Water Industry Operators Association of Australia

Submission of Abstract

Platform or Poster: Platform Paper

Title of Abstract:

A Clean Slate: Novel Chemical Cleaning to Recover Water Filtration Membranes

Abstract:

The Tea Gardens water supply scheme sources water from the Viney Creek aquifer. The aquifer water source is considered good quality with low turbidity, pathogens and chemical contaminants of health concern. The aquifer, however, naturally contains elevated levels of soluble iron. Iron is removed at Tea Gardens Water Treatment Plant (WTP) through a combination of pH adjustment, aeration and membrane filtration.

The membranes at Tea Gardens WTP have been operating since 2013. Regular backwashing with citric acid through extended flux maintenance and Clean in Place (CIPs) have been relatively effective at maintaining membrane performance measures, such as specific flux and transmembrane pressure. In 2021 however, a notable drop specific flux was observed, with several adjustments to CIP cleans unable to recover performance.

Council undertook a membrane autopsy, including thermogravimetric analysis and Fourier transform infrared with energy-dispersive spectroscopy. The autopsy identified significant fouling caused by iron compounds on membrane fibres. Subsequently, a cleaning study was commissioned with Avista Membrane Treatment Solutions which identified a proprietary cleaning chemical effective at targeting iron-based fouling, marketed as Avista127.

This paper presents the processes taken by Council, including the outcomes of onsite cleaning studies to successfully recover membrane performance at Tea Gardens WTP.

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