

# Engineering a new drinking water management system

By Hershel Guttman and Brett McDermott



Hershel Guttman



Brett McDermott

Recent debates about drinking water management have emphasized the need to have appropriate standards and monitoring of not only drinking water itself, but also those who manage and operate the systems we rely upon. In the context of this debate, the Ontario government passed the *Safe Drinking Water Act, 2002* (SDWA). The SDWA addresses drinking water management systems, training and oversight head-

on. One of the highlights of the SDWA will be the introduction of a new municipal drinking water licensing regime. Part of this new regime will be a requirement for municipalities to designate an accredited operating authority (a person(s) or entity(ies) named by the owner and given overall responsibility for the oper-

ation, maintenance, and management of the drinking water system).

The Ontario government plans to accredit operating authorities based on an audit process. This process will involve comparing operational plans for a drinking water system, which will include a quality management system, with the requirements of a new Drinking Water Quality Management Standard (DWQMS).

In the Part Two Report of The Walkerton Inquiry, Justice O'Connor recommended the adoption of quality management for drinking water systems, as a means of assuring:

- The adoption of best practices and continual improvement;
- “Real time” process control such as the continuous monitoring of turbidity, chlorine residual, and

disinfectant contact time, wherever feasible;

- Effective operation of robust multiple barriers to protect public health;
- Preventive rather than strictly reactive strategies to identify and manage risks to public health; and,
- Effective leadership.

The proposed DWQMS, which is still under review with the Ministry of the Environment, represents a progressive approach to the standard of care for drinking water systems and the water that is delivered from them. Operating authorities who demonstrate compliance with the new DWQMS can expect to receive a Certificate of Accreditation.

Current government proposals supporting implementation of the DWQMS

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include the creation of several new positions and tasks. With over 680 water treatment plants in Ontario, the new positions represent tremendous opportunities for water industry professionals, particularly professional engineers, to take a leading role in protecting and enhancing public health.

Professional Engineers who work in the design, maintenance, and management of drinking water systems have the expertise that makes them ideal to assume the following new roles and responsibilities:

**Implementation Lead** – This role is the key to successful delivery of the DWQMS. The individual designated as “Implementation Lead” will have oversight responsibility for ensuring compliance with all aspects of the quality management system. To do that, the Implementation Lead will have to be acutely familiar with, among others:

- The drinking water system itself;
- Best practices for drinking water systems;
- The Drinking Water Quality Management Standard (DWQMS);

- How to properly document and maintain records;
- Audit principles and what demonstrates that the DWQMS is being properly implemented;
- Standard operating procedures and any regulatory requirements; and,
- Risk assessment and management principles.

By training and experience, and through their obligations under the *Professional Engineers Act* to protect the public welfare, professional engineers are an obvious choice for the role of Implementation Lead.

**Quality Management System Representative** – This individual will be responsible for assuring that processes and procedures stipulated in the quality management system for the drinking water facility are properly implemented. This person is also expected to ensure that all facility staff are aware of legislative and regulatory requirements associated with their duties.

**Preparation of a Gap Analysis** – The new DWQMS is expected to require an assessment of the differences between current system management and management enhancements that will be needed to demonstrate that water treatment and distribution facilities are being managed in compliance with the DWQMS. The gap analysis will result in an action plan, including tasks and timelines, for implementing the enhancements.

**Risk Assessment** – A fundamental underlying principle of any quality management system is prevention. The task will entail identifying potential threats to the drinking water system and the measures necessary to remedy those threats. This report and the risk assessment are intended to determine the possibility for microbiological contamination and to place checks in the system to ensure no contamination takes place. In many ways, the risk assessment represents a follow-up to the first Engineer’s Report, which was completed for all Ontario drinking water systems after passage of the Ontario Drinking Water Protection Regulation in August 2000. And it’s expected that the Ontario government will continue to require Engineer’s Reports as part of the new licensing regime. Engineers would be especially suitable to oversee the risk assessment, given their role in the preparation of the first Engineer’s Reports.

**Drinking Water System Description** – Before undertaking any risk as-

