



Town of Renfrew

OPERATIONAL PLAN for the Town of Renfrew

Town of Renfrew Water System DWS# 210001102
Sub-System 2 - Town of Renfrew Water Distribution
System

Owned by the Town of Renfrew
Operated by Town of Renfrew

Revision 0, 01-Nov-09

DISCLAIMER STATEMENT

This Operational Plan is designed for the exclusive use of Town of Renfrew.

This Operational Plan has been developed with OCWA's assistance.

Any use which a third party makes of this Operational Plan, or any part thereof, or any reliance on or decisions made based on information within it, is the responsibility of such third parties. OCWA and Town of Renfrew accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Operational Plan or any part thereof.



OPERATIONAL PLAN REVISION HISTORY

Date	Revision	Description of Revision
01-Nov-09	0	Operational Plan issued



TABLE OF CONTENTS

1	Town of Renfrew’s Quality Management System (QMS)	5
2	Quality Management System (QMS) Policy	6
3	Commitment & Endorsement of Town of Renfrew’s QMS & Operational Plan.....	7
4	Quality Management System Representative	8
5	Document and Records Control.....	8
6	Drinking-Water System	8
7	Risk Assessment	10
8	Risk Assessment Outcomes	10
9	Organizational Structure, Roles, Responsibilities, and Authorities.....	10
10	Competencies.....	10
11	Personnel Coverage	13
12	Communications	13
13	Essential Supplies and Services.....	13
14	Review and Provision of Infrastructure	13
15	Infrastructure Maintenance, Rehabilitation and Renewal.....	13
16	Sampling, Testing, and Monitoring	16
17	Measurement and Recording Equipment Calibration and Maintenance	16
18	Emergency Management	16
19	Internal Audits	16
20	Management Review	16
21	Continual Improvement	17

List of Appendices

Appendix A - TR-01 Document and Record Control

Appendix B - TR-02 Risk Assessment and Risk Assessment Outcomes

Appendix C - TR-03 Organizational Chart

Appendix D - TR-04 Personnel Coverage

Appendix E - TR-05 Communications

Appendix F - TR-06 Essential Supplies and Services

Appendix G - TR-07 Review and Provision of Infrastructure

Appendix H - TR-08 Sampling, Testing, and Monitoring

Appendix I - TR-09 Measurement and Recording Equipment Calibration and
Maintenance

Appendix J - TR-10 Emergency Management

Appendix K - TR-11 Internal Audits

Appendix L - TR-12 Management Review

Appendix M - TR-13 Town of Renfrew Distribution System Map



1 Town of Renfrew's Quality Management System (QMS)

This Operational Plan defines and documents the Quality Management System (QMS) for the Town of Renfrew Water Distribution System owned by Town of Renfrew and operated by the Town of Renfrew's Development Works Department. It sets out Development Works Department's policies and procedures with respect to quality management in accordance with the requirements of the Province of Ontario's Drinking Water Quality Management Standard (DWQMS).

The QMS for the Development Works Department covers the transmission and distribution of potable drinking water to the consumers within the Town of Renfrew and connections made to properties outside of the boundaries of the Town of Renfrew.

The Town of Renfrew Drinking Water System – DWS # 210001102 consists of two subsystems.

Sub-System 1 – Town of Renfrew Water Treatment Plant

Sub-System 2 – Town of Renfrew Water Distribution System

Treated potable drinking water is supplied from the Town of Renfrew Water Treatment Plant which is owned by the Town of Renfrew and is operated by Ontario Clean Water Agency.

The Town of Renfrew supplies potable drinking water to users of Town of Renfrew.



2 Quality Management System (QMS) Policy

The Town of Renfrew, its Management and entire staff are committed to the principles and objectives set out in our Quality Management System (QMS) Policy.

Town of Renfrew's Policy is to:

- Ensuring a consistent supply of safe, high quality water
- Maintaining and continuously improving its quality management system, and
- Meet or surpass applicable regulations and legislation
- Train all staff on their responsibilities under this QMS

Our Management and entire staff will act to ensure the implementation of this Policy and will monitor progress of the Quality Management System (QMS).



3 Commitment & Endorsement of Town of Renfrew's QMS & Operational Plan

This Operational Plan supports the overall goal of Town of Renfrew's Development and Works Department and the Town of Renfrew to provide a Quality Management System and Operation Plan.

The Development and Works Department are responsible for developing, implementing, maintaining and continually improving its QMS with respect the Town of Renfrew Water Distribution System and will do so in a manner that ensures compliance with applicable legislation. Through the endorsement of this Operational Plan, the Town of Renfrew commits to cooperating in any reasonable request of the Development and Development Department to facilitate this goal.

Top management of both the Development and Works Department and the Town of Renfrew has approved the QMS for the drinking water system as evidenced by the signatures at the bottom of this page.

QMS reviewer – Lane Cleroux


QMS approval – Mike Asselin

Operating Authority Approval


Michel Asselin
Director of Development and Works

Oct. 23, 2009
Date

Owner Endorsement & Approval


Sandra Heins
Mayor

NOVEMBER 10, 2009
Date


Kim Bulmer
Clerk

Nov. 10, 2009
Date



4 Quality Management System Representative

All personnel have a role and associated responsibilities within their QMS.

The role of QMS Representative for the Town of Renfrew Water Distribution System is shared between the Director of Development and Works and the Engineering Technician who will administer the QMS.

The Director of Development and Works is ultimately responsible for our related to the operation of the drinking water system and for establishing and maintaining processes and procedures required for the overall administration of the subsystem QMS.

To assist in fulfilling the specific duties set out for the QMS Representative, the Engineering Technician is responsible for:

- Reporting on QMS performance to top management and identifying opportunities for improvement,
- Ensuring that current versions of documents related to the QMS are in use, and
- Ensuring personnel are aware of all applicable legislative and regulatory requirements that pertain to their operational duties.

Both the Director of Development and Works and the Engineering Technician are responsible for promoting awareness of the QMS to all subsystem personnel.

5 Document and Records Control

Refer to Appendix A for QMS Procedure # TR-01 Document and Records Control.

6 Drinking-Water System

Owner/Operating Authority

The Corporation of Town of Renfrew is the Owner and Operating Authority of the Town of Renfrew Water Distribution System serves a population of approximately 7850 residents. The Town of Renfrew's Development and Works Department Office is located on the second floor at 127 Raglan Street South, Renfrew Ontario.

System Description

Water is supplied to the Town of Renfrew by the Town of Renfrew Water Treatment Plant (WTP) which is situated at 224 McAndrew Avenue in the Town of Renfrew. Renfrew WTP is owned by the Corporation of Town of Renfrew and is operated by Ontario Clean Water Agency (OWCA).

The system consists of:

- 67 km of watermains
- Pipe sizes from 400 to 19mm in diameter
- Materials include cast, ductile iron, pvc, copper, galvanized, transite, lead



- Two Pressure Zones
- 6,820 m3 capacity standpipe located on O'Brien Road which is operated by OCWA.
- One pressure boosting station located at Erindale Avenue and Kedrosky Drive to decrease the incidents of low pressure in that area.
- Dead end bleeds

Item	Sub-System	Owner	Operating Authority
Town of Renfrew Water Treatment Plant	1	The Corporation of Town of Renfrew	Ontario Clean Water Agency
Renfrew Standpipe	1	The Corporation of Town of Renfrew	Ontario Clean Water Agency
Renfrew Water Distribution System	2	The Corporation of Town of Renfrew	Town of Renfrew's Development and Works Department
Kedrosky Boosting Station	2	The Corporation of Town of Renfrew	Town of Renfrew's Development and Works Department

Process Flow Chart

Refer to Appendix M - QMS Procedure # TR-13 Town of Renfrew Distribution System Map.

Upstream and Downstream Processes Outside of Your Control

The water supplied by the Town of Renfrew Water Treatment Plant has sufficient chlorine to ensure that the regulatory requirements for chlorine residual are met within the distribution system. In addition, the water treatment processes at the main plant are relied upon to treat the water so that when it enters the Town of Renfrew Water Distribution System, the water quality is safe for consumers. The Town of Renfrew WTP is regular tested for lead, chlorine residual and for water quality. No other drinking water system is supplied by this distribution system. Dead End Bleeds provides means to increase flow and promote chlorine migration in water system.

Monitoring and Management

The Town of Renfrew meters the flow of water delivered to its residents, commercial and industrial clients.

The system pressures are between 50 Psi and 110 Psi at normal operation.

The booster station boosts pressure in pressure zone 2 and is equipped to send various alarms to operators via text messages to General Forman or Assistant Forman.

The Operation challenges for the Town of Renfrew Water Distribution System:



- Aging infrastructure
- Pipe Material Issues
 - Lead joints
 - Red water

- Dead end
 - water quality for chlorine residual
 - Loss of water due to bleeds

- Pressure and Flow Management
 - Fire protection

7 Risk Assessment

Refer to Appendix B for QMS Procedure # TR-02 Risk Assessment and Risk Assessment Outcomes.

8 Risk Assessment Outcomes

Refer to Appendix B - QMS Procedure # TR-02 Risk Assessment and Risk Assessment Outcomes, Table 1.

9 Organizational Structure, Roles, Responsibilities, and Authorities

The QMS Representative will maintain the organizational structure, roles, responsibilities, and authorities current and will communicate this information to the Operating Authority's personnel and the Owner. The Director of Development and Works is the Top Management for the *Town of Renfrew Water Distribution System*.

Organizational Chart

Refer to Appendix C QMS Procedure # TR-03 - Organizational Chart

10 Competencies

The following table illustrates the competencies required by personnel whose duties directly affect drinking water quality.



COMPETENCY REQUIREMENTS TABLE

Role	Required Competencies	Desired Competencies
Mayor and Council	<ul style="list-style-type: none"> • Meet requirements of the Municipal Elections Act and Duly be sworn in • Knowledgeable about DWQMS Legislation • Able to make required decisions in emergency situations that affect Emergency responses • Participate in Emergency Management Plan as outlined in the Municipal Emergency Plan • Communicate water system issues to the public as required 	
Director of Development and Works	<ul style="list-style-type: none"> • Experience in water distribution planning engineering, operation and maintenance • Certificate in good standing • DWQMS training • H & S Procedures and Policies • Supervisory training/experience • Computer skills • A valid Ontario Drivers Permit (require Class G) • Knowledgeable in water related legislation and regulation • OH&S Training • MOE licenses in Water Treatment (Class III) and Distribution (Class I) in good standing • Communications with Council and Public 	<ul style="list-style-type: none"> • First Aid/ CPR • Traffic Safety
Engineering Technician (QMS Representative)	<ul style="list-style-type: none"> • DWQMS training • H & S Procedures and Policies • Knowledgeable in water related legislation and regulation • A valid Ontario Drivers Permit (require Class G) • Communications with Council and Public 	<ul style="list-style-type: none"> • First Aid/ CPR • Traffic Safety
General Foreman	<ul style="list-style-type: none"> • Supervisory training/experience. • Computer skills • A valid Ontario Drivers Permit (require Class G) • Knowledgeable in water related legislation and regulation • OH & S Procedures and Policies • MOE license in Water Distribution (Class I) in good standing • Communications with coworkers, supervisors and Public 	<ul style="list-style-type: none"> • First Aid/ CPR • Traffic Safety



Assistant Foreman	<ul style="list-style-type: none"> • Knowledgeable in water related legislation and regulation • Supervisory training/experience. • Computer skills • DWQMS training • A valid Ontario Drivers Permit (require Class G) • OH&S • MOE license in Water Distribution (Class I) in good standing • Communications with coworkers, supervisors and Public • 	<ul style="list-style-type: none"> • First Aid/ CPR • Traffic Safety
Waterworks Operator	<ul style="list-style-type: none"> • MOE license in Water Distribution (Class 1) in good standing • Knowledgeable in water related legislation and regulation • • Understanding of DWQMS • Knowledgeable in best practices and operational policies governing work • A valid Ontario Drivers Permit (require Class G) • H & S Procedures and Policies • Communications with coworkers, supervisors and Public 	<ul style="list-style-type: none"> • First Aid/ CPR • Traffic Safety
Office Coordinator	<ul style="list-style-type: none"> • Knowledgeable in DWQM document control requirements • Knowledgeable in Microsoft office suite • Communications with coworkers, supervisors and Public • Knowledgeable in management of training records, license renewal processes and staff waterworks staff records management • Working familiarity with Financial system and financial reporting 	<ul style="list-style-type: none"> • First Aid/ CPR

The competency requirements listed in the Competency Requirements Table are addressed by various means including:

- All employees listed have provided evidence of certification and other “required” competencies.
- All MOE required certificates or copies thereof are posted at the Development and Works Department office.
- All new employees undergo training to perform their duties including a review of best practices, Operational Procedures, Contingency/Emergency Plans; a review of the QMS Operational Plan; and ongoing on the job training.
- All waterworks employees receive training which meets or exceeds the requirements of Ontario Regulation 128/04.
- Changes to the Water Distribution System and/or to the QMS are communicated, as needed, to Development and Works Staff by either the Works Foreman, Assistant Foreman or QMS Representative.



All records of training are maintained by the Office Coordinator at the Department of Development and Works office as proof that the required training has been successfully completed.

11 Personnel Coverage

Refer to Appendix D for QMS Procedure # TR-04 - Personnel Coverage Procedures.

12 Communications

Refer to Appendix E for QMS Procedure # TR-05 - Communications.

13 Essential Supplies and Services

Refer to Appendix F for QMS Procedure # TR-06 - Essential Supplies and Services.

14 Review and Provision of Infrastructure

Refer to Appendix G for QMS Procedure # TR-07 - Review and Provision of Infrastructure.

15 Infrastructure Maintenance, Rehabilitation and Renewal

Planned Infrastructure Maintenance

The Development and Works staff prepared a list of maintenance activities that may be completed on an annual basis. This list of maintenance activities is presented below. The maintenance activities are authorized by the Director of Development and Works and the General Foreman. The maintenance activities are supported in the annual budget.

Water Distribution System maintenance includes:

- Flushing
- Fire Flow Testing
- Monitoring and adjustment of dead end water flows to maintain chlorine residual
- Lead sampling in accordance with legislated requirement
- Testing and exercising of water valves
- Documentation of water system improvements and maintenance activities in a waterworks report that is consolidated at the end of each year

Water Distribution System maintenance is documented in the following manner:

- Activities are logged by the operator in charge in the water system logbook located at the municipal garage
- A waterworks report is consolidated at the end of each calendar year (available by February the following year



- Ministry of Environment conducts annual inspections of the Distribution system that summarize actions to be taken by the Town of Renfrew.

Planned maintenance is communicated to the Director by the issuance of the waterworks report. This report is then forwarded to the Development and Works Committee for review on an annual basis. Annual Inspection reports from the Ministry of Environment are presented to the owner and are made available to the public at the Development and Works office at 127 Raglan Street South, Town of Renfrew.

Unplanned Infrastructure Maintenance

Emergency conditions arise in the distribution system. These can be generated by numerous sources such as:

- Water Quality Complaints
- Result of regular monitoring
- Reporting of water breaks
- Reporting of loss of pressure
- Reporting of change in water quality
- Large water use as a result fire fighting activities

The Operator in Charge as stated in the Waterworks Log Book is authorized to direct activities related to unplanned maintenance. Items that impact in service or are reportable to the Ministry of Environment are reported to the Overall Responsible Operator listed in the waterworks Logbook located at the works Garage.

The Operator in Charge determines the method to mitigate the impact of unplanned maintenance and directs the waterworks crew to undertake the required system adjustments by orienting valves.

Consumers affected by the unplanned maintenance are advised as soon as practical that services have been disrupted. This is done by the waterworks crew going door to door or by providing a written notice to residents delivered by the waterworks crew or available public works staff. If the affected area is broad the notices will be provided by advertisement in the local paper or use of the local radio station if time permits.

Unplanned maintenance is documented in the following manner:

- Activities are logged by the operator in charge in the water system logbook located at the municipal garage
- A waterworks report is consolidated at the end of each calendar year (available by February the following year

The OIC works in coordination with the Works foreman to review the unplanned maintenance for trends. If a trend is developing this is discussed with the Overall Responsible Operator.



Infrastructure Rehabilitation

The Operator in Charge is verbally requested to annually to contribute operating and capital project development and budget development. The Director of Development and Works prepares an annual operating budget and a 10 year capital forecast. This draft budget is advanced to the Finance Committee for review and integration with the annual budget deliberations.

Once the annual budget is passed by Council the Director of Development and Works communicate the capital projects to the Development and Works staff for implementation.

Rehabilitation activities are planned by:

- Review of the Asset Management Plan prepare by Dillon Consulting
- Review of unplanned maintenance activities through discussions with the Operator in Charge and the Works Foreman
- Review of consumer complaints as registered in the Town of Renfrew complaints database
- Review of correspondence requesting rehabilitation of infrastructure
- Review of potential funding programs that may be available
- Review of related infrastructure that may have to be replaced

The Director of Development and Works prepares an annual operating budget and a 10 year capital forecast through consultation with Development and Works Staff. This draft budget is advanced to the Development and Works Committee and then to Finance Committee for review and integration with the annual budget deliberations.

The Director of Development and Works and Engineering technologist include the analysis of projected growth in request for proposals that are issued to prepare for the design of infrastructure projects. In development areas, the Town of Renfrew includes major upgrade requirements due to growth in the development charges background studies.

Infrastructure Renewal

The Operator in Charge is verbally requested to annually to contribute operating and capital project development and budget development for the purpose of infrastructure renewal. The Director of Development and Works prepares an annual operating budget and a 10 year capital forecast. This draft budget is advanced to the Finance Committee for review and integration with the annual budget deliberations.

Once the annual budget is passed by Council the Director of Development and Works communicate the renewal capital projects to the Development and Works staff for implementation.

Renewal activities are planned by:

- Review of the Asset Management Plan prepare by Dillon Consulting
- Review of unplanned maintenance activities through discussions with the Operator in Charge and the Works Foreman



- Review of consumer complaints as registered in the Town of Renfrew complaints database
- Review of correspondence requesting rehabilitation of infrastructure
- Review of potential funding programs that may be available
- Review of related infrastructure that may have to be replaced

The Director of Development and Works prepares an annual operating budget and a 10 year capital forecast through consultation with Development and Works Staff. This draft budget is advanced to the Development and Works Committee and then to Finance Committee for review and integration with the annual budget deliberations.

The Director of Development and Works and Engineering Technologist include the analysis of projected growth in request for proposals that are issued to prepare for the design of infrastructure renewal projects. In development areas, the Town of Renfrew includes major upgrade requirements due to growth in the development charges background studies.

Maintenance plans are development according to the manufacture's instructions, regulatory requirements, and industry standards. Equipment operation and maintenance (O&M) manuals are accessible to staff at the location specified in QMS Procedure TR-01 Document and Records Control

16 Sampling, Testing, and Monitoring

Refer to Appendix H for QMS Procedure # TR-08 - Sampling, Testing, and Monitoring.

17 Measurement and Recording Equipment Calibration and Maintenance

Refer to Appendix I for QMS Procedure # TR-09 - Measurement and Recording Equipment Calibration and Maintenance.

18 Emergency Management

Refer to Appendix J for QMS Procedure # TR-10 - Emergency Management.

19 Internal Audits

Refer to Appendix K for QMS Procedure # TR-11 - Internal Audits

20 Management Review

Refer to Appendix L for QMS Procedure # TR-12 - Management Review



21 Continual Improvement

The Town of Renfrew shall strive to continually improve the effectiveness of its QMS through the use of corrective actions from annual audits, staff suggestions, and management reviews.



Legislation


- O. Reg. 128/04 Certification Of Drinking Water System Operators And Water Quality Analysts
- O. Reg. 242/05 Compliance and Enforcement
- O. Reg. 172/03 Definitions of 'Deficiency' And 'Municipal Drinking Water System'
- O. Reg. 171/03 Definitions of Words And Expressions Used in the Act
- O. Reg. 170/03 Drinking Water Systems
- O. Reg. 248/03 Drinking Water Testing Services
- O. Reg. 453/07 Financial Plans
- O. Reg. 188/07 Licensing of Municipal Drinking Water Systems
- O. Reg. 252/05 Non-Residential And Non-Municipal Seasonal Residential Systems that Do Not Serve Designated Facilities
- O. Reg. 169/03 Ontario Drinking Water Quality Standards
- O. Reg. 243/07 Schools, Private Schools and Day Nurseries
- O. Reg. 229/07 Service of Documents



Appendix A

TR-01 Document and Record Control



	<h1>QMS Procedure</h1>	Proc.: TR-01 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 4
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

DOCUMENT and RECORDS CONTROL

1.0 Purpose

The purpose of this procedure is to describe the methods for identification, storage, protection, retrieval, retention time and disposition of records.

2.0 Scope

This procedure is applicable to Development and Works - Waterworks employees who manage or perform work related to the distribution operations. This procedure covers all QMS documents and records identified in Table 1 of Section 6 of this procedure.

3.0 Responsibility

The following staff is responsible for documentation and records control:

- Office Coordinator
- Town Foreman
- Assistant Foreman
- Engineering Technician
- Director of Development and Works

4.0 Definitions

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

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

QMS Document – any document required by the QMS as identified in this procedure

QMS Record – any record required by the QMS as identified in this procedure

Controlled – managed as per the conditions of this procedure

Retention Period – length of time that a document or record must be kept; see chart 5.6

5.0 Procedure

5.1 Documents and records required by the QMS are listed in Table 1 of Section of this procedure.

5.2 Procedure – Currency & Legibility

As process and activities change within a drinking water system, the operational plan, policies and procedures require updating

- The operations staff will develop the technical details to be incorporated into documents
- The Engineering Technician and Director of Development and Works will meet to review proposed changes.

- The QMS reviewer – Engineering Technician will input a change into documents.
- The QMS approval authority will be the Director of Development and Works and shall approve changes.
- Changes that occur during mid term will be noted in the revision section of the document.
- Edits will be done on an annual basis to consolidate revisions (after the annual audit)
- A copy of the revised procedure will be forwarded to the Town Foreman who will provide in house training (or external training if required) and training will be recorded in the training record.
- All handwritten records must be legible and permanently rendered in ink.

5.3 Procedure – Identification

The Town of Renfrew internal documents and records will be controlled by the use of the following:

- Use of headers or logos to identify the originator
- Use of stamps for controlled document
- Use of revision numbers and issue dates

All external documents will be date received stamped.

5.4 Procedure – Storage/Retrieval

Documents and records will be stored as described in Table 1. All Hard copy documents will be scanned and electronically filed. Electronic files will be placed on the Shared network drive. The files can be reviewed on the network drive and will be write-protected.

5.5 Procedure - Protection

The QMS information contained on the network drive will be controlled through access by restricted users as controlled by network user name and passwords. The network drive is backed on a daily basis and copies of most recent backup tapes are located in a fireproof vault.

Hardcopy information will be filed in the Departmental filing system which maintained at the Departmental Headquarters at the Municipal office located at 127 Raglan Street South (Town Hall). Archived documents are maintained in the basement of the Town Hall. Electronic documents will be the control documents and all other hard copy documents are considered to be uncontrolled.

5.6 Procedure – Retention

Minimum Retention Times for Records will be kept as per O. Reg. 170/03 or other related legislation.

Record	Retention Time	Legislation
Section 11 Annual Report	6 Years	O. Reg. 170/03, Subsection 13.2
Schedule 22 Summary Report	6 Years	O. Reg. 170/03, Subsection 13.2
Lab. Test Results Water Chemical	6 Years	O. Reg. 170/03, Subsection 13.2
Lab. Test Results Water Bacti.	2 Years	O. Reg. 170/03, Subsection 13.1
On Site Testing (continuous and grab) chlorine residuals, turbidity, and fluoride where fluoridation is added	2 Years	O. Reg. 170/03, Subsection 13.1
Training Records	5 years	O. Reg. 128/04, Subsections 29(7) and 31(7)
Logs and other record keeping mechanisms	5 years	O. Reg. 128/04, Subsection 27(6)
Operation Plan	10 years	Directors Direction

5.7 Procedure - Disposal

After the retention period has expired or if a document has been superseded by a revision, the old file will be archived in network server.

A revised document will be submitted to the authorized QMS representative who will initiate the file transfers.

Archived paper non-control documents will be shredded at periodic intervals.

6.0 Related Documents

Refer to Table 1

7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued


Table 1: Designated location for documents and records required by the Operating Authority's QMS

Type of Document	Designated Document Control Location (HC = Hardcopy)
Internal QMS Documents	
AutoCad Mapping (Water System Layer)	Office server - electronic
Dillon Database	Office server - electronic
Hydrant Master Record Forms	HC - Development and Works Head Office
Hydrant Inspection Forms	Office server - electronic
Hydrant Maintenance Request Form	Office server - electronic
Infrastructure Maintenance Form	Office server - electronic
Training Record Form	Office server - electronic
Training Request Form	Office server - electronic
Master Plan – OMM	HC - Development and Works Head Office
Water System Model	HC - Development and Works Head Office
Lead Testing Records	Office server - electronic
Water Distribution System Logbook	HC - Town Garage
Dead End Chlorine Bleed Results	HC - Town Garage
MOE procedures F-6-1	Office server - electronic
Complaints Database	Office server - electronic
Patrol Records	HC - Town Garage
Operation Plan	Office server - electronic
Calibration Reports	HC - Town Garage
External QMS Documents	
QMS Records	
<i>Logbooks</i>	HC - Town Garage
Cof A's	HC - Development and Works Head Office
Permit to Take Water	HC - Development and Works Head Office
Inspection Reports	HC - Development and Works Head Office
AwwA procedures	HC - Development and Works Head Office
Complaints Database	Office server - electronic
Operator Licenses	HC - Development and Works Head Office
Facility Classification Certificates	HC - Development and Works Head Office
Patrol records	HC - Town Garage
Sample Results	HC - Development and Works Head Office

Appendix B

TR-02 Risk Assessment and Risk Assessment Outcomes



	<h1 style="margin: 0;">QMS Procedure</h1>	Proc.: TR-02 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 7
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep		Approved by: Mike Asselin, Director of Development and Works

RISK ASSESSMENT and RISK ASSESSMENT OUTCOMES

1.0 Purpose

To define the process for conducting a drinking water risk assessment and for documenting and reviewing the results of the assessment at the facility level.

2.0 Scope

Applies to the Town of Renfrew drinking water system and is limited to the assessment of potential drinking water health hazards, documenting their control measures, and the identification of critical control points.

3.0 Responsibility

QMS Implementation Team which consists of the QMS representative, Director of Development Works, Foreman and Assistant Foreman.

4.0 Definitions

Consequence – the potential impact to public health in the drinking water system if a hazard/hazardous event is not controlled

Control Measure – includes any processes, physical steps or other contingencies that have been put in place to prevent or reduce a hazard before it occurs

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

Critical Control Point (CCP) – 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

Hazard – a source of danger or a property that may cause drinking water to be unsafe for human consumption; may be biological, chemical, physical or radiological in nature

Hazardous Event – an incident or situation that can lead to the presence of a hazard

Likelihood – the probability of a hazard or hazardous event occurring

Threshold Number – numerical value assigned by the assessment team to a high risk event. Events ranked at or above this limit require further investigation to determine whether they are critical control points.

5.0 Procedure

5.1 The QMS Implementation Team will conduct the risk assessment.

- 5.2 Using the process diagram, identify hazardous events and associated hazards possible outcomes that could impact the system's ability to deliver safe drinking water in Table 1.
- 5.3 For each of the hazardous events, identify the control measures currently in place that control the hazard or prevent it from becoming a threat to public health.
- 5.4 Taking into consideration existing control measures (including the reliability and redundancy of equipment), assign each hazardous event a value for the likelihood and a value for the consequence of that event based on the criteria in the following tables:

Value	Likelihood of Hazardous Event Occurring
1	Rare – Estimated to occur every 50 years or more (usually no documented occurrence at site)
2	Unlikely – Estimated to occur in the range of 10 – 49 years
3	Possible – Estimated to occur in the range of 1 – 9 years
4	Likely – Occurs monthly to annually
5	Certain – Occurs monthly or more frequently

Value	Consequence of Hazardous Event Occurring
1	Insignificant – Little or no disruption to normal operations, no impact on public health
2	Minor – Significant modification to normal operations but manageable, no impact on public health
3	Moderate – Potentially reportable, corrective action required, potential public health impact, disruption to operations is manageable
4	Major – Reportable, system significantly compromised and abnormal operations if at all, high level of monitoring and corrective action required, threat to public health
5	Catastrophic – Complete failure of system, water unsuitable for consumption

Multiply the likelihood and consequence values to determine the Threshold Number (risk value) of each hazardous event and record all values in Table 1. Hazardous events with a ranking of 12 or greater are considered high risk.

- 5.5 Review the hazardous events and rankings documented in Table 1 and identify your Critical Control Points. Critical Control Points must meet all the following criteria::
- ✓ The hazardous event has a ranking of 12 or greater
 - ✓ The hazardous event can be prevented, eliminated or reduced
 - ✓ Can be monitored
 - ✓ Able to assign control limits, and
 - ✓ Essential to ensure the safety of the drinking-water.

5.6 List identified CCPs in Table 2. Document critical control limits (e.g. chlorine residuals) for each CCP. List the procedures that are developed to:

- Monitor the critical control limits
- Respond to, report and record deviations from the critical control limits.

5.7 The QMS representative will review this Procedure on an annual basis and revise as necessary. This Procedure and revisions will be reviewed annually as part of the Management Review process. The risk assessment will be verified and updated every three years by QMS Team members.

6.0 Related Documents

Operation Manual/Standard Operating Procedures
Emergency/Contingency Plans
Process Diagram
AWWA/Industry Standards
Municipal Bylaws

7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Table 1: Risk Assessment Table

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	Critical Control Point?
Distribution	Low Pressure < 20 psi	Potential or unsafe drinking water Potential Backflow	<ul style="list-style-type: none"> Monitor respond and log customer complaints Report as AWQI and work with MOE and Health Unit Foreman to investigate and direct a response 	2	4	8	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	Pipeline Break	Potential or unsafe drinking water Back- siphoning	<ul style="list-style-type: none"> Isolate area of break Use best practices for excavation and main repairs Report as AWQI and work with MOE and Health Unit if system quality has been affected (back-siphon) Maintain Competent Staff AWWA Disinfection procedures 	4	3	12	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No No Control limits Adequate control measures in place
	Adverse Water Result in Distribution Adverse as defined in O.Reg. 170/03	Potential or unsafe drinking water	<ul style="list-style-type: none"> Report AWQI to MOE Medical Officer of Health. Follow instructions of Medical Officer of Health Sampling and monitoring Foreman investigate & direct Flushing and corrective measures Follow MOE protocol for adverse water quality, response as per Reg. 170/03 Direction received from the Medical Officer of Health and MOE based on the specific incident Complete reporting as per MOE AWQI requirements 	4	3	12	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No No Control limits Adequate control measures in place

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	Critical Control Point?
	Loss of Supply – water plant	Inadequate supply to maintain service	<ul style="list-style-type: none"> Consider initiating emergency plan if expended duration Report and Treat as AWQI is supply will be lost Work with MOE and Medical Officer of Health Foreman investigate & direct measures corrective measures 	3	5	5	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	Lack of looping / dead ends	Low chlorine residuals – potential adverse water	<ul style="list-style-type: none"> Initiate AWQI if low chlorine is observed Work with MOE and Medical Officer of Health Monitor Dead Ends Best Practice Procedure for Flushing Follow manufactures recommendation for Sampling and Monitoring Report AWQI as per MOE 	3	4	12	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No No Control limits Adequate control measures in place
	Aging Infrastructure leading to frequent breaks	<ul style="list-style-type: none"> Potential or unsafe drinking water, reduced flows, pipeline breaks Unreliable service Poor Drinking water quality 	<ul style="list-style-type: none"> Annual review infrastructure Maintenance and Renewal Program with Foreman Allocate Resources in Budget to improve system 	3	2	6	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No No Control limits Adequate control measures in place
	Failure of back flow preventers	Potential or unsafe drinking water	<ul style="list-style-type: none"> Report as AWQI if evidence of backflow Investigate reports or poor water quality or potential backflow Promote backflow 	3	3	9	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No Municipality oversees

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	Critical Control Point?
			prevention system monitoring and maintenance <ul style="list-style-type: none"> Encourage Back Flow Prevention annual inspections by commercial/Industrial consumers 				back flow prevention program
	Chemical/Biological Contamination at (vandalism/terrorism)	Potential or unsafe drinking water	Isolate system to a safe reservoir Advise MOE and Medical Officer of Health Report as AWQI Invoke Municipal Emergency Plan	1	5	5	<input checked="" type="checkbox"/> Yes CCP <input type="checkbox"/> No
	Valve Failure	<ul style="list-style-type: none"> Potential larger isolation area Possible low fire flow due to valve failing closed Inability to isolate sections 	<ul style="list-style-type: none"> Isolate Larger area Provide notification to consumers affected Notify Emergency Services Follow best practice for valve exercise Valve replacement when valve is found to be faulty 	5	1	5	<input checked="" type="checkbox"/> Yes CCP <input type="checkbox"/> No
	Incorrect Valve closing	<ul style="list-style-type: none"> Potential or unsafe drinking water Effect hospital Fire Protection reduced Water quality 	<ul style="list-style-type: none"> Monitor water quality if affected area Maintain competent staff Advise emergency services AWWA Standards & best practices 	2	4	8	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	Hydrant flow testing	-Water quality -Effect hospital -Hydrant failure -No fire protection	<ul style="list-style-type: none"> Provide consumer notification in advance Maintain Competent Staff AWWA Standards & best practices 	2	2	4	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	River Crossing failure	Loss of hydraulic capacity	Isolate crossing Initiate inspection and	3	4	12	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	Critical Control Point?
		Potential or unsafe drinking water Undetectable water loss -Inability to maintain storage.	repair or twin main temporarily				
	Sub-contractor cutting corners	-Potential or unsafe drinking water -Premature failure	<ul style="list-style-type: none"> Supervise sub-contractors AWWA Standards & best practices Certification Demand Engineered systems & as-builts 	3	3	6	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	New infrastructure cutting corners	-Potential or unsafe drinking water -Premature failure	<ul style="list-style-type: none"> Supervise sub-contractors AWWA Standards & best practices Certification Demand Engineered systems & as-builts 	2	3	6	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No
	Digging up unknown Watermains	-Potential or unsafe drinking water -Potential adverse water -Back-siphoning	<ul style="list-style-type: none"> Isolate system to reduce loss Advise consumers of disruption Use best practices to repair Maintain Competent Staff Maintain accurate Mapping 	2	4	8	<input type="checkbox"/> Yes CCP <input checked="" type="checkbox"/> No


Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Sampling Stations for dead ends	Combined Chlorine Residual mg/L Free Chlorine Residual mg/L	Weekly sampling and Monitoring	Chlorine lower than Legislated requirement would be a AWQI and will be reported as such.

Appendix C

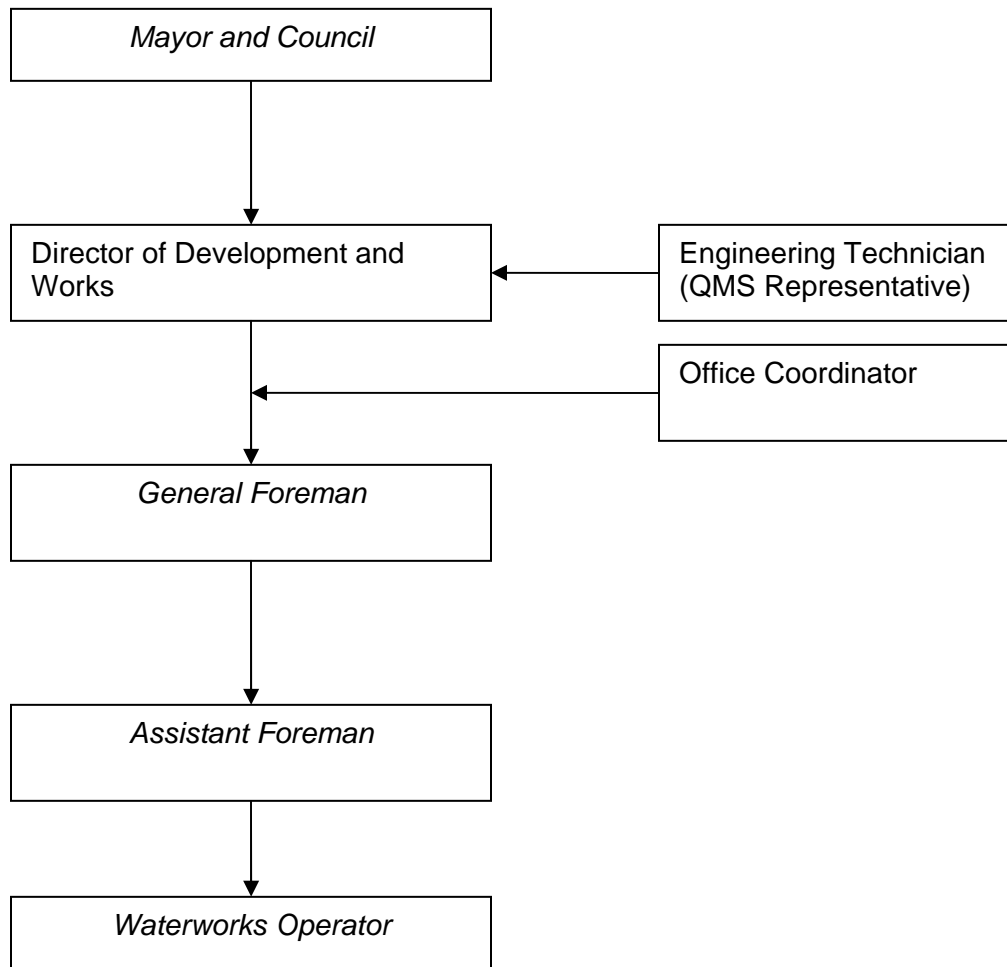
TR-03 Organizational Chart



	<h2>QMS Procedure</h2>	Proc.: TR-03 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 3
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.		Approved by: Mike Asselin, Director of Development and Works

Organizational Chart

The following flow chart represents the Organizational Structure for the *Town of Renfrew Water Distribution System and the owner.*



Roles, Responsibilities, and Authorities Table

TITLE	ROLES and RESPONSIBILITIES	AUTHORITIES
<i>Mayor & Council Owner</i>	<ul style="list-style-type: none"> • Approve Human and Financial Resources • Approves Budgets • Approve Policies & Procedures • Ensure Facilities Operate in compliance with legislation • Ensure delivery of safe drinking water to the public • Owner Representative • Member of the Emergency Management Control Group 	<ul style="list-style-type: none"> • Final Financial Authority • Final approval of Policy as appropriate • Pass Bylaws as required • Legal representative of the owner of <i>Town of Renfrew</i> Water Distribution System • Supervises Director of Development and Works
<i>Director of Development and Works</i>	<ul style="list-style-type: none"> • Assigns Human Resources Levels • Develops Budget • Report to owner/attend council meetings • Overall Responsible Operator (ORO) • Develop Policies and Procedures in consultation with Foreman, contingency/emergency plans • Operational Training • Staff administration • Ensuring operation in compliance with legislative requirements • Reports to top management (owner), ministry's (MOL MOH MOE) • Ensure responding Adverse/Non compliance • Maintains appropriate water licenses • Undertakes QMS Management Review • Member of the Municipal Emergency Management Control Group (Emergency Plan) 	<ul style="list-style-type: none"> • Prepare annual budgets • Financial control within approved budget • Final purchasing authority • Report to Development and Works Committee • Report to Council • Plan and manage human resource • Approve training • Allocation of staff • Employee administration – discipline • Authority to direct operation and maintenance of system • Delegate ORO responsibility • Supervises Works Foreman, Assistant Foreman, Engineering Technician • Top Management responsibilities related to DWQMS
<i>Engineering Technician (QMS Representative)</i>	<ul style="list-style-type: none"> • Responsible for implementation and maintenance of the Operational Plan • Schedules Management Review • Maintain records and Mapping • Serves as Alternate Community Emergency Management Coordinator to link DWQMS requirements 	<ul style="list-style-type: none"> • Approve changes to plan and procedures • Train staff DWQMS/Operational Plan • Serve as back for Director • Serves as Alternate Community Emergency Management Coordinator
<i>Office Coordinator</i>	<ul style="list-style-type: none"> • Communicate complaints received to General Forman/ Assistant Forman • Manages DWQMS records • Provides financial records update to General Foreman • Provides administrative support to Development and Works Staff • Provides time sheet consolidation 	<ul style="list-style-type: none"> • Issues purchase orders • Coordinates activities between head office and Works Garage

	<ul style="list-style-type: none"> • Distributes Purchase Orders to support departmental activities • Coordinates notices and documents available to the public 	
<i>General Foreman</i>	<ul style="list-style-type: none"> • Day to day operation and maintenance - scheduling • OIC • May be designated as ORO and OIC as backup • Ensure compliance with legislative requirements • Reports – legislative, incident • Training staff • Responding Adverse/Non compliance • 24/7 monitoring (on call) • Maintain records and Mapping 	<ul style="list-style-type: none"> • Direction of operations and maintenance • Supervises field staff and Assistant Foreman • Authorize Expenditures approved within budget • Authorizes Expenditures related to emergency responses in absence of Foreman or Director of Development and Works
<i>Assistant Foreman</i>	<ul style="list-style-type: none"> • Day to day operation and maintenance - scheduling • Operator in Charge • May be designated as ORO and OIC as backup to Director of Development and Works and Assistant Foreman • Ensure compliance with legislative requirements • Reports – legislative, incident • Training staff • Responding Adverse/Non compliance • 24/7 monitoring (on call) • Maintain records and Mapping 	<ul style="list-style-type: none"> • Direction of operations and maintenance • Supervises field staff and Assistant Foreman • Authorize Expenditures approved within budget • Authorizes Expenditures related to emergency responses in absence of Foreman or Director of Development and Works
<i>Waterworks Operator</i>	<ul style="list-style-type: none"> • Perform day to day operation & maintenance under the direction of the foreman • Operator in Charge (OIC) • Reporting, documentation • Maintenance of system • Ensuring compliance with legislative requirements • OIC • Responding Adverse/Non compliance 	Operate and maintain systems to ensure safe drinking water


1.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix D

TR-04 Personnel Coverage



	<h1>QMS Procedure</h1>	Proc.: TR-04 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.		Approved by: Mike Asselin, Director of Development and Works

PERSONNEL COVERAGE

1.0 Purpose

To describe the procedure for ensuring that sufficient and competent personnel are available for duties that directly affect drinking water quality.

2.0 Scope

Applies to operations personnel for the *Town of Renfrew Distribution System*.

3.0 Responsibility

- Owner (Mayor and Council)
- Director of Development and Works
- General Foreman
- Assistant Foreman
- Operators
- Development and Works staff
- Office Coordinator

4.0 Definitions

Competence – The combination of observable and measurable knowledge, skills, and abilities which are required for a person to carry out assigned responsibilities. Competencies are listed in section 10 of the DWQMS Operational Plan.

5.0 Procedure

5.1 The *Director of Developments and Works*, General Foreman and Assistant Foreman ensure that personnel meeting the competencies identified in the Competency Requirements Table are available for duties that directly affect drinking water quality. In the event of position vacancies the duties will be reassigned on an interim basis by the Director of Development and Works, Works Foreman or Assistant Foreman

5.2 The *Town of Renfrew Distribution System* is staffed by operators of Development and Works Department during regular business hours. Periods where staff is not at the facility an On-call operator is made available.

5.3 The Town of Renfrew personnel are assigned to act as and fulfill the duties of Overall Responsible Operator (ORO) and Operator-in-Charge (OIC) in accordance with SDWA O. Reg. 128/04.

The Director of Developments and Works is the primary ORO and the back-up ORO is designated as required.

The designated OIC for each shift shall be recorded in the facility logbook.

- 5.4 *The General Foreman* assigns an on-call Development and Works staff for the time that the facility is un-staffed (i.e., evenings, weekends and Statutory Holidays). An issue with the Distribution system, the on-call staff contracts an operator. The on-call shift change is end of business day on Friday. The on-call schedule is maintained by the General Foreman.
- 5.5 After hours consumer complaints are called in to the Town of Renfrew dispatch who then directs the call to the on-call Public works staff member. The Staff member will report to work and assess the complaint and contract the operator in charge by phone.
- 5.6 The General Forman is responsible for approving vacation time for staff in a manner which ensures sufficient personal are available for the performance of normal operation duties.
- 5.7 In the effect of a strike, the non-union certified General Foreman and Assistant Foreman will perform day-to-day operations and maintenance.

6.0 Related Documents

Facility Logbook
Daily Round Sheets
On-Call Schedule
Call-In Reports
Shift/Vacation Schedule
Agreement with Union
Water system annual report


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix E

TR-05 Communications



	<h1>QMS Procedure</h1>	Proc.: TR-05 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Communications

1.0 Purpose

To describe the *Town of Renfrew* procedure for QMS-related communications between Top Management and the Owner, Operating Authority personnel, Suppliers and the public.

2.0 Scope

Applies to the internal and external communications regarding the Quality Management System (QMS) implemented at the Town of Renfrew Water Distribution System.

3.0 Responsibility

- Director of Development and Works
- QMS Representative
- Mayor and Council
- General Foreman
- Assistant Foreman
- Waterworks Operator
- Office Coordinator

4.0 Definitions

Public – includes subject system consumers and stakeholders

5.0 Procedure

- 5.1 The status of the QMS and its effectiveness shall be communicated to the owner during Council Briefings held regularly by the owner. The meetings are open to the public and a record of the proceedings are maintained by the Municipal Clerk.

- 5.2 The operating authority will communicate the QMS to the owner and all employees (involved in the water system) as part of the implementation process. New Owner representatives and new staff hires will receive QMS awareness training during orientation.

- 5.3 The Operational Plan will be presented to the Municipal Council and will be made available to the public at the Development and Works office at 127 Raglan Street South. The Operational plan will also be posted on the *Town of Renfrew* website.
- 5.4 Where appropriate, information on the QMS requirements will be communicated to suppliers/contractors.

6.0 Related Documents

Water Distribution System Logbook
TR-06 Essential Supplies and Services
TR-10 Emergency Management
TR-12 Senior Management Review


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix F

TR-06 Essential Supplies and Services



	<h2 style="margin: 0;">QMS Procedure</h2>	Proc.: TR-06 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.		Approved by: Mike Asselin, Director of Development and Works

ESSENTIAL SUPPLIES AND SERVICES

1.0 Purpose

To describe the Town of Renfrew's procedure for procurement and for ensuring the quality of essential supplies and services.

2.0 Scope

Applies to essential supplies and services pertaining to the *Town of Renfrew Distribution System*, as identified in this procedure.

3.0 Responsibility

- General Foreman
- Assistant Foreman

4.0 Definitions

Supplies and Services – are goods and people coming in from outside of the drinking-water system that can introduce risks to the quality and safety of your drinking water.

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

5.0 Procedure

- 5.1 Contacts for essential supplies and services for the Town of Renfrew Water Distribution System are maintained at the Development Works Garage. These lists consist of cards placed in a booklet. This listing is updated as required by the Staff Person responsible for inventory as assigned by the Development and Works Foreman.

- 5.2 Purchasing is conducted in accordance with Renfrew's Purchasing Policy. The facility orders and receives ongoing deliveries to satisfy current short-term needs based on operational needs and storage capacities.

- 5.3 Where applicable, supplies must meet AWWA and ANSI/NSF standards. The supplier is held responsible for safe transport and delivery of chemicals to the facility in accordance with applicable regulations, guidelines and practices for transportation.

All process components/equipment provided by the supplier must meet applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

- 5.4 All third-party drinking water testing services are provided by accredited and licensed laboratories. Sampling is performed by certified operators.

Calibration is done in accordance with the manufactures calibration methods or if not possible in house then are performed externally. Calibration services are provided by qualified personnel familiar with the equipment being calibrated.

All Contractor services are provided by accredited and licensed companies.

- 5.5 The supplies and services requirements will be communicated to all relevant personnel in the operating authority. Purchasing policies and requirements will be communicated to suppliers and service providers.

6.0 Related Documents

Procurement and Administration policies and procedures
Renfrew's Purchasing Policy
Renfrew of Renfrew Emergency Plan


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix G

TR-07 Review and Provision of Infrastructure



	<h1>QMS Procedure</h1>	Proc.: TR-07 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.		Approved by: Mike Asselin, Director of Development and Works

Review and Provision of Infrastructure

1.0 Purpose

To describe the Town of Renfrew procedure for reviewing the adequacy of infrastructure necessary to operate and maintain a drinking water system.

2.0 Scope

Applies to review and provision of infrastructure at the Town of Renfrew Water Distribution System.

3.0 Responsibility

- Council
 - Annual Review of Projects as part of Budget or Emergency work
- Development and Works Committee
 - Review annual programs recommended by Director of Development and Works
- Director of Development and Works
 - Develops and Recommend projects to Development and Works Committee and Council for deliberation in the annual budgets.
- General Foreman
 - Coordinates Operation and Maintenance of the Distribution System and identifies and reports problem areas of infrastructure that need financial or staff resources.
- Assistant Foreman
 - Coordinates Operation and Maintenance and identifies problem areas of infrastructure
- Development and Works Staff
 - Performs Infrastructure development, operation and maintenance as directed.

4.0 Definitions

Infrastructure – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspace, process equipment, hardware and software and supporting services, such as transport or communication.

Rehabilitation – the process of repairing or refurbishing an infrastructure element.

Renewal – the process of replacing the infrastructure element with new elements.

5.0 Procedure

- 5.1 On an annual basis, the Director of Development and Works and the Development and Works staff conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. This is done in conjunction with the annual budget preparation.
- 5.2 A summary of maintenance and capital recommendations will be submitted to the owner for review and comment. Upon authorization, timelines and responsibilities for implementation of items identified will be documented and scheduled.
- Project identified
 - Project added to annual budget
 - Projects reviewed by Council
 - Once approved in budget then project is implemented by Staff
 - Routine operation and maintenance is coordinated by the General Foreman and Assistant Foreman. These activities may include:
 - Directional Flushing
 - Fire Flow Testing
 - Leak Detection
 - Dead end Bleeds
 - Lead Testing
 - Valve Exercising
 - Hydrant Inspection
 - Hydrant Repairs
 - Service Replacements
 - Mapping updates
- 5.3 The Director of Development and Works ensures that the results of the infrastructure review will be included as an input to the Management Review.

6.0 Related Documents

10 Year Water Capital Plan


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix H

TR-08 Sampling, Testing, and Monitoring



	<h1>QMS Procedure</h1>	Proc.: TR-08 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 3
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Sampling, Testing and Monitoring

1.0 Purpose

To describe the Town of Renfrew procedure for sampling, testing and monitoring for process control and finished drinking water quality.

2.0 Scope

Applies to sampling, testing and monitoring at the *Town of Renfrew Distribution System*

3.0 Responsibility

- General Foreman
- Assistant Foreman
- QMS Representative
- Waterworks Operator

4.0 Definitions

None

5.0 Procedure

5.1 All sampling, monitoring and testing is conducted at a minimum in accordance with regulatory requirements. Adverse water quality incidents are responded to and reported as per the Ministry of Environment regulations.

5.2 Samples are submitted to an accredited and licensed laboratory according to Table 1 – Sampling Schedule. The sampling schedule is maintained by the Water Quality Technician in coordination with the Works Foreman and is updated as required

Table 1 – Sampling Schedule

Parameter	Location	Frequency
Microbiological (total coliforms, e. coliforms, HPC)	Samples are collected from where there is question of water quality or consumer complaints where the Water Quality Technician sees a need for this testing. Sample data is reviewed from	As required

	private subdivisions prior to connections being made to the distribution system.	
Lead/ Testing	Samples are collected as per O. Reg. 170/03 Schedules 15.1 and 15.2 or as exempted by the Ministry of Environment	As defined in O. Reg. 170/03
Chlorine residuals	Chlorine testing is done on a periodic basis to monitor the free chlorine concentration at dead end watermains. The dead end flow rates are adjusted depending on the results of the chlorine testing. Chlorine Residual Testing is also performed by the Water Quality Technician when watermains are taken out of service for repair. The purpose of this testing is to ensure that watermains have been disinfected appropriately prior to being placed back into service.	O.Reg 170/03

Hardcopy reports are maintained as per TR-01 Document and Records Control.

- 5.3 In-house sampling and flow monitoring activities are conducted on a regular basis by the certified operator(s) and are shown in Table 2 as follows:

Table 2 – In-House Sampling and Testing Schedule

Parameter	Location	Frequency
Free Chlorine Residual	Varying points in the distribution system as required to monitor chlorine residual distribution – Compliance testing is completed by the Ontario Clean Water Agency as part of Sub-System 1 – Please refer to the Sub-System 1 Operation Plan	7 points per week as per O. Reg. 170/03
Flows	The water meters are read on a monthly basis for commercial/Industrial Meters and every two months for residential water meters	

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- 5.4 OCWA is contracted for any continuous chlorine concentration compliance monitoring in distribution system.

- 5.5 A communication protocol is in place to ensure that Town of Renfrew is notified by the Town of Renfrew Water Treatment Plant of any changes in the quality of water supplied to the distribution system which may require operational adjustments.

- 5.6 Sampling, testing and monitoring results are readily accessible to the owner from OCWA.

6.0 Related Documents

Water Distribution System Logbook
TR-01 Document and Records Control
TR-05 Communication
TR-12 Management Review
Laboratory Analysis Reports
Annual Report


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix I

TR-09 Measurement and Recording Equipment Calibration and Maintenance



	<h2>QMS Procedure</h2>	Proc.: TR-09 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Measurement and Recording Equipment Calibration and Maintenance

1.0 Purpose

To describe the Town of Renfrew procedure for the calibration and maintenance of measurement and recording equipment.

2.0 Scope

Applies to the measurement and recording equipment at the *Town of Renfrew Distribution System*

3.0 Responsibility

- General Foreman
- Assistant Forman
- Waterworks Operator

4.0 Definitions

None

5.0 Procedure

5.1 All measurement and recording equipment calibration and maintenance activities must be performed by appropriately trained and qualified personnel or by a qualified third-party calibration service provider (refer to TR-06 Essential Supplies and Services). The calibration methods as presented in the manufactures literature for the equipment is used to define the calibration method and requirement.

5.2 The General Foreman establishes which measurement and recording devices require calibration and coordinates a calibration schedule.

Calibration and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual.

- 5.3 Any measurement device which does not meet its specified performance requirements during calibration must be removed from service until repaired or replaced. Staff are required to report the failure of any equipment or calibration of equipment to the General Foreman as soon as possible so that immediate measures can be taken to ensure that drinking water quality or OH&S has not been compromised by the malfunctioning device. Any actions taken as a result of the failure are recorded and any notifications required by applicable legislation are completed and documented within the specified time period.
- 5.4 Calibration and maintenance records and maintenance/equipment manuals are maintained as per TR-01 Document and Records Control.

6.0 Related Documents

Facility Logbook
Calibration/Maintenance Records
TR-01 Document and Records Control
TR-06 Essential Supplies and Services


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix J

TR-10 Emergency Management



	<h1>QMS Procedure</h1>	Proc.: TR-10 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Emergency Management

1.0 Purpose

To describe the Town of Renfrew procedure for maintaining a state of emergency preparedness.

2.0 Scope

Applies to potential emergency situations or service interruptions identified for the water system operated by Town of Renfrew Water Distribution System.

3.0 Responsibility

- Owner
- Director of Development and Works
- General Foreman
- Assistant Foreman
- Waterworks Operators
- OMS Representative

4.0 Definitions

Municipal Emergency Plan – The emergency plan required by the Emergency Management and Civil Protection Act and adopted as a by-law by council, governing the provision of necessary services during an emergency and the procedures under and the manner in which employees of the municipality and other persons will respond to the emergency.

Emergency – a potential situation or service interruption that may result in the loss of the ability to maintain a supply of safe drinking water to consumers.

Emergency Response – the effort to mitigate the impact of an emergency on consumers

5.0 Procedure

- 5.1 The Community Emergency Management Coordinator maintains the Renfrew Emergency Response Plan.

5.2 Table 1 describes the list of potential emergency situations or service interruptions.

TABLE 1 - POTENTIAL EMERGENCIES

Description of Emergency	Potential Outcome
Loss of Power and Backup System fails	Loss of water supply and loss of pressure
Chemical Contamination of water supply	Loss of potable water supply
Microbiological Contamination	Loss of potable water supply and initiation of a Boil water advisory
Loss of Supply from River	Loss of water supply to distribution system and thus a loss of pressure
Natural Disaster	Potential loss of supply leading to system failure
Terrorism or Vandalism	Potential loss of supply, contamination leading to loss of potable water supply or complete system failure
Loss of Pressure	Potential Backflow leading to potential contamination

5.3 Appropriate personnel are trained on this procedure and on specific emergency situations on an ongoing basis. The engineering technician is the backup Community Emergency Management Coordinator. The Director of Development and Works is a member of the Emergency Management Control Group. This participation ensures training and integration of Town emergency management plans.

5.4 Operating Authority and Owner roles and responsibilities for Emergency Management are set out in the Roles and Responsibilities table in Appendix 'C'

Relevant sections of the Municipal Emergency Plan, which may also contain additional information on emergency roles and responsibilities, for those situations which affect drinking water are contained in the "Responsibilities" section of the Plan.

An emergency contact list is maintained for Development Works Department is available to all staff and updated at least annually.

6.0 Related Documents

Emergency Response Plan
Records of Training/testing/plan updates
Municipal Emergency Plan sections


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix K

TR-11 Internal Audits



	<h1>QMS Procedure</h1>	Proc.: TR-11 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 2
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Internal Audits

1.0 Purpose

To describe the *Town of Renfrew* procedure for conducting Internal Audits at the facility level that evaluates the conformance to the requirements of the Drinking Water Quality Management Standard (DWQMS).

2.0 Scope

This procedure applies to the process of conducting internal audits at the Renfrew Water Distribution System.

3.0 Responsibility

- Director of Development and Works
- General Foreman
- Assistant Foreman
- QMS Representative

4.0 Definitions

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.

Non-conformance – the non-fulfillment of a DWQMS requirement

5.0 Procedure

- 5.1 The QMS Representative maintains the Internal Audit Procedure and schedules the internal QMS audit that addresses all DWQMS elements is conducted for the facility on an annual basis. The Director of Development and Works selects personnel to perform the audit considering adequate skills, training and/or experience.
- 5.2 The Auditor evaluates conformity of the QMS with the requirements of the DWQMS by asking questions which are designed to encompass all of the requirements of the DWQMS.
- 5.3 The Auditor will use a check list, developed from MOE's DWQMS and supporting documentation, to ensure all 21 Elements of the DWQMS are addressed. This step

will include interviews with select staff of the Operating Authority, observation of operating practices, and review of documents. The auditor will document the audit findings in a written report to the Operating Authority.

5.4 The auditor reviews the facility's approved policies and procedures, the results of previous internal and external QMS audits, the status of corrective and preventive actions and other QMS-related documentation prior to the audit.

5.5 When nonconformity is identified through the internal audit process, an action plan to rectify the issue is developed by the QMS representative with assistance from the Director of Development and Works, specifying responsibility and a target date for resolution. The Director of Development and Works will monitor progress of the action plan related to the identified nonconformity until it is fully resolved.

5.6 The QMS Representative ensures that results of the audit are included as input to the management review process.

6.0 Related Documents

Audit checklist


7.0 Revision History

Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix L

TR-12 Management Review



	<h1>QMS Procedure</h1>	Proc.: TR-12 Issued: 01-Nov-09 Rev.#: 0 Pages: 1 of 3
Reviewed by: Lane Cleroux – Engineering Technician - Town QMS Rep.	Approved by: Mike Asselin, Director of Development and Works	

Management Review

1.0 Purpose

To describe the Town of Renfrew procedure for a Management Review of the Quality Management System (QMS) at the facility level.

2.0 Scope

Applies to the review by Top Management of Town of Renfrew of the QMS implemented at the Town of Renfrew Water Distribution System.

3.0 Responsibility

Top Management (facility level):

- Director of Development and Works

Other Management Review Participants:

- QMS Representative
- General Foreman and/or Assistant Foreman
- Office Coordinator as required

4.0 Definitions

Management Review – a process where a higher level of managers in the operating authority considers various indicators within the QMS.

5.0 Procedure

The QMS representative determines a suitable frequency for Management Review meetings for the drinking water system. As a minimum, reviews must be conducted at least once every 12 months. The following positions are included: Director of Development and Works, QMS representative, General Foreman, Assistant Foreman in the Management review.

- 5.1 The QMS Representative maintains the Management Review Procedure, coordinates the Management Review and ensures that the agenda with identified responsibilities is distributed to all participants in advance of the Management Review meeting along with any related reference materials.

The standing agenda for Management Review meetings is as follows:

- a) Incidents of regulatory non-compliance
 - I.e. review MOE inspection reports, annual reports to MOE

- b) Incidents of adverse drinking water tests (ADWI)
 - I.e. review Annual reports and adverse reports to MOE
- c) Deviations from critical control limits and response actions
 - I.e. review adverse reports to MOE, call-in reports, logbook entries
- d) The efficacy of the risk assessment process
 - I.e. review of Summary of Risk Assessment Outcomes
- e) Internal and third-party audit results
 - I.e. review Audit reports and action plans
- f) Results of emergency response testing
 - I.e. review Facility Emergency Plan, training records, related test Documentation
- g) Operational performance
 - I.e. review MOE inspection rating reports
- h) Raw water supply and drinking water quality trends
 - I.e. review drinking water facility description in Operational Plan, annual reports to MOE, flushing trends, consumer feedback
- i) Follow-up on action items from previous Management Reviews
 - I.e. review minutes and action plans
- j) The status of management action items identified between reviews
 - I.e. review action plans; memos, correspondence to operating authority staff
- k) Changes that could affect the QMS
- l) Consumer feedback
 - I.e. review community complaints, Logbook
- m) The resources needed to maintain the QMS
 - I.e. review staffing levels
- n) The results of the infrastructure review
 - I.e. review capital works recommendations (see element 14, XX-06)
- o) Operational Plan currency, content and updates
 - I.e. review the status of the Operational Plan including QMS Procedures
- p) Staff suggestions.
 - I.e. review relevant correspondence

5.2 The Management Review participants review all data presented and make recommendations and/or initiate action plans to address identified deficiencies as appropriate.

- 5.3 The QMS Representative ensures that minutes of and action plans resulting from the Management Review meeting are prepared and distributed to all participants involved in the Management Review and the Clerk for circulation to the Council of the Corporation.
- 5.4 The QMS Representative in consultation with the Director of Development and Works monitors the progress and documents the completion of action plans resulting from the Management Review.

6.0 Related Documents

Minutes and action plans resulting from the Management Review
Audit Reports
Management Review Records/Documents

7.0 Revision History

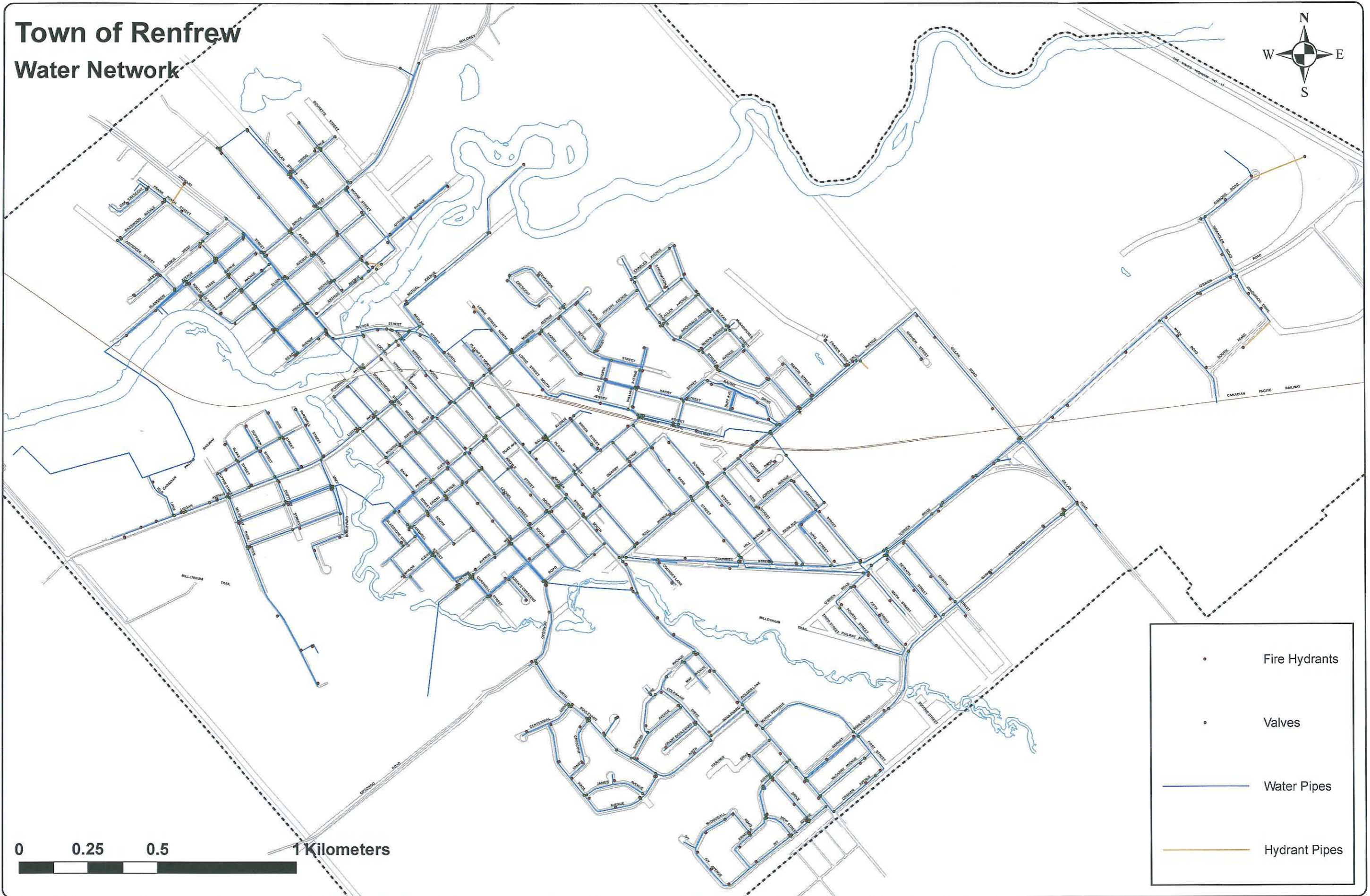
Date	Revision #	Reason for Revision
01-Nov-09	0	Procedure issued

Appendix M

TR-13 Town of Renfrew Distribution System Map



Town of Renfrew Water Network



0 0.25 0.5 1 Kilometers

•	Fire Hydrants
•	Valves
—	Water Pipes
—	Hydrant Pipes