



Introduction

Monitoring and control technologies are indispensable for the production of safe drinking water. They allow for the surveillance of source water, the permanent control of the treatment processes, and they safeguard the high quality of finished water. Furthermore, appropriate analytical techniques are indispensable for the detection of changes in water quality during distribution and for monitoring drinking water quality at consumers' tap. Reliable monitoring technologies contribute to a large extent to the consumers' trust in a high drinking water quality.

Importance

The major objective of WA 3 is to provide a set of analytical techniques and methods that ensure the provision of safe high quality drinking water that has the trust of the consumers. In WP 3.1 existing monitoring technologies will be evaluated according to their suitability for application in controlling water quality in the whole drinking water production process. Evaluation criteria will not only be analytical parameters like sensitivity or reproducibility but will include criteria like ease-of-use, robustness, maintenance, and costs.

Approach

This first WP 3.1 report handles about different locations and purposes in which monitoring and control technologies need to be applied and the respective biological and chemical water quality parameters that provide essential information for water suppliers. It creates the basis for the inventory and evaluation of available analytical techniques that will be conducted during the second 18 months of the TECHNEAU project.

Result

The results are an easy-reference document stating the key-parameters for the selected purposes. The following purposes for water quality monitoring are considered:

- Catchment characterisation
- Source water characterisation

- Performance of treatment technologies
- Overall treatment effect/water quality status (before entering distribution network)
- Detection of quality changes during distribution
- Monitoring of water quality at consumers' tap

For each purpose tables with selected microbiological and chemical key-parameters are presented, together with the criteria for selection.

Criteria for selection were:

- A. Health-related parameter
- B. Parameter listed in EU Drinking Water Directive 98/83/EC (DWD).
- C. Parameter for process control
- D. Aesthetic parameter
- E. Early-warning parameter
- F. Emerging water quality parameter (usually not new parameters, but recently emerged as being of interest).

At the end of the report all tables have been combined into one major monitoring table for all purposes.

More information

More information can be found in the report covering D3.1.1 & D3.1.2:

Monitoring and control of drinking water quality. Selection of key-parameters by Margreet Mons (Kiwa Water Research), Beate Hambsch (TZW) and Frank Sacher (TZW).

Contact person: Margreet Mons, +31 30 606 96 57, Margreet.mons@kiwa.nl

TKI Categorisation

| Classification | | | | | |
|------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------|--------------------------------------|
| Supply Chain | Process Chain | Process Chain (cont'd) | Water Quality | Water Quantity (cont'd) | |
| Source | Raw water storage | Sludge treatment | Legislation/regulation | - Leakage | |
| - Catchment | - Supply reservoir | - Settlement | - Raw water (source) | - Recycle | |
| - Groundwater | - Bankside storage | - Thickening | - Treated water | | |
| - Surface water | Pretreatment | - Dewatering | Chemical | X | |
| - Spring water | - Screening | - Disposal | - Organic compounds | | |
| - Storm water | - Microstraining | Chemical dosing | - Inorganic compounds | | |
| - Brackish/seawater | Primary treatment | - pH adjustment | - Disinfection by-products | | |
| - Wastewater | - Sedimentation | - Coagulant | - Corrosion | | |
| Raw water storage | - Rapid filtration | - Polyelectrolyte | - Scaling | | |
| - Supply reservoir | - Slow sand filtration | - Disinfectant | - Chlorine decay | | |
| - Bankside storage | - Bank filtration | - Lead/plumbosolvency | Microbiological | X | |
| Water treatment | - Dune infiltration | Control/instrumentation | - Viruses | | Consumers / Risk |
| - Pretreatment | Secondary treatment | - Flow | - Parasites | | |
| - Primary treatment | - Coagulation/flocculation | - Pressure | - Bacteria | | Trust |
| - Secondary treatment | - Sedimentation | - pH | - Fungi | | - In water safety/quality |
| - Sludge treatment | - Filtration | - Chlorine | Aesthetic | X | - In security of supply |
| Treated water storage | - Dissolved air flotation(DAF) | - Dosing | - Hardness / alkalinity | | - In suppliers |
| - Service reservoir | - Ion exchange | - Telemetry | - pH | | - In regulations and regulators |
| Distribution | - Membrane treatment | Analysis | - Turbidity | | Willingness-to-pay/acceptance |
| - Pumps | - Adsorption | - Chemical | - Colour | | - For safety |
| - Supply pipe / main | - Disinfection | - Microbiological | - Taste | | - For improved taste/odour |
| Tap (Customer) | - Dechlorination | - Physical | - Odour | | - For infrastructure |
| - Supply (service) pipe | Treated water storage | | | | - For security of supply |

| | | | | | | |
|---------------------|--|------------------------|--|--|--------------------------|----------------------------|
| - Internal plumbing | | - Service reservoir | | | Water Quantity | Risk Communication |
| - Internal storage | | Distribution | | | | - Communication strategies |
| | | - Disinfection | | | Source | - Potential pitfalls |
| | | - Lead/plumbosolvency | | | - Source management | - Proven techniques |
| | | - Manganese control | | | - Alternative source(s) | |
| | | - Biofilm control | | | Management | |
| | | Tap (Customer) | | | - Water balance | |
| | | - Point-of-entry (POE) | | | - Demand/supply trend(s) | |
| | | - Point-of-use (POU) | | | - Demand reduction | |

TKI Categorisation (continued)

| Contains | | Constraints | | Meta data | | | |
|----------------------------|---|-----------------------------|--|--|---|---|--|
| Report | X | Low cost | | <i>Author(s)</i> | X | Margreet Mons (Kiwa Water Research) Beate Hamsch (TZW) Frank Sacher (TZW) | |
| Database | | Simple technology | | <i>Organisation(s)</i> | | | |
| Spreadsheet | | No/low skill requirement | | <i>Contact name</i> | | Margreet Mons | |
| Model | | No/low energy requirement | | <i>Contact email</i> | | Margreet.mons@kiwa.nl | |
| Research | | No/low chemical requirement | | <i>Quality controller name</i> | | All WA3 partners | |
| Literature review | | No/low sludge production | | <i>Quality controller organisation</i> | | | |
| Trend analysis | | Rural location | | <i>Source</i> | | | |
| Case study / demonstration | | Developing world location | | <i>Date prepared</i> | | February 2007 | |
| Financial / organisational | | | | <i>Date submitted (TKI)</i> | | | |
| Methodology | | | | <i>Date revised (TKI)</i> | | | |
| Legislation / regulation | | | | | | | |
| Benchmarking | | | | | | | |

