

Abstract:

Nitrate contamination in groundwater, particularly in agricultural regions, poses a critical challenge for drinking water safety. Elevated nitrate levels reduce blood oxygen-carrying capacity, presenting serious health risks, especially for children. Ensuring compliance with stringent drinking water guidelines requires accurate, continuous monitoring and proactive water management strategies.

Traditional nitrate monitoring methods, such as ISE sensors, often suffer from drift, cannot effectively compensate for interfering compounds. Reliance on grab sampling can create gaps in data and delay response to unexpected changes. ABB's UviTec Nitrate Sensor overcomes these challenges by providing real-time, drift-free measurements using UV/VIS technology with automatic interference compensation. Combined with an automatic chemical cleaning system, it ensures reliable, low-maintenance operation. Continuous monitoring at key points including raw water intake, post-blending, pre- and post-treatment, enables operators to optimize blending, improve treatment efficiency, and reduce operational costs.

This paper presents a case study demonstrating how continuous nitrate monitoring supports utilities managing multiple groundwater wells to maintain finished water below regulatory limits while achieving operational efficiency and cost savings. Groundwater is a vital source in many Australian regions, including WA, SA, inland NSW, QLD and NT. Real-time monitoring helps optimize resource water management, protect public health, and ensure sustainable, efficient water operations.