

MSc research

Subject

WRK I/II redesign

Introduction

The river Rhine is an important raw water source for drinking water production and industrial water production: river Rhine water is used by the drinking water companies Waternet and PWN, and by the industries Tata Steel (steel mill) and Crown van Gelder (paper mill). The river Rhine water is pretreated in Nieuwegein by a conventional treatment coagulation – sedimentation – rapid sand filtration, the so called “WRK” treatment. After pretreatment the water is transported to the drinking water companies Waternet and PWN for post treatment (Leiduin) and to the industries in the northern part of the Netherlands. The transport infrastructure is shown in figure 1.

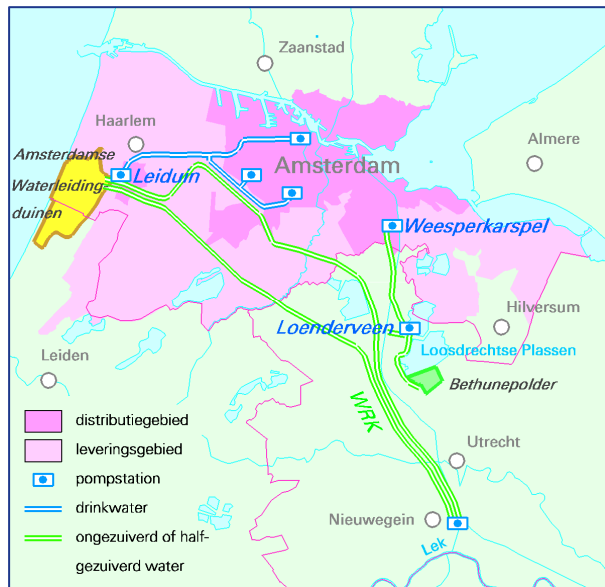


Figure 1. WRK pretreatment in Nieuwegein and transport infrastructure

The pretreatment “WRK I” originates from 1954, the pretreatment “WRK II” originates from 1962. The total capacity of WRK I and II is 150 million m³/year. The actual production is lower. Although the pretreatment functions very well, despite its age, it is necessary to reconsider the design and necessary to develop alternatives for the pretreatment coagulation – sedimentation – rapid sand filtration.

Objectives and approach

The objective of the research is to develop alternatives for the existing pretreatment, which can compete with the existing pretreatment on quality, sustainability (energy and residuals) and costs. Alternatives to consider are a.o. dynamic sand filtration and membrane filtration (microfiltration, ultrafiltration).

Expected results

The research should result in a design of a pretreatment plant including a cost comparison and sustainability evaluation with the existing pretreatment.

Supervision and support

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