

# **Challenges in Water Treatment for Small Drinking Water Systems**

## **Retos en el Tratamiento de Agua para Sistemas de Agua Potable Pequeños**

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### **Abstract**

The causes of boil water advisories (BWAs) are many and varied, but also extensive in number and duration in small systems providing drinking water in Canada. The frequency of BWAs for small system is very high throughout Canada. Typical causes of the BWAs as they are occurring in Canada are reviewed, some of which are the result of non-operating conditions as opposed to actual failures. To a significant extent, the challenges to supply water are particularly difficult for small systems due to issues of affordability for multiple barriers in treatment systems, and more challenging as a result of limited resources (lack of economies of scale). Additional dimensions of concern also relate to source water type which greatly influences the treatment technologies that will be needed to ensure the safety of the supplied water. Insights into procedures to differentiate between 'secure' groundwater supplies that are not vulnerable to contamination, and ground water under the direct influence (GUDI) of surface water (e.g. use of color and turbidity). Some of the issues of staffing, training and economics, associated with small water systems are reviewed and extensive reliance upon case study applications to demonstrate how risks of system failure are provided.

**Keywords:** boil water advisories, drinking water, water systems, contamination.