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Vienna Water counts on s::can for more than 20 years

Drinking Water Monitoring

Compared to other world cities, the municipality of Vienna invested in the sustainable protection of its spring waters at a very early stage. Spectrometer probes from s::can GmbH have been used since 2001. Today 70 systems continuously monitor the water quality in real-time.

Customer:

City of Vienna | Vienna Water

Parameters monitored:

- Turbidity
- SAC 254
- UVT
- Nitrate
- TOC
- DOC
- spectral fingerprint
- Conductivity
- Temperature

Facts & Figures

Company:
Vienna Water

Location:
Vienna, Austria

Application:
Drinking Water

Key Products installed:
spectro::lyser, con::cube, i::scan, con::lyte

Background

Most of the drinking water for Vienna's 1.9 million inhabitants is supplied from several mountain springs located in the Lower Austrian-Styrian Alps more than 100 km away from the city.

In general, the water from these springs is of very high quality. Yet because they lie in geological regions consisting of karstic formations, natural events such as very heavy rainfalls can cause rapid fluctuations of raw water quality, especially in turbidity, but also elevated concentrations of dissolved organic substances can occur. Furthermore, anthropogenic events like accidents in neighboring areas of the springs might affect the quality of the raw water.

Challenge

The raw water from the springs becomes drinking water after transport by gravity over two support lines (HQI and HQII). So to ensure excellent water quality, early warning and event detection is crucial at all times

Before 2001, the main springs and important positions in the main pipes were monitored with cabinet analyzers. Those needed separate housing, consisting of power supply, pipe installations and special foundations to be built. Due to the high costs of this and the remote location of the springs the setup of a broader monitoring network covering all essential springs was nearly impossible.

s::can's solution

In 2001 twelve s::can spectrometer probes were operated simultaneously to the existing cabinet analyzers as a test run. In total readings of more than 18 months were analyzed which proofed the measuring performance and long-term stabilityw of the spectrometer probes. The parameters measured include Turbidity, UV254, UVT, Nitrate, TOC, DOC, spectral fingerprint, Temperature and Conductivity.

Over the years additional systems were installed and today 60 spectrometer probes are in operation. Additionally, 10 nano::stations with i::scans were installed in front of UV disinfection facilities located at smaller springs. s::can is providing 24/7 maintenance assistance to Vienna Water Works formalized by a yearly maintenance framework agreement.

Benefits

The s::can systems provide continuous 24-hour monitoring of the raw water. In the case of an abnormal event, like for example elevated turbidity levels after heavy rain falls, the water is simply discharged into one of the rivers flowing from the moutains and not used for drinking water production.

Because the spectrometer probes require virtually no regular maintenance they can be operated in remote locations with limited access and the operating costs are very low.

"The online s::can spectrometers provide us with in-depth data and real-time alarms, if the water quality changes. This enables us to react extremely fast in the case of events and to always provide drinking water of the highest quality to the population."

Vienna Water

Vienna Water Supply – Overview

Grafic by Vienna Water, modified by s::can
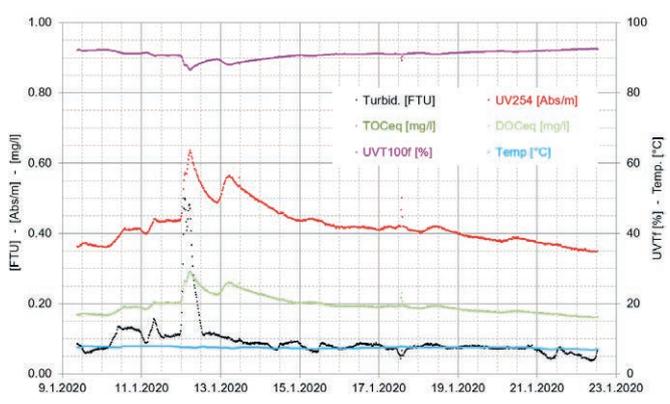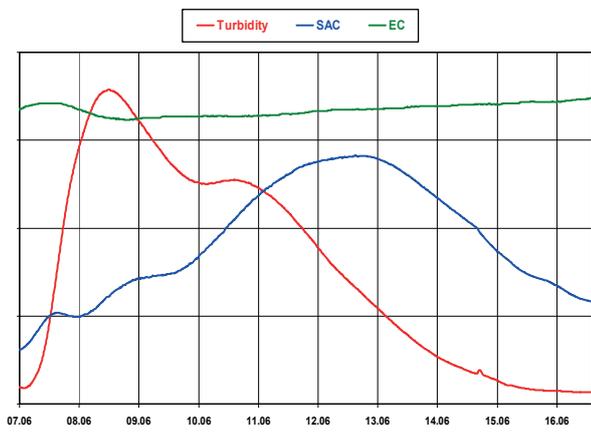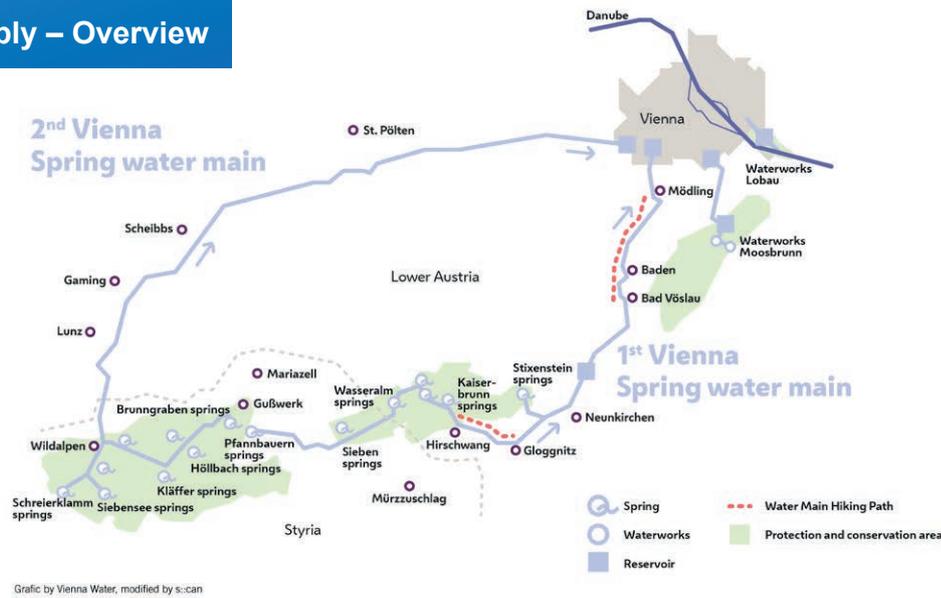
The diagram shows the relationship between Turbidity and TOC in spring water. Elevated Turbidity is followed by elevated TOC during a heavy rainfall event. No significant change in conductivity was observed.

The time series above shows i::scan measurement data of raw water. The increase in Turbidity and Organics around 12.1.2020 was due to an event with heavy rainfalls.

The s::can spectro::lyser™ is a fully submersible UV/Vis spectrophotometer which measures light absorbance between 190 – 750 nm. s::can's proprietary algorithms analyze and decompose the spectral data to provide measurements for many water quality parameters. There are no moving parts in contact with the water and no reagents are used, resulting in almost zero operating costs.

The i::scan is an optical online probe that uses a LED light source and can measure up to eight parameters simultaneously.
Parameters that can be measured accurately include Turbidity, TSS, COD, TOC, DOC, Color and UV254.
Due to the use of multiple wavelengths, cross-sensitivities can be automatically compensated.

con::cube - a compact, versatile terminal for data acquisition and station control. Newest processor technology and very flexible options for interfacing to SCADA or any central database systems makes the con::cube in combination with moni::tool a powerful terminal for compact station control.