

MUNICIPALITY OF BAYHAM



Bayham Water Distribution System Quality Management System Operational Plan

PREPARED BY: MUNICIPALITY OF BAYHAM
QUALITY MANAGEMENT SYSTEM TEAM

Revision 1.11 February 11, 2016

MUNICIPALITY OF BAYHAM QUALITY MANAGEMENT SYSTEM OPERATIONAL PLAN

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1. QUALITY MANAGEMENT SYSTEM

This document will be the Quality Management System Operational Plan for the Bayham Water Distribution System (DWS#260004748). The Municipality of Bayham is the owner and operating authority of the said system.

The Quality Management System for Bayham covers the transmission and distribution of potable drinking water to consumers within the Municipality of Bayham. Treated potable drinking water is purchased from the producer, Elgin Area Water Treatment Plant. The water enters the Bayham distribution system from the Port Burwell Secondary Water Supply System.

The Bayham Water Distribution System transmits and distributes potable drinking water to the communities of Port Burwell and Vienna.

2. QUALITY MANAGEMENT SYSTEM POLICY

The Municipality of Bayham and its water distribution system is committed to comply with applicable regulations set forth by the Safe Drinking Water Act (SDWA) 2002 – Ontario Regulation 170/03 Drinking Water Systems Regulation and Ontario Regulation 169/03 Ontario Drinking Water Quality Standards and other requirements. The Municipality of Bayham will supply clean safe drinking water to meet consumer requirements and is committed to the maintenance and continual improvement of the Quality Management System. **(March 2009)**

This Quality Policy is applicable to all water department employees and is displayed in public areas of the municipal administrative offices located at 9344 Plank Road, Strathfordville, the Port Burwell Wastewater Treatment Plant at 1 Chatham Street, Port Burwell, and on the municipal website (www.bayham.on.ca).

3. COMMITMENT AND ENDORSEMENT

The owner (Mayor and Council) has passed a motion to endorse the operational plan of the DWQMS and the plan be reviewed annually with revisions made as necessary to maintain and continually improve the quality management system.

Upon major changes to the system, change in top management and/or council, the operational plan requires re-endorsement by the Owner and Top Management.

See Appendix A (pg. 11)

Through water publications, association memberships, ministry newsletters and on-going training requirements, these resources of regulatory requirements help

to maintain and improve the quality management system. Any actions undertaken to completion are tracked through the Document Management Spreadsheet

4. QUALITY MANAGEMENT SYSTEM REPRESENTATIVE

The Water/Wastewater Operations Manager will be the QMS representative or in his absence, a Certified Operator.

The QMS representative will develop, implement, maintain and report the effectiveness, including the need for improvement, of the QMS to the owner and ensure that the current versions of the documents required by the QMS are in use at all times. The representative will promote the QMS throughout the water department and see that personnel are aware of all current legislation and regulatory requirements that are relevant to the operation.

5. DOCUMENT AND RECORDS CONTROL

All records required by the Ministry of the Environment O Reg. 128/04 and O. Reg.170/03 to demonstrate compliance and or conformance shall be maintained per the regulations. In summary, the following documents and records are retained;

2 years - Operational and Maintenance Checks Records, Microbiological Sampling and Testing Results and Corrective Action Reports For Microbiological (AWQI)

5 years – Logbooks

6 years – THM and Lead Parameter Sample Results and Annual Summary Reports

15 years – Engineering Reports if applicable

The operational plans that were the subject of an audit, as required by Section 4.0.1 of the Director's Directions Minimum Requirements for Operational Plans (July 2007), will be retained for 10 years.

All documents and records received is reviewed, acted upon if needed, filed in labeled folders in a file cabinet, or placed in a binder and retained for five years at the water department office. After 5 years, all documents and records will be archived at the wastewater treatment plant. The municipality complies with Provincial Records Management through By-Law 2014-091 Records Retention and Document Control.

See PROCEDURE A (pg. 16)

6. DRINKING WATER SYSTEM

The Municipality of Bayham is the owner and operating authority of the Bayham Distribution System (DWS#260004748). As shown on the organizational structure, the Mayor and Council are the head of the Municipality, and this responsibility is delegated to the staff. See **Appendix B (pg. 12)** for the organizational structure. The Bayham Water Distribution System transmits and distributes potable drinking water to the communities of Port Burwell and Vienna.

A system description can be found in the Bayham Water Distribution System Operations/Management Manual Section 1 – Distribution System Operations and Management.

All customers within the Bayham Water Distribution System are metered and the meters are read on a bi-monthly basis. There is no discount within our system for larger users. All bills are calculated on a cubic metre rate.

Treated potable drinking water is purchased from the producer, Elgin Area Water Treatment Plant. The most recent annual and quarterly water quality reports can be found in the Bayham Water Distribution System Operations/Management Manual.

The water enters the Bayham distribution system from the Port Burwell Area Secondary Water Supply System. The Port Burwell Area Secondary System runs along Nova Scotia Line to the Port Burwell Tower and Lakeview Re-chlorination Facility. Both of these facilities maintain secondary disinfection using sodium hypochlorite complete with continuous on-line analyzers, data loggers and alarms. On Nova Scotia Line, the services and hydrants are the responsibility of the municipality (Bayham and Malahide) in which they are located. Water volumes entering the Bayham Water Distribution System are metered at the Port Burwell and Vienna water meter chambers.

Event driven fluctuations are originated from the Elgin Area Water Treatment Plant (i.e. Taste and odour) and along the Port Burwell Area Secondary System (ie pressure changes related to water tower levels). The Bayham Water Distribution System has no control over these event driven fluctuation. Bayham is the end user of the Elgin Area Water Treatment Plant/Port Burwell Area Secondary System and rely on the safe delivery of the water to our distribution system.

See APPENDIX C (pg. 13)

7. & 8. RISK ASSESSMENT AND OUTCOMES

See PROCEDURE B (pg. 18)

9. OPERATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

The Water/Wastewater Operations Manager shall keep the operational structure, organizational structure, respective roles, responsibilities and authorities current, and shall communicate this information to the owner and personnel. (See Municipality of Bayham Essential Supplies, Services and Emergency Contact List in the Bayham Water Distribution System Operation/Management Manual Section 3 – Contact List regarding names of persons having top management responsibilities.)

See APPENDIX B (pg. 12)

See APPENDIX D (pg. 14)

10. COMPETENCIES

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

Function	Required Competencies	Desired Competencies
Water/Wastewater Operations Manager	<ul style="list-style-type: none"> • Minimum Class I Distribution certification • Minimum 10 years Class I operation 	<ul style="list-style-type: none"> • Development of all capital and regular plans • WHMIS • First Aid (including CPR) • Leadership Training • Confined Space Training
Operators	<ul style="list-style-type: none"> • Operator in Training to Distribution Class I certification 	<ul style="list-style-type: none"> • Internal auditor training • WHMIS • Confined Space Training • First Aid (including CPR)

The Municipality of Bayham's Water Department provides for training in their annual budget process. At a minimum the training budget includes funding for legislated and required training to maintain operator certification in accordance with O.Reg.128/04.

Training or knowledge gain may take the form of on or off-site training sessions and seminars, on-the-job training, distance learning or courses of study. Where appropriate, proof of participation or proficiency will be required as proof of competency.

Through internal audits, risk assessments of the operational plan, QMS changes/updates through staff meetings (communications), annual training (On-The-Job and/or Director Approved), personnel are aware of the relevance of their duties and how they affect safe drinking water quality.

11. PERSONNEL COVERAGE

The water department is staffed from Monday to Friday 8:00 am to 4:30 pm five days per week. The Water/Wastewater Operations Manager is the primary overall responsible operator (ORO) and the back-up ORO is tracked through the water system logbook and time sheets.

The 24/7 personnel coverage procedure shows how after hour emergencies are handled. Spectrum Communications bumps numbers until either the superintendent or one of the operators is contacted.

See PROCEDURE C (pg. 25)

An on-call operator is assigned by the Water/Wastewater Operations Manager on a weekly basis to respond to after-hours and weekend emergencies. When on-call, the operator is required to remain within one hour driving time of the municipal water system.

The Municipality of Bayham is a member of OnWARN (Ontario Water/Wastewater Agency Response Network). OnWARN is a network of utilities helping other utilities to respond to and recover from emergencies. The OnWARN contact list can be found in the Richmond Community Water System Operations/Management Manual Section 6 – Contact List and Forms. If the municipality requires assistance in recovering from and responding to emergencies, the CAO and Treasurer have access to the OnWARN list and the authority to request for external Operator assistance.

The municipality is committed to ensuring that adequate staff meet the required competencies are available for duties that affect drinking water quality.

12. COMMUNICATION

The QMS representative shall ensure the owner (Mayor and Council) is provided with a current copy of the Operational Plan. The QMS representative shall keep the owner informed of any changes to the QMS, the adequacy of infrastructure

requirements, the outcome of management reviews and other issues related to the QMS on an annual basis.

Personnel will be informed of the QMS and of any changes or updates through staff meetings with the QMS representative. A current version of the Operational Plan is available for review by staff at the water department office and at the municipal office.

Essential suppliers shall receive information regarding the QMS from the purchaser if and when necessary.

Consumers may be informed of the QMS and any significant changes by newsletters, flyers or hand-outs.

The QMS policy will be posted at the water department office and at the municipal office. It can also be viewed on the municipal web site.

13. ESSENTIAL SUPPLIERS AND SERVICES

Where applicable, supplies must meet or be equal to AWWA, NSF or ANSI specifications. Supplies are verified against the order requisition when received.

Laboratory analysis services provided require accreditation through CALA (Canadian Association For Laboratory Accreditation Inc.). Accreditation certificate copies and a list of licensed laboratories available from the Ministry of the Environment can be found in the Bayham Water Distribution System Operations/Management Manual Section 10 – Scope of Accreditation of Applicable Laboratories

Verification/Calibration of measurement and recording equipment (ie. portable chlorine analyzers) services provided, a copy of the Statement of Qualifications/Accreditations is located in the Bayham Water Distribution System Operations/Management Section 3 – Calibration Reports.

A list of suppliers and contractors has been developed and can be found in the Bayham Water Distribution System Operations/Management Manual Section 3 – Contact List (Municipality of Bayham Water Department Essential Supplies, Service and Emergency Contact List) in the water department office. This list is reviewed annually by the Water/Wastewater Operations Manager to ensure that it is current and up-to-date.

The Municipality of Bayham is a member of OnWARN (Ontario Water/Wastewater Agency Response Network). OnWARN is a network of utilities helping other utilities to respond to and recover from emergencies. The OnWARN contact list can be found in the Bayham Water Distribution System Operations/Management Manual Section 3 – Contact List.

Only authorized municipal employees can purchase or engage service providers as listed as set out in By-Law 2012-122 Procurement Policy.

14. REVIEW AND PROVISION OF INFRASTRUCTURE

The Water/Wastewater Operations Manager will communicate with the owner on an annual basis during budget deliberations, the infrastructure necessary to operate and maintain the QMS.

The adequacy of the infrastructure to operate and maintain the distribution system may be assessed based on Water department staff suggestions, water quality trends and consumer complaints. The Water/Wastewater Operations Manager will communicate to the owner, during the annual budget deliberations, the infrastructure deemed necessary to operate and maintain the Bayham Distribution System.

15. INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

The following routine planned maintenance is conducted on the Bayham Distribution System: annual valve inspection/exercising, annual hydrant flushing, annual hydrant inspection, annual pressure testing, leak detection as required, minimum annual inspection of water main chambers, as well as the activities required for maintaining the Vienna Booster station as listed in the preventative maintenance binder at the water department office. All records are maintained at the water department office in the appropriate binders using the forms maintained in the back of the binder. All planned maintenance is scheduled and communicated to staff by the Water/Wastewater Operations Manager. All records are retained at the water department office.

Water main or other equipment replacement is conducted on an as-needed basis.

Once per year, the Water/Wastewater Operations Manager prepares a summary of the infrastructure maintenance, rehabilitation and renewal programs and specifically reviews any unplanned maintenance to determine if additional planned maintenance is required. This summary will be communicated to the top management during the yearly Management Review meeting.

16. SAMPLING, TESTING AND MONITORING

All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03. Adverse water quality incidents are responded to and reported as stated in the Operations Manual.

Samples are submitted to an accredited and licensed laboratory according to the facility's sampling schedule as stated in the Bayham Water Distribution System Operations/Management Manual Section 1 – Distribution System Operations and Management.

All analytical results from laboratory reports are kept and maintained as per Document and Record Control. Sampling, testing and monitoring results are readily accessible to the owner. As a minimum, owners are provided with an annual summary of sampling, testing and monitoring results through SDWA O.Reg. 170/03 sections 11, schedule 22 and through the Management Review process.

Upstream Quarterly Water Quality Reports, Annual Reports and Compliance Reports from the Elgin and Area Water Supply System are available in Section 25 of the Bayham Water Distribution Operations/Management Manual or on the website www.watersupply.london.ca.

17. MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE

A contractor will perform a verification/calibration test on the portable chlorine analyzers annually. Verification/calibration records are located in the Bayham Water Distribution System Operations/Management Manual Section 3 – Calibration Reports.

The manufacturer calibrates the residential water meters on an “as-needed” basis. The records of calibration are maintained and kept as per Documents and Records Control

18. EMERGENCY MANAGEMENT

The contamination of the treated water supply and a major or prolonged loss of water supply are deemed to be emergency situations. The Risk Assessment chart contained in the QMS Operational Plan (**PROCEDURE B pg. 18**) can be referenced, for emergency procedures and contingency plans.

The Municipality of Bayham has created an Emergency Response Plan as established under By-law 2006-113. The custodian of this plan shall be the Corporation of the Municipality of Bayham Community Emergency Management Coordinator and Community Emergency Management Program Committee, who are responsible for the annual review, revisions and testing of the plan. A specific water supply emergency plan (**PROCEDURE D pg. 26**) forms part of the said Municipal Emergency Response Plan along with contingency plans and Procedural Guideline of Providing Water within the Bayham Distribution System During a Prolonged Outage (Bayham Water Distribution System Operations/Management Manual Section 5). A list of emergency contacts and essential suppliers and services along with OnWARN (Ontario Water/Wastewater

Agency Response Network) member contact list are also kept with the emergency plan. Both can also be found in the Bayham Water Distribution System Operations/Management Manual Section 2 – Contact List (Municipality of Bayham Water Department Essential Supplies, Service and Emergency Contact List in the water department office.

The QMS Representative will keep the emergency contacts and essential suppliers and services list current.

The responsibilities of all affected positions within the municipality during an emergency are listed in the municipal emergency plan as is in the emergency protocol.

All water department staff is required to review the emergency plans to coincide with the risk assessment every 3 years. Desktop simulations will be planned and documented to keep all water personnel up to date on the emergency procedures.

19. INTERNAL AUDIT

See PROCEDURE E (pg. 33)

20. MANAGEMENT REVIEW

A management review will be completed annually with the QMS Representative and the Chief Administrative Officer (Top Management) evaluating the adequacy and effectiveness of the QMS.

See PROCEDURE F (pg. 35)

21. CONTINUAL IMPROVEMENT

The Municipality of Bayham shall strive to continually improve the effectiveness of its Quality Management System through the use of corrective actions from the annual audits and management review.

APPENDIX A

COUNCIL ENDORSEMENT

Municipality of Bayham – Bayham Water Distribution System

APPENDIX A

COUNCIL ENDORSEMENT

Date: 05 Jun 2014

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Moved by:
Seconded by:



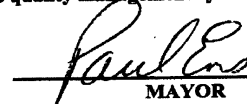
10(a)

"That Staff Report 2014-004 be received;

THAT Council and the Administrator be authorized to endorse both the Municipality of Bayham Water Distribution System and the Richmond Community Water System Operational Plans;

AND THAT the Plans be reviewed by staff and revisions made, as necessary to maintain and continually improve the quality management system, on an annual basis."

CARRIED


MAYOR

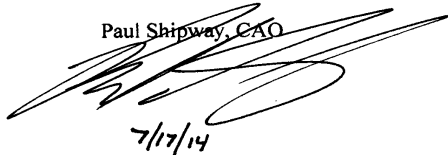
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MAYOR

TOP MANAGEMENT ENDORSEMENT

Top Management (CAO) hereby endorses the Municipality of Bayham Operational Plans for the Bayham Water Distribution System and the Richmond Community Water Supply System and that revisions to the plans be reviewed annually to maintain and continually improve the quality management system.

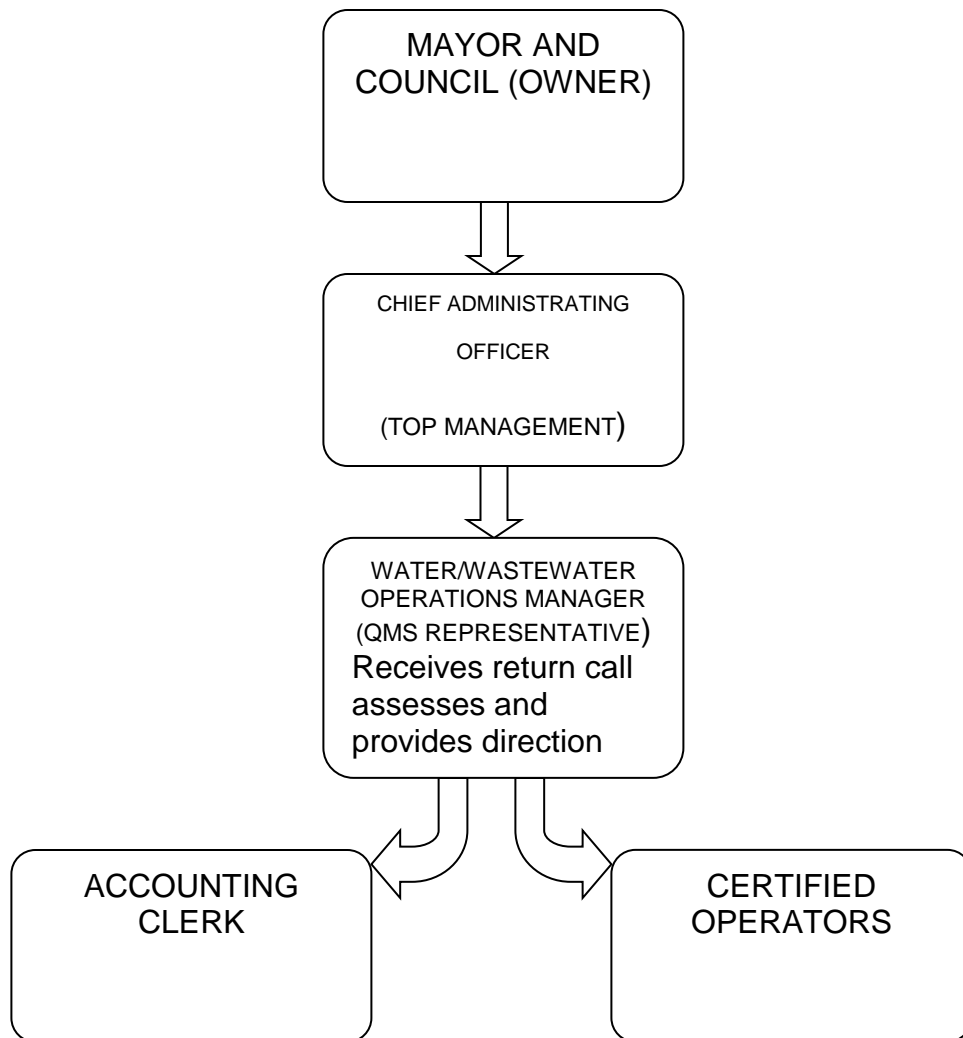
Paul Shipway, CAO


7/17/14

Operational Plan – Revision 1.9 13-Mar-14

APPENDIX B

ORGANIZATIONAL AND OPERATIONAL STRUCTURE



The map displays the Elgin Area Water Treatment Plant and its associated infrastructure. Key features include:

- ELGIN AREA WATER TREATMENT PLANT**: Located near the Elgin River, with a **1500 INTAKE**.
- Port Burwell Area Secondary Supply System**: A red box highlights the area around Port Burwell, including the **PORT BURWELL** and **PORT BRUCE** storage tanks.
- Bayham Water Distribution System**: A red box highlights the area around Bayham, including the **PORT BURWELL** and **PORT BRUCE** storage tanks.
- Other Infrastructure**: The map shows various other water storage tanks (e.g., **PORT STANLEY**, **PORT BRUCE**, **PORT BURWELL**) and pumping stations (e.g., **ST. THOMAS**, **VIENNA**).

APPENDIX D

OPERATIONAL RESPONSIBILITIES AND AUTHORITIES

Mayor/Council (Owner)

Responsibilities	Authorities
<ul style="list-style-type: none"> - Complete oversight of the entire distribution system and the QMS - Ultimate responsibility for the provision of safe drinking water - Ensure compliance with applicable legislation and regulations 	<ul style="list-style-type: none"> - Financial, administrative authority related to the distribution of safe drinking water

Chief Administrative Officer (Top Management)

Responsibilities	Authorities
<ul style="list-style-type: none"> - Complete oversight of the entire distribution system - Endorse and lead the development and implementation and maintenance of the QMS - Provide and/or obtain resources for the QMS and necessary infrastructure and resources to operate and maintain the drinking water system safely and effectively - Ensure the system is operated in accordance with all applicable legislation and regulations - Lead for Management Reviews - Communication with Mayor and Council about QMS and the water distribution system - Communications lead during emergencies 	<ul style="list-style-type: none"> - Financial, administrative and technical authority related to the distribution of safe drinking water

Water/Wastewater Operations Manager

Responsibilities	Authorities
<ul style="list-style-type: none"> - Complete oversight of the entire distribution system - Overall Responsible Operator - Quality Management System representative - Provide and/or obtain resources for the QMS and necessary infrastructure and resources to operate and maintain the drinking water system safely and effectively - Ensure the system is operated in accordance with all applicable legislation and regulations - Lead for management reviews - Communication with mayor and council about the QMS and the water distribution system - Preparation of budget and planning materials - Recommendation of system improvements - Develops procedures and processes for assuring water quality - Emergency response planning, training 	<ul style="list-style-type: none"> - Financial, administrative and technical authority related to the distribution safe drinking water to the Municipality of Bayham - Staffing-within the guidelines of the Municipality and any in-force collective agreements - Activity/program scheduling within the department - Oversee adverse water quality incidences and responses - Identify and oversee staff training needs - Make changes to the QMS - Delegate ORO to certified operator in absence

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Accounting Clerk

Responsibilities	Authorities
<ul style="list-style-type: none">- Communication/liaison with Operations Manager, operators- Communication of water shut-offs to superintendent or operators due to non-payment of account- Respond to and document public complaints- Prepare reports as required by regulations and circulate to management and council- Generate bi-month water billings- Communication during emergency- Treasurer backup in the absence of accounting clerk	<ul style="list-style-type: none">- Recommend changes to the QMS- Update and document changes to QMS as required

Operators

Responsibilities	Authorities
<ul style="list-style-type: none">- Daily chlorine residual testing- Weekly testing of water system- Regular maintenance- Report any incidents of non-compliance- Respond to repairs directed from operations manager, and accounting clerk- Water shut-offs as directed by accounting clerk- Bi-monthly water meter reads- Knowledge of QMS	<ul style="list-style-type: none">- Monitor process and equipment- Respond to public complaints as relayed from superintendent, or accounting clerk- Recommend changes to the QMS

PROCEDURE A

DOCUMENT AND RECORD CONTROL

QMS Document Control

This procedure is applicable to the following QMS documents:

- Operational Plan
- Procedures
- Audit Checklists
- Forms
- Equipment Manuals
- As Built Drawings

Creating New or Updating Existing Documents

- The need for document changes or for new documents or procedures may be identified through audits or management reviews. The Water/Wastewater Operations Manager will delegate the task of creating the new document
- Any employee of the Water Department may request a change to an existing QMS. The request must be made in writing, dated and submitted to the Water/Wastewater Operations Manager. The request must include the following information:
 1. Reason for new or changed document - must belong in one or more of these categories:
 - Required by the DWQMS
 - Enhances process control
 - Reduces risk
 - Supports regulatory requirements
 - May improve operational efficiency
 2. Outline of document change or new document content
 - Narrative format is acceptable
- The requester shall develop the new/changed document and submit it to the Water/Wastewater Operations Manager for approval.
- Document changes or the need for new documents or procedures may be identified through audits or management reviews.

- Electronic versions of the new/changed documents will be created by the Office Assistant and approved by the Water/Wastewater Operations Manager.

Approving Documents

- All QMS related documents shall be approved by the Water/Wastewater Operations Manager.
- The Water/Wastewater Operations Manager shall be responsible for ensuring that copies of the new or changed document show the revision number and date modified and are distributed. Obsolete documents (due to changes) shall be collected and destroyed.

Reviewing Documents

- The Operational Plan and procedures shall be reviewed annually for applicability and relevance.

Document Identification, Storage, Availability and Control

- Documents are identified in the Master Document List by the title and revision number/date of the document.
- Hard copy of the Master Documents will be kept at the water department office in a file cabinet.
- Electronic copy of the Master Documents will be kept on the laptop computer at the water department.
- Backup copy of the electronic file of the Master Documents will be saved on the master server at the municipal office. There is a secondary back-up server at the municipal office and four times a day everything is backed to an offsite DATTO Cloud.
- All procedures, instructions, forms and checklists are retained in the QMS binders at the water department office.
- Original sets of equipment manuals and specifications are kept at the water department office.
- As appropriate, copies are kept at the pumping station.
- Logbook specific to the pumping station is kept at the pumping station. Logbook specific to distribution system is kept at the water department office.

QMS Record Control

This procedure is applicable to all records that demonstrate conformance to DWQMS requirements. Ontario Regulations 170/03 and 128/04 cover all records that demonstrate compliance.

Manual Records

- The record title shall be clearly visible and legible
- Manual records shall be legible. Pencil or any other erasable marker shall not be used to record process or product information or data.
- QMS records shall be filed by type by date
- QMS related water distribution records will be available at the water department office.
- QMS records shall be stored in such a manner as to prevent deterioration.
- All manual records shall show the name or initials of the recorder and the date (and time if appropriate) the record was generated.

PROCEDURE B

RISK ASSESSMENT AND OUTCOMES

The QMS team consists of the Water/Wastewater Operations Manager, certified operators and the accounting clerk. The QMS team will identify the potential hazards and hazardous events, which could affect the water system, the control measures to address the hazards, identify the Critical Control Points (if applicable) and control limits, and associated methods of monitoring critical limits and responding to deviations. Equipment reliability, accuracy, and redundancy are all reviewed on an annual basis as stated in Element 17 (pg. 9).

Hazardous events and hazards were assessed on the basis of likelihood, severity and detectability. The assessment criteria are summarized in the following tables and values were combined to give an overall level of risk as shown.

Every year the Water/Wastewater Operations Manager will review the risk assessment and ensure that the information and assumptions remain current and valid.

Every 3 years the Water/Wastewater Operations Manager will assemble a team to conduct a new risk assessment.

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past	1
Unlikely	Could occur at some time, historically has occurred less than once every 5-10 years	2
Possible	Has occurred or may occur once or more per year	3
Likely	Has occurred or may occur on a monthly to quarterly basis	4
Very Likely	One or more occurrences on a monthly or more frequent basis	5

Description	Severity of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk	1
Minor	Limited public exposure, minor health risk	2
Moderate	Minor public exposure, minor health risk	3
Major	Large population at risk	4
Catastrophic	Major impact for large population, complete failure of systems	5

Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, visual	1
Moderately Detectable	Increased flow rates	2
Normally Detectable	Visually detectable but not on rounds or regular basis	3
Poorly Detectable	Visually detectable but not inspected on a regular basis	4
Undetectable	Cannot detect	5

Municipality of Bayham – Bayham Water Distribution System

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plans	Likelihood	Severity	Detectability	Total (High Risk CCP Threshold=7)	CCP?
Source Water (supply Elgin Area Water Treatment Plant)	Contamination of source water and/or unable to supply water	Adverse Water Unable to supply water	No control	Notification by Elgin Area Treatment Plant – on-line monitoring Notification by operating authority of the Port Burwell Secondary System – on-line monitoring and daily chlorine residuals	Monitor residual at furthest sampling points Communication essential with Elgin Area Treatment Plant – depending on levels/demands at other reservoirs and locations Communication essential with the Port Burwell Secondary System – dependent on levels/demands at the tower On-going discussions with Elgin Area Water Treatment Plant operators; see if water quality and/or system chlorine residual has been restored Discuss water quality with Medical Officer of Health (MOH) and Elgin Area Treatment Plant operators (should have been reported Ministry of the Environment (MOE)). Communicate boil water/drinking water advisory if issued by MOH See Contingency Plans (Contamination of Source Water and/or Unable to Supply Water, AWQI and Procedural Guideline During A Prolonged Outage) Section 5 of Operations/Management Manual	1	3	1	5	No-Below risk threshold for CCP

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plans	Likelihood	Severity	Detectability	Total (High Risk CCP Threshold=7)	CCP?
Vienna Booster Station	Power Loss	Adverse Water Loss of Pressure		No on-line notification, feedback by consumers complaints, visual checks daily basis	Contact secondary operating authority to maintain adequate tower level to maintain pressure in system. Reconfigure distribution system (i.e. open loop), if required See Contingency Plans (Vienna Booster – Power Loss) Section 5 of Operations/Management Manual	3	1	1	5	No Below risk threshold for CCP
	Vandalism/Terrorism	Adverse Water		Drive by visual checks everyday.	Call police and contact MOH and MOE Spill Action Centre, if necessary See Contingency Plans (Vandalism/Terrorism) Section 5 of Operations/Management Manual	1	2	3	6	No No control at this point
	Failure of booster pump	Adverse Water Loss of Pressure		No on-line notification, feedback by consumers complaints, visual checks daily basis	Contact secondary operating authority to maintain adequate tower level to maintain pressure in system. Reconfigure distribution system (i.e. open loop), if required See Contingency Plans (Vienna Booster – Failure of Booster Pump) Section 5 of Operations/Management Manual	3	1	1	5	No Below risk threshold for CCP

Municipality of Bayham – Bayham Water Distribution System

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plans	Likelihood	Severity	Detectability	Total (High Risk CCP Threshold=7)	CCP?
Distribution	Watermain Break within distribution system causing low pressure/no water	Adverse Water Low pressure / back-siphoning	Elevated distribution system storage in Port Burwell Secondary	<p>Customer complaints; Low pressure or high flows, visual if at ground, no on-line indication/monitoring of flows from tower.</p> <p>V001 and E038 Flow monitoring through the checks of the flow meters and graphing through the week.</p> <p>May not be aware of fire/break.</p> <p>Looping has improved ability to isolate areas and also maintain flow in event of breaks.</p> <p>Mapping</p>	<p>Repair; watermain disinfection procedures per Operations Manual, training.</p> <p>Repair parts ect. Stocked.</p> <p>If necessary issue boil water advisory after consultation with MOH.</p> <p>See Contingency Plans (Main Break, AWQI and Procedural Guideline During A Prolonged Outage) Section 5 of Operations/Management Manual</p>	3	2	2	7	<p>Yes</p> <p>No control of event taking place. CCP are identified with-in the AWQI Contingency Plan.</p>
	Loss of chlorine residual (secondary disinfection from secondary water system)	Adverse Water	Legislated under O. Reg. 170/03	<p>Daily residual testing at far end of system, weekly microbiological sampling at locations in town, values are tracked & trended on data spreadsheet</p>	<p>Contact secondary operating authority to maintain chlorine residual. Flush the system and resample. Corrective actions required by O. Reg. 170/03.</p> <p>See Contingency Plans (Low Cl2 Residual and AWQI) Section 5 of Operations/Management Manual</p>	1	4	1	6	<p>No</p> <p>Below risk threshold for CCP</p>

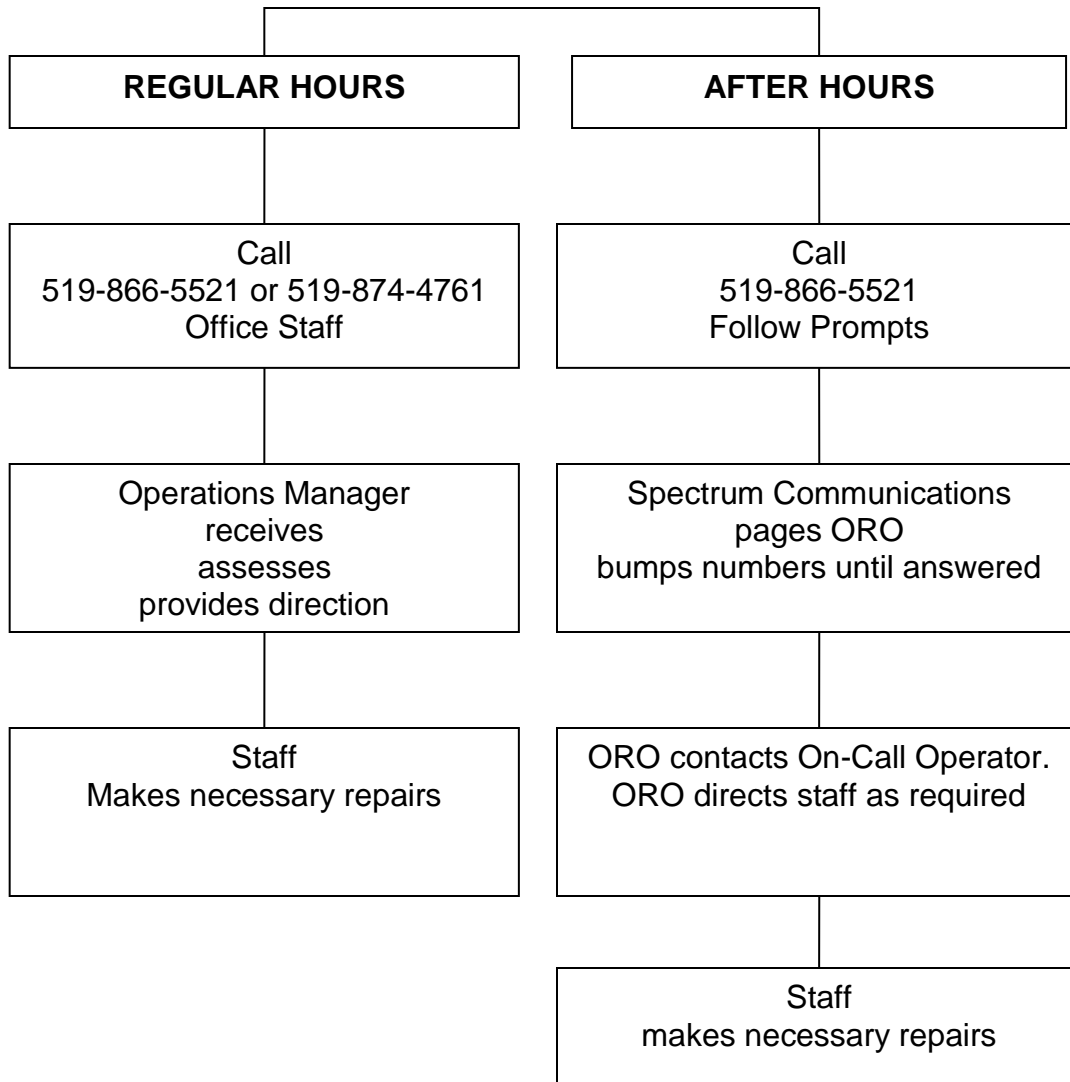
Municipality of Bayham – Bayham Water Distribution System

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plans	Likelihood	Severity	Detectability	Total (High Risk CCP Threshold=7)	CCP?
Distribution	Commissioning of new watermain/service installation	Adverse Water		<p>Follow procedures for disinfection of new watermain using AWWA Standard – C605-05.</p> <p>Check chlorine residuals and conduct microbiological testing.</p>	<p>Follow corrective action per O.Reg. 170/03.</p> <p>If necessary, communicate issuance of boil water advisory after consultation with MOH.</p> <p>See Contingency Plans (Contamination of Commissioning of New Watermain/Service Installation and AWQI) Section 5 of Operations/Management Manual</p>	1	2	1	4	No Below risk threshold for CCP
	Loss of pressure – watermain break, major fire	<p>Adverse Water</p> <p>Low pressure /back-siphoning</p>		<p>V001 and E038 Flow monitoring through the checks of the flow meters and graphing through the week.</p> <p>Water hammer, consumer complaints.</p> <p>Backflow contamination prevented by 2" double check valves on all connections of concerns.</p> <p>Backflow preventor required (residential & commercial) through by law</p>	<p>Check pressure and chlorine residual. Discussion with MOE and MOH if low.</p> <p>If necessary, communicate issuance of boil water advisory after consultation with MOH.</p> <p>Restore pressure and chlorine residual. Conduct sampling per MOH and MOE direction.</p> <p>See Contingency Plans (Loss of Pressure, Main Break, AWQI and Procedural Guideline During A Prolonged Outage) Section 5 of Operations/Management Manual</p>	1	2	2	5	No Below risk threshold for CCP

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring & Control Measures	Emergency Procedure or Contingency Plans	Likelihood	Severity	Detectability	Total (High Risk CCP Threshold=7)	CCP?
Distribution	Backflow from private plumbing (Cross connection)	Adverse Water	Backflow preventors on all new connections of concern	Meters are installed throughout. Backflow preventor required (residential & commercial) through by law	Inspect homes/commercial properties in area, install backflow preventor. Isolate area: Flush the system and sample as appropriate. Notify MOH and MOE Spill Action Centre. If necessary, communicate issuance of boil water advisory after consultation with MOH. See Contingency Plans (Backflow Failure and AWQI) Section 5 of Operations/Management Manual	1	2	3	6	No Below risk threshold for CCP
	Biofilms	Adverse Water		Visual inspection of pipe breaks, reduced flow in pipes, inability to maintain chlorine residual Flushing and swabbing. Replacement of old watermain based on material, age, observations. Mapping	See Contingency Plans (Biofilm – Taste/Colour/Odour/Other Customer Complaints or Adverse Water and AWQI) Section 5 of Operations/Management Manual	2	2	1	5	No Below risk threshold for CCP

PROCEDURE C

PERSONNEL COVERAGE 24/7



PROCEDURE D

WATER SUPPLY EMERGENCY RESPONSE PLAN

AIM:

The aim of this plan is to:

- Provide a guideline to assist the Municipality in responding to water supply emergency affecting residents, community or infrastructure within the Municipality of Bayham.
- Define the roles and responsibilities of municipal staff and departments, and supporting agencies during a water supply emergency.

AUTHORITY AND CUSTODIAN:

This plan is published as an Annex to the Corporation of the Municipality of Bayham Emergency Response Plan as established under By-law 2006-113, and the *Emergency Management and Civil Protection Act, RSO 1990*.

The Custodian of this plan shall be the Corporation of the Municipality of Bayham Community Emergency Management Coordinator and Community Emergency Management Program Committee, who are responsible for annual review, revisions and testing of the plan.

WATER SUPPLY EMERGENCY DEFINITION:

A water supply emergency is defined as a situation wherein the lives or property of the Municipality of Bayham and residents of the municipality are threatened by the effects of a water supply emergency from:

- Contamination of the treated water supply
- A major or prolonged loss of water supply (24 hours or greater)

NOTIFICATION AND IMPLEMENTATION:

This plan may be implemented in whole or in part, as required, by the Municipality of Bayham

- Head of Council
- Chief Administrative Officer (CAO)
- Water/Wastewater Operations Manager
- Community Emergency Management Coordinator (CEMC), or
- Municipality of Bayham Community Control Group
with or without the declaration of an emergency by the Head of Council.

This plan may be activated through the notification of the Head of Council, CAO or CEMC.

Upon implementation, all participating departments and agencies will respond in accordance with the guidelines described within this plan.

AGENCY/INDIVIDUAL ROLES & RESPONSIBILITIES:

Elgin St. Thomas Health Unit

- Issuing a Seek Alternative Source Water Advisory or Boil Water Advisory
- Request the activation of the Emergency Operation Centre(s) in the event of an emergency resulting from a major or prolonged water supply event.
- Act as lead agency to coordinate the County's response during a prolonged water supply emergency.
- Contact known schools and day care facilities who may be at high risk of severe health impacts due to water supply loss or contamination.
- Print and distribute materials on the Seek Alternative Source Water Advisory or Boil Water Advisory.
- Provide 24/7 "on call" service to respond to public inquiries regarding water related issues and refer concerned citizens' calls, as appropriate.
- Make necessary logistical arrangements for news conferences, as required.

Water/Wastewater Department, Municipality of Bayham

- Determine the source of the water supply emergency.
- Immediate and ongoing consultation with the Ministry of Environment and Medical Officer of Health and will advise CEMC.
- Coordinate the delivery of potable water where vulnerable people are likely to gather, if required.
- Coordinate the delivery of potable water to designated pick-up centers, as required.
- Once water supply is restored, flushing of the system and the collection of samples for lab analysis until the Seek Alternative Source Water Advisory or Boil Water Advisory is lifted.

Fire Department

- Increase awareness of, and report on, persons who may be vulnerable to the water supply emergency.
- Increase vigilance of how the water supply emergency affects firefighters' performing duties.
- Arrange alternate supply sources for fire protection in areas normally protected by municipal hydrants.

Emergency Management Ontario (if necessary)

- Provide advice, assistance, and liaison with the EOC

Canadian Red Cross (if necessary)

- Provide shelter management in times of declared disaster.
- Train on recognition of potential illness, first aid and personal disaster assistance training for staff and volunteers of community agencies who serve vulnerable clients.

Human Resources Manager (As Designated)

- Register and coordinate volunteer assistance

Emergency Information Officer

- Coordinate communications with County/Elgin St. Thomas Health Unit of all press releases and information fact sheets issued.
- Coordinate local public inquiry messaging for staff.
- Develop public education strategies for vulnerable populations within the Municipality.

Ontario Works

- Liaison with Red Cross for co-ordination of evacuation and emergency shelters

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NOTIFICATION GUIDELINE:

Elgin St. Thomas Public Health

- The Medical Officer of Health (or designate) activates a Seek Alternative Source Water Advisory or Boil Water Advisory and provides relevant fact sheets by fax or email to the regional media if an extended alert is anticipated.

Municipality of Bayham

- The Medical Officer of Health notifies the Mayor or CAO when a Seek Alternative Source Water Advisory or Boil Water Advisory.
- The Municipality is responsible for internal notification of its staff and for the notification of their external partnering services.
- The Mayor, CAO and CEMC will consult with each other to determine if the Municipality of Bayham Community Control Group (CCG) will assemble to discuss the impacts of the issued Water Supply Emergency Alert.
- If the CCG is to be assembled CCG members shall be notified in accordance with the Municipality of Bayham Emergency Response Plan Notification Protocol.

RESPONSE GUIDELINE:

When a major or prolonged water supply emergency event is declared by the Warden of Elgin County and/or the Mayor of any municipality in Elgin County, the lead will be the Emergency Community Control Group at Elgin County. The Elgin County Community Control Group will provide direction to municipalities involved in the emergency in accordance with the mandate of the Elgin County CCG.

The following guideline shall be followed when water supply conditions pose a threat to municipal infrastructure, property and/or residents.

- The Municipality of Bayham CCG will assemble upon request from the Elgin County CCG.
- The Municipality of Bayham Emergency Operation Center will be activated upon receiving a request from the Elgin County CCG for assistance or deployment of municipal resources.
- Upon activation of the EOC, the CCG will determine the most appropriate method of providing emergency response resources to facilitate effective response pertaining to the request of the Elgin County CCG.

In the event the Elgin County CCG requests assistance from the Municipality of Bayham and the Bayham EOC is activated, the roles and responsibilities of municipal departments/representatives will include the following in addition to roles and responsibilities outlined in the Bayham ERP:

Emergency Information Officer

- Develop and issue emergency evacuation information
- Coordinate communications with County of all press releases and information fact sheets issued.
- Coordinate local public inquiry messaging for staff.
- Develop public education strategies for vulnerable populations within the Municipality.

Water/Wastewater Department

- Immediate and ongoing consultation with the Ministry of Environment and Medical Officer of Health and will advise CEMC.
- Coordinate the delivery of potable water where vulnerable people are likely to gather, if required.
- Coordinate the delivery of potable water to designated centers, as required.
- Increase awareness of, and report on, persons who may be vulnerable to the water supply emergency.
- Implement/incorporate “Procedural Guideline of Providing Water, Within The Bayham Distribution During A Prolonged Outage” if applicable.
- Increase vigilance of how the water supply emergency affect water/wastewater employees working outside and performing duties.

Fire Department

- Increase awareness of, and report on, persons who may be vulnerable to the water supply emergency.
- Increase vigilance of how the water supply emergency affects firefighters' performing duties.
- Arrange alternate supply sources for fire protection in areas normally protected by municipal hydrants.

Roads Department

- Increase awareness of, and report on, persons who may be vulnerable to the water supply emergency.
- Increase vigilance of how the water supply emergency affects road employees working outside and performing duties.

Deputy Clerk

- Set up of EOC
- Coordinate connection of EOC communications (e.g. phones, fax, email, etc.)
- Coordinate set up of public inquiry avenues (e.g. website update, phone inquiry messaging)

Administrative Support Staff

- Registering members of public attending a water pick-up center(s)
- Staffing public inquiry phone lines
- Updating municipal website information and municipal sign
- Monitoring of water pick-up center supplies

Clerk

- Register and coordinate volunteer assistance
- Coordinating volunteers and or municipal employees to staff (supervise) water pick-up center(s)

RESOURCES

Water

Canadian Kool Water – 53104 Vienna Line, Port Burwell, ON – Ph. 519-765-4970
Roses Sandytown Variety – 9292 Plank Road, Straffordville, ON – 519-866-5800
Mudford Family Food Town – 54362 Heritage Line, Straffordville, ON – 519-866-5505
GFS Bulk Water Services – Greg – 519 633-1391

Water Pick-Up Facilities

Municipal Council Chambers, 9344 Plank Road, Straffordville, ON
Bayham Community Centre, 54164 Heritage Line, Straffordville, ON
Vienna Community Centre, 26 Fulton Street, Vienna, ON
Straffordville Fire Station, 55264 Third Street, Straffordville, ON
Port Burwell Fire Station, 55451 Nova Scotia Line, Port Burwell, ON

TRAINING AND SUPPLIES

Each participating agency is responsible for defining and providing the training required by its own staff in performing its emergency roles at its own cost.

All costs and/or damages resulting from a water supply emergency will be forwarded to the Treasurer of the Municipality of Bayham for consideration and resolution.

RECOVERY

Recovery procedures will be implemented in accordance with the Municipality of Bayham Recovery Plan/Business Continuity which is currently under development.

PROCEDURE E

INTERNAL AUDIT

Internal audits will be conducted to ensure that the QMS conforms to the requirements of the Municipality of Bayham and of the DWQMS. These requirements include ensuring that the QMS has been effectively implemented and properly maintained.

The Municipality of Bayham may, from time-to-time, request that trained auditors from a neighbouring municipality conduct internal audits. In turn, the Municipality of Bayham may provide the same service to other municipalities as the case arises.

Audits Conducted by Bayham

Auditors

- All internal auditors must have successfully completed a recognized 14 hour Internal Auditor workshop

Internal Audit Schedule

- Each element of the Standard is audited at least once during the fiscal year.

Audit Planning

- The auditor shall review all related QMS documentation and obtain the current version of the DWQMS checklist prior to the audit, which will include results from the previous internal and external audits.

Conducting the Audit

- The auditor shall observe activities, review records and interview personnel as necessary to ensure that the status of the audited element of the QMS has been effectively covered.

Reporting the Results

- The auditor shall submit a completed checklist and report to the QMS Representative.
- The report shall include any requirement for corrective actions. Corrective actions shall be communicated to the responsible individual and included as part of Management Review input.

Audits Conducted by Another Municipality

Auditors

- Outside auditors must provide proof of competency prior to conducting an audit.
- Current version of the DWQMS checklist must be used during the audit.

Audit Schedule

- Audits are to be conducted per the Municipality of Bayham schedule.

Planning and Conducting the Audit and Reporting the Results

- Audits may be planned and conducted per the procedures of the auditing Municipality. Prior approval by the Water/Wastewater Operations Manager.
- Audit results may be reported per the procedures of the auditing municipality as long as the results are documented. Requirements for corrective action must be indicated.
- A document management spreadsheet is used to track and document any changes to documents, corrective action report, opportunities for improvement, management review, emergency response testing and internal audit findings and/or actions taken.
- Previous internal and external audits to be reviewed prior to the commencement of a new audit.

PROCEDURE F

MANAGEMENT REVIEW

This procedure defines the Management Review process to ensure the continuing suitability, adequacy and effectiveness of the QMS.

Review Frequency

Management Reviews shall be conducted on an annual basis.

Review Participants

The QMS Representative convenes the management review. Attendees shall include the QMS Representative and the Chief Administrative Office (Top Management).

Review Input

The QMS Representative shall provide information and data concerning the following categories, for the review:

- Incidents of regulatory non-compliance
- Incidents of adverse drinking water tests
- Deviations from critical control point limits and response actions
- Efficacy of the risk assessment process
- Results of internal and 3rd party audits
- Results of relevant emergency response testing
- Operational performance and water quality trends including raw water supply
- Follow-up on action items from previous management reviews
- Status of action items (if any) identified between reviews
- Changes in resource requirements, infrastructure, process, personnel, Drinking Water Quality Management Standard or regulations that could affect the QMS
- Resources needed to maintain the Quality Management System
- Operational plan currency, content and updates
- Consumer feedback (including consumer complaint reports), and
- Staff suggestions

Review Process

The Management Review shall be a planned event. An appropriate time shall be set aside by the participants to ensure a thorough review of the QMS is conducted.

Each input category shall be reviewed in order to identify if, where and when improvements to the QMS and its procedures are required.

The QMS Representative shall make note of any changes or action items required during the course of the review.

Review Output

A list of changes required to be made to procedures or other QMS based documentation and processes and/or amendments must be made prior to the next annual internal audit.

Complete a list of “action” items if applicable. Action items shall identify the individual responsible.

A list of recommendation(s) for any human or financial resources may be required to maintain and improve the QMS.

The QMS Representative shall maintain minutes of management review. These minutes shall include the date and time of the review activity and the name of participants.

The QMS Representative shall review findings to the owner by March 31 of each year.