

Case Study: Innovative Kuntze Analyzers Save \$16,350 Operation Expenses Per Year in an Alberta Surface Drinking Water System

Background Information

A public surface drinking water system (DWS) located in Alberta, Canada operates two level 2 drinking water treatment plants, one level 3 drinking water treatment plant, and three drinking water storage systems. The DWS used both a membrane-covered amperometric sensor and an on-line colorimetric sensor to control and monitor free chlorine residual levels in their drinking water systems.



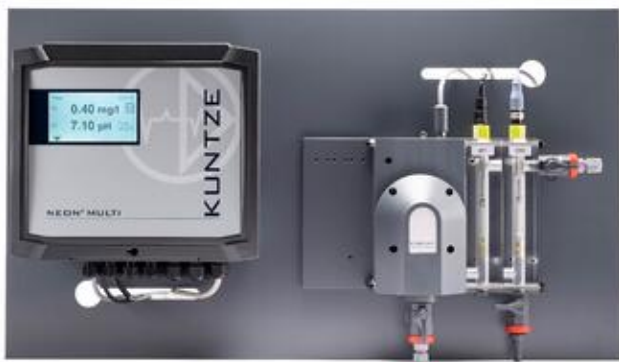
Challenge

Both analyzer systems required significant preventative maintenance, the need for replacements parts, and the purchase of consumables. The DWS was also concerned that the measurements of the membrane-covered amperometric sensor would be influenced by bubbles, which occurred frequently in their system.

Kuntze Solution

ClearTech suggested the installations of Kuntze Krypton® Multi analyzers to measure and control the disinfectant residuals. The DWS agreed to trial the Kuntze analyzer and installed it at the distribution system header right next to the existing membrane sensor. The Krypton® Multi system also featured Kuntze's patented ASR® automatic sensor cleaning technology, which was set-up for automatic cleaning once per week to prevent the sensor from fouling. The membrane sensor of the competitive system was manually cleaned once per month.

The trial was conducted for one month in September 2020. The operators used a handheld colorimeter taking manual DPD reference measurements five days per week. The free chlorine residual target range was 1.0 to 1.5 ppm, and the reference measurements were compared with the readings of both the Krypton® Multi system and the analyzer with the membrane sensor.



Results

While both analyzers were able to stay in the residual target range, the Krypton® Multi system had on average less deviation from the reference measurements providing more accurate readings.

Conclusions

Recently the DWS replaced two on-line colorimetric analyzers with two Kuntze Krypton® DIS analyzers at one of their 750 cubic meter storage tanks to measure the free chlorine residuals at the inlet and discharge points. The DWS reported following reasons for their decision:

- > **Reduced installation** and start-up time - commissioning is much easier and faster due to the plug-and-play nature of the Kuntze analyzer

- > **Reduced waste** - sampling water can be returned into the well water storage tank, eliminating the need to discharge the sampling water of the on-line colorimetric analyzer to a sanitary sewer (4 m³/day or 1,500,000 liters/year). This water system purchases the water from another municipality at a rate of \$3.15/m³; savings of \$4,725 per analyzer per year.

- > **Increased safety** - no reagents are needed to create the measurement; savings of \$1,920 per year per analyzer

- > **Reduced maintenance time** - elimination of internal preventative maintenance service hours and external analyzer recertification – total savings/year = \$1,530 per analyzer

 - >> Monthly manual sensor cleaning (10-12 operator hour savings/year - \$330/unit)

 - >> Annual recertification of analyzer by manufacturer (\$1,200/unit)

The Kuntze Krypton® Multi system became the preferred technology to monitor and control the free chlorine residuals while significantly reducing the preventative maintenance requirements. The Krypton® Multi system requires no consumables or reagents generating significant cost savings for the drinking water system. Replacing the two on-line colorimetric analyzers with the two Kuntze Krypton® DIS analyzers has generated total savings of **\$16,350 per year**.

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