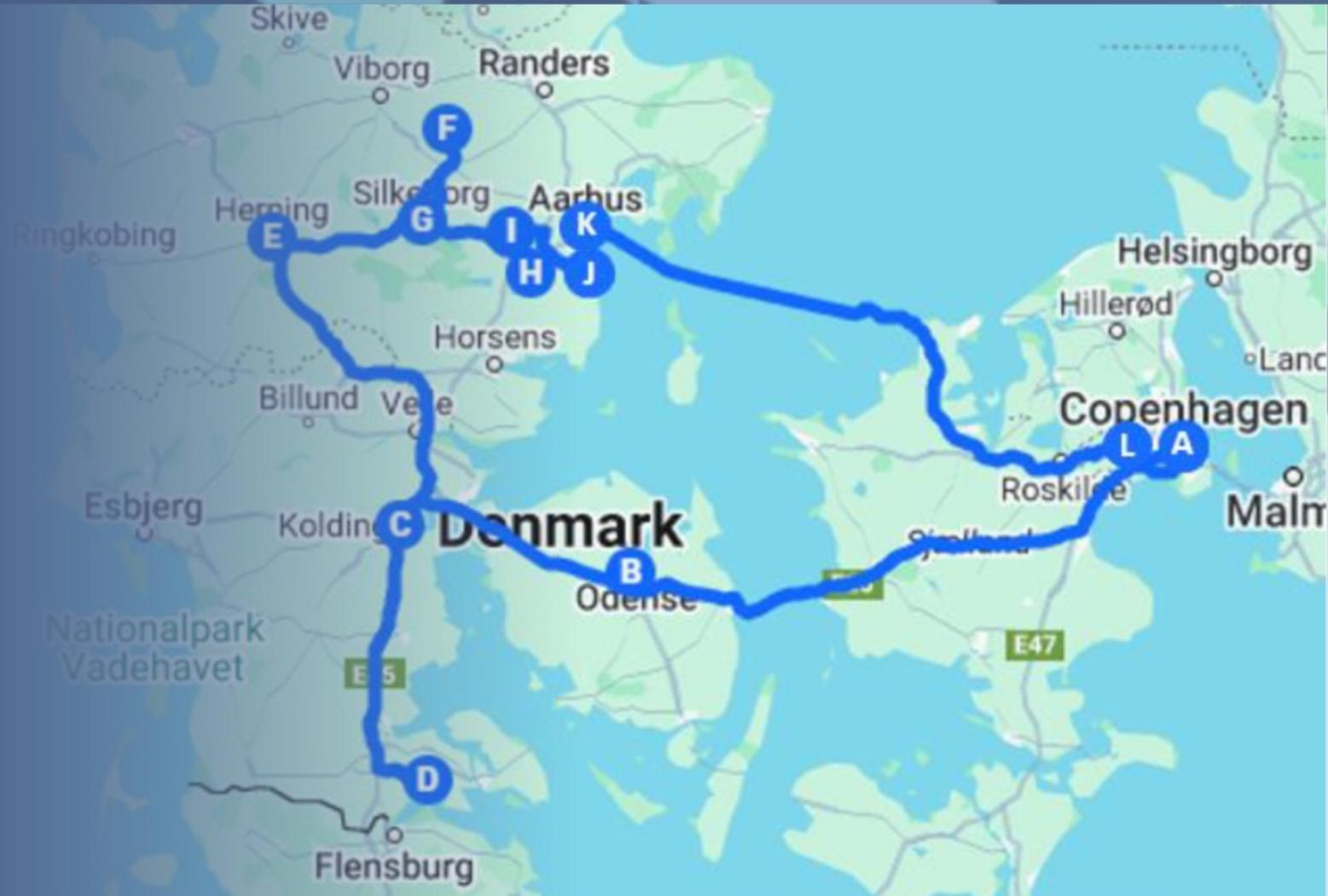




# Innovative Water Solutions from Denmark's Water Technology Alliance

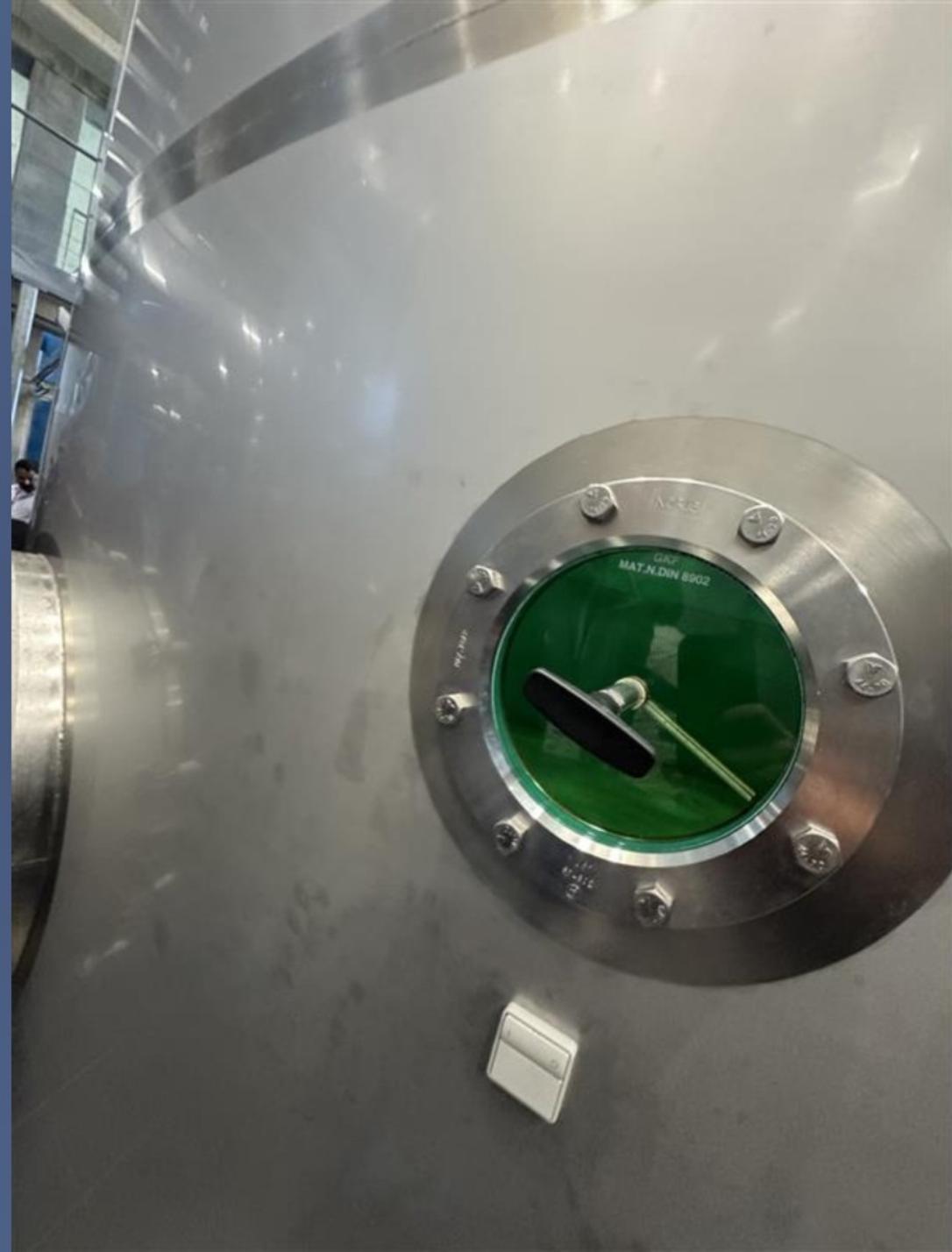
# Trip Overview

During our week-long fact-finding tour across Denmark, we visited leading water utilities, treatment plants, manufacturers, and national water agencies to study real-world innovations in groundwater treatment, pressure management, and smart metering. From Copenhagen to Aarhus, we toured facilities such as Kamstrup, Grundfos, and the Beder Waterworks, we observed chemical-free iron and manganese oxidation, saw fully automated meter production, and met with national water regulators and technology partners. The trip provided a firsthand look at simple, sustainable, and highly efficient systems—many of which align directly with RCSD’s operational challenges and future goals.



# Beder Treatment Facility







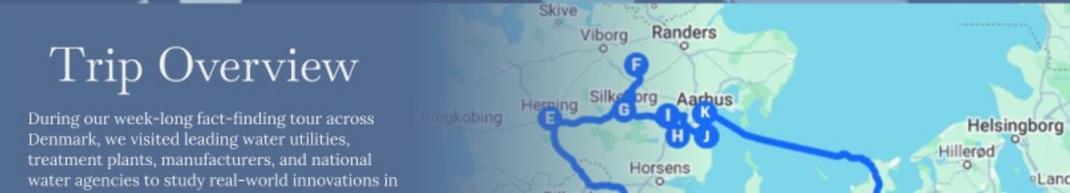
Kamstrup  
Meter Factory



Grundfos Pump Factory



AVK Valves Factory



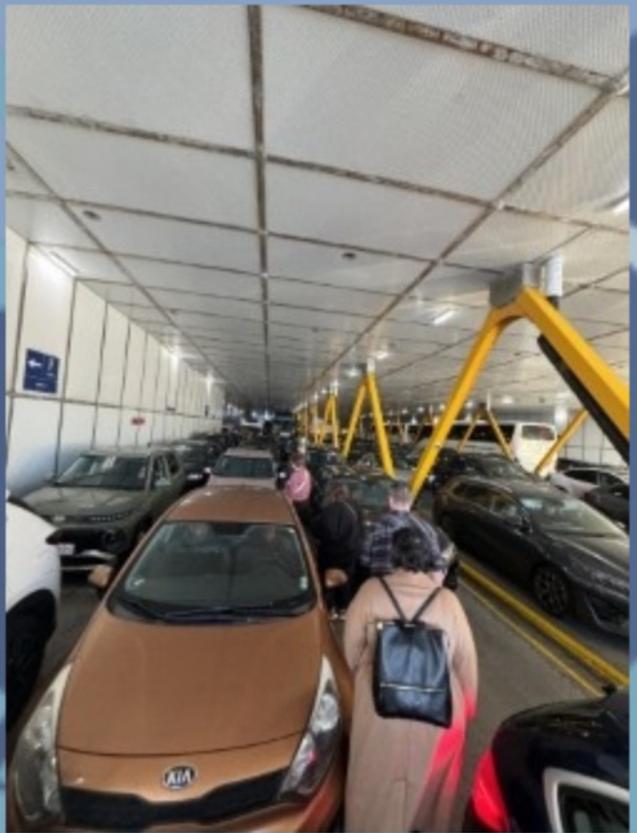
### Trip Overview

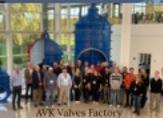
During our week-long fact-finding tour across Denmark, we visited leading water utilities, treatment plants, manufacturers, and national water agencies to study real-world innovations in

Over the five days in Denmark, we also experienced a valuable mix of cultural immersion and professional networking. Between technical site visits, we toured the Hans Christian Andersen house, ate dinner in a historic castle, and traveled by ferry across the ocean. I had the privilege of being partnered with engineers and managers from across the United States, allowing us to exchange operational experiences, compare system challenges, and build relationships that will absolutely benefit RCSD for years to come.









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# Innovative Water Solutions from Denmark's Water Technology Alliance

What are we bringing  
back to RCSD ?



# Beder Water Works Oxygen Treatment

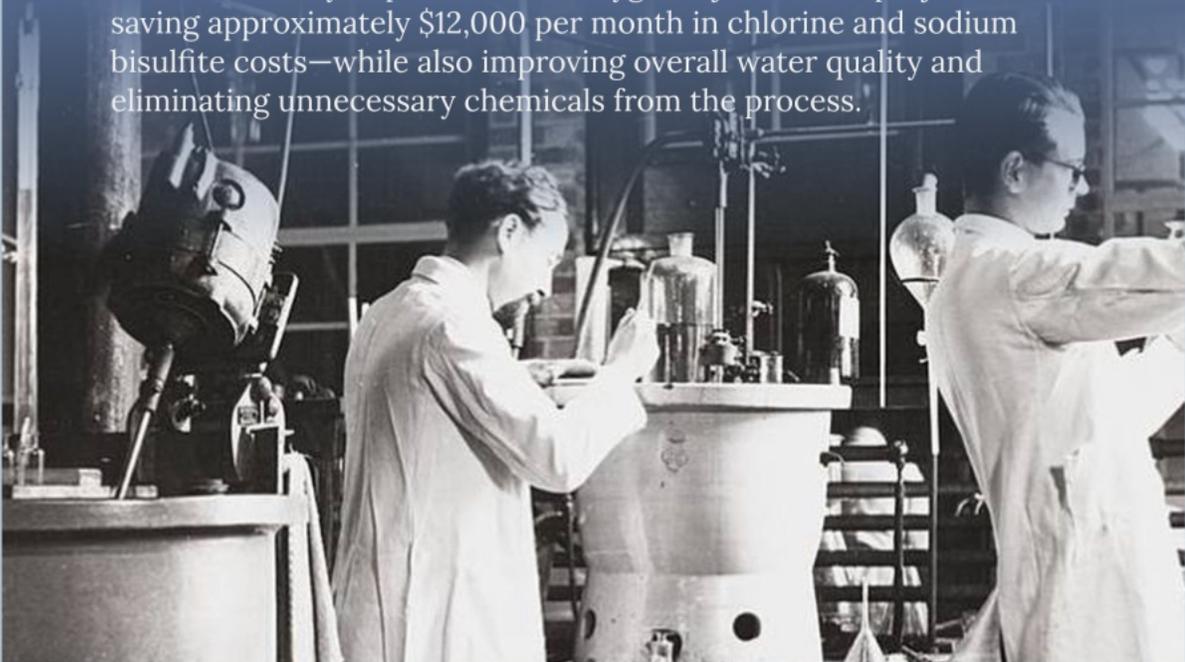
Beder's innovative approach utilizes pure oxygen for the treatment of iron and manganese, avoiding the use of harmful chemicals such as chlorine or bisulfite. This method is particularly relevant for Thompson Plant, which has similar groundwater characteristics, making Beder's solution an ideal fit for effective and safe water treatment.





# RCSD Pilot: Thompson Plant

We are partnering with EUROWATER and the Water Technology Alliance (WTA) to develop a pilot project at the Thompson Plant that will evaluate oxygen-based iron and manganese oxidation. Both organizations have expressed strong interest in helping fund the pilot, especially since there is currently no treatment plant in the United States using this approach. If the pilot is successful and RCSD ultimately implements full oxygen injection, we project saving approximately \$12,000 per month in chlorine and sodium bisulfite costs—while also improving overall water quality and eliminating unnecessary chemicals from the process.



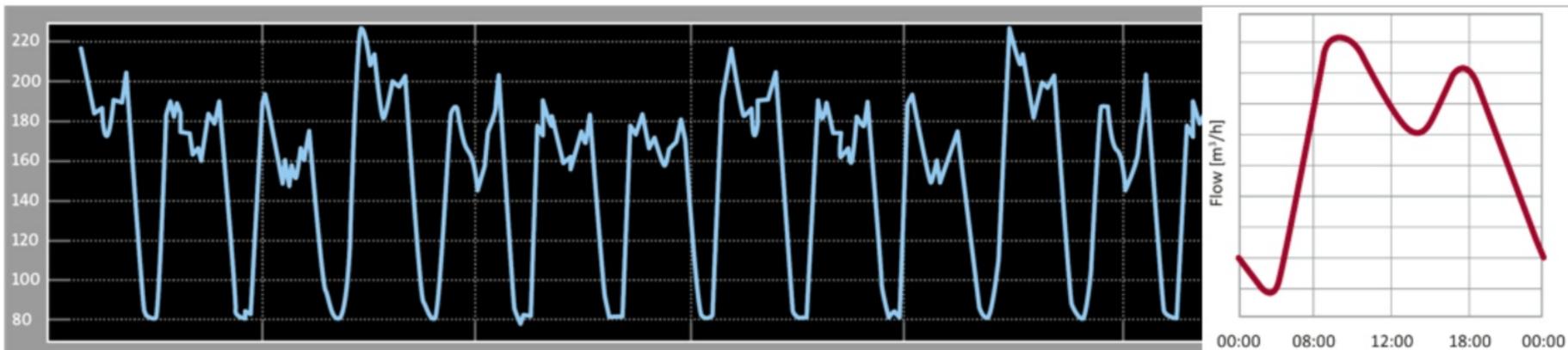
# Grundfos HydroPac Boosters

The Grundfos HydroPac booster system is a machine-learning, high-efficiency pumping solution that actively smooths out pressure fluctuations across the distribution system. By eliminating pressure spikes and water hammer, it reduces stress on our pipelines and helps prevent main breaks before they occur. Since we are not yet prepared to spend \$5 million per year on large-scale pipeline replacement programs, implementing HydroPac technology gives RCSD a reliable, cost-effective way to mitigate breaks and extend pipeline life in the meantime. The system also improves operational efficiency, saves energy, and provides real-time adaptive pressure control — making it an ideal fit for our Golden West Booster Station design and future retrofits.

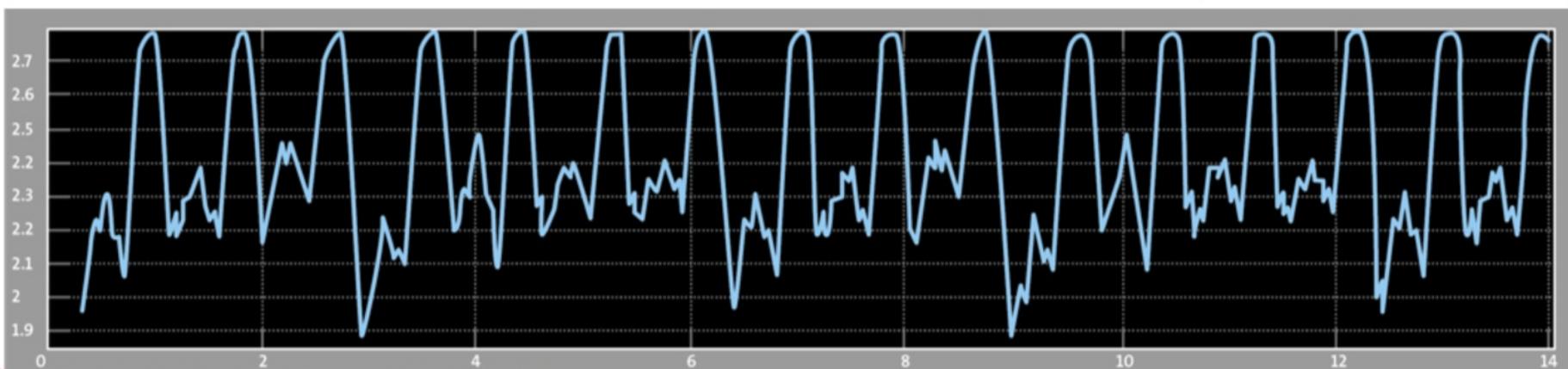


# Before and after 14 days

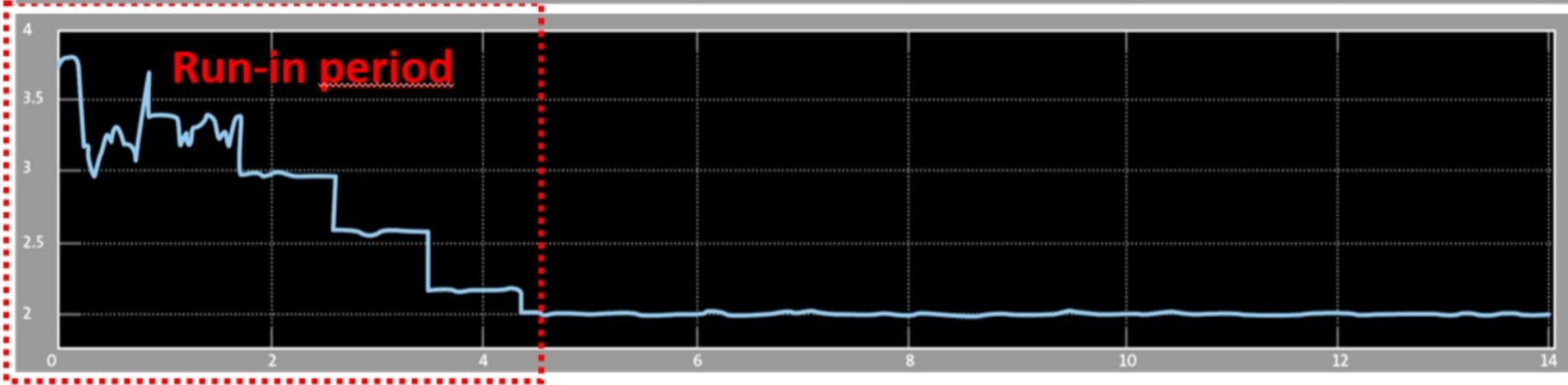
Flow fluctuates during each day.



Remote sensor pressure without DDD



Remote sensor pressure with DDD



# Grundfos Hydro MPC

Integrated Intelligent Pressure Boosting Systems

Boost your Pressure & Confidence!



**GRUNDFOS** 

Possibility in every drop

RCSD Staff has sheduled Demo here at the office on Monday December 8th at 11am if you would like to see the presentation for Inperson

# Kamstrup AMI

Ultrasonic solid-state meters with no moving parts □ long life, stable accuracy

20-year warranty reduces long-term maintenance and replacement costs

High-resolution flow data improves customer service, billing accuracy, and system transparency

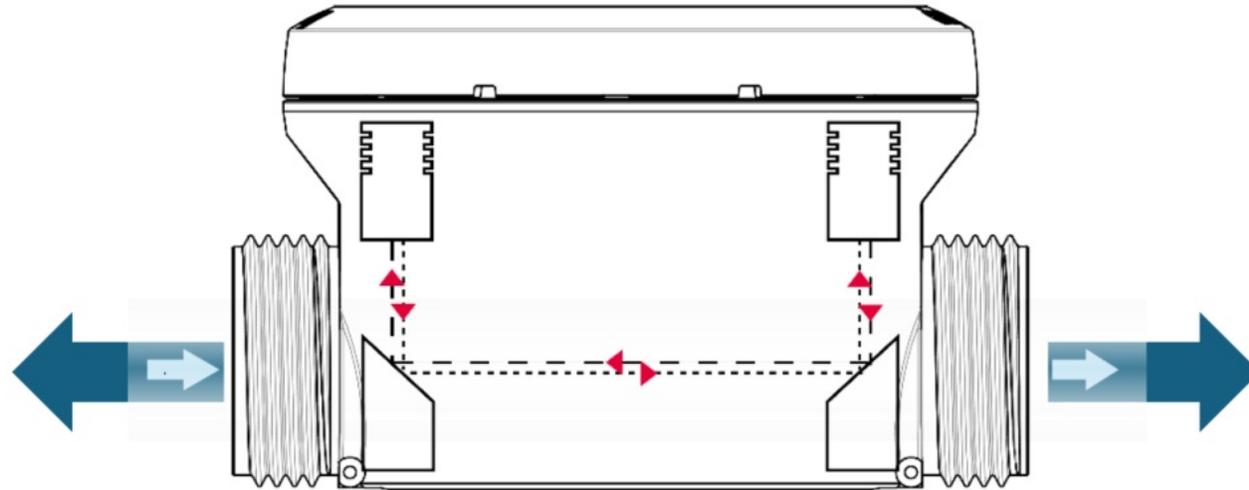
Supports RCSD's goal of reducing system water loss to below 7% by 2028

Built-in acoustic leak detection helps identify hidden leaks and reduce non-revenue water

Strong alignment with California's "Conservation as a Way of Life" regulatory requirements



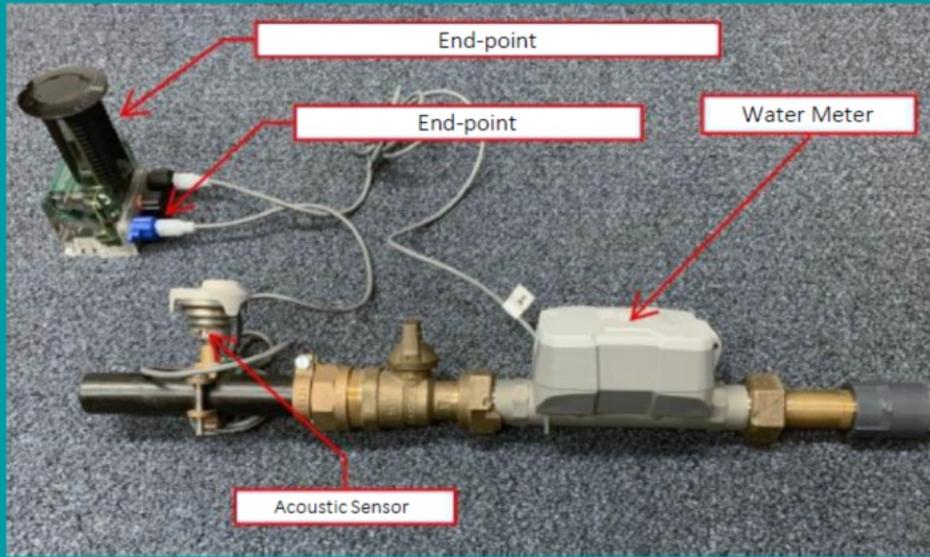
## Acoustic Sensors With The Ultrasonic Measuring Principle



With the integral acoustic sensor, it is possible to measure noise in both directions of the pipe.

The acoustic sensor does not influence the flow measurements at any time.

# Reduced Complexity to Deliver the Future, Today



## Legacy Non-Revenue Water Solutions

**Meter Cost + Radio Cost + Leak Sensor Cost**

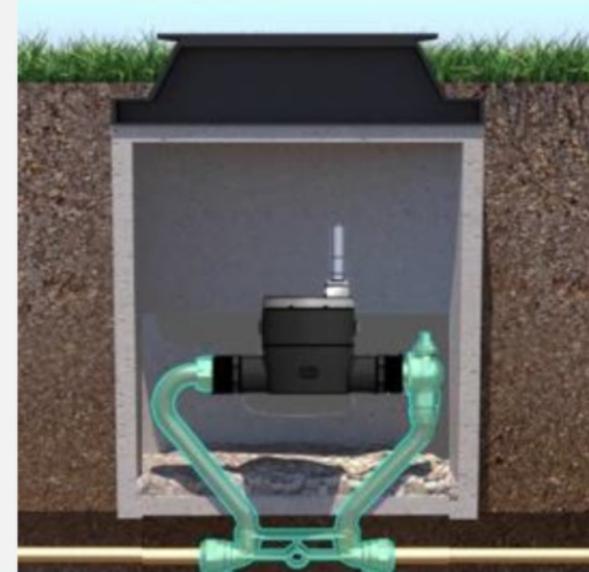
**Meter installation + Radio installation + Leak Sensor installation**

**2 Wires**

**3 Hardware Components to Manage / Troubleshoot**

**3 Different Warranties**

**Unlikely 100% Distribution Coverage**



## flowIQ® 2200 with Embedded Acoustic Leak Detection Built-in

**Just The Meter Cost**

**Just The Meter Installation**

**No Wires**

**1 Hardware Component to Manage / Troubleshoot**

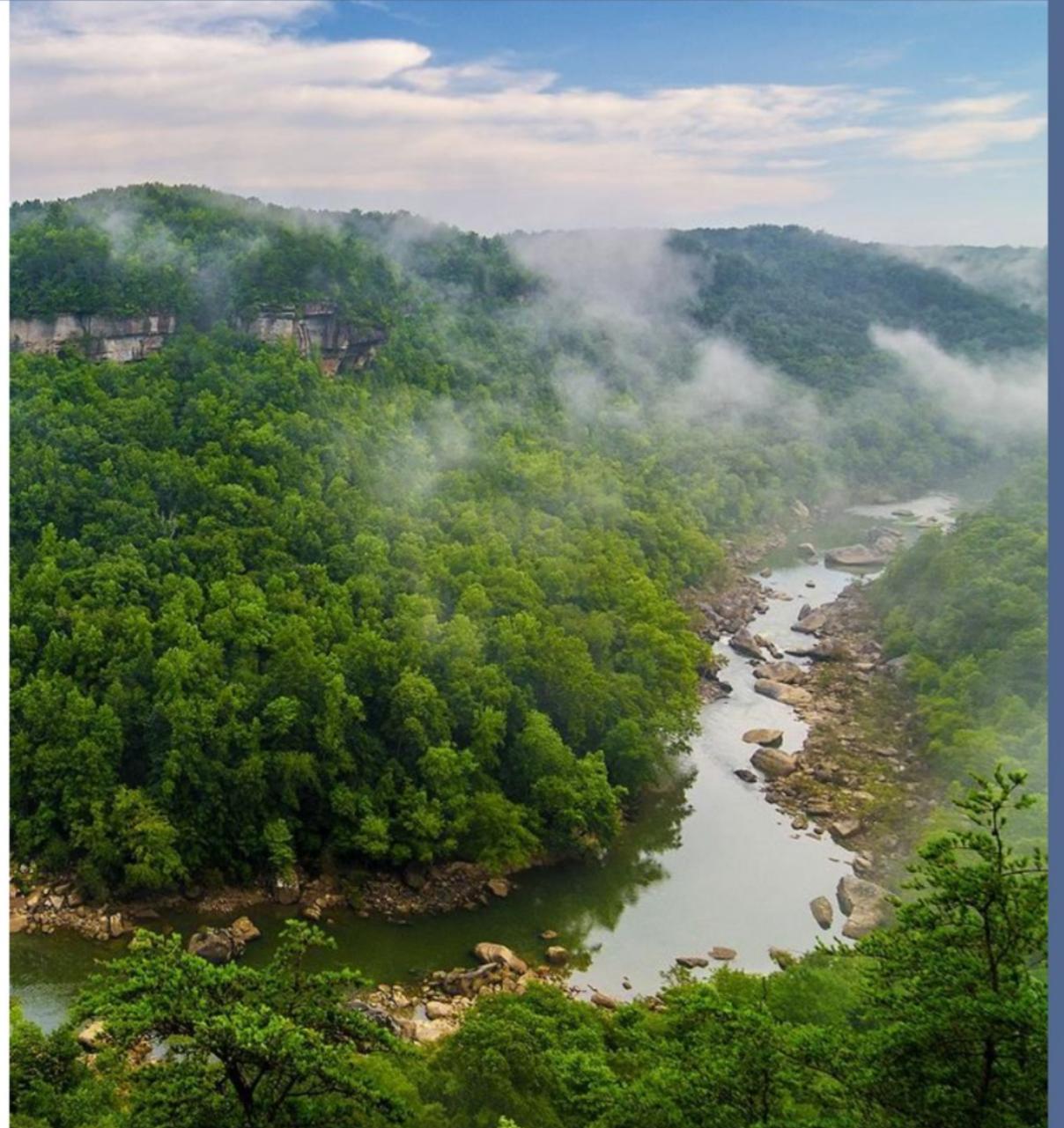
**1 Warranty**

**100% Distribution Coverage**

***IT'S TIME TO KNOW***

## Town of Oneida, TN

- **4,620** AMI / ALD Meters
- **15** Data Collectors
- **118** Square Miles
- **322** Miles of Mainline Pipe
- 6 Month Deployment





## Water Loss at 51%

Oneida Water Department under new management seeing the water **loss at 51%**, chose to go with the new AMI/ALD meter due to its overwhelming accuracy and reliability.

In the first 3 months, Oneida went **from 51% Non-Revenue water loss, down to 28%**.

- Of that, **10.7%** was after the initial total changeout. Which indicates the existing water meters were not registering accurately.
- At the initial Kamstrup meter startup Oneida had **77 meters** that had acoustic sound levels over **100 noise value** indicating possible leaks.



## Cost Savings

During the initial changeout, Oneida's water treatment plant was operating on average around **14-15 hours** per day. 3 months later it was now down to **11-12 hours per day** resulting in even more dramatic **OPEX Savings** in Electricity, Treatment Chemicals, and Man Hours.

### *Fun Fact:*

*A 3 hour per day reduction in water treatment plant runtime equals 1.5 months less runtime (Over 45 WTP Operating Days Saved) in just year one!*

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