

IRELAND WATER TREATMENT PLANTS

Case Study

LOCATION:

300 sites
across Ireland

SOURCE TYPE:

Surface Water

PARAMETERS:

UV254, NOM

APPLICATION(S):

Source Water Monitoring,
Coagulation Optimization,
DBP Reduction,
UV Disinfection

SYSTEM:

Real UV254 Online Analyzers
with Real Clean Systems



**300
INSTALLATIONS
ACROSS IRELAND**



IMPROVING PROCESS CONTROL BY MONITORING ORGANICS IN SOURCE WATER

Background

With over 300 installations across Ireland, Real Tech in partnership with Glan Agua, are helping to improve process control and drinking water quality. Simple and affordable real-time UV254 organics analyzers from Real Tech are enabling plants to rapidly detect organic fluctuations in raw water and take action to ensure effective removal is achieved.

UV254 provides one of the best indicators of a water's potential to form disinfection by-products (DBPs) and should be monitored at treatment plants that are susceptible to elevated concentrations of organic matter in raw water. This is due to the fact that most naturally occurring organic matter (NOM), such as humic substances that are aromatic in nature, absorb strongly at 254 nm. These reactive organic compounds are known to be a major precursor of DBPs such as trihalomethanes (THMs) and halo acetic acids (HAAs).

Organic concentration, specifically in surface water, can change quickly posing challenges for treatment plants. Implementing a source water monitoring strategy that includes UV254 has enabled many plants across Ireland to detect raw water organics events rapidly, optimize treatment processes and protect public health from DBPs.

Moving from Grab Sampling to Real-Time Analysis

Prior to installation of Real Tech's UV254 analyzers, many of the drinking water plants measured turbidity and colour with supplemental grab sampling for organics in raw water. Rapid changes are often not captured or assessed adequately with grab sampling, therefore continuous organics monitoring that would produce data at a greater frequency was essential. The UV254 analyzers provide various benefits to the treatment plants including raw water event monitoring and aiding with control of the coagulation process to enhance or optimize organics removal. Reducing the concentration of organics helps to limit DBP formation and increases disinfection efficiency, particularly for UV disinfection systems.

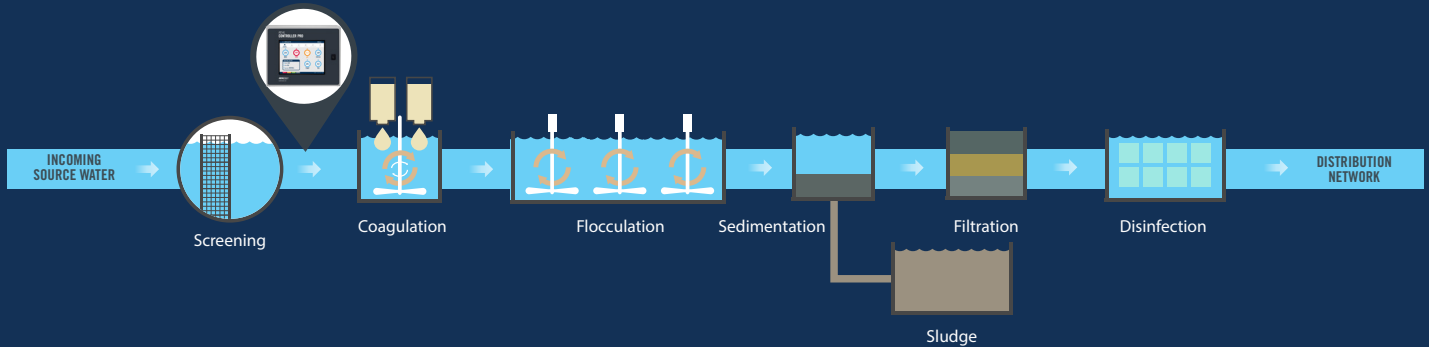


Figure 2: The typical installation point for raw water quality monitoring at a conventional drinking water treatment plant. Real Tech's dual feed upgrade allows for monitoring at two locations within the plant with a single UV254 analyzer.

In addition to event detection and improving plant efficiencies, UV254 data is also collected from numerous facilities across Ireland to observe and capture longer term trends in raw water organics concentration that will allow the utilities to anticipate and plan for future treatment needs.

Spotlight: UV254 Coagulation Control at Burncourt WTP

The Burncourt Water Treatment Plant in Co. Tipperary in Ireland is an example of a plant that manages a challenging raw water source from an extremely reactive catchment. Significant deterioration of water quality can occur in a matter of hours during and after storm events. The need to respond to these events faster prompted Glan Agua to develop an innovative automatic coagulant control system. The system relies on Real Tech's UV254 analyzer to provide accurate and reliable measurements of organics to control coagulant dose.

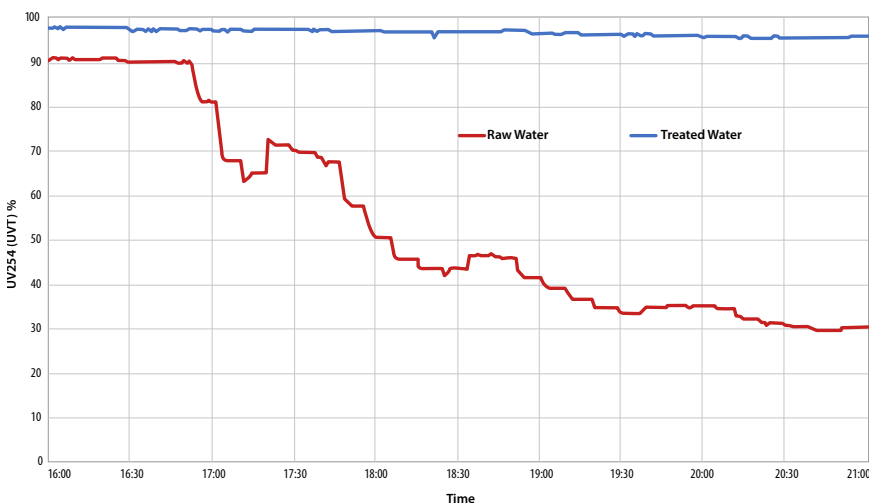


Figure 3: Data from Real Tech's dual feed UV254 analyzer. UV transmittance (UVT%) readings from raw water (red) compared to treated water (blue) visualize treatment efficiency for operators.

Specific data sets were established for varying raw water UV254 and coagulant dose rates. This UV254 to coagulant correlation data set was input into the coagulation controller to allow for predictive automated dosing of coagulant in response to varying raw water conditions. Figure 3 shows measurement from Real Tech's UV254 analyzer with dual feed upgrade that displays rapid water quality deterioration in red with consistent finished water quality in blue.

The automated system, driven by real-time UV254 data, consistently produced high quality treated water throughout raw water events with little manual intervention required. In addition, the system reduces coagulant dose rate as raw water quality improves, thus saving operational costs on chemicals.