

# A statistical tool for water quality monitoring

## WLN

Since 30 years WLN safeguards the quality of drinking water in Groningen and Drente. By using chemical, biological and technological research protects the quality of the drinking water that water company Groningen and water transportation company Drente provide. Quality control is essential for WLN.

## Background

Measuring the quality of drinking water is WLN's core business. A large number of parameters is measured during the different stages of the production of drinking water. Nowadays this is usually done on-line, that is, by taking water proofs and performing quality analysis in a laboratory.

The monitoring is partly prescribed by law, but allows some freedom for the company, such as how to implement the different steps in monitoring the water. The purpose of monitoring is to obtain a clear picture of how well each of the elements in water purification function. Different water quality parameters, such as the concentration of Fe, ammonia, and oxygen and the water turbidity, are being measured during the different stages of water purification.

The monitoring frequency is important for obtaining a good idea of the water quality. At the moment this frequency is determined from expert judgement. WLN would like to rationalize this decision and obtain a way to find a *critical monitoring frequency*. By this we mean the *minimal frequency* of measurements that must be available in order to obtain a *good representation* of the water quality. For example, if the parameters are measured many times a very good representation of the water quality will be obtained, but at high costs. Measuring 10 times a year is much cheaper, but this will probably not allow a good representation of the water quality to be deduced for all times. The critical monitoring frequency depends on the variation of the water quality in time and on the process technological value associated with the varying parameter. Large amounts of historical data are available from which variations in the water quality can be determined.

## Question for the studygroup:

How can the critical monitoring frequency be determined for a specific water quality parameter at a certain stage in the water purification process ?