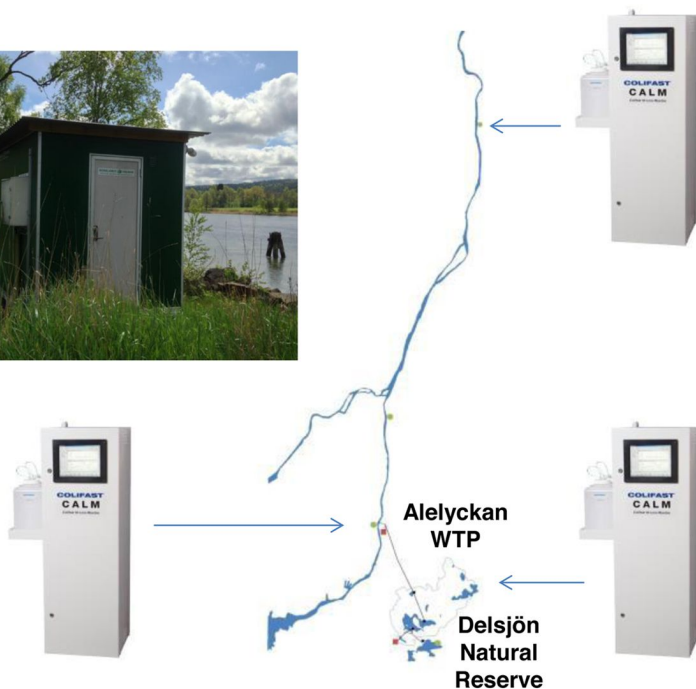


### Application Overview

Three CALM instruments (Colifast At-Line Monitor) continuously monitor Gothenburg's raw water. The analyses are completed in 12 hours and results are directly transferred to the control room at the treatment plant. Water treatment is optimized based on bacteria levels reported by the instruments.

### Technology

The CALM detects and quantifies *E. coli*, thermotolerant coliforms (fecal coliforms) and total coliforms in water. The instrument is fully automated and performs the analysis in shorter time compared to traditional methods. The instrument can run a rapid screening method that takes only 2 hours. For low levels of bacteria the MPN (Most Probable Number) is recommended. MPN analysis takes 12 hours.



### Gothenburg Water

The first CALM was installed here in 2003 and has been running continuously for more than 12 years. The other two were installed in 2005 and 2012. Twice a day the instruments measure *E. coli* using an MPN technique (Most Probable Number).

If the reported bacteria level in the river exceeds a certain level this leads to closing of the raw water intake on the river and switching to the Delsjön reservoir. The river intake is closed numerous times each year due to increased *E. coli* levels reported by the CALM. In 2008 the number of times the intake was closed was 51, which corresponds to 2,712 hours (31% of the year)<sup>1</sup>.

<sup>1</sup>[Svenskt Vatten No. 2010-13](#)

