Municipality of
Dutton Dunwich

TO: Mayor and Members of Council

FROM: Kate Morreau, Executive Assistant

DATE: December 14, 2022

SUBJECT: Revision 14 - Quality Management System Operational Plan

That the attached Revision 14 of the Quality Management System (QMS) Operational Plan be received for information, and

That the Mayor and Water Operations Manager sign the Record of Revision and Endorsement.

BACKGROUND:

The QMS Operational Plan is required to be reviewed annually by staff. Once this has been completed the new revision is submitted to Mayor and Council for endorsement by resolution to comply with the Drinking Water Quality Management Standard.

Respectfully submitted by:

Kate Morreau
Executive Assistant

Approved for submission by:

Tracy Johnson
Treasurer/Acting CAO

QMS OPERATIONAL PLAN – SIGN OFF SHEET

This is to acknowledge that I have reviewed and understood the information presented in this operational plan:

Date	Name	Signature
	Tim Hansen	
	Archie Leitch	
	Ryan McGahan	
	Andy Davie	

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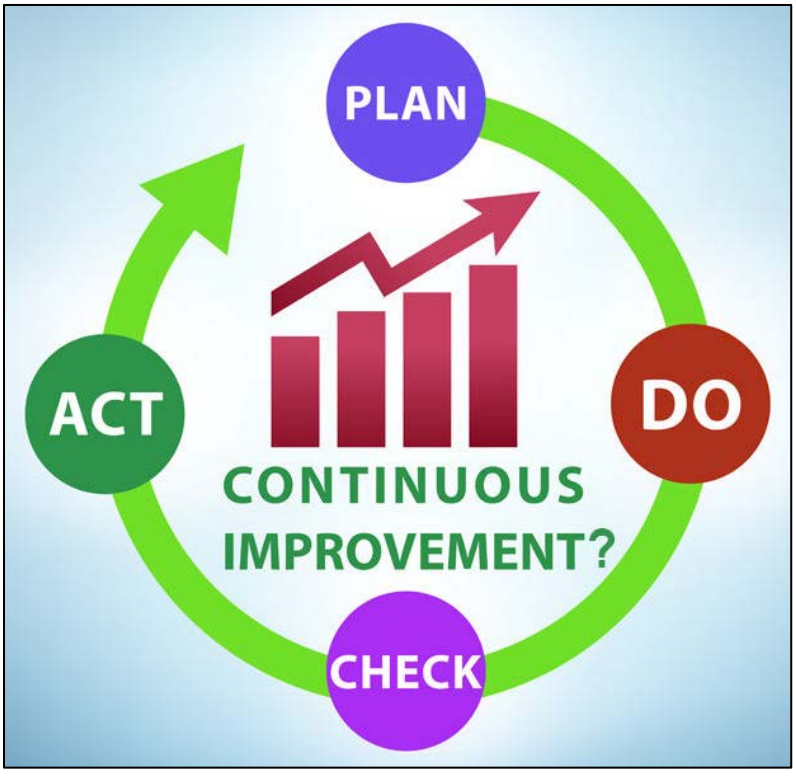
Municipality of
Dutton Dunwich

Water Distribution System

Drinking Water Quality Management Standard Operational Plan



Record of Revision and Endorsement

Revision No.	Date Issued	Approval Sign-Off*
14	December 14, 2022	Mayor Water Operations Manager

Table of Contents

1. Quality Management System

This Operational Plan documents the Quality Management System (QMS) for the Municipality of Dutton Dunwich Water Distribution System No. 220002967. The Municipality of Dutton Dunwich is the Owner and Operator of the Dutton Dunwich Water Distribution System.

This Operational Plan covers the transmission and distribution of potable water to consumers within the Municipality of Dutton Dunwich. Treated potable water is purchased from the Municipality of West Elgin which supplies the West Elgin Area Distribution System and enters the Dutton Dunwich Water Distribution System from the following three points of entry:

- Eagle Interconnect Control Chamber
- Marsh Line/County Road 76 Interconnect Chamber
- Pioneer Line Interconnect Chamber

Water is also provided to the Municipality of Dutton Dunwich from the Southwold Water Distribution System via the Iona Interconnect Control Chamber, located at the intersection of Talbot Line (Highway 3) and Iona Road. This water supply connection is based on an agreement between the Municipality of Dutton Dunwich, the Joint Board of Management of the Elgin Area Primary Water Supply System and the Joint Board of Management of the St. Thomas Area Secondary Water Supply System.

In an emergency, potable water can be supplied to the Township of Southwold's Water Distribution System, from the Dutton Dunwich Water Distribution System, via the Iona Interconnect Control Chamber located at the intersection of Talbot Line (Highway 3) and Iona Road.

2. Quality Management System Policy

The Municipality of Dutton Dunwich is committed to comply with all applicable regulatory requirements to supply safe drinking water to meet their consumers' requirements. The Municipality is also committed to the maintenance and continual improvement of the Quality Management System (QMS) and the Drinking Water Quality Management Standard (DWQMS).

The DWQMS Policy is posted inside the Municipal Office at 199 Currie Road and at the Water Department, in the office at 254 Shackleton Road and on the Municipal Website.

A copy of the DWQMS Policy can be found in Annex A – Commitment and Endorsement.

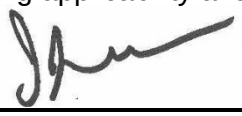
3. Commitment and Endorsement

The Municipality of Dutton Dunwich is committed to ensuring that the Quality Management System (QMS) is developed and implemented for the Municipality's drinking water system in accordance with the requirements of the Drinking Water Quality Management Standard (DWQMS). The Owner and Top Management are committed to ensuring that the established QMS complies with all applicable legislation and regulations and that all resources required for the maintenance and continual improvement of the system are identified and provided. They are also committed to ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements governing the provision of safe drinking water.

To promote awareness and understanding of the QMS, the Municipality of Dutton Dunwich's QMS will be communicated to relevant parties according to the procedures outlined in Section 12 of the QMS Operational Plan - **Communication**.

The Mayor and Council of the Municipality of Dutton Dunwich have passed a motion to endorse this DWQMS Operational Plan and intend to review revisions of the Operational Plan annually, upon changes to Mayor and Council, or significant changes to the system. **Annex A** provides a copy of the Municipal Council resolution, which endorses the Operational Plan.

The signatures below further commit to ensuring that the QMS is regularly assessed to confirm its ongoing applicability and relevance.



Tracy Johnson, Treasurer/Acting CAO
QMS Top Management

Tim Hansen, Water Operations Manager
QMS Representative

Tara Kretschmer, Acting Clerk
QMS Top Management (alternate)

4. Quality Management System Representative

The Water Operations Manager will be the Quality Management System (QMS) Representative. In their absence, the Water Operations Manager will delegate to the acting Overall Responsible Operator (ORO).

The QMS Representative has the following responsibilities:

- develop, implement and maintain process, and procedures needed for the QMS and report the effectiveness of the QMS through Management Review and Council Reports,
- report the effectiveness of this document, including the need for improvement to the Treasurer/Acting CAO (or alternate),
- ensure that the current versions of the documents required by the QMS are in use at all times,
- promote this document throughout the Water Department, and
- ensures that personnel are aware of all current regulatory and legislative requirements that are relevant to the operation of the Dutton Dunwich Water Distribution System.

5. Document and Records Control

All material required by the Ministry of the Environment, Conservation and Parks (MECP), as part of Ontario Regulations 170/03 and 128/04, will be maintained to demonstrate compliance. All material related to the Quality Management System (QMS) will also be maintained to meet the Drinking Water Quality Management Standard (DWQMS).

All material can be effectively accessed if needed and is digitally filed using The Ontario Municipal Records Management System (TOMRMS) - File Classification System and hard

copies are also located in a filing cabinet or placed in a binder at the Dutton Dunwich Municipal Water Department. **Procedure A** provides the Document and Record Control Procedure.

All documents that are active, inactive or archived will follow the retention period table as outlined in **Procedure A.**

6. Drinking Water System

The Municipality of Dutton Dunwich is the Owner and Operator of the Dutton Dunwich Water Distribution System, which includes approximately 2,020 service connections and approximately 4,152 customers. It is the Municipality's goal to supply safe drinking water to their customers at all times. As shown on the Organizational Structure in **Annex B**, the Mayor and Municipal Council Members are considered the head of the Municipality, and this responsibility is delegated to municipal staff.

The Dutton Dunwich Water Distribution System includes an Elevated Water Tank and Rechlorination Facility in the hamlet of Wallacetown, and one Rechlorination Facility located on the north east corner at the intersection of Iona Road and Talbot Line (Highway 3).

The West Elgin Distribution System is owned by the Municipality of West Elgin and is operated by the Ontario Clean Water Agency. The West Elgin Distribution System relies on the Tri-County Drinking Water System to supply the system with potable water. The West Elgin Distribution System is connected to the Dutton Dunwich Water Distribution System.

Treated potable water is purchased from the West Elgin Distribution System (Municipality of West Elgin) located southeast of Eagle, which treats raw water from Lake Erie and enters the Dutton Dunwich Water Distribution System from the following three points of entry:

- Eagle Interconnect Control Chamber.
- Marsh Line/County Road 76 Interconnect Chamber.
- Pioneer Line Interconnect Chamber.

The pressure and flow at the Eagle Interconnect Control Chamber are monitored and controlled as part of the West Elgin SCADA system. The West Elgin Distribution System serves a portion of the Counties of Elgin (West Elgin and Dutton Dunwich), Newbury, Middlesex (Southwest Middlesex), and Chatham-Kent (Bothwell), and is managed by the Tri-County Water Board. The Municipality of Dutton Dunwich is a member of this Board. Other members include the Municipality of West Elgin, the Municipality of Southwest-Middlesex, the Village of Newbury and the Municipality Chatham-Kent.

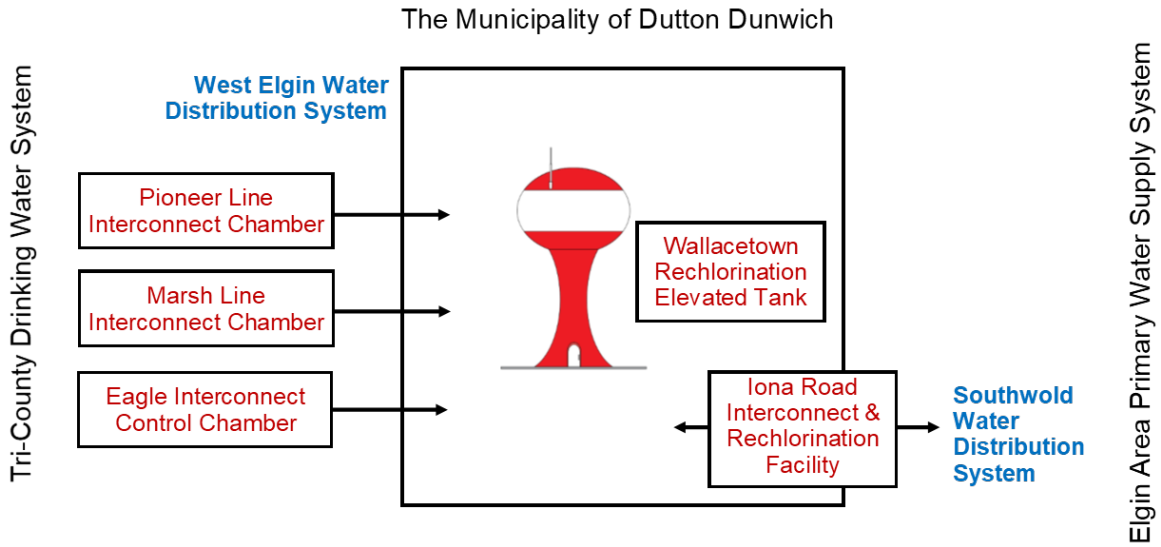
Water is also provided to the Municipality of Dutton Dunwich from the Southwold Water Distribution System which is owned by the Township of Southwold and operated by the Ontario Clean Water Agency via the Iona Interconnect Control Chamber located at the intersection of Talbot Line (Highway 3) and Iona Road. This water supply connection is based on an agreement between the Municipality of Southwold, the Municipality of Dutton Dunwich and the Joint Board of Management of the Elgin Area Primary Water Supply System and the Joint Board of Management of the St. Thomas Area Secondary Water Supply System.

The Iona Interconnect Control Chamber is monitored by the Municipality of Dutton Dunwich Water Department Operators who ensure the regulated Drinking Water Quality Management

System (DWQMS) and the Ministry of the Environment, Conservation and Parks (MECP) requirements are complied with.

The Elgin Area Primary Water Supply System is managed by the Joint Board of Management of the Elgin Area Primary Water Supply System and operated by OCWA. The Iona Interconnect is controlled by Dutton Dunwich.

A schematic of the Municipality of Dutton Dunwich Water Distribution System is shown in the figure below.



NOTE: The Iona/Shedden connection is used only for providing emergency water supply to the Township of Southwold.

The Wallacetown Elevated Storage Tank and Rechlorination Facility provides temporary storage for approximately 36 hours of normal use or approximately 13 hours of fire flow conditions (based on a hydrant flow of 500 gpm or 38 L/s). The water in this tank is replaced about every three days. The total storage capacity of the Elevated Storage Tank is 1792 m^3. The water level of the Elevated Storage Tank is controlled by the West Elgin Water Treatment Plant Water Operators (OCWA), in conjunction with the Municipality of Dutton Dunwich Water Operators. There are no booster pumps within the Dutton Dunwich Water Distribution System.

OCWA is the operating authority for the West Elgin Distribution System, and is responsible for sampling, testing, and monitoring within this main system. The Wallacetown Elevated Storage Tank and Rechlorination Facility located on McBeth Street consists of the following:

- one duty and one standby sodium hypochlorite metering pump.
- one sodium hypochlorite storage tank. (Note the tank is contained in a larger tank for spill containment).
- one ABB flow meter measuring tank outgoing flow.
- an online chlorine residual analyzer, which is monitored by the SCADA system.

The Iona Rechlorination Facility which is owned and operated by Dutton Dunwich consists of the following:

- one duty and one standby sodium hypochlorite metering pump.
- one sodium hypochlorite storage tank. (Note the tank is contained in a larger tank for spill containment).
- two online chlorine residual analyzers. One measuring free chlorine residual coming in and one measuring free chlorine residual going out, which is monitored by the SCADA system.
- One ABB flow meter measuring system flows.

The provision of safe drinking water from the Tri-County Drinking Water System (via the West Elgin Distribution System), and the Elgin Area Primary Water Supply System (via the Southwold Water Distribution System), is critical to the provision of safe drinking water within the Municipality of Dutton Dunwich's drinking water system. The quality and quantity of water supplied to the Municipality of Dutton Dunwich does not normally fluctuate.

All customers within the Dutton Dunwich Water Distribution System are metered and the meters are read on a quarterly basis. There is no discount for large water users. All water bills are calculated on a cost per cubic metre rate.

7. Risk Assessment

Procedure B provides the methodology and outlines for process for assessing risks associated with the Dutton Dunwich Water Distribution System.

8. Risk Assessment Outcomes

The outcomes of the risk assessment are provided in the following table. A blank Risk Assessment Form is provided in **Annex E**.

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
Source Water – West Elgin - Tri-County Drinking Water System (treated water) and Southwold - Elgin Area Primary Water Supply System (treated water).	Contamination of Source Water	Chemical or biological contamination of source water	No control	-water providers – (Tri-County Drinking Water System and Elgin Area Primary Water Supply System) treat and monitor water in their systems -online monitoring of free chlorine residual at Rechlorination Facility, with an alarm to notify operations staff -at least seven distribution samples collected per week for free chlorine residual testing -four distribution samples collected per week for microbiological analysis	-ongoing communication with Tri-County Drinking Water System and Elgin Area Primary Water Supply System is critical. -assess on regular basis what parts of distribution system needs to be isolated. -discuss water quality with Medical Officer of Health (MOH) and Ministry of the Environment, Conservation and Parks (MECP), which should have been reported by West Elgin Operator (OCWA) -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -conduct sampling as required -increase monitoring of distribution system	1	3	2	**6**	no	Low Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Long term impacts of Climate Change	Increase/ decrease of water levels due to flooding or drought Increase in population/ water demand		-water conservation, water use restrictions -increase in Permit To Take Water (PTTW) limits -capital infrastructure projects and upgrades	-website, social media notices (facebook, twitter) for water conservation. -make application to MECP -identified infrastructure needs current and forecasted added to annual budget for consideration by council.	1	4	1	**6**	no	Low Risk
	Water Supply Shortfall	Loss of water (decrease or no water) Unable to provide to customers Decreased fire protection		-if possible, increase production from non-affected source water. -if possible, increase storage at the Wallacetown Elevated Storage Tank and Rechlorination Facility. -decrease water use/conservation and restrictions, educate public -long term water conservation -increase monitoring	-ongoing communication with Tri-County Drinking Water System and Elgin Area Primary Water Supply System is critical. -ensure there is an ongoing discussion with West Elgin and Southwold Operator to determine if water quality and quantity has been restored. -increase flow from West Elgin or Southwold water mains, whichever one is not affected -website, public notices issued/social media alerts posted for water conservation. -Mutual Aid Agreement with adjacent Fire Departments may be implemented	2	4	1	**7**	no	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Extreme weather events (tornado/ice storm)	Infrastructure damage Treatability of water Loss of water service Loss of commun-ication Flooding/drought Increase in water consumption Water supply for fire fighting impacted		-ONWARN -Emergency Response Plan may be put into effect. -if both watermains (West Elgin and Southwold) are damaged or compromised use alternate drinking water supplies -increase monitoring	-ongoing communication with Tri-County Drinking Water System and Elgin Area Primary Water Supply System is critical. -OCWA to bring in their tanker and other potable drinking water options. -Mutual Aid Agreement with adjacent Fire Departments may be implemented	1	2	1	**4**	no	Low Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Chemical spill	Water source characteristics may change Public health may be affected Operational challenges with treatment Customer confidence affected Detectability can be low, no continuous monitoring for this Drought		-water providers (Tri-County Drinking Water System and Elgin Area Primary Water Supply Systems) treat and monitor water in their systems -online monitoring of free chlorine residual at Rechlorination Facilities, with an alarm to notify operations staff -at least seven distribution samples collected per week for free chlorine residual testing -four distribution samples collected per week for microbiological analysis -increase monitoring	-ongoing communication with Tri-County Drinking Water System and Elgin Area Primary Water Supply System is critical. -assess if and what parts of the distribution system needs to be isolated from the supply -contact Spills Action Centre, MOH, MECP -discuss water quality with Medical Officer of Health (MOH) and Ministry of the Environment, Conservation and Parks (MECP), which should have been report by West Elgin Operator (OCWA) or Southwold Operator (OCWA) -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -conduct sampling as required -in case of adverse conditions follow proper adverse procedures.	2	4	1	**7**	No	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Sustained extreme temperatures (e.g., heat wave, deep freeze	Freeze issue – source plant intake and watermains Increase in watermain breaks Decreased chlorine residuals Heat Wave - Increased water demand from running water Drought conditions		-increase monitoring and up residuals if required. -water conservation measures	-ongoing communication with Tri-County Drinking Water System and Elgin Area Primary Water Supply System is critical. -in case of adverse conditions follow proper adverse procedures. -in case of adverse conditions follow proper adverse procedures. -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -website – public notices and social media posted promoting water conservation measure	2	3	1	**6**	no	Low Risk
	Cybersecurity Threats and System Security	Loss of alarms, communication, monitoring		-SCADA system alarmed	-increase chlorine and grab sampling -continue manual sampling and operation of equipment as required -increase monitoring -may need to implement water conservation measures.	1	4	2	**7**	No	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
Elevated Storage Tank and Rechlorination Facility		Chemical or biological contamination Cyber Terrorism to SCADA Water quality and/or quantity affected Damage or failure of infrastructure		-locked and alarmed entry -visual inspection every day, except weekends, as a minimum -SCADA system alarmed	-contact Police, Medical Officer of Health (MOH), and MECP Spills Action Centre -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -in case of adverse conditions follow proper adverse procedures. -check chlorine residual. If necessary, take Elevated Rechlorination Storage Tank offline -conduct sampling as required	1	4	3	**8**	no	Moderate Risk
	Biofilm development in tank, build-up of sludge in tank	Biological contamination as a result of rapid deterioration of chlorine residual		-online monitoring of free chlorine residual at Rechlorination Facilities, with alarm to notify operations staff -at least seven distribution samples collected per week for free chlorine residual testing -visual inspection every day, except weekends, as a minimum -four distribution samples collected per week for microbiological analysis	-conduct cleaning of the Elevated Storage Tank, as per American Water Works Association (AWWA) Standard for Disinfection of Water Storage Facilities (C652-02). -increase chlorine dose if necessary at rechlorination sites. -in case of adverse conditions follow proper adverse procedures.	2	2	1	**5**	no	Low Risk

RISK ASSESSMENT	Source Water	Elevated Storage Tank	Rechlorination Facilities	Waste Water Treatment Plant	Distribution							
Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
				-camera inspection of reservoir every five years							
	Cybersecurity Threats and System Security	Cyber Terrorism to SCADA		-locked and alarmed entry -visual inspection every day, except weekends, as a minimum -SCADA system alarmed	-contact Police, -increase monitoring procedures -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -notify MECP of the situation and follow up with updates -in case of adverse conditions follow proper adverse procedures. -monitor chlorine residual using grab samples. If necessary, run chlorine pumps in manual -conduct sampling as required	1	4	2	**7**	No	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
Rechlorination Facilities		Chemical or biological contamination Water quality and/or quantity affected Damage or failure of infrastructure		-facility is locked -visual inspection of the facility completed every day, except weekends, as a minimum -SCADA system alarmed	-contact Police, MOH, and MECP Spills Action Centre -in case of adverse conditions follow proper adverse procedures. -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -check chlorine residual in Distribution System -conduct other sampling as required	1	4	2	**7**	no	Moderate Risk
	Power Loss	Degradation of water quality in the case that secondary disinfection cannot be provided if needed		-Wallacetown Elevated Storage Tank and Rechlorination Facility and Iona Rechlorination facility have automatic generators which are set to automatically test run every Wednesday morning for 5 minutes and is recorded on the SCADA system.	-provide fuel supply for several days -in case of power loss, a Water Operator shall attend on site each hour to conduct manual readings until power is restored -a portable generator will be set up by the on-call Operator if required. -in case of adverse conditions follow proper adverse procedures.	2	2	1	**5**	no	Moderate Risk

RISK ASSESSMENT	Source Water	Elevated Storage Tank	Rechlorination Facilities	Waste Water Treatment Plant	Distribution							
Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Cybersecurity Threats and System Security	Cyber Terrorism to SCADA Low/high chlorine Loss of online monitoring and recording Loss of auto chlorine pumps		-locked and alarmed entry -visual inspection every day, except weekends, as a minimum -SCADA system alarmed	-contact Police, -notify MECP of the situation and follow up with updates -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -increase monitoring procedures -in case of adverse conditions follow proper adverse procedures. -monitor chlorine residual using grab samples. If necessary, run chlorine pumps in manual -conduct sampling as required	1	4	2	**7**	No	Moderate Risk
Waste Water Treatment Plant	Vandalism/ Terrorism Cybersecurity Threats and System Security	Cyber terrorism to SCADA Mainframe (remote SCADA) Water quality and/or quantity affected Damage or failure of infrastructure		-facility locked and alarmed -SCADA system alarmed -visual inspection of the facility completed every day, except weekends as a minimum	-contact Police -check chlorine residual in Distribution System -conduct other sampling as required -increase monitoring	2	4	1	**7**	no	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
Distribution	Watermain break within Distribution System	Water quality/ quantity issues Low pressure/ back siphoning Bacteriological or chemical contamination		-customer complaints of low water pressure -reports of watermain break, based on conditions at ground surface -monitoring of pressure -looping of distribution system makes it possible to isolate non affected areas and maintain flow	-the Operator-in-Charge must determine if the watermain break is either a Class 1 or Class 2 and complete the corresponding form. -repair watermain and appurtenances, if necessary -in case of adverse conditions follow proper adverse procedures. -conduct watermain disinfection as per AWWA Standard for Disinfection Watermains (C651-05) -if necessary, communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices	3	3	2	**8**	no	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Loss of chlorine residual (secondary disinfection)	Biological contamination	-legislated under Ontario Regulation 170/03	-online monitoring of free chlorine residual at Rechlorination Facilities with alarm to notify operations staff -at least seven distribution samples collected per week for free chlorine residual -values are recorded and tracked	-immediately flush the system to increase chlorine dosage, and restore secondary disinfection above the 0.20 ppm requirement, and then resample -increase chlorine dosage at rechlorination sites if necessary -increase monitoring -report adverse results in the case that the free chlorine residual is less than 0.05 mg/L. -in case of adverse conditions follow proper adverse procedures. -take other steps as directed by the Medical Officer of Health	2	4	2	**8**	yes	Moderate Risk Critical Limit set at 0.20mg/L Minimum regulatory limit is 0.05mg/L
	Commission-ing of new mains causing contamination	Biological contamination		-online monitoring of free chlorine residual at Rechlorination Facilities with alarm to notify operations staff -at least seven distribution samples collected per week for free chlorine residual -4 bacti samples taken weekly from distribution system	-conduct watermain disinfection as per AWWA Standard for Disinfection Watermains (C651-05) -follow corrective action as outlined in O.Reg. 170/03 -in case of adverse conditions follow proper adverse procedures.	1	3	2	**6**	no	Low Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
					-check chlorine residual and conduct microbiological testing -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices						
	Loss of pressure – watermain break, major fire	Water quality / quantity issues Low pressure/ back siphoning Bacteriological or chemical contamina-tion Fire suppression impacted		-consumer complaints -water pressure monitored by OCWA at the West Elgin Water Treatment Plant. Municipality of Dutton Dunwich Water Operators monitor pressure daily -Dutton Dunwich conducts annual testing of municipally-owned serviceable backflow prevention devices to ensure proper operation -private facility owners (high risk only) are required to complete annual testing of their serviceable backflow prevention devices and provide evidence of this testing to the Municipality -water losses monitored annually by the Municipality	-check pressure and chlorine residual. Contact MECP and MOH to discuss if values are low -increase chlorine dosage at rechlorination sites if necessary -increase monitoring -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -restore pressure and chlorine residual. Conduct any sampling based on MOH and MECP direction -Mutual Aid Agreement with adjacent Fire Departments -increase monitoring	1	4	2	**7**	no	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
				-Municipality continues with backflow prevention program installing dual check valves on all new or repaired water meter installs.	-in case of adverse conditions follow proper adverse procedures.						
	Backflow from private plumbing (cross connection)	Biological and chemical contamination	Backflow preventers on all connections of concern (including large livestock operations)	-By-law 2006-31, Part 8 (Cross Connection and Backflow Prevention) prohibits cross connection to the Water Distribution System -backflow preventers are installed at new connections to the system, and also in the case of meter replacements -backflow preventers installed for large livestock operations -Dutton Dunwich conducts annual testing of municipally-owned and non municipally-owned serviceable backflow prevention devices to ensure proper operation (high risk users).	-notify MOH and MECP Spills Action Centre. If necessary, -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices after consultation with MOH -isolate the area. Flush the system and sample as appropriate -inspect homes and commercial properties in area, install backflow preventers -in case of adverse conditions follow proper adverse procedures. -increase monitoring	1	4	3	**8**	no	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
	Biofilm development in area of watermain break	Biological contamination		-visual inspection of watermain breaks, reduced flow in pipes, inability to maintain chlorine residual -flushing and swabbing -replacement of old watermains, based on material, age, and observations	-following a watermain break, conduct sampling for chlorine residual at locations in proximity to break -if necessary, conduct watermain disinfection as per AWWA Standard for Disinfection Watermains (C651-05)	1	2	1	**4**	no	Low Risk
	Extreme weather events (tornado/ice storm/drought)	Infrastructure damage Treatability of water Loss of water service Loss of communication Flooding/ drought Personnel coverage		-ONWARN -Emergency Response Plan may be put into effect -If both watermains (West Elgin and Southwold) are damaged or compromised use alternate drinking water supplies -essential Contractors and Suppliers on standby -have back up power available - propane.	-communication with West Elgin Distribution System and Southwold Operators is critical. -ensure there is an ongoing discussion with West Elgin and Southwold Operators to determine if water quality and quantity is affected and when service infrastructure will be restored and/or repaired -if needed, OCWA to bring in their tanker and other potable drinking water options.	1	4	1	**6**	no	Low Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
		Fuel Supply compromised Bush fires Increase in water consumption Water supply for fire fighting impacted		-prioritize fuel and hydro at critical locations -if possible, increase flow from West Elgin and/or Southwold	–Mutual Aid Agreement with adjacent Fire Departments -increase monitoring. -in case of adverse conditions follow proper adverse procedures.						
	Sustained extreme temperatures (e.g., heat wave, deep freeze	Freeze issue - water tower & watermains Increase in watermain breaks Reduced functionality of frozen hydrants Decreased chlorine residuals Heat Wave - Increased water demand from running water		-increase water cycling and decrease time in water tower -infrastructure upgrades with lower services and watermains below freezing level -increase monitoring and up residuals if required. -water conservation measures	-trained staff for extreme conditions. -the Operator-in-Charge must determine if the watermain break is either a Class 1 or Class 2 and complete the corresponding form. -repair watermain and appurtenances, if necessary -conduct watermain disinfection as per AWWA Standard for Disinfection Watermains (C651-05) -in case of adverse conditions follow proper adverse procedures.	3	2	2	**7**	no	Moderate Risk

RISK ASSESSMENT	Source Water	Elevated Storage Tank	Rechlorination Facilities	Waste Water Treatment Plant	Distribution							
Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
		Drought conditions			-communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -increase monitoring -website, public notices and social media posted promoting water conservation measure						
	Cybersecurity Threats and System Security	Cyber Terrorism to SCADA		-SCADA system alarmed	-contact Police, -notify MECP of the situation and follow up with updates -communicate drinking water advisory, if issued by MOH using social media, website and hand delivered notices -in case of adverse conditions follow proper adverse procedures. -monitor chlorine residual using grab samples throughout the distribution system. If necessary, run chlorine pumps in manual -increase monitoring throughout the distribution system.	1	4	2	**7**	No	Moderate Risk

RISK ASSESSMENT — Source Water | Elevated Storage Tank | Rechlorination Facilities | Waste Water Treatment Plant | Distribution

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan*	Likelihood	Severity	Detectabilit	Risk Rating	CCP?	Comment
					-conduct sampling as required						

NOTE: CCP is 9 - anything below is not a critical control point unless it is regulated.

*In the case of responding to hazards/emergencies, all actions must be recorded in the Dutton Dunwich Water Distribution System Log Book as required by Ontario Regulation 128/04.

Effective Date: January 16, 2014	Reviewed by: Tim Hansen, Brad Reive, Lori Redman, Ryan McGahan, Kate Morreau, Kim Grogan
Effective Date: January 5, 2015	Reviewed by: Tim Hansen, Katie Morreau – No Changes
Effective Date: October 22, 2015	Reviewed by: Risk Assessment Team - Tim Hansen, Archie Leitch, Ryan McGahan
Effective Date: October 11, 2016	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan and Andy Davie
Effective Date: June 28, 2017	Reviewed by: Tim Hansen, Katie Morreau, Tara Kretschmer
Effective Date: October 23, 2017	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan
Effective Date: October 9, 2018	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan
Effective Date: October 11, 2019	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan and Andy Davie
Effective Date: October 23, 2020	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan and Andy Davie
Effective Date: October 25, 2021	Reviewed by: Risk Assessment Team – Tim Hansen, Ryan McGahan and Andy Davie
Effective Date: September 7, 2022	Reviewed by: Risk Assessment Team – Tim Hansen, Archie Leitch, Ryan McGahan and Andy Davie

9. Operational Structure, Roles, Responsibilities, and Authorities

An Operational Structure is provided in **Annex C** for the operation of the Dutton Dunwich Water Distribution System. The Operational Roles, Responsibilities and Authorities are provided in **Annex D**. The Water Operations Manager will maintain the information in **Annex C** and **D** to ensure that it is current and communicate this information to the owner and personnel.

10. Competencies

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

Position	Required Competencies	Desired Competencies
Water Operations Manager	• minimum Class II Distribution Certification • WHMIS 2015 training • first aid training (including CPR) • confined space training • valid driver's license • thorough knowledge of Drinking Water Quality Management Standard and Quality Management System • Attends Annual Emergency Response Exercise and Training (or alternate)	• > 10 years of experience in the operation of municipal drinking water systems • leadership and managerial skills • problem solving skills • internal auditor training • trenching safety training • traffic protection training • leadership training • SCADA training
Certified Operators	• from Operator in Training (OIT) to Class II Distribution Certification • WHMIS 2015 training • first aid training (including CPR) • confined space training • valid driver's license • thorough knowledge of Drinking Water Quality Management Standard and Quality Management System • Designated Operator attends Annual Emergency Response Exercise and Training (or alternate)	• ability to work alone or as part of a team • problem-solving skills • post-secondary education in a course for a water Operator • internal auditor training • trenching safety training • traffic protection training

The Quality Management System (QMS) Representative ensures each water department employee is aware of the relevance of their duties and how they affect safe drinking water in accordance with **Procedure A –** Reviewing Documents.

To ensure the Treasurer/Acting CAO (or alternate) is aware of the relevance of their duties and how they affect safe drinking water the Treasurer/Acting CAO (or alternate):

- Reviews and completes the annual Management Review with the QMS Representative.
- Reviews the QMS Operational Plan before it is brought to Council.
- Communicates regularly with the QMS Representative.

Training records are maintained for the Water Operations Manager and Certified Operators to track completed and upcoming training, including training hours to maintain Operator Certification. All training records for Water Department personnel are maintained in files at the Water Department, as proof that the required training has been successfully completed. Human Resources are provided with information of all ongoing training and certificates received from the Water Operations Manager for all Water Department personnel. This information is included in an Excel spreadsheet and is stored on the Municipality's server under:

S:\CENTRAL FILING INDEX & RETENTION BY-LAW \H - Human Resources\H03 Employee Records\Employee Training and Certificates.

The above required competencies are ensured by the following:

- Competency of the Water Operations Manager is confirmed through performance evaluations by the Treasurer/Acting CAO (or alternate) and by the Mayor and Council.
- Competency of the Certified Operators is confirmed through performance evaluations by the Water Operations Manager.
- All new employees must provide evidence of certification and other competency requirements. All operator certificates/licenses are posted at the Water Department, and copies are also kept in their individual personnel file H03 Employee Records.
- All new employees must undergo training under the Water Operations Manager, including a review of this Operational Plan, and on-the-job training.
- All Water Department personnel must maintain their certification and provide evidence of certification.

Changes to the Dutton Dunwich Water Distribution System or the QMS Operational plan are communicated, as needed, to all Water Department Operators by the QMS Representative (Water Operations Manager).

An Operator and an Operator-in-Training (OIT) can work on their own with an Operator-in-Charge (OIC) being readily available by phone or radio. An OIT is not qualified to be an OIC or Overall Responsible Operator (ORO). Other uncertified or unlicensed municipal personnel must have an OIC present when completing any work associated with the Water Distribution System. If required, sub-contractors must be approved by the Water Operations Manager and used at the discretion of the OIC.

11. Personnel Coverage

The Dutton Dunwich Municipal Water Department is staffed Monday through Friday, from 7 a.m. to 4 p.m. The Water Operations Manager is the primary Overall Responsible Operator (ORO). The alternate or back-up ORO is designated by the Water Operations Manager, when the Water Operations Manager is on holidays or sick.

The alarms at both Rechlorination Facilities are connected to the Dutton Waste Water Treatment Plant SCADA system through a Virtual Private Network (VPN) tunnel which is then forwarded to the On-Call Water Department Operators through Smartphone notifications and dial up voice messaging. **Procedure C** provides the process for 24/7 personnel coverage during after-hours for the Dutton Dunwich Water Distribution System. There is a call-forwarding system that allows water users to dial the on-call Operator, during after-hours.

Periods of vacation and training for the Water Operations Manager and the Certified Operators must be properly coordinated to ensure there is at least one Operator available to act as the Operator in Charge (OIC) during the day and also during after-hours.

In the case of illness of the ORO the second in command is designated as ORO.

Any change in hands in the ORO shall be posted at the Water Department and communicated to the Water Department Operators so that other Operators are aware of the change. All Operators acting on their own (except Operator in Training (OIT)) in the field are considered an OIC, and therefore all Operators should act accordingly.

In the case of a pandemic, as a worst-case scenario that limits coverage by any of the available four Water Department Operators, the following groups/agencies would be contacted for assistance and support:

- Joint Board of Management of the Elgin Area Primary Water Supply System.
- The Ontario Clean Water Agency.
- The Tri-County Water Board of the West Elgin Distribution System.
- Ministry of the Environment, Conservation and Parks.

Contact information for the above groups/agencies is provided in **Element 12**.

12. Communication

The Quality Management System (QMS) Representative shall ensure the Mayor and Council is provided with a current copy of the Operational Plan.

The QMS Representative and Treasurer/Acting CAO (or alternate) shall keep the Mayor and Council informed of any changes to the QMS, and the adequacy of infrastructure requirements through regular Council Meetings and annual Management Review.

The minutes of the Council Meetings will be maintained by the Treasurer/Acting CAO and filed at the Municipal Office.

Water Department personnel will be kept informed of the QMS and any changes or updates to the QMS Operational Plan, through regular staff / safety meetings. A current hard copy version of the QMS Operational Plan is available for review by staff at the Water Department.

Essential Suppliers shall receive information regarding the QMS Operational Plan from the Municipality, if and when necessary. Suppliers are contacted either by telephone or by email. The Water Operations Manager and the Certified Water Department Operators must coordinate the procurement of services and products related to the Dutton Dunwich Water Distribution System with appropriate municipal staff.

Consumers and Essential Suppliers are informed of the QMS Operational Plan and any significant changes by website, newsletters, flyers or handouts.

The Drinking Water Quality Management Standard (DWQMS) Policy (provided in Element 2) is posted at the Water Department, Municipal Office, and on the Municipal Website

The following table provides contact information for the neighbouring municipal Water Distribution Systems and Regional Water Supply Systems.

Name	Title	Phone No.
Andrew Henry, Division Manager, Regional Water Supply, Elgin Primary Water Supply System Contact		Office: 519-661-2500 ext. 1335 Fax: 519-474-0451
Ontario Clean Water Agency (OCWA), West Elgin Water Treatment Plant		Plant: 519-768-1820 (normal business hours) Emergency Pager: 519-435-6472
Ontario Clean Water Agency (OCWA), Elgin Water Treatment Plant		Plant (24 hrs): 519-782-3101 On-Call Switchboard 519-435-6472
Municipality of West Elgin: Magda Badura - CAO/Treasurer cao@westelgin.net Janna Nethercott – Clerk Clerk@westelgin.net Dale LeBritton Ontario Clean Water Agency		 Office: 519-785-0560 Fax: 519-785-0644 Office: 519-785-0560 Fax: 519-785-0644 Office: 519-768-9925 Cell: 519-476-5898
Township of Southwold: Lisa Higgs CAO/Clerk cao@southwold.ca Jeff Carswell, Treasurer-Water Advisor treasurer@southwold.ca Lori Redman, Accounting Clerk Accounting@southwold.ca Dale LeBritton Ontario Clean Water Agency		 Lisa's Cell: 519-671-0358 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-768-9925 Cell: 519-476-5898
The Ministry of the Environment, Conservation and Parks Meghan Morgan Meghan.Morgan@ontario.ca		 Cell: 226-926-1785 Tel: 519-873-5091 Fax: 519-873-5096

13. Essential Suppliers and Services

The Municipality of Dunwich provides all Contractors and Suppliers that undertake work on, or supply materials for the Dutton Dunwich Water Distribution System with a Drinking Water Quality Management Standard (DWQMS) Contractor and Supplier sign off form as a provision that contractors and suppliers shall agree to the DWQMS requirements while on site - **Annex G**. Completed forms are kept in a filing cabinet at the Municipal office and stored on the Municipality's server:

S:\CENTRAL FILING INDEX & RETENTION BY-LAW\E - Environmental Services\E20 Source Water Protection\QMS Annex G Contractor AODA Sign Off

The Water Operations Manager ensures certifications/qualifications for Essential Suppliers and Service providers are retained on file, i.e., plumbers, calibration technician certificates etc.

The Municipality of Dutton Dunwich maintains a stock of standard pipes and fittings on hand at the Water Department. Where applicable, supplies must meet AWWA and ANSI Standards. Supplies are verified against the packing slip, purchase order, or original order notes when received by Water Department personnel. Supplies are also visually checked for product quality and workmanship by the Water Operations Manager or Certified Water Department Operators.

A list of suppliers and contractors has been developed and is provided below. The list includes primary and secondary suppliers/service providers for areas of essential supply/service. The list is reviewed annually by the Water Operations Manager to ensure that it is current and up-to-date.

Supplier	Contact	Phone No.	Cell No.
Contractors			
Van Bree Drainage		519-828-3641	519-520-0796
Dielco Industrial Ltd	Chris Schmid	519-685-2224	519-630-5635
Campbellton Excavating	John Drummelsmith	519-762-2947	519-670-0958
Laemers Excavating	Frank Laemers	519-782-4424	519-671-5696
Timmerman Drainage	Steve Timmermans	519-762-3454	519-872-4739
Robinson Drainage	Carl Robinson	-	519-777-7300
Discount Drain Service	Barry Marche	519-451-8342	519-521-2240
Melo Directional Drilling	Walter Melo	519-289-9051	519-777-2138
Extreme Drilling	Frank Vandenbooman	519-785-0555 519-785-0553	519-670-0564
Clarke Construction	Dan Vanderveen	519-676-7226	519-359-7359
Streib Trucking	Pete Streib	-	519-670-9779
Watech	Greg Pritchard	519-289-5678	519-671-6541
Water Works Equipment and Supplies			
Iconix Water Products	Stephen Ferguson	-	519-383-3051 519-652-5555
Eramosa Engineering	Peter Samson	519-763-7774	519-831-1264
Badger/Benko	On Call Phone	519-472-6181	519-521-6900
Evans Utility & Municipal Products Supply	Mike Zeitler	519-453-6515	
Syntec Process Equip.	Bob Wright	-	1-905-321-8782

Supplier	Contact	Phone No.	Cell No.
Wolseley Waterworks	Glenn Hudacek	519-737-1263	519-317-2065
HM Pipe Products Inc	Rick Henry	519-652-5822	519-872-4677
Plasco Fabricating	Darcy Etherington	519-268-1190	
Electrical			
CPE Services	Cody Gibson	519-693-4895	1-226-373-2918
Gerber Electric	Stephen Gerber		519-857-4508
Neptune	Evans Supply	-	519-453-6515
Erth Corporation	Jurgen van Dijken	519-485-6038 extension 406	226-926-9352
SCG Flowmetrix	William Luisser Jeremy Stevens Radostina Vassileva Brandon Lui	 905-738-5520 1-226-213-7274	416-219-9475 416-427-8483 1-647-470-0138
Anchem Sales - Chlorine	-	-	519-451-1614
Lovibond (Hach Canada)	-	-	1-800-387-7503
Dowler Karn Fuel Supplies	John Karn	519-631-3810	
Penny's Plumbing & Heating	Greg Penny	-	519-661-7534
CPE Services	Cody Gibson	519-693-4895	1-226-373-2918
Accredited Labs			
SGS Lakefield Research	Angela Scott (London)	519-672-4500	-
	Carrie Greenlaw	1-705-652-2116	-

Other:

- Elevated Storage Tank Equipment Suppliers List provided in the Elevated Storage Tank Operations and Maintenance Manual.

14. Review and Provision of Infrastructure

The infrastructure of the Dutton Dunwich Water Distribution System consists of an Elevated Storage Tank and Rechlorination Facility, a Rechlorination Facility, and the Distribution System including hydrants, valves, and appurtenances.

Watermain and other equipment are replaced and maintained on an as needed basis. Unplanned maintenance activities are authorized by the Water Operations Manager. All records are maintained in the Water Department.

The adequacy of infrastructure to operate and maintain the Dutton Dunwich Water Distribution System may be assessed based on Water Department staff suggestions, water quality trends, and consumer complaints. An annual review of infrastructure adequacy will be completed by the Water Operations Manager, to assess the need for infrastructure rehabilitation or replacement. During the annual Management Review, the Water Operations Manager will communicate to the Mayor/Council and the Treasurer/Acting CAO (or alternate) the infrastructure deemed necessary to operate and maintain the Dutton Dunwich Water Distribution System.

15. Infrastructure Maintenance, Rehabilitation and Renewal

The following routine maintenance activities are conducted for the Dutton Dunwich Water Distribution System:

- annual valve inspection / exercising
- annual hydrant flushing and inspection
- annual testing of serviceable backflow prevention assemblies
- annual pressure testing as required
- camera inspection of the Wallacetown Elevated Storage Tank and Rechlorination Facility every five years
- monthly dead-end blow offs during summer
- annual chamber inspection & maintenance

All records are maintained at the Water Department in the appropriate binders using the forms located on the c:/drive on the Water Department's computer. All planned maintenance is scheduled and communicated to staff by the Water Operations Manager.

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the acting Overall Responsible Operator (ORO). This work is recorded in the daily logbook located at the Water Department. All records are stored in a filing cabinet at the Water Department.

Some examples of infrastructure rehabilitation and renewal activities for the Dutton Dunwich Municipal Water Distribution System include:

- extensions or looping or watermains in the Dutton Dunwich Water Distribution System,
- watermain twinning,
- replacement of pipes and appurtenances, including the valves in the interconnect chambers,
- repainting/resealing of the Wallacetown Elevated Storage Tank and Rechlorination Facility (interior and exterior),
- control strategy upgrades, including SCADA programming of the system.

The need for infrastructure rehabilitation or replacement must be approved by the Mayor and Council. The schedule for infrastructure rehabilitation and renewal work will be determined by the Water Operations Manager and Treasurer/Acting CAO (or alternate) and will be approved by the Mayor and Council and reviewed at least once every Calendar Year.

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring of the treated water at the West Elgin Treatment Plant is carried out by Operators from the Ontario Clean Water Agency (OCWA), as required by Ontario Regulation 170/03. These Operators ensure that the water supplied to the Dutton Dunwich Water Distribution System meets the Drinking Water Quality Management Standard (DWQMS) and ensures a minimum free chlorine residual of at least 0.20 mg/L. The free chlorine residual concentration of the water supplied to the Dutton Dunwich Water Distribution System is typically around 1.2 mg/L.

Sampling and testing of the Dutton Dunwich Water Distribution System is completed according to Ontario Regulation 170/03 by a Certified Operator. The following is recorded for each sample collected within the Dutton Dunwich Water Distribution System:

- the date and time that the sample was collected,
- the location where the sample was collected,
- the name of the Certified Operator who collected the sample,
- free chlorine residual.

There are two portable chlorine residual analyzers that are stored at the Water Department. Sterile sample bottles are received from the laboratories and sampling procedures are provided in the Water Department Operations and Procedures Manual.

Operational Checks – Free Chlorine Residual

There is an online chlorine residual analyzer at the Wallacetown Elevated Storage Tank and Rechlorination Facility which is monitored by a SCADA system. This online analyzer is checked each day (except weekends). There is a chart in the rechlorination building, which must be signed upon inspection and a record of any maintenance signed by the Operator doing the checks.

There are two online chlorine residual analyzers at the Iona Rechlorination Facility, which is monitored by a SCADA system. One online analyzer measures the “inflow” chlorine residuals, and the other online analyzer measures the “outflow” chlorine residuals, both are checked each day (except weekends). There is a chart in the Iona Rechlorination building, which must be signed upon inspection and a record of any maintenance signed by the Operator doing the checks.

Operational checks for chlorine residual are conducted onsite since chlorine residuals deteriorate rapidly. At least five chlorine residual samples are taken per week at the Water Department and tested immediately for free chlorine residual.

Microbiological and Chemical Sampling and Testing

The following samples are collected for the required microbiological and chemical tests, which must be analyzed by a licensed laboratory.

- Microbiological Samples: Four samples are collected per week for analysis of E. Coli, total coliform, and 25% for heterotrophic plate count (HPC) bacteria. At each sample location, the Operator manually tests for free chlorine residual at the same time that the microbiological sample is collected. The sampling locations include the Wallacetown Elevated Storage Tank and Rechlorination Facility, the Water Department, and various other test stations within the Municipality.
- Trihalomethane (THM) Samples: One sample is collected, from one sampling point, for analysis of THMs each calendar quarter. The sampling location is selected by Water Operations staff at one location where the possibility of THMs may exist.
- Haloacetic Acid Samples (HAAs): One sample is collected for analysis each calendar quarter from the Dutton Dunwich Water Distribution System. The Sampling area is selected by the Water Operations Staff in accordance with Schedule 13-6.1 of O. Reg 170/03 with the frequency stipulated in Schedule 6-1.1(4).

- Lead Samples: The system has qualified for reduced lead sampling. The annual & community sampling are now combined. Testing must be done for total alkalinity and pH on three sample points during December 15 – April 15 and June 15 – October 15 of each year (6 samples / year). Testing for lead will be done at these sample points every third year.

Adverse Test Results

The laboratories will provide immediate oral notification of any adverse readings, defined in Schedule 16 of Ontario Regulation 170/03. The Municipality of Dutton Dunwich will, in turn, call the Medical Officer of Health (MOH) and the Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre and record the name of the individual contacted. Within 24 hours of notification, the lab will send Section (1) of the Notice of Adverse Test Results form to Dutton Dunwich for completion of Section 2(a). The Water Operations Manager will indicate the corrective action taken by the Municipality and fax this completed form to the MOH and the MECP Spills Action Centre.

Once the sample location has been retested and the results received, Section 2(b) of the Notice of Adverse Test Results form will be completed and sent to the MOH and the MECP Spills Action Centre. This completed form will then be properly filed.

Total Trihalomethanes (THMs)/ Haloacetic Acid Samples (HAAs)

If a total Trihalomethanes or Haloacetic Acid adverse occurs, the Municipality of Dutton Dunwich must calculate the running annual average (RAA) for THMs/HAAs and report any adverse test result in writing to the MECP (Spills Action Centre) and the Health Unit within 7 calendar days of the end of the calendar quarter that produced the adverse test result. The written notice is submitted using Section 2(c) of the MECP Adverse Notice. **Note:** Immediate oral notification is no longer required for this parameter.

The annual report submitted to MECP (Spills Action Centre) for the Dutton Dunwich Water Distribution System will report any adverse readings. This annual report will be available to the public.

Challenging Conditions

Challenging conditions such as adverse weather events, a major watermain break, or a major fire may require additional, non-regulatory sampling, testing and monitoring.

In these challenging conditions, the free chlorine residual concentration should be monitored locally and/or throughout the Dutton Dunwich Water Distribution System to assess the need for flushing of certain lines. Extra samples should also be collected for microbiological analysis. Other sampling and monitoring may include:

- Check and maintain a minimum pressure of 140 kPa (20 psi) throughout the Dutton Dunwich Water Distribution System.
- Check and maintain periodic turnover of the Wallacetown Elevated Storage Tank and Rechlorination Facility through frequent re-filling operation.
- Check and maintain free chlorine residual concentrations above 0.2 mg/L.

Testing and monitoring results are shared between Operating Authority and the Owner through Annual Water Reports.

17. Measuring and Recording

The following equipment is calibrated on an annual basis according to the manufacturer's procedures:

- online chlorine residual analyzers located at the Wallacetown Elevated Storage Tank and Rechlorination Facility and the Iona Rechlorination Facility.
- portable chlorine residual analyzers
- five flow meters in the various interconnect chambers and at the Wallacetown Elevated Storage Tank and Rechlorination Facility
- testable backflows at high risk facilities.

The calibration of the online and portable chlorine residual analyzer is carried out by a Certified Operator, according to the manufacturer's instructions. A record of this calibration is filed at the Water Department.

Certified Calibration Services are retained by the Municipality of Dutton Dunwich to calibrate the flow meters on an annual basis.

18. Emergency Management

Some emergency situations or service interruptions include the loss of power, contamination, watermain breaks, or interruptions in water pressure. The Risk Assessment Outcomes provided in **Element 8** can be referenced for emergency procedures and contingency plans. Other contingency procedures for emergencies are provided below:

1. Chlorine Residuals: If chlorine drops below 0.2 mg/L of free chlorine residual, then action should be taken to increase chlorine levels. If the free chlorine residual drops below 0.05 mg/L, this is considered an adverse test result, and must be reported as such. The procedure for reporting adverse test results is provided in **Element 16**.

2. Sodium Hypochlorite: This chemical is very corrosive and is irritating to the skin and eyes. Extreme caution should be used when handling this substance. Workers should be aware of the Safety Data Sheet (SDS) for this chemical. In the case of a large spill, the Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre should be contacted immediately, and a report to the Overall Responsible Operator (ORO) must be filed.

3. Main and Service Leaks: Once a leak has been reported, it should be responded to as quickly as possible. The main priorities are to keep proper pressure on the lines to prevent contamination and to keep interruption of services to a minimum. Before any digging all locates must be done, a tailgate meeting should take place, so all workers are aware of the procedures to be followed, and that all safety concerns have been looked at (i.e., traffic signs, locates, etc.). If possible, the public affected should be notified of the problem with an approximate timeframe of the disruption in service.

4. Adverse Test Results: Any Operator that receives an adverse test result whether it is free chlorine residual or by microbiological sample, must take immediate action to correct the problem. There are two copies of procedures for adverse test results at the Water Department, one posted and one in the Procedural Manual. Adverse test results could come from either field test results or from lab results and must be responded to immediately with the proper procedures followed. The procedure for reporting adverse test results is provided in **Element 16**.

5. Injuries or Accidents: In the case of any Injuries or Accidents, the following should be completed: call 9-1-1, notify the Municipal Office, and fill out an Accident Report. All information and details of the accident (i.e., when, where, how, etc.) should be documented in the Accident Report.

In the case of responding to hazards/emergencies, all actions must be recorded in the Dutton Dunwich Water Distribution System Log Book as required by Ontario Regulation 128/04.

An emergency training exercise relating to the Dutton Dunwich Water Distribution System is completed annually to prepare Water Department Operators should an emergency occur. Results of the training exercise are evaluated to ensure the procedures implemented to respond to the "emergency" was effective and successful.

Emergency response training and testing requirements for Water Department personnel is outlined in **Element 10**.

The Dutton Dunwich Emergency Response Plan is reviewed annually by the Emergency Management Program Committee and Water Department personnel.

Emergency Management Exercise and Training (Municipal) is completed on an annual basis. Staff is required to be present at a training session, which may include a tabletop emergency exercise. The water emergency associated with the Municipal Emergency Management Exercise and Training will be reviewed separately by all Water Department Staff for effectiveness of the procedure followed.

When an emergency occurs, The Emergency Response Plan is activated and the Municipal Emergency Control Group (MECG) is assembled. This group is comprised of the Mayor (or alternate), Treasurer/Acting CAO (or alternate), Community Emergency Management Coordinator (CEMC) (or alternate), and Emergency Information Officer (EIO) (or alternate). A Water Department representative is designated as a MECG support and advisory staff member. During an emergency, a Water Department representative will be responsible for providing advice on water matters, including other duties as outlined in the Dutton Dunwich Emergency Response Plan.

If there is a water problem after-hours, the resident will call the Water Department (519-762-2733), and then have their call forwarded to the On-Call Operator, and the problem will be addressed promptly.

The table below provides emergency contact information:

Name	**Title**	**Phone No.**
Fire, Ambulance, Police		911
Tim Hansen	Water Operations Manager	Cell: 519-933-6483
Archie Leitch	Water & Wastewater Operator	Cell: 519-476-8784
Ryan McGahan	Water & Wastewater Operator	Cell: 519-859-5699
Andy Davie	Water Operator	Cell: 519-234-4198
Lubna Khani – or alternate	Elgin St. Thomas Public Health Unit	Work: 519-631-9100 Fax: 519-633-0468

Name	Title	Phone No.
Ministry of the Environment, Conservation and Parks (MECP) Spills Action Centre		1-800-268-6060 Fax:1-800-268-6061
Tracy Johnson	Treasurer/Acting CAO	Office: 519-762-2204 Cell: 519-857-9601
Tara Kretschmer	Acting Clerk	Office: 519-762-2204 Cell: 519-851-2243
Roads On Call (Monitored 24/7)		519-762-2748
Andrew Henry, Division Manager, Regional Water Supply - Elgin Area Primary Water Supply System Contact		Office: 519-661-2500 ext. 1335 Fax: 519-474-0451
Ontario Clean Water Agency (OCWA), West Elgin Water Treatment Plant		Plant: 519-768-1820 (normal business hours) Emergency Pager: 519-435-6472 On-Call Switchboard: 519-435-6472
Ontario Clean Water Agency (OCWA) Elgin Water Treatment Plant		Plant (24 hrs): 519-782-3101
Municipality of West Elgin: Magda Badura - CAO/Treasurer cao@westelgin.net Janna Nethercott – Clerk Clerk@westelgin.net Dale LeBritton Ontario Clean Water Agency		 Office: 519-785-0560 Fax: 519-785-0644 Office: 519-785-0560 Fax: 519-785-0644 Office: 519-768-9925 Cell: 519-476-5899
Township of Southwold: Lisa Higgs CAO/Clerk cao@southwold.ca Jeff Carswell, Treasurer-Water Advisor treasurer@southwold.ca Lori Redman, Accounting Clerk Accounting@southwold.ca Dale LeBritton Ontario Clean Water Agency		 Lisa's Cell: 519-671-0358 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-769-2010 Fax: 519-769-2837 Office: 519-768-9925 Cell: 519-476-5898
Dutton Dunwich Council:		
Mike Hentz	Mayor	Home: 519-762-3949
Ken Loveland	Deputy Mayor	Home: 519-762-3314
Amarilis Drouillard	Councillor	Home: 519-762-0576
Henry Dryfhout	Councillor	Home: 519-661-7574
Corey Pemberton	Councillor	Home: 519-671-8936

19. Internal Audit

All Elements of the Quality Management System (QMS) will be subject to an internal audit at least once every calendar year and at least one month before the annual Management Review.

The person designated to complete the Internal Audit, should have necessary training to complete audits and act as an Internal Auditor. The audit date shall be determined between the QMS Representative and the Internal Auditor. The written record of the completed audit shall be distributed to the Treasureer/Acting CAO (or alternate) and the QMS Representative (Water Operations Manager).

Procedure D outlines the process for completing Internal Audits. **Annex F** provides the Internal Audit Checklist Form and the Correction Action Procedure and Report Form.

20. Management Review

A Management Review will be completed once every calendar year by the Treasurer/Acting CAO (or alternate) and the Quality Management System (QMS) Representative (Water Operations Manager) to evaluate the suitability, adequacy, and effectiveness of the QMS. The procedure for the Management Review process is provided in **Procedure E**.

21. Continual Improvement

The Quality Management System (QMS) is regularly reviewed by Water Department Operators for the purpose of implementation and improvement. The Operating Authority strives to continually improve the effectiveness of the QMS Plan by reviewing industry Best Management Practices and identifying and implementing Preventive and Corrective Actions. Preventive and Corrective Actions are typically identified through Internal and External Audits but may result from various sources such as Management Reviews or staff suggestions. Applicable Best Management Practices will be reviewed and considered, including those published by the Ministry of the Environment, Conservation and Parks (MECP), at least once every thirty-six months.

Internal and External Audits are reviewed by the QMS Representative for the purpose of effecting changes to continually improve the QMS. In addition to the Preventative and Corrective Action Requests that need to be addressed, the recommendations and Opportunities for Improvement are reviewed and whenever possible changes and revisions are made.

The Non-Conformance Preventive and Corrective Action Procedure **(Annex F)** outlines how QMS-related Non-Conformances, OFIs, and Preventive and Corrective and Actions are initiated, assigned, documented, implemented, and validated as being effective.

A Table of Revisions is used to track improvements and amendments to the QMS Plan - **Annex H**

Annex A – Municipal Council Resolutions/ Endorsements
Resolution of Council and the Municipality's Drinking Water Quality Management Standard Policy.

Municipality of
Dutton Dunwich

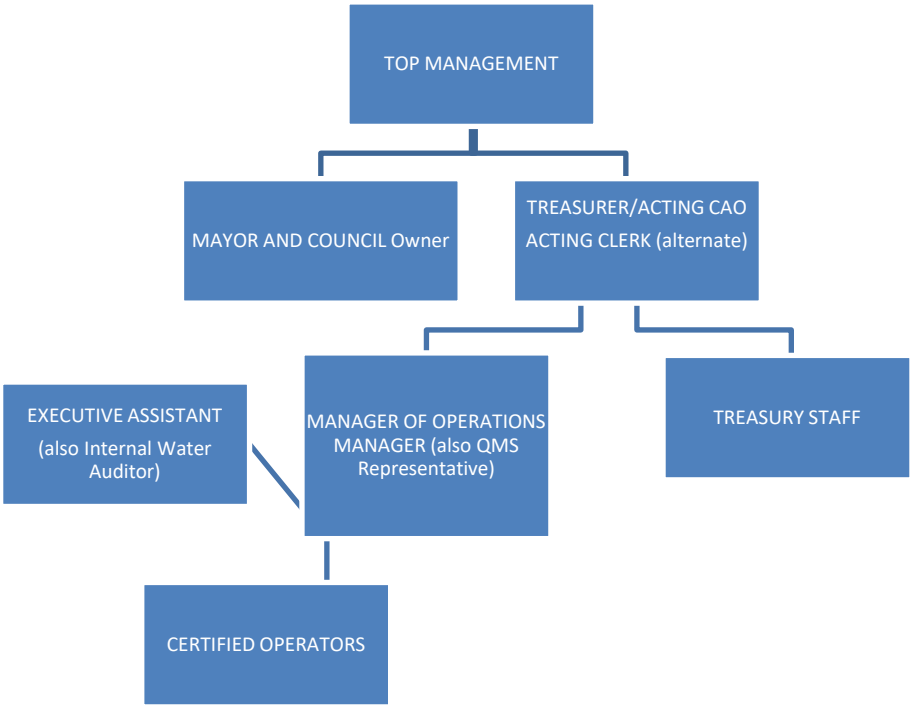
DRINKING WATER QUALITY MANAGEMENT STANDARD POLICY

The Municipality of Dutton Dunwich is committed to comply with all applicable regulatory requirements to supply safe drinking water to meet their consumers' requirements.

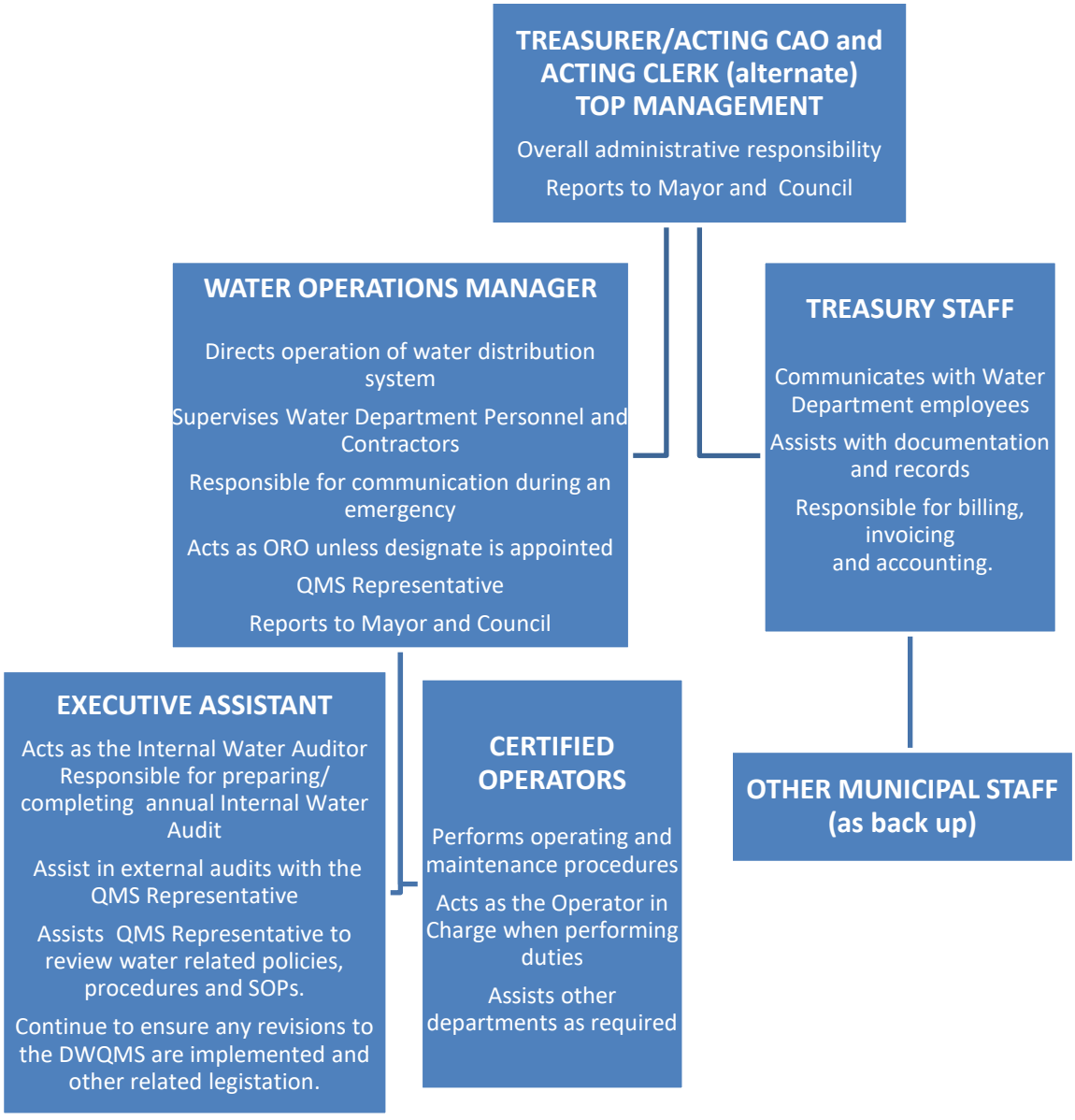
The Municipality is also committed to the maintenance and continual improvement of the Quality Management System and the Drinking Water Quality Management Standard.

(QMS-Operational Plan, Rev. 14 - November 2022)

Annex B – Organizational Structure



Annex C – Operational Structure



Annex D – Operational Roles, Responsibilities and Authorities

Mayor/Council (Owner)

Responsibilities	Authorities
- ultimate responsibility for the provision of safe drinking water	- financial and administrative authority related to the distribution of safe drinking water - review and approve changes to the Quality Management Standard (QMS) Operational Plan document, through Council motions to endorse the plan

Water Operations Manager

Responsibilities	Authorities
- complete oversight of operations and maintenance of the entire Water Distribution System - acts as the Overall Responsible Operator (ORO) - acts as the QMS Representative (see **Element 4**) - supervises Water Department personnel - ensures the system is operated in accordance with all applicable legislation and regulations - maintains Distribution System certification - will complete the annual management review of the Quality Management System with the Treasurer/Acting CAO (or alternate). - reports on operations and the Quality Management System to Mayor/Council - provides recommendations for Dutton Dunwich Water Distribution System improvements - develops operating procedures and policies - contingency/emergency planning - provides training for Operators in the Water Department	- performs listed responsibilities - financial, administrative, and technical authority related to the distribution of safe drinking water - reports adverse water quality incidents to regulatory agencies - administers the QMS - delegates the role of ORO to one of the Certified Operators in his absence

Certified Water Department Operators:

Responsibilities	Authorities
- follows procedures and carries out required operations and maintenance activities - completes forms and files records - maintains Operator's licence and attends training as required	- performs listed responsibilities - recommends changes to the QMS

Excutive Assistant

Responsibilities	Authorities
- acts as the Internal Water Auditor - is responsible for preparing and completing the annual Internal Water Audit - will complete the Internal Auditor report - will assist in external audits with the QMS Representative - able to make objective observations and record the results - with the QMS Representative review water related policies, procedures and safe operations practices. - successfully complete the DWQMS Internal Auditor's course - will continue to ensure any revisions to the DWQMS are implemented with the QMS Representative. - understand the Safe Drinking Water Act and other related legistation.	- will evaluate and determine the effectiveness of the water department and employees through the annual internal and external audits in alignment with the DWQMS and any revisions.

Management Review Group
QMS Representative, Treasurer/Acting CAO (Acting Clerk designated as alternate)

Responsibilities	Authorities
- follows Procedure E for the annual Management Review	- evaluate the suitability, adequacy, and effectiveness of the QMS - recommend any improvements for the QMS

Annex E – Risk Assessment Form

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan	Likelihood	Severity	Detectability	Risk Rating	CCP	Comment
Source Water: West Elgin - Tri-County Drinking Water System (treated water) and Southwold - Elgin Area Primary Water Supply System											
Elevated Storage Tank											

Activity or Process Step	Description of Hazard	Potential Result of Hazard	Comments	Available Monitoring and Control Measures	Emergency Procedure or Contingency Plan	Likelihood	Severity	Detectability	Risk Rating	CCP	Comment
Rechlorination Facilities											
Waste Water Treatment Plant											
Distribution											

Effective Date: Reviewed by:

Annex F – Internal Audit Checklist Form, Corrective Action Procedure and Report Form

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
General Comments			
1. Quality Management System (QMS) PLAN- The Operational Plan shall document a QMS that meets the requirements of this standard DO – The Operating authority shall establish and maintain the QMS in accordance with the requirements of this Standard and the policies and procedures included in the Operational Plan.			
2. QMS Policy PLAN – The Operational Plan shall document a QMS Policy that provides the foundation for the QMS, and: a) includes a commitment to the maintenance and continual improvement of the QMS, b) includes a commitment to the consumer to provide safe drinking water, c) includes a commitment to comply with applicable legislation and regulations, and d) is in a form that can be communicated to all Operating authority personnel, the Owner, and the public. DO – The Operating authority shall establish and maintain a QMS that is consistent with the Policy.			
3. Commitment and Endorsement PLAN – The Operational Plan shall contain a written endorsement of its contents by top management and the Owner.			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
DO – Top management shall provide evidence of its commitment to an effective QMS by: a) ensuring the QMS is in place that meets the requirements of this standard b) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements, c) communicating the QMS according to the procedure for communication and d) determining, obtaining or providing the resources needed to maintain and continually improve the QMS.			
4. QMS Representative PLAN – The Operational Plan shall identify a QMS Representative. DO – Top management shall appoint, authorize, and maintain a QMS Representative who, irrespective of other responsibilities, shall: a) administer the QMS by ensuring that processes and procedures needed for the QMS are established and maintained, b) report to top management on the performance of the QMS and any needs for improvements, c) ensure that current versions of documents required by the QMS are being used at all times, d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to the duties in the operation of the subject system, and e) promote awareness of the QMS throughout the Operating authority.			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
5. Documentation and Records Control PLAN – The Operational Plan shall document a procedure for document and records control that describes how: a) documents required by the QMS are: - kept current, legible, and readily identifiable - retrievable - stored, protected, retained and disposed of, and b) records required by the QMS are: - kept legible and readily identifiable - retrievable - stored, protected, retained, and disposed of. DO – The Operating authority shall implement the procedure for document and records control and shall ensure that the QMS documentation for the subject system includes: a) the Operational Plan and its associated policies and procedures, b) documents and records determined by the Operating authority to ensure that effective planning, operation and control of its operations, and c) the results of internal and external audits and management reviews			
6. Drinking Water System PLAN – The Operational Plan shall document, as applicable: a) for the Subject System: i. the name of the Owner and Operating Authority,			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection: a. a description of the system including all applicable treatment System processes and Distribution System components, b. a Treatment System process flow chart, c. a description of the water source, including: I. general characteristics of the raw water supply, II. common event-driven fluctuations, and III. any resulting operational challenges and threats. iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection: a. a description of the system including all Distribution System components, and b. a description of any procedures that are in place to maintain disinfection residuals. b) if the Subject System is an Operational Subsystem, a summary description of the Municipal Residential Drinking Water System it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems. c) if the Subject System is connected to one or more other Drinking Water Systems owned by different Owners, a summary description of those systems which: i. indicates whether the Subject System obtains water from or supplies water to those systems, ii. names the Owner and Operating Authority(ies) of those systems, and			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
iii. dentifies which, if any, of those systems that the Subject System obtains water from are relied upon to ensure the provision of safe drinking water. DO – The Operating authority shall ensure that the description of the drinking-water system is kept current.			
7. Risk Assessment PLAN – The Operational Plan shall document a risk assessment process that: a) considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment, Conservation and Parks document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. b) identifies additional potential hazardous events and associated hazards, c) assesses the risks associated with the occurrence of hazardous events, d) ranks the hazardous events according to the associated risk, e) identifies control measures to address the potential hazards and hazardous events, f) identifies critical control points, g) identifies a method to verify once a year, the currency of information and the validity of the assumptions used in the risk assessment, h) –ensures that the risks are assessed at least once every 36 months, and i) considers the reliability and redundancy of equipment.			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
DO – The Operating authority shall perform a risk assessment consistent with the documented process.			
8. Risk Assessment Outcomes PLAN – The Operational Plan shall document: a) the identified potential hazardous events and associated hazards, b) the assessed risks associated with the occurrence of hazardous events, c) the ranked hazardous events d) the identified control measures to address the potential hazards and hazardous events, e) the identified critical control points and their respective critical control limits, f) procedures and/or processes to monitor the critical control limits, g) procedures to be undertaken in response to deviations from the critical control limits, and h) procedures for reporting and recording deviations from the critical control limits. DO – The Operating authority shall implement and conform to all procedures.			
9. Organizational Structure, Roles, Responsibilities and Authorities PLAN – The Operational Plan shall: a) describe the organizational structure of the Operating Authority including respective roles, responsibilities and authorities,			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
b) delineate corporate oversight roles, responsibilities, and authorities in the case where the Operating Authority operates multiple subject systems, c) identify the person, persons or groups of people within the management structure responsible for undertaking the Management Review, d) identify the person, persons, or group of people, having top management and responsibilities required by this standard, along with their responsibilities, and e) identify the Owner of the subject system. DO – The Operating authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to the Operating authority personnel and the Owner.			
10. Competencies PLAN – The Operational Plan shall document: a) competencies required for personnel performing duties directly affecting drinking water quality, b) activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality, c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water. DO – The Operating authority shall undertake activities to: a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water quality and shall maintain records of these activities.			
11. Personnel Coverage PLAN – The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality. DO – The Operating authority shall implement and conform to the procedure.			
12. Communications PLAN – The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the QMS are communicated between top management and: a) the Owner, b) Operating Authority personnel c) Suppliers that have been identified as essential under the Plan (a) of Element of this Standard, and d) the public. DO – The Operating authority shall implement and conform to the procedure.			
13. Essential Supplies and Services PLAN – The Operational Plan shall: a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
b) include a procedure by which the Operating authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality. DO – The Operating authority shall implement and conform to the procedure.			
14. Review and Provision of Infrastructure PLAN – The Operational Plan shall document a procedure for the annual review of the adequacy of the infrastructure necessary to operate and maintain the subject system that: a) considers the outcomes of the risk assessment documented under Element 8, and b) ensures that the adequacy of the infrastructure necessary to operate and maintain the Subject System is reviewed at least once every Calendar Year. DO – The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.			
15. Infrastructure Maintenance, Rehabilitation, and Renewal PLAN – The Operational Plan shall document: a) a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system. b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities. DO – The Operating authority shall: a) keep the summary current, b) communicate the programs to the Owner, and			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
c) monitor the effectiveness of the maintenance program.			
16. Sampling, Testing and Monitoring PLAN – The Operational Plan shall document: a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system, b) a description of any relevant, testing or monitoring activities if any, that take place upstream of the subject system, and c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable. DO – The Operating authority shall implement and conform to the procedures.			
17. Measurement and Recording Equipment Calibration and Maintenance PLAN – The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment. DO – The Operating authority shall implement and conform to the procedure.			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
18. Emergency Management PLAN – The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes: a) a list of potential emergency situations or service interruptions, b) process for emergency response and recovery, c) emergency response training and testing requirements, d) Owner and Operating authority responsibilities during emergency situations e) references to municipal emergency planning measures as appropriate, and f) an emergency communication protocol and an up-to-date list of emergency contacts. DO – The Operating authority shall implement and conform to the procedure.			
CHECK ELEMENTS of the QMS 19. Internal Audits PLAN – The Operational Plan shall document a procedure for internal audits that: a) evaluates conformity of the QMS with the requirements of this standard, b) identifies internal audit criteria, frequency, scope, methodology and record keeping requirements, c) considers previous internal and external audit results, and d) describes how QMS corrective actions are identified and initiated.			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
DO – The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every 12 months.			
20. Management Review PLAN – The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the QMS and that includes consideration of: a) incidents of regulatory non-compliance, b) incidents of adverse drinking-water tests, c) deviations from critical control point limits and response actions, d) the effectiveness of the risk assessment process e) internal and third-party audit results, f) results of emergency response testing, g) operational performance, h) raw water supply and drinking water quality trends, i) follow up on action items from previous management reviews, j) the status of management action items identified between reviews, k) changes that could affect the QMS, l) consumer feedback m) the resources needed to maintain the QMS n) the results of the infrastructure review, o) Operational Plan currency, content, and updates, and p) staff suggestions			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
DO – Top management shall implement and conform to the procedure and shall: a) ensure that a management review is conducted at least once every 12 months, b) consider the result of the management review and identify deficiencies and action items to address the deficiencies, c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, and d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.			
21. Continual Improvement PLAN – The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by: a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment, Conservation and Parks at least once every thirty-six months; b) documenting a process for identification & management of Quality Management System Corrective Actions that includes: i. investigating the cause(s) of an identified non-conformity, ii. documenting the action(s) that will be taken to correct the nonconformity and prevent the non-conformity from re-occurring, and			

Requirements for PLAN and DO Elements of the Quality Management System (QMS)	Notes, Observations, and Audit Evidence	Comments	Records or Documents Reviewed, Interviews Conducted
iii. reviewing the action(s) taken to correct the non-conformity, verifying that they are implemented and are effective in correcting and preventing the re-occurrence of the nonconformity. c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes: i. reviewing potential non conformities that are identified to determine if preventive actions may be necessary, ii. documenting the outcome of the review, including the action(s), if any, that will be taken to prevent a non-conformity from occurring, and ii. reviewing the action(s) taken to prevent a non-conformity, verifying that they are implemented and are effective in preventing the occurrence of the non-conformity. DO – The Operating authority shall strive to continually improve the effectiveness of its QMS through the use of corrective actions.			

PREVENTIATIVE and/or NON-CONFORMANCE CORRECTIVE ACTION PROCEDURES

The purpose of this procedure is to describe how preventative and/or non-conformance corrective actions are initiated, assigned, documented, implemented, and validated as being effective.

This procedure is applicable to all detected peventaitive actions and non-conformities of the QMS, with respect to the requirements of the Drinking Water Quality Management System (DWQMS), or any other undesirable situation.

Initiating a Preventative Action Report or Non-Conformance Corrective Action Report (PARS or CAR)

1. PARs and/or CARs shall be initiated through the identification of non-conformities within the QMS as it applies to the Dutton Dunwich Water Distribution System. Non-conformities may be detected by any number of methods including:

    - Daily operations by water department employees
    - Internal or external audits;
    - End user complaints;
    - Incident debriefings;
    - Management reviews; and,
    - Operator or employee feedback.

2. Any PAR initiated by water operators shall be reported to the QMS Representative. The QMS Representative will discuss and review with water operators and if the preventative action is warranted a PAR will be completed. This process is an effective corrective measure to eliminate any future occurrences of potential non-conformities in the QMS.

3 Non-conformities shall be reported to the QMS Representative, who shall determine if a CAR is required.

Investigating, Completing and Closing a Non-Conformance Corrective Action Report (CAR)

1. When it is determined that a non-conformance CAR is required, each non-conformance requires a separate CAR.

2. The QMS Representative (or designate) shall be provided with the CAR which must be completed and returned to the Auditor by the due date.

3. The CAR shall be completed with the following information:

    PART A – Completed by the CAR initiator:

    - Non-conformance CAR number;
    - Date the non-conformance corrective action was initiated;
    - Who the or CAR was issued by;
    - The source of the CAR – internal audit, management review meeting, Non
    - Conformance Report #, or other; and
    - Description of the non-conformance;

PART B – completed by the QMS Representative:

- Name of the personnel PAR or CAR is assigned to;
- Date Due;
- Description of the root cause of the non-conformance or preventative measures recommended
- Description of the action(s) to be taken (immediate and long-term); including timelines;
- If the effectiveness can be measured and how, with follow up date and who the PAR or CAR has been assigned to; and
- Specify any documents that are required to be changed, if applicable.

PART C – completed by the QMS Representative:

- Determination of effectiveness of action taken;
- Determination of whether PAR or CAR is complete and completion date; and
- QMS Representative signature and date.

4. The root cause of the non-conformance shall be determined. The '5-why' technique may be used, where the question 'why' is asked five times, and the answer to the fifth 'why' is usually the root cause. Other techniques that can be used include a fish-bone diagram and analysis where potential root causes are listed and then ranked.

5. The Auditor shall establish a due date appropriate for the specific CAR. When a CAR is initiated from an audit, it is the responsibility of the QMS Representative to provide the Auditor with a copy of all the completed CAR forms.

6. CARs shall be considered closed once validated by the QMS Representative. The purpose of validation is to ensure that the root cause of the non-conformance was identified and that the corrective action was effective in eliminating the root cause.

Tracking of Non-Conformance and Corrective Actions

1. The Executive Assistant tracks the progress of each PAR or CAR with the QMS Representative to monitor root cause, effectiveness, completion, and if the deadline will be met (if applicable).

2. For outstanding CARs that are past due, the QMS Representative and Executive Assistant will meet on a regular basis to evaluate progress and potential resources, if needed, to complete the CAR.

3. The Executive Assistant shall document and maintain an Excel spreadsheet of all PARs/ CARs/OFIs. This Spreadsheet will include the date it was validated by the QMS Representative. This password protected file is stored on a secure server under:

S:\CENTRAL FILING INDEX & RETENTION BY-LAW\E - Environmental Services\E20 Source Water Protection\Non Conformance and OFI Spreadsheet.xls

4. The Executive Assistant scans and stores **ALL** generated and completed PAR or CAR forms digitally on a secured server and password protected folders under either:

   S:\CENTRAL FILING INDEX & RETENTION BY-LAW\E - Environmental Services\E20 Source Water Protection\QMS Internal Audit Notes and Records\DD

   OR

   S:\CENTRAL FILING INDEX & RETENTION BY-LAW\E - Environmental Services\E20 Source Water protection\QMS External Audit - SAI Global

PREVENTATIVE AND CORRECTIVE ACTION REPORT FORM (PAR and CAR)

This form serves to document the need for corrective or preventive action. This request will be closed when adequate corrective action has been implemented and determined to be effective.

PART A PAR or CAR #_____

DATE:	**ISSUED BY:**
Source: O Daily Water Department Operations O Internal Audit O Management Review Meeting – Date: _____ O Non Conformance Report # _____ O Other	
Description of Issue/Concern:	

PART B

Assigned to:	**Date Due:**
What is the root cause of the problem or potential problem (explain)?	
Describe Action to be taken: (include timelines if necessary):	
Can the effectiveness of action be measured, and if so how (explain)? Follow up date: Assigned to:	
Which documents need to be changed?	

PART C

Was action taken effective (explain)? Document Change Complete: O Yes O Not Applicable
Is PAR or CAR Complete? O Yes O No _____ _____ Signature - QMS Representative Date

Annex G – Drinking Water Quality Management Standard (DWQMS) Contractor and Supplier Sign off Form

All Contractors and Suppliers that undertake work on or supply materials for the Dutton Dunwich Water Distribution System shall agree to the DWQMS requirements while working on the drinking water system and must meet AWWA and ANSI Standards. A copy of licenses (where applicable) must be returned with this sign off form.

1. Operation of Waterworks Equipment

No contractor shall perform the duties of an "Operator" as defined by O.Reg 128/04 which states:

> *"Operator" means a person who conducts operational checks of or who adjusts, tests or evaluates a process that controls the effectiveness or efficiency of a subsystem and includes a person who adjusts or directs the flow, pressure or quality of the water within the subsystem, if the person works in a distribution subsystem or a distribution and supply subsystem;*

Unless that person holds a valid Operator's Certificate and has notified the Operator in Charge.

2. SCADA System Maintenance

- SCADA is critical to the operation and regulatory requirement to monitor document and record the system operation. Any interruption of the system must include alternate monitoring methods and must include details of the work, explanation of work to be performed along with details of process before and during work.

3. Subcontracted Services

- All subcontractor personnel providing services at the Dutton Dunwich Water Distribution System shall have all necessary licenses, permits and/or certificates of approval as required for the task.

4. Equipment Suppliers

- All equipment must be delivered with an operations and maintenance manual that includes a list of maintenance tasks to be completed, the recommended maintenance frequency and operations instructions

5. Disinfection of Equipment

- When required, all equipment will be disinfected according to legislation (as per *The Procedure for Disinfection of Drinking Water in Ontario* which has been adopted by reference by O.Reg. 170/03 - Drinking-Water Systems).

Type of Supply: _____

In signing this form, you have the authority on behalf of your company and are accepting corporate responsibility for ensuring that you and all employees from your company that may have reason to work on the Dutton Dunwich Water Distribution System property have been made aware of the DWQMS requirements. If you or any of the employees from your company need further information, you can contact the Water Department for assistance.

For Subcontractor
I acknowledge receipt of the DWQMS Procedures from the Operating Authority.

Signature	Print Name
Company Name	Date
Daytime Contact	
After Hours Contact	

Quality Management System (QMS) Representative for the Dutton Dunwich Water Distribution System

Signature	Print Name
Date	

Annex H – Table of Revisions

Table of Revisions	
EFFECTIVE DATE:	November 28, 2014
REVISION:	Revision #11
TO BE REVIEWED:	Annually or When DWQMS Changes

November 28, 2014	Initial Issue of Document
January 5, 2015:	
Element 2	Added: Locations where Drinking Water Quality Management Standard Policy is posted and added to Annex A.
Element 6	Amended: Number of service connections changed. Amended: Tri-County Management Committee changed to Tri-County Water Board. Amended: Iona Interconnect – responsibility of duties changed.
Element 11	Amended: UOM changed to Water Operations Manager.
Element 10	Added: Reference to outlining how water department employees ensure relevance of duties for providing safe drinking water.
Element 12	Amended: Southwold - Accounting Clerk. Added: QMS policy also at the Municipal Office.
Element 13	Added: A following procedure is now being implemented: Water Operations Manager ensures certifications/qualifications for essential supplies and service providers are retained on file, i.e., plumbers, calibration technician certificates etc. Removed: Packing slips, purchase orders and /or order notes are signed/ initialled to document the product check. Added: Essential Supplier – under Plumbing, Water Works Equipment Supplies and Meter Manufacturers and Calibration Contractors.
Element 16	Added: reference to how sampling, monitoring and testing is shared between operating authority and owner. Added: under Operational Checks - Free Chlorine Residual: Iona Rechlorination Facility. Amended: Sampling locations.
Element 18	Added: Emergency Exercise and Training revised to indicate how and how often this is completed. Amended: Wastewater Operator. Amended: Southwold - Accounting Clerk. Amended: Change in Member of Council.
Element 21	Amended: Opportunities for Improvement added.
Annex B	Amended: Accounting Clerk II changed to Treasury Staff.
Annex E	Amended: A section to add date and who participated in Risk Assessment review was added.
Annex C	Amended: Accounting Clerk II changed to Treasury Staff.
Annex G	Amended: Reference to Quality Coordinator (QC) replaced with QMS Representative.
Annex H	Created: Table of Revisions to track changes for continual improvements.

Procedure A	Added: Under QMS Record Control – location of duplicate files at municipal office. Amended: Retention Period minor changes.
Procedure D	Added: Internal Audit – evidence and storage of audit.
January 20, 2015 – Internal Audit	
Element 5	Removed In Procedure A: Applicable drinking water regulations (O.Reg. 170/03 and 128/04).
Element 7	Added: to Risk Assessment Effective Date and Reviewed by.
Element 10	Added: Under competencies: thorough knowledge of DWQMS added under Operators.
Element 17	Added: Testable backflows at high risk facilities.
Element 19	Updated Procedure: at least once every 12 months.
Annex G	Deleted/Amended some content: Contractors and suppliers applicable to our water department operations.
Procedure B	Added: The Risk Assessment form must be dated and names of the members of the Risk Assessment team in attendance added. If no changes are made this must be stated.
October 22, 2015 - Risk Assessment Review by Risk Management Team	
Element 8	Added: 1 Additional procedure under Watermain Break. Amended: 8 Ratings changed. Amended: 2 Risk Ratings as a result of Rating changes. Amended: 1 CCP changed for Loss of Chlorine. Added: NOTE: CCP is 9 - anything below is not a critical control point unless it is regulated.
November 1, 2015 – QMS Rep and Admin Assistant Annual Review of Plan	
Element 3	Added: Upon changes to Mayor and Council, or significant changes to the system.
Element 6	Added: Addition of second Rechlorination Facility and location. Added: Identified the Owner and Operating Authority of the Elgin Area Primary Water Supply System. Deleted: Iona Interconnect is controlled by Dutton and no longer under joint control. Added: Description of the second Rechlorination Facility in Iona. Amended: Bi-monthly and monthly meter readings to quarterly.
Element 8	Added: 2 Procedures as recommended by the Risk Management Team. Amended: 8 Ratings as recommended by the Risk Management Team. Amended: 2 Risk Ratings as a result of Rating changes. Amended: 1 CCP. Added: NOTE: CCP is 9 - anything below is not a critical control point unless it is regulated.
Element 10	Deleted: A Class I Operator from working on their own. Added: Operator in Training limitations when working alone. Added: Attends Annual Emergency Response Exercise and Training (or alternate) to Water Operations Manager and Certified Operators Required Competencies.

Element 11	Amended: Process how auto dialer alarm reaches On-Call Operator.
Element 12	Added: Website as method of how customers are informed of significant changes to the QMS. Added: How Essential Suppliers are informed of significant changes to the QMS. Amended: Municipality of West Elgin Clerk.
Element 13	Amended: New Supplier's contact information added to table.
Element 18	Amended: Township of Southwold CAO/Clerk. Amended: Municipality of West Elgin Clerk.
Element 21	Added: and external audits.
Annex A	Amended: New revision number and date.
Annex D	Deleted: from Mayor and Council Responsibilities the reference that they are involved with Management Review. Deleted: Mayor and Council from Management Review Group.
Procedure A	Deleted: Under QMS Control – superseded or obsolete documents do not need to be retained. Added: Under QMS Record Control: • Classifications E14 and H02. • Water Department (E Classification). • As indicated in the table below. • How HR classification records are managed. Added: Under Retention Period: • Clarified the meaning of Active and Inactive files. • Clarified how files are destroyed. Added: The retention period tables for E14 and H03. Amended: Retention periods in E Classifications – Active to 7 and Inactive to 8 as recommended by the MOECC.
Procedure D	Amended: How generated CARs from internal and external audits are managed Deleted: Under Audit Follow-up - Internal Audit Checklist Form. QMS does not file and complete this form.
Procedure E	Deleted: Mayor and Council as they are not involved in Management Review Amended: Clarified Management Review Report to Council.
November 16, 2015 – Internal Audit	
	No revisions required to the QMS Operational Plan.
February 9, 2016 – Change to Regulation	
Element 16	Changed from two THM's samples to one.
February 24, 2016 – OFIs/MNCs from External Audit	
Element 4	Added: and report the effectiveness of the Quality Management System through Management Review and Council Reports.
Element 6	Added Location of Dutton and Iona Rechlorination Facilities on schematic.
Element 10	Added: To ensure the CAO/Clerk is aware of the relevance of their duties and how they affect safe drinking water the CAO/Clerk: • Reviews and completes the annual Management Review with the QMS Representative. • Reviews the QMS Operational Plan before it is brought to Council. • Communicates regularly with the QMS Representative.

	• Attends the Standard of Care Training. Deleted: and by the Mayor and Council.
Element 12	Added: To second paragraph: CAO/Clerk. Added: To second paragraph: annual Management Review.
Element 17	Added: and the Iona Rechlorination Facility. Removed: two.
Annex C	Added: To Water Operations Manager: Reports to Mayor and Council.
March 21, 2016 – OFIs and Minor Non-Conformance from External Audit	
Element 3	Added additional endorsement by Top Management and QMS Representative.
Element 6	Clarification of Drinking Water System - Tri County Drinking Water System supplies potable water to the West Elgin Distribution System.
October 23, 2017 Risk Assessment Review by Risk Management Team	
Risk Assessment	Team considered potential hazardous events and associated hazards, as identified by the MOECC in the document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017. Potential hazards were added to the Risk Assessment and rated the impact on our distribution system by the Team.
October 23, 2017 - QMS Rep, Admin Assistant, Auditor in Training Annual Review of Plan	
Entire Plan	Plan incorporates DWQMS Standard 2.0, February 2017 updates. Amended: Footer to Revision 9 and November 1, 2017. Amended: West Elgin Area Primary Water Supply System – to West Elgin Distribution System.
Table of Contents	Added: Annex F – "Procedure."
Element 8	Added: Potential new identified hazards and risk with rating ratings as established by Risk Assessment Team from October 23, 2017.
Element 10	Deleted: WHMIS training. Added: WHMIS 2015 training.
Element 12	Added: Hard Copy. Added: and Municipal Website. Changed: New CAO for Township of Southwold and new MOECC Inspector.
Element 13	Added: New contractors
Element 15	Changed: to "every calendar year."
Element 16	Changed: THMs – tested each calendar quarter. Added: Halo acetic Acid sampling. Added: New MOECC Adverse Result Procedure for THMs.
Element 17	Changed: Contact information for Councillor changed from home number to cell number.
Element 18	Changed: New CAO for Township of Southwold.
Element 19	Changed: to "every calendar year."
Element 20	Changed: to "every calendar year."
Element 21	Amended: to include the new additions required under the new DWQMS Standard, February 2017.

Annex F	Changed: Audit Checklist to include additions/amendments to DWQMS standard for each element. Added: Non-Conformance Corrective Actions Procedure. Amended: Corrective Action Report to included Preventive Actions.
Procedure D	Changed: to "every calendar year."
October 9, 2018 Risk Assessment Review by Risk Management Team	
Risk Assessment	Due to the decommissioning of the Dutton Rechlorination Facility and the installation of new rechlorination equipment at the Wallacetown Elevated Water Tank, the Risk Assessment Team reviewed the processes and assessed any increase or decrease in existing risk ratings. A 1-point decrease in detectability on page 15 – Biofilm – as a result of the installation of a chlorine analyzer; and a 1-point decrease in likelihood on page 16 – Power Loss as automatic self testing generators are installed at both Rechlorination Facilities and recorded on SCADA were determined.
October 25, 2018 - QMS Rep, Admin Assistant, Auditor in Training Annual Review of Plan	
Entire Plan	Changed: MOECC to MECP throughout document with the exception of the Table of Revisions as MOECC was relevant at that time the revision was noted. Amended: Footer to Revision 10 and November 1, 2018 throughout document Deleted: Reference to the Dutton Rechlorination Facility as it has been decommissioned. Renamed: Wallacetown Elevated Water Tank to Wallacetown Elevated Water Tank and Rechlorination Facility as this Facility replaced the Dutton Rechlorination Facility.
Element 6	Updated: Service connections and customers Updated: Schematic - the Dutton Rechlorination Facility no longer exists. Added: Village of Added: Location of Water Tank – McBeth Street. Added: The new equipment located in the Wallacetown Elevated Water Tank and Rechlorination Facility
Element 9	Added: Designated Certified Operator
Element 10	Deleted: Under Certified Operators reference to "Wastewater."
Element 11	Added: both rechlorination facilities
Element 12	Updated: New CAO and Deputy CAO/Clerk at the Municipality of West Elgin.
Element 13	Updated: Contact for Extreme Drilling. Added: New contact for HM Pipe Products Added: Chemical Supplier – Hach Canada
Element 15	Removed: Repair, replacement or decommissioning of the Dutton Rechlorination Facility.
Element 16	Added: (except weekends) under Operational Checks.
Element 17	Added: Wallacetown Elevated Tank and Rechlorination Facility
Element 18	Deleted: Dutton Rechlorination Facility and replaced with increase chlorine levels. Updated: Water Department duties as updated in the Dutton Emergency Response Plan Updated: Public Health representative Added: Wastewater to Water Operator's title.

	Updated: New CAO and Deputy CAO/Clerk at the Municipality of West Elgin. Updated: Member of Council following October 22, 2018 Municipal Election.
Annex A	Updated: Plan Revision number to 10 and date.
Procedure A	Amended: Library name to John Kenneth Galbraith
January 3, 2019 – QMS Rep, Auditor in Training Review of Plan	
Element 18	Changed: New Council Members for Municipality of Dutton Dunwich
October 11, 2019 Risk Assessment Review by Risk Management Team	
Risk Assessment	One change was made on page 20 of the Risk Assessment - under "loss of chlorine residual." The CCP rating was amended to "Yes" even though the "Risk Rating" total was less than 9.
October 24, 2019 - QMS Rep, Admin Assistant, Auditor in Training Annual Review of Plan	
Entire Document	Changed: Due to organizational restructuring reference to CAO/Clerk was changed to Clerk and Administrative Assistant changed to Executive Assistant. The municipal Treasurer has been assigned the role of the alternate to the Clerk (Top Management).
Entire Document	Changed: Due to an update in TOMRMS all root directories and file references were changed to the new classifications
Element 3	Added: "complies with all applicable legislation and regulations"
Element 6	Updated: total of services connections was updated Added: Municipality of Southwold and regulated requirements under the DWQMS and MECP
Element 8	Changed: under loss of chlorine CCP to "yes" Added: non-municipally owned back flow devices
Element 11	Updated: technology to reflect new fibre optics and smartphone devices are now used
Element 12/18	Updated: Contact information - new employees at the Municipality of West Elgin Added: On-Call OCWA Switchboard phone number.
Annex A	Updated: Plan Revision number to 11 and date.
October 21, 2020 Risk Assessment Review by Risk Management Team	
Risk Assessment	No changes were required.
October 28, 2020 - QMS Rep and Executive Assistant Review of Plan (Separately)	
Element 5	Edited: 2nd paragraph reworded for clarity.
Element 6	Updated: Approximate service connections
Element 8	Risk Assessment review date and team added.
Annex A	Updated: Revision 12 – November 2020
Procedure D	Added: Digital file root directories on the S: Drive/Server.
November 16, 2020 Internal Audit – OFIs and Minor Non-Conformance	

Element 5	Replaced out of date documents posted at the Municipal Office and/or on Municipal website
October 24, 2019 - QMS Rep, Admin Assistant, Auditor in Training Annual Review of Plan	
Entire Document	Changed: Due to organizational restructuring reference to CAO/CAO/Clerk was changed to CAO/Clerk and Administrative Assistant changed to Executive Assistant. The municipal Treasurer has been assigned the role of the alternate to the CAO/Clerk (Top Management).
Entire Document	Changed: Due to an update in TOMRMS all root directories and file references were changed to the new classifications
Element 3	Added: "complies with all applicable legislation and regulations"
Element 6	Updated: total of services connections was updated Added: Municipality of Southwold and regulated requirements under the DWQMS and MECP
Element 8	Changed: under loss of chlorine CCP to "yes" Added: non-municipally owned back flow devices
Element 11	Updated: technology to reflect new fibre optics and smartphone devices are now used
Element 12/18	Updated: Contact information - new employees at the Municipality of West Elgin Added: On-Call OCWA Switchboard phone number.
Annex A	Updated: Plan Revision number to 11 and date.
October 21, 2020 Risk Assessment Review by Risk Management Team	
Risk Assessment	No changes were required.
October 28, 2020 - QMS Rep and Executive Assistant Review of Plan (Separately)	
Element 5	Edited: 2nd paragraph reworded for clarity.
Element 6	Updated: Approximate service connections
Element 8	Risk Assessment review date and team added.
Annex A	Updated: Revision 12 – November 2020
Procedure D	Added: Digital file root directories on the S: Drive/Server.
November 16, 2020 Internal Audit – OFIs and Minor Non-Conformance	
Element 5	Replaced out of date documents posted at the Municipal Office and/or on Municipal website.
June 4, 2021 – OFIs and Minor Non-Conformance from External Audit	
Procedure B	OFI – Added: Reliability and and redundancy of equipment by Risk Assessment Team OFI – Added: procedure how CCPs are reported.
Procedure D	OFI: Added: Consider previous internal and external audit results and any positive finding as part of the audit preparation.
October 21, 2021 - QMS Rep and Executive Assistant Review of Plan	

Element 12	Updated: Contact information
Element 13	Updated: Essential Services and Suppliers
Element 18	Updated: Contact information
Annex A	Updated: Revision and date
October 25, 2021 Risk Assessment Review by Risk Management Team	
Risk Assessment	No changes
November 16, 2021 Internal Audit	
QMS Plan	No changes
April 5, 2022 Exernal Desktop Audit	
QMS Plan	No changes
May 4, 2022 – OFIs and Minor Non-Conformance from Accreditation Audit	
Element 9	OFI – Added Executive Assistant to ANNEXES A, B and C
Element 20	OFI – Procedure E updated to reflect additional requirments for minutes
Element 21	MnC – Annex E Procedure and Form updated to add the process for identifying and implement preventative actions
September 7, 2022 Risk Assessment Review by Risk Management Team	
Risk Assessment	Added a new risk – Cybersecurity, threats and system security at Source Water possible hazard – loss of alarms, communicaton and monitoring. Moderate Risk determined by the team. Added a new risk – Cybersecurity, threats and system security at Elevated Storage Tank and Rechlorination Facilities and Distribution System - possible hazards – cyber terrorism to SCADA. Moderate Risk determined by the team in both cases
November 3, 2022 - QMS Rep and Executive Assistant Review of Plan	
Entire Document	Changed: Due to organizational restructuring reference to CAO/Clerk was changed to Treasurer/Acting Clerk and added Acting Clerk as the Top Management alternate. Updated: Revision and Date
Element 3	Updated: Top Management and Alternate
Element 6	Updated: Total of services connections was updated
Element 12	Updated: Contact information
Element 13	Updated: Essential Services and Suppliers
Element 18	Updated: Contact information

Procedure A – Document and Record Control

Quality Management System (QMS) Document Control
This procedure is applicable to the following documents:

- Operational Plan including associated procedures and forms.
- Completed QMS forms including but not limited to:
  - internal and external audit forms and documentation, including corrective action reports,
  - completed risk assessment forms,
  - management review meeting minutes.
- Operations Manuals and Equipment Manuals
- As Built Drawings

The above documents should be kept legible and readily identifiable, so that they could be easily retrieved. All material received is initialled after reviewing, acted upon if needed, and filed in labelled folders in a filing cabinet or placed in a binder at the Dutton Dunwich Water Department. These documents are retained onsite for at least seven years in accordance with the recommendations by the Ministry of the Environment, Conservation and Parks (MECP).

Creating New or Updating Existing Documents
The need for document revisions or for new documents may be identified through the audits or the Management Reviews. The QMS Representative (Water Operations Manager) will delegate the task of creating a new document, and/or updating an existing document.

Any employee of Dutton Dunwich's Water Department may request a change to an existing QMS document. The request must be made to the QMS Representative.

The need for a new document or a document revision should be warranted based on one the following reasons:

- enhances process control
- reduces risk
- supports regulatory requirements
- improves operational efficiency
- meets the Drinking Water Quality Management Standard

The QMS Representative is responsible to ensure that new or changed documents are communicated to the Water Department personnel.

Approving Documents
The QMS Representative will make any changes to the document, review the new or updated document, and approve the document. The appropriate sign-offs should be collected and provided on the Record of Revision and Endorsement Form (Page 2) when the Operational Plan is updated.

All QMS documentation must be approved by the QMS Representative.

Operational Plan Document Availability

A binder containing the most-up-to-date version of the Operational Plan shall be stored at the Water Department and the Municipal Office. A file containing all QMS documentation should be stored at the Water Department.

The electronic PDF version of the Operational Plan shall be saved, with the appropriate revision number in the file name, on the Dutton Dunwich server, and can be accessed from a computer at the Water Department or the Municipal Office. This electronic "pdf" document has "read-only" capabilities for all municipal staff.

Reviewing Documents

The QMS Operational Plan and Operating Procedures should be reviewed annually by the QMS Representative for applicability and relevance. Water department personnel should review both documents with a sign-off on the hardcopies of the current QMS Operational Plan and Operating Procedures (located in the Water Department and Municipal Office).

QMS Record Control

Water Department personnel must collect records to demonstrate compliance with Ontario Regulations 170/03 and 128/04. These records include:

- operator Log Books
- monitoring records and laboratory analysis reports
- training records
- maintenance reports and equipment calibration records
- annual reports submitted to the Ministry of the Environment, Conservation and Parks (MECP)

All hardcopy records are filed in labelled folders in a filing cabinet or placed in a binder at the Dutton Dunwich Water Department.

Some duplicate files are also maintained and stored at the Municipal Office in a cabinet containing:

- A09 Policies and Procedures
- E13 Water Monitoring
- E14 Water Sampling
- E15 Chemical Sampling of Water
- E16 Backflow Prevention and Cross Connection Control
- E20 Source Water Protection
- E21 Ministry of the Environment Conservation and Parks Compliance Approvals
- H03 Employee Records

Both alarmed buildings provide a secure storage area with minimal exposure to water damage.

Electronic documents are stored on the Municipality's server which is backed up each evening. Access to the Municipality's computer network infrastructure is restricted through use of individually assigned usernames and passwords.

To ensure compliance with these regulations:

- material, including records, that are regularly used and referenced, should be located so that they can be quickly retrieved.
- policies and procedures (A classification) records should be filed or archived, in accordance with the Municipality's TOMRMS Document Retention System and as indicated in the table below.
- water department (E classification) records that are greater than seven years in age, and are not regularly used or referenced, should be filed or archived, for up to 15 years in accordance with the Municipality's TOMRMS Document Retention system and as indicated in the table below.
- human resources (H Classification) records should be filed or archived, in accordance with the Municipality's TOMRMS Document Retention System and as indicated in the table below.

Retention Period

The retention period refers to the length of time that a document or record must be kept; starts from the date of issue for QMS records or from the point of time when a QMS document is replaced by a new or amended document.

Documents and record retention periods (electronic or hard copies) required by the QMS are listed below. Active retention refers to departmental files that are being stored on site and accessible. Inactive retention refers to files that are stored off site at a centralized location (Library Basement) and accessible upon request. Once total retention is reached a "request for destruction form" is completed, approved and signed by the QMS Representative. Files are destroyed by a contracted shredding company.

Inactive/archived records are stored (and locked) in the basement at the John Kenneth Galbraith Library. The secure access of the building ensures property protection and prevents unauthorized use and access, damage (including water), deterioration or loss of QMS documents and records.
NOTE: External documents i.e., Drinking Water Regulations O.R 170/03 and 128/04 are not subject to the Municipality's Document Retention Bylaw.

Code	Scope Notes -Secondary subjects	Responsible Department	Active	Inactive	Total Retention
A	**Administration** – Includes records regarding routine administration and office services functions.				
A09	**Policies and Procedures** Includes: policy and procedure manuals, work instructions, protocols, guidelines and directives relating to administrative, governance and operational processes	Originating	15	-	15
	Legend **C –** Current Year **E –** Events **S –** Superseded **P –** Permanent **All numbers refer to years unless specified**				

Code	Scope Notes -Secondary subjects	Responsible Department	Active	Inactive	Total Retention
E	**Environmental Services** – Includes records regarding provisions of public works and other environmental services other than roads. Includes water works, sewers, treatment plants, waste management and environmental monitoring. Also includes tree removal and pruning.				
E13	**Water Monitoring** Includes: records regarding the routine monitoring of water quality, water quantity-for source water protection purposes, as well as warning notice checks and posting of them and responses to interference with quality or quantity and chemical samples collected quarterly (trihalomethanes, nitrate and nitrites), water taking logs, methodology and reports. Also includes monitoring and control of creeks and floods, weeds, noise erosion, top soil and storm water. Includes records of MOE drinking water and wastewater compliance inspection reports, data request items, inspection responses and related documents Excludes: Air quality monitoring- see E05 Land Quality Monitoring- see E23 By-law enforcement- see P01 Complaints and Inquiries- see M04 Annual Reports- see A25	Water/ Wastewater	E + 7	8	E + 15 E= created, approved or plan no longer in force
E14	**Water Sampling** Includes: operational checks, weekly and monthly microbiological sampling and testing, chain of custodies, report of analysis – adverse samples, notice to Ministry – Spills Action Centre and local Health Unit.	Water/ Wastewater	E + 7	8	E + 15 E= created, approved or plan no longer in force

Code	Scope Notes -Secondary subjects	Responsible Department	Active	Inactive	Total Retention
	Includes hydrocarbon records, drinking water and wastewater routine sampling and determination results, systems effluent information records, sewer overflow reports, CoC and laboratory related communications or documentation. Includes phosphorus content records, hydrocarbon records of upset condition and spill reports for wastewater treatment and/or collection systems to MOE and local Health Unit				
E15	**Chemical Sampling of Water** Includes: Includes chemical samples collected and tested, inorganic and organics, samples collected and tested every 60 months and lead, sodium and fluoride samples collected and tested annually, and engineer evaluation and corrective action reports and pesticide parameter test results.	Water/ Wastewater	E + 7	8	E + 15 E= created, approved or plan no longer in force
E16	**Backflow Prevention and Cross Connection Control** Includes: Includes records relating to backflow prevention and cross connection control by-law program. Records will include: cross connection surveys, test reports and test results, inspection reports, list of approved and installed backflow prevention devices/assemblies, compliance tracking and notifications; plumbing drawings/schematics; correspondence, forms, copies of work orders, job reports, copies of invoices, fees structures and any other type of media related directly	Water	7	8	15

Code	Scope Notes -Secondary subjects	Responsible Department	Active	Inactive	Total Retention
	to backflow prevention and cross connection control.				
E20	Source Water Protection Includes: records regarding DWQMS, Accreditation, DWQMS Operational Plan (Revisions). Includes: Risk Management Official & Inspector appointment certificates and the Risk Management Officials Annual Report, fee schedules for risk management applications, plans, issuing of notices or compliance orders or the acceptance of an assessment. Also includes modeling analysis, vulnerability assessments, source protection area assessment reports & comments, technical studies & Significant Drinking Water Threat (SDWT) verification surveys. Includes Source Water Protection Committee's Terms of Reference and Meeting Minutes	Originating	E + 7	8	E + 15 E= created, approved or plan no longer in force
E21	**Ministry of the Environment (MOE) Environmental Compliance Approvals** Includes Environmental Compliances issued by MOE to the Municipality for Municipal Drinking Water Systems, municipal and private sewage works and waste disposal sites, air quality, noise, storm-water management, storm sewers, culverts, etc.	Originating	E + 7	8	E + 15 E= ceases to apply
	Legend: **C –** Current Year **E –** Events **S –** Superseded **P –** Permanent **All numbers refer to years unless specified**				

Code	Scope Notes -Secondary subjects	Responsible Department	Active	Inactive	Total Retention
H	Human Resources – Includes records regarding the municipality's relationship with its employees. Includes records regarding general staff programs as well as information on specific employees.				
H03	**Employee Records** Includes: records regarding the employment history of municipal employees. Includes initial resumes and applications, leave documentation, criminal background checks, performance evaluations, correspondence with the employee, employee assistance, and individual lay-off notices. Includes part-time staff, student employees and volunteers. Also includes agreements on extended hours and averaging hours of work, annual summary of hours worked. Includes CVOR operator safety record, certificates and licences such as lifeguard, instructor, first aid and retirement home staff certificates; and training records such as working at heights and service station operations training and training certificates for employees related to legislation such as the Safe Drinking Water Act, Environmental Protection Act, Occupational Health and Safety Act and the Ontario Water Resources Act.	Human Resources	E	E + 6	E + 6 E= date employee ceased to be employed by employer Firefighter employment terms = 25 years Certifications kept in this file – see H22 for retention
	Legend **C –** Current Year **E –** Events **S –** Superseded **P –** Permanent **All numbers refer to years unless specified**				

Manual Records

Manual records should be legible. Ink should be used to record process or product information data. All manual records should show the name or initials of the recorder and the date that the record was generated.

Procedure B – Risk Assessment
The Water Department personnel including the Water Operations Manager and the Certified Operators shall form a Risk Assessment Team to identify:

- potential hazards and hazardous events which could affect the water system
- control measures to address the hazards
- critical control points and control limits
- methods of monitoring critical limits and responding to deviations
- the reliability and redundancy of equipment

A blank Risk Assessment Form is provided in **Annex E** and is used to record the results of the risk assessment.

The Risk Assessment should be completed by the Risk Assessment team once every thirty-six months. The Risk Assessment must be dated and names of the members of the Risk Assessment team in attendance added. If no changes are made this must be stated.

Each year, the Water Operations Manager should review the results of the Risk Assessment, to ensure that the information and assumptions remain valid.

The Risk Assessment Team should complete the following as part of the Risk Assessment exercise:

- review the potential hazards and hazardous events associated with the Dutton Dunwich Water Distribution System
- identify the available monitoring and control measures, as well as emergency or contingency procedures
- assess the risks for each potential hazard or hazardous event, using the below tables.

Description	Likelihood of Hazard	Rating
Rare	May occur in exceptional circumstances and has not occurred in the past	1
Unlikely	Could occur at some time, historically has occurred less than once in 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 Hazard	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, health impact on a small part of the population	3
Major	Large part of population at risk	4
Catastrophic	Major impact for large population, complete failure of systems	5

Description	Detectability of Hazard	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA system	1
Moderately Detectable	Possible to detect, alarm present, problem is indicated promptly by in-house results	2
Normally Detectable	Visually detectable on rounds through regular maintenance	3
Poorly Detectable	Visually detectable but not inspected on a regular basis	4
Undetectable	Cannot be detected	5

An overall risk rating for each potential hazard is determined by summing the three rating values:

Likelihood + Severity + Detectability = Risk Rating

The overall risk rating for designating hazards is provided in the table below:

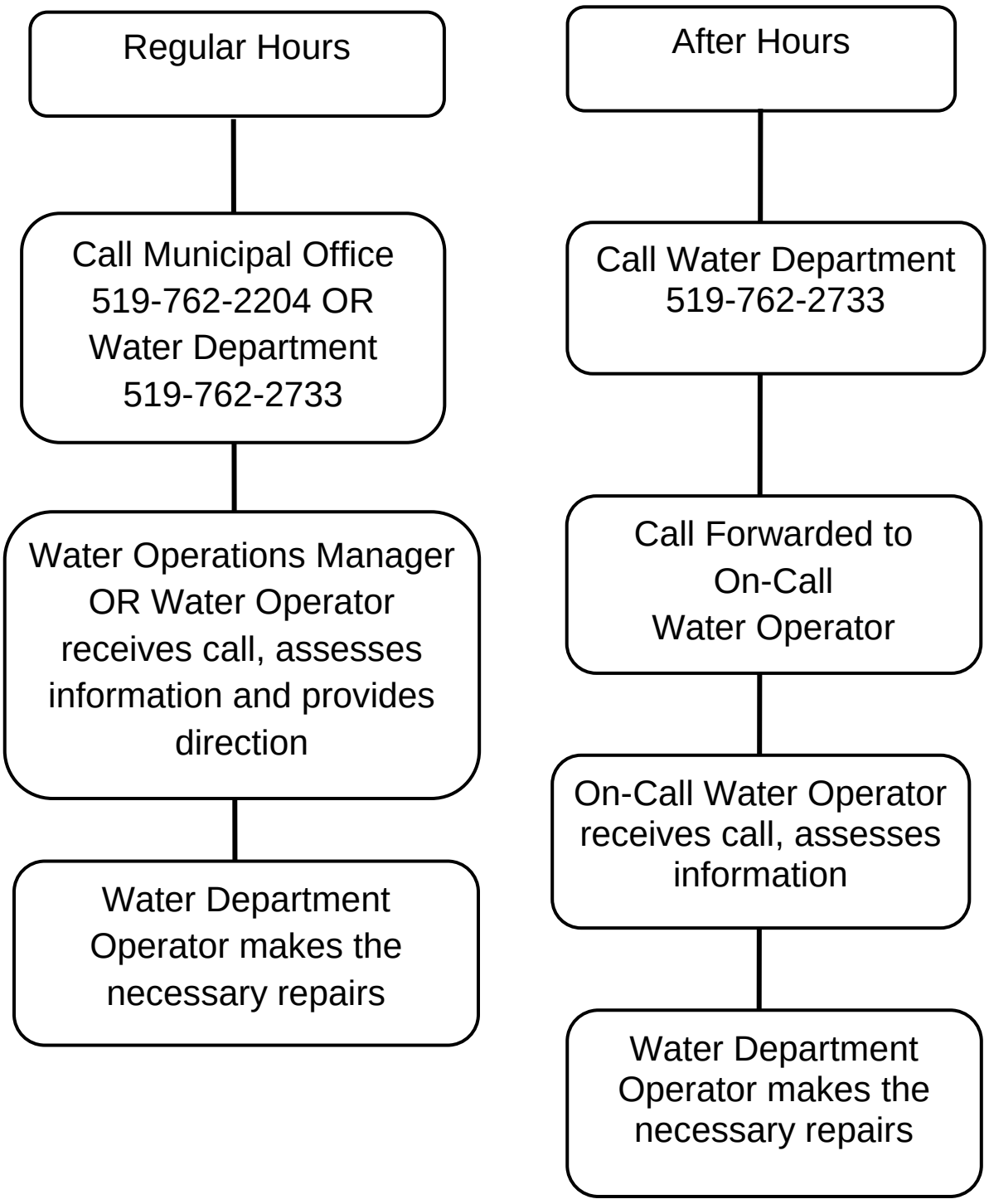
Description	Risk Rating
Low Risk	3-6
Moderate Risk	7-11
High Risk	12-15

The Critical Control Point (CCP) is considered the essential step or point in the Dutton Dunwich Water Distribution System where a control can be applied to eliminate or reduce the potential for a hazard. In the case of a system which provides secondary disinfection, the disinfection system represents the minimum CCP since it is needed to meet the treatment requirements of the Procedure for Disinfection of Drinking Water in Ontario.

The Critical Control Point is considered 9 or greater. Any Risk Assessment that is 9 or greater shall be considered a CCP and identified in the CCP column of the Risk Assessment Table.

If applicable, ensure procedures have been developed and implemented to monitor the CCP limits and respond to, report and record deviations from the critical control limits. List these procedures in the Risk Assessment Table. Operators report any critical changes to the QMS Representative in addition to being documented on site logs and/or log book as per OP/P manual.

Procedure C – Procedural Coverage 24/7



Procedure D: Internal Audit

Internal audits will be conducted to ensure that the Quality Management System (QMS) conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS). The internal audit process ensures that the QMS has been effectively implemented and properly maintained.

Internal audits may be completed by:

- Dutton Dunwich Water Department Certified Operators or other Municipal Staff who have completed Internal Auditor training.
- Personnel from other operating authorities who have completed internal auditor training.
- Contractors who have completed internal auditor training and who have relevant auditing experience.

Internal Audit Schedule

- The audit schedule is prepared at least one year in advance.
- Each element of the DWQMS is audited at least once per calendar year.

Conducting the Internal Audit

- The Auditor should obtain the **Internal Audit Checklist Form (Annex F),** which follows the DWQMS.
- The Auditor should review related QMS Documentation, such as the Operational Plan and procedures.
- The Auditor should prepare questions and interview Water Department personnel to assess conformance with the requirements.
- The Auditor should complete the **Internal Audit Checklist Form (Annex F)** and/or alternative audit checklist forms as needed and document all audit findings.
- Consider previous internal and external audit results and any positive finding as part of the audit preparation.
- Upon completion of the internal audit, the auditor(s) shall review their findings and determine if there is a non-conformance and opportunities for improvement.
- A closing meeting will be held, where findings are presented to the Treasurer/Acting CAO (or alternate) and Water Operations Manager. The Auditor should identify at this meeting any non-conformances. A report of the Audit findings should be provided to the Acting Treasurer/Acting CAO (or alternate) and the Water Operations Manager.
- The Water Operations Manager (or designate) shall handle the non-conformances by completing the **Corrective Action Report Form (Annex F)** by completing the steps under "Audit Follow-up" below.
- The Auditor should ensure evidence of what was reviewed (i.e., documents and records) to support the conclusions of the audit relating to each element and filed in a binder E20 - QMS Operational Plan - Revisions and Records of Internal Audit located in the locked filing cabinet in the Executive Assistant's office. All electronic documents are stored on the Municipality's secure server.

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Audit Follow-up

- All non-conformances must be addressed through a Corrective Action by the appropriate staff in the Water Department, and are ideally completed within ten business days, where possible. This designated staff member should document their actions on a **Corrective Action Report Form (Annex F**).
- The audit shall be considered closed once all Corrective Actions have been verified as being effective.
- Once the audit is closed, the QMS Representative will return the completed **Corrective Action Report Forms** to the Executive Assistant. Once the details of the Corrective Action Reports are recorded in a QMS Non-Conformance and OFI spreadsheet, they are scanned and stored digitally on a secure server in password protected folders under either:

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OR

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Procedure E – Management Review

The Management Review is a process in which the Treasurer/Acting CAO (or alternate), and the Quality Management System (QMS) Representative (Water Operations Manager), evaluate the suitability, adequacy, and effectiveness of the QMS.

The following individuals should be involved in the Management Review process: the Treasurer /Acting CAO (or alternate), and the QMS Representative (Water Operations Manager). This review should be conducted annually and presented to Mayor/Council through a report at a regular council meeting. Minutes will be taken to clearly identify all mandatory topics, action items resulting from discussion, assigned responsibility and timelines for completion.

The Management Reviews are required to consider:

a) Incidents of regulatory non-compliance,
b) Incidents of adverse drinking-water tests,
c) Deviations from critical control point limits and response actions,
d) The efficacy of the risk assessment process,
e) Internal and third-party audit results,
f) Results of emergency response testing,
g) Operational performance,
h) Raw water supply and drinking water quality trends,
i) Follow-up action items from previous management reviews,
j) The status of management action items identified between reviews,
k) Changes that could affect the Quality Management System
l) Consumer feedback,
m) The resources needed to maintain the Quality Management System,
n) The results of the infrastructure review,
o) Operational plan currency, content and updates, and
p) Staff suggestions.

The Management Review Report is presented to Council to communicate any issues or concerns that may have been identified as a result of the Management Review in respect to the items outlined above. The report may include resource needs, progress, pitfalls, deficiencies, impending business, and operational changes and any recommendations related to the QMS.