

# Assessment of *Cryptosporidium* in wastewater reuse for drinking water purposes: A case study for the city of Amsterdam, The Netherlands

LC Rietveld<sup>1\*</sup>, L Meijer<sup>2</sup>, PWMH Smeets<sup>3</sup> and JP van der Hoek<sup>4</sup>

<sup>1</sup> Delft University of Technology, Department of Water Management, PO Box 5048, 2600 GA Delft, The Netherlands

<sup>2</sup>Evides, PO Box 4472, 3006 AL Rotterdam, The Netherlands

<sup>3</sup>KWR, Groningenhaven 7, 3422 PE Nieuwegein, The Netherlands

<sup>4</sup>Waternet, PO Box 94370, 1090 GJ Amsterdam, The Netherlands

## Abstract

Wastewater reuse is becoming increasingly important for supplementing drinking water supply needs and/or to reduce costs in many communities around the world. However, wastewater reuse can result in a potential transmission route for infectious agents. Therefore, the occurrence of *Cryptosporidium* was assessed in a treatment plant geared for the production of drinking water from wastewater effluent and the results were compared to those on an existing typical drinking water treatment plant operated by Waternet, the water cycle company of Amsterdam, The Netherlands, and its surrounding areas. The assessment was done using Monte-Carlo simulation and probability density functions to determine the occurrence of *Cryptosporidium* in raw surface water and wastewater effluent and the removal in different treatment steps. From the research conducted, it was concluded that under normal conditions, drinking water that meets Dutch drinking water quality standards could also be produced from treated wastewater effluent. However, additional redundancy should be built in to meet the standards under extreme operating conditions.

**Keywords:** risk assessment, wastewater reuse, drinking water treatment