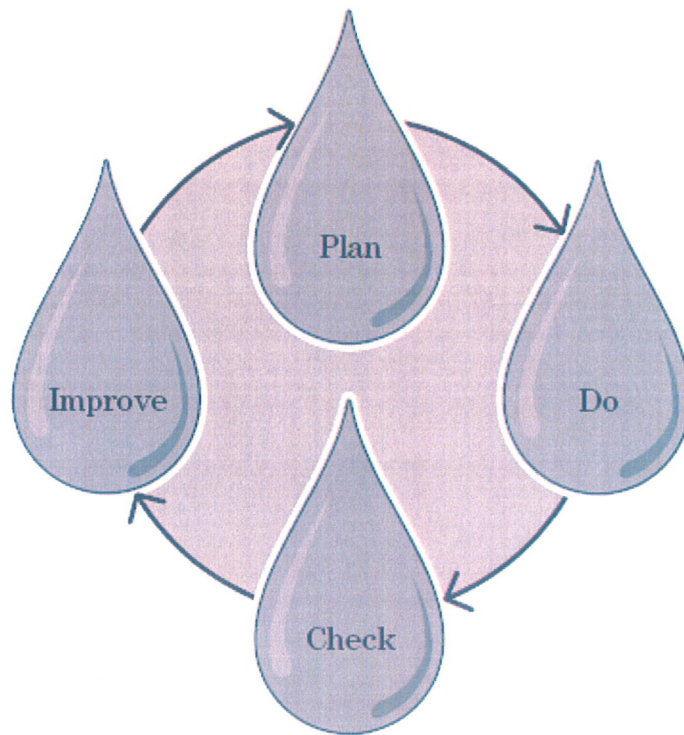


MINISTRY OF THE ENVIRONMENT

DRINKING WATER QUALITY MANAGEMENT STANDARD



October 2006

Introduction

The *Safe Drinking Water Act, 2002* (SDWA) requires Owners and Operating Authorities of municipal residential drinking-water systems to have an accredited Operating Authority. In order to become accredited, an Operating Authority must establish and maintain a Quality Management System (QMS). Minimum requirements for the QMS are specified in this Standard, the Drinking Water Quality Management Standard (DWQMS). Operating Authorities will be accredited by a third party Accreditation Body against the requirements of this Standard.

Operational Plan

The DWQMS requires an Operating Authority to document a Quality Management System for each 'subject system' that it operates in an Operational Plan which must be accepted by the Ministry of the Environment. The term subject system is used in the DWQMS to refer to either a municipal residential drinking-water system or an operational subsystem, as applicable in the circumstances.

Where an Operating Authority is operating multiple subject systems, the Operating Authority may choose to develop QMS components that are common for all drinking-water systems. The Operational Plan for the subject system would contain these common components or would reference separate documents that would be available to users of the Operational Plan. The common QMS components would need to be implemented both at the subject system level and at the corporate level, and corporate roles, responsibilities and authorities would need to be documented for each level.

Roles, Responsibilities and Authorities

The DWQMS requires that roles, responsibilities and authorities be defined. Where the Owner and Operating Authority are the same entity, the Operational Plan should identify a specific person, persons or group of people within the entity and their respective Owner and/or Operating Authority roles, responsibilities and authorities. If the same person, persons or group of people are assigned both Owner and Operating Authority roles, responsibilities and authorities, then the requirement to communicate the QMS between Top Management and the Owner is met by the person, persons or group of people in possession of the information to be communicated.

In cases where the Owner has not assigned Operating Authority roles, responsibilities and authorities to a specific person, persons or group of people within the entity, the Owner will assume all of the roles, responsibilities and authorities of the Operating Authority. If the Owner is not the same entity as the Operating Authority, s. 14 of the *SDWA* specifies that the Owner and the Operating Authority shall enter into an agreement that identifies, among other things, their respective responsibilities. Section 11 of the *SDWA* provides further information on the Duties of Owners and Operating Authorities.

Prescribed Dates Regulation

A Prescribed Dates Regulation will be used to specify dates for the submission to the Ministry of the Environment of the first Operational Plans, applications for Drinking Water Works Permits and applications for Municipal Drinking-Water Licences. Subsequent submissions of Operational Plans and applications for Licence renewals will be required through conditions placed on the Licence.

Director's Direction

A Director's Direction, issued under the authority of the *SDWA*, will provide further direction respecting the minimum content of Operational Plans as well as rules respecting document retention, public disclosure of information and other requirements that the Director considers necessary for the purposes of the Act and its Regulations.

Guidance Document

The Ministry of the Environment has prepared a comprehensive guidance document entitled '*Drinking Water Quality Management System – Guidance Document*' that outlines QMS and DWQMS concepts and provides guidance on the development, implementation, maintenance and continual improvement of a Quality Management System.

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Drinking Water Quality Management Standard

i) Scope

This Standard specifies minimum requirements for the Quality Management System of an Operating Authority for a subject system:

- a.) to facilitate the Operating Authority's ability to consistently produce and/or deliver drinking water that meets applicable legislative, regulatory and Owner requirements, and
- b.) to enhance consumer protection through the effective application and continual improvement of the Quality Management System.

ii) Terms and Definitions

Applicable Legislative and Regulatory Requirements – the *Safe Drinking Water Act, 2002*, the *Ontario Water Resources Act*, and all regulations and instruments issued under these Acts which are associated with drinking water.

Audit – a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a Quality Management System conforms to the requirements of this Standard.

Consumer – the drinking water end user.

Corrective Action – action to eliminate the cause of a detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.

Critical Control Limit – the point at which a Critical Control Point response procedure is initiated.

Critical Control Point – an essential step or point in the subject system at which control can be applied by the Operating Authority to prevent or eliminate a drinking-water health hazard or to reduce it to an acceptable level.

Document – includes a sound recording, video tape, film, photograph, chart, graph, map, plan, survey, book of account, and information recorded or stored by means of any device.

Drinking-Water Health Hazard – means, in respect of a drinking-water system,

- a.) a condition of the system or a condition associated with the systems' waters, including any thing found in the waters,
 - i.) that adversely affects, or is likely to adversely affect, the health of the users of the system,
 - ii.) that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or
 - iii.) that endangers or is likely to endanger public health,
- b.) a prescribed condition of the drinking-water system or,
- c.) a prescribed condition associated with the system's waters or the presence of a prescribed thing in the waters

Drinking Water Quality Management Standard (DWQMS) – this Standard and its collective requirements for a Quality Management System.

Drinking-Water System – means a system of works, excluding plumbing, that is established for the purposes of providing users of the system with drinking water and that includes,

- a.) any thing used for the collection, production, treatment, storage, supply or distribution of water,
- b.) any thing that relates to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and
- c.) a well or intake that serves as the source or entry point of raw water supply for the system

Municipal Drinking-Water System – means a drinking-water system or part of a drinking-water system,

- a.) that is owned by a municipality or by a municipal service board established under section 195 of the Municipal Act, 2001,
- b.) that is owned by a corporation established under section 203 of the Municipal Act, 2001,
- c.) from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or
- d.) that is in a prescribed class.

Municipal Residential Drinking-Water System – a large municipal residential system or a small municipal residential system as defined in O. Reg. 170/03.

Operating Authority - means, in respect of a Subject System, the person or entity that is given responsibility by the owner for the operation, management, maintenance or alteration of the Subject System.

Operational Plan - means, in respect of a Subject System, the operational plan required by the Director's Direction.

Operational Subsystem – means a part of a Municipal Residential Drinking-Water System operated by a single Operating Authority and designated by the Owner as being an Operational Subsystem.

Owner – includes, in respect of a drinking-water system, every person who is a legal or beneficial owner of all or part of the system, but does not include the Ontario Clean Water Agency or any of its predecessors where the Agency or predecessor is registered on title as the owner of the system.

Public – subject system consumers and stakeholders.

Quality Management System (QMS) – a system to:

- a.) establish policy and objectives, and to achieve those objectives, and
- b.) direct and control an organization with regard to quality.

Record – a document stating results achieved or providing proof of activities performed.

Subject System – means:

- a.) a Municipal Residential Drinking-Water System where the system is operated by one Operating Authority, or
- b.) an Operational Subsystem where two or more parts of a Municipal Residential Drinking-Water System are operated by different Operating Authorities.

Supplier – an organization or person that provides a product or service that affects drinking water quality.

Top Management – a person, persons or a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner respecting the subject system or subject systems.

PLAN AND DO elements of the Quality Management Standard**1. Quality Management System**

PLAN – The Operational Plan shall document a Quality Management System that meets the requirements of this Standard.

DO – The Operating Authority shall establish and maintain the Quality Management System in accordance with the requirements of this Standard and the policies and procedures documented in the Operational Plan.

2. Quality Management System Policy

PLAN – The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and:

- a.) is appropriate for the size and type of the subject system,
- b.) includes a commitment to the maintenance and continual improvement of the Quality Management System,
- c.) includes a commitment to the consumer to provide safe drinking water,
- d.) includes a commitment to comply with applicable legislation and regulations, and
- e.) is in a form that provides for ready communication to all Operating Authority personnel, the Owner and the public.

DO – The Operating Authority shall establish and maintain a Quality Management System that is consistent with the Policy.

3. Commitment and Endorsement

PLAN – The Operational Plan shall contain a written endorsement of its contents by Top Management and the Owner.

DO – Top Management shall provide evidence of its commitment to an effective Quality Management System by:

- a.) ensuring that a Quality Management System is in place that meets the requirements of this Standard,
- b.) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,
- c.) communicating the Quality Management System according to the procedure for communications, and
- d.) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.

4. Quality Management System Representative

PLAN – The Operational Plan shall identify a Quality Management System representative.

DO – Top Management shall appoint and authorize a Quality Management System representative who, irrespective of other responsibilities, shall:

- a.) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained,
- b.) report to Top Management on the performance of the Quality Management System and any need for improvement,

- c.) ensure that current versions of documents required by the Quality Management System are being used at all times,
- d.) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and
- e.) promote awareness of the Quality Management System throughout the Operating Authority.

5. Document and Records Control

PLAN – The Operational Plan shall document a procedure for document and records control that describes how:

- a.) documents required by the Quality Management System are:
 - i. kept current, legible and readily identifiable
 - ii. retrievable
 - iii. stored, protected, retained and disposed of, and
- b.) records required by the Quality Management System are:
 - i. kept legible, and readily identifiable
 - ii. retrievable
 - iii. stored, protected, retained and disposed of.

DO – The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes:

- a.) the Operational Plan and its associated policies and procedures,
- b.) documents and records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and
- c.) the results of internal and external audits and management reviews.

6. Drinking-Water System

PLAN – The Operational Plan shall document, as applicable:

- a.) for the subject system:
 - i. a description of the system including all treatment processes and distribution system components
 - ii. the name of the Owner and Operating Authority
 - iii. a process flow chart
 - iv. a description of the water source, including:
 - i. general characteristics of the raw water supply
 - ii. common event-driven fluctuations and
 - iii. any resulting operational challenges and threats
 - v. a description of any critical upstream or downstream processes relied upon to ensure the provision of safe drinking water.
- b.) if the subject system is an operational subsystem, a summary description of the municipal residential drinking-water system it is a part of.
- c.) if the subject system is connected to one or more other drinking-water systems owned by different owners, a summary description of those systems which:
 - i. indicates whether the subject system obtains water from or supplies water to those systems, and
 - ii. names the Owner and Operating Authority of those systems.

DO – The Operating Authority shall ensure that the description of the drinking-water system is kept current.

7. Risk Assessment

PLAN – The Operational Plan shall document a risk assessment process that:

- a.) identifies potential hazardous events and associated hazards,
- b.) assesses the risks associated with the occurrence of hazardous events,
- c.) ranks the hazardous events according to the associated risk,
- d.) identifies control measures to address the potential hazards and hazardous events,
- e.) identifies critical control points,
- f.) identifies a method to verify at least once a year, the currency of the information and the validity of the assumptions used in the risk assessment,
- g.) ensures that a risk assessment is conducted at least once every thirty-six months, and
- h.) considers the reliability and redundancy of equipment.

DO – The Operating Authority shall perform a risk assessment consistent with the documented process.

8. Risk Assessment Outcomes

PLAN – The Operational Plan shall document:

- a.) the identified potential hazardous events and associated hazards,
- b.) the assessed risks associated with the occurrence of hazardous events,
- c.) the ranked hazardous events,
- d.) the identified control measures to address the potential hazards and hazardous events,
- e.) the identified critical control points and their respective critical control limits,
- f.) procedures and/or processes to monitor the critical control limits,
- g.) procedures to respond to deviations from the critical control limits, and
- h.) procedures for reporting and recording deviations from the critical control limits.

DO – The Operating Authority shall implement and conform to the procedures.

9. Organizational Structure, Roles, Responsibilities and Authorities

PLAN – The Operational Plan shall:

- a.) describe the organizational structure of the Operating Authority including respective roles, responsibilities and authorities,
- b.) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple subject systems,
- c.) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review,
- d.) identify the person, persons or group of people having Top Management responsibilities required by this Standard, along with their responsibilities, and
- e.) identify the Owner of the subject system.

DO – The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.

10. Competencies

PLAN – The Operational Plan shall document:

- a.) competencies required for personnel performing duties directly affecting drinking water quality,

- b.) activities to develop and maintain competencies for personnel performing duties directly affecting drinking water quality, and
- c.) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.

DO – The Operating Authority shall undertake activities to:

- a.) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and
- b.) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.

11. Personnel Coverage

PLAN – The Operational Plan shall document a procedure to ensure that sufficient personnel meeting the identified competencies are available for duties that directly affect drinking water quality.

DO – The Operating Authority shall implement and conform to the procedure.

12. Communications

PLAN – The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and:

- a.) the Owner,
- b.) Operating Authority personnel,
- c.) Suppliers, and
- d.) the public.

DO – The Operating Authority shall implement and conform to the procedure.

13. Essential Supplies and Services

PLAN – The Operational Plan shall:

- a.) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and
- b.) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.

DO – The Operating Authority shall implement and conform to the procedure.

14. Review and Provision of Infrastructure

PLAN – The Operational Plan shall document a procedure for the annual review of the adequacy of the infrastructure necessary to operate and maintain the subject system.

DO – The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.

15. Infrastructure Maintenance, Rehabilitation and Renewal

PLAN – The Operational Plan shall document a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system.

- DO – The Operating Authority shall:
- a.) keep the summary current,
 - b.) communicate the programs to the Owner, and
 - c.) monitor the effectiveness of the maintenance program.

16. Sampling, Testing and Monitoring

- PLAN – The Operational Plan shall document:
- a.) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system,
 - b.) a description of any relevant sampling, testing or monitoring activities that take place upstream of the subject system, and
 - c.) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.

DO – The Operating Authority shall implement and conform to the procedures.

17. Measurement and Recording Equipment Calibration and Maintenance

PLAN – The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.

DO – The Operating Authority shall implement and conform to the procedure.

18. Emergency Management

- PLAN – The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes:
- a.) a list of potential emergency situations or service interruptions,
 - b.) processes for emergency response and recovery,
 - c.) emergency response training and testing requirements,
 - d.) Owner and Operating Authority responsibilities during emergency situations,
 - e.) references to municipal emergency planning measures as appropriate, and
 - f.) an emergency communication protocol and an up-to-date list of emergency contacts.

DO – The Operating Authority shall implement and conform to the procedure.

CHECK elements of the Quality Management Standard

19. Internal Audits

- PLAN – The Operational Plan shall document a procedure for internal audits that:
- a.) evaluates conformity of the QMS with the requirements of this Standard,
 - b.) identifies internal audit criteria, frequency, scope, methodology and record-keeping requirements,
 - c.) considers previous internal and external audit results, and
 - d.) describes how Quality Management System corrective actions are identified and initiated.

DO – The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every twelve months.

20. Management Review

PLAN – The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of:

- a.) incidents of regulatory non-compliance,
- b.) incidents of adverse drinking-water tests,
- c.) deviations from critical control point limits and response actions,
- d.) the efficacy of the risk assessment process,
- e.) internal and third-party audit results,
- f.) results of emergency response testing,
- g.) operational performance,
- h.) raw water supply and drinking water quality trends,
- i.) follow-up on action items from previous management reviews,
- j.) the status of management action items identified between reviews,
- k.) changes that could affect the Quality Management System,
- l.) consumer feedback,
- m.) the resources needed to maintain the Quality Management System,
- n.) the results of the infrastructure review,
- o.) Operational Plan currency, content and updates, and
- p.) staff suggestions.

DO – Top Management shall implement and conform to the procedure and shall:

- a.) ensure that a management review is conducted at least once every twelve months,
- b.) consider the results of the management review and identify deficiencies and action items to address the deficiencies,
- c.) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, and
- d.) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.

IMPROVE element of the Quality Management Standard**21. Continual Improvement**

DO - The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System through the use of corrective actions.