, the Grundfos Hydrogen Sulphide Solution automatically handles the issue.*

# Less smell and corrosion – at 5 cents per cubic metre of wastewater

The Grundfos Hydrogen Sulphide Solution has been in operation at the Hobro pumping station throughout 2015, and the results so far have been very positive. "After installing the Grundfos solution, the smell problem is completely gone. The hydrogen sulphide sensor in Hobro indicates zero, and the complaints have stopped", says Brian Frost.

In addition to greatly improved customer satisfaction, Mariagerfjord Vand A/S has made significant financial gains. The price per cubic metre of treated wastewater has

	Manual solution	Grundfos Hydrogen Sulphide Solution
Annual iron sulphate consumption	3,268 kg	1,032 kg
Annual iron sulphate consumption	EUR 4,128	EUR 1,277
Customer complaints	Daily	None
Dose adjustment	Manual following complaints	Automatically, as needed

dropped to 5 cents with the Grundfos Hydrogen Sulphide Solution (based on an average consumption of 590 ml of liquid iron sulphate per cubic metre of wastewater at the pumping station in 2015, and at a

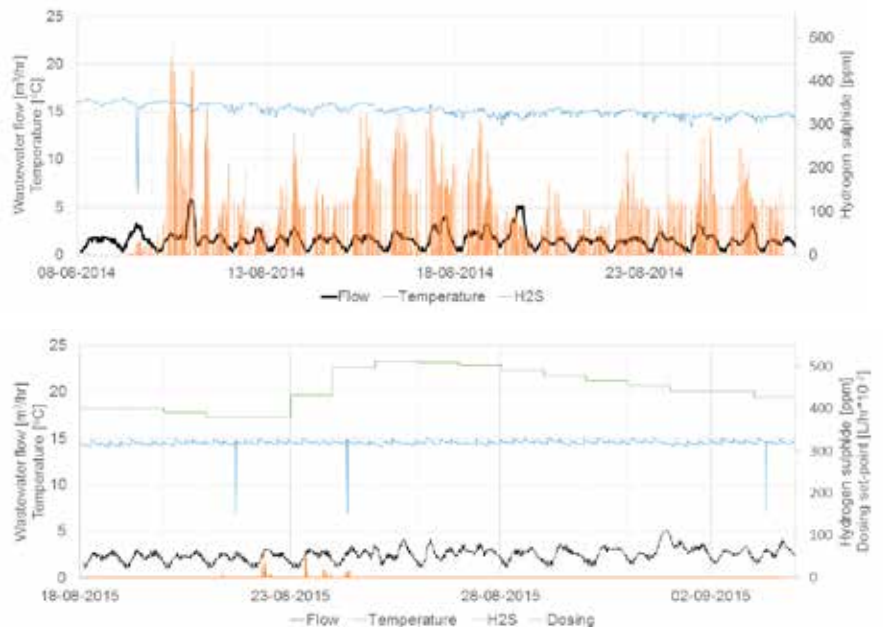
price of EUR 0.06 per kilo of iron sulphate). At Mariagerfjord Vand A/S, the Grundfos Hydrogen Sulphide Solution has resulted in chemical savings of around 70% in the area.

The system is designed to adjust the dosed amount of iron sulphate according to daily and seasonal variations in hydrogen sulphide amounts which have therefore dropped significantly (from up to 500 ppm to 0 with single, isolated deviations of around 50 ppm).

In addition, Mariagerfjord Vand A/S staff no longer need to spend time monitoring the system and manually adjusting the chemical dose to match current demand. This reduces workload in connection with the manhole and saves staff time that can be used for handling other assignments

As an added bonus, Mariagerfjord Vand A/S expects to be able to save money on pipe network maintenance. The greatly reduced amount of hydrogen sulphide means that pumps and pipes do not corrode as quickly as previously and therefore do not need to be replaced quite as often. "The hydrogen sulphide dissolves the lime in our concrete pipes. After installing the Grundfos solution, we expect that it will be a longer time before we need to replace them", says Brian Frost.

The two graphs show how much the hydrogen sulphide problems (shown in orange) were reduced between comparable periods in 2014 and 2015 with the Grundfos Hydrogen Sulphide Solution.



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## GRUNDFOS COMPONENTS IN THE SOLUTION

The Grundfos Hydrogen Sulphide Solution is based on a number of Grundfos components, and the connectivity between these components results in a solution of excellent quality. The unique Grundfos Dedicated Controls makes it possible to calculate the dosed amount with great precision proportionally with system flow. The incredible accuracy of the digital dosing pump means that the calculated amount of chemicals can be dosed with great precision, even with varying flow patterns. The interplay between Dedicated Controls, the dosing pump, and GRM thus provides an efficient and reliable solution that can result in significant savings for the utility company.