Wawa Drinking Water System Operational Plan

March 2025

Updated by:

Ryan Wilson, Project Engineer, Kresin Engineering Corporation

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Revision Control

Revision Control Table

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
Aug. 18/10	Initial draft	N/A	DB	JH
Aug. 27/10	Appendix N: Emergency Management revised. Appendix P: Improved Management Review Procedure.	N/A	DB	JH
Aug 28/10	Appendix M: Improved Measurement and Recording Equipment Calibration and Maintenance Procedure.			
Sept. 13/10	Appendix Q: Continual Improvement Procedure revised, now includes Non-Conformance Report and CAR Log.	N/A	DB	JH
Jan. 31/11	Element 6: Flow Chart of Water Treatment Plant added. Element 9: Chart now clarifies the respective responsibilities of the Owner, Senior Management, Infrastructure Services Staff and QMS Representative and Implementation Lead have during emergency situations that may affect the drinking water quality. Appendix B: Document Master List now contains Complaint Form. Appendix D: Records Master List updated. Appendix E:	N/A	DB	JH

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	Summary of Risk Assessment Outcomes updated. Appendix F: Competencies (required and desired) updated. Appendix G: Hours of operation updated. Appendix H: Improved description of communications. Appendix I: Contact information added to essential supplies and services providers Appendix M: Annual review revised. Appendix Q: Continual Improvement Procedure revised.			
May 27/11	Element 9.3: Management review added to Senior Management responsibilities. Element 6.2: Revised to note that no common event driven fluctuations are known to currently exist. Element 4.2: New QMS Representative and Implementation Lead identified	N/A		JH
Dec. 11/12	Element 6.2: Schedule C Revised Contact Information Appendix A: Change of Signing Authority	N/A		

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
	Appendix N: Emergency Management revised			
April 3/13	Element 4.2: Change to QMS and Implementation Lead Element 6.2: Change to number of cartridges from 24 to 30 Appendix A: Signature and dates for commitment/ Endorsement included Appendix B: Document Master List updated DWQMS Records not specified retention, deleted "Certificate of Approval" changed to "PTTW, DWWP and License/ Certificates of Approval, (other treatment components) " Appendix D: Records Master List updated "Notification of Adverse Results" inserted as located in Office Cabinet "B". Appendix E: Change to Table 2, Critical Control Point Limit for Free Chlorine Residual form 0.5 mg/l to 0.05 mg/l Appendix F: Procedure 2.1 reference to Table 3 replaced with reference to Table 1. Following page, Table 3 changed to Table 1. Name of Table changed to "Required Competences". Note added to bottom of Table to indicate Ontario Regulation 128/04 for requirements to maintain competencies for Operators. Appendix H: Item 4) title change from "Public" to "Summary" Appendix N: Under 2.7 insert new sentence; "There is a Municipal Emergency Plan". Table 5, delete Chris Wray and insert CAO. New row for "Community Emergency Management Coordinator (Deputy Clerk) and new phone number for contact. Change Water/ Sewer Assistant cell number to 1-705-852-0412	N/A		JH
October 11, 2013	Appendices B and D – List to include Document, Form or Record	N/A	BS	MT

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
	Element 5.2 – Document Control Procedure to be updated as per NCR 2013-01, add footer, description of Document vs. Form vs. Record, including the controlled copy location Add distribution List to Appendix B Insert new Flow Chart Update as per NCR 2013-03 to include fluoridation as CCP, units of measure for turbidity and min. or max. for free chlorine Edit Communication Procedure pg. 55 to record Public vs. Summary and add a second location for OP Add a description of how Maintenance Records are to be included in the Monthly Reports to the Director of IS Insert the new description of Element 18 including SOP, updated list of emergencies and training options (in both the Document pg. 26 and Appendix) Update Revision Control List after CARs and NCRs are complete Pg. 8 to say 'acceptance' not 'approved' by MOE Pg. 20 to list Top Management for CAO and Director of IS Records Master List changed to 'Maintained By' Water Staff (documents in WTP) Update Competency Table Pg. 50 Remove Deputy Mayor from Emergency Contact List			

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
July 15, 2014	Update Revision Control Table with the below edits Correct numbering system in section 3 and add Owner for the signature of the Commitment and Endorsement form Capitalize water class on section 6.2 Add 'during the internal audit' and remove risk assessment team in section 8.2 Remove appointment of QMS Rep from Mayor and Council Responsibilities, section 9.3 Section 10.2, remove 'Annual' regarding QMS awareness training Add 'once per calendar year' to section 14.1 and 19.2 Section 2.0 of Appendix H should say QMS not Quality Remove 'Public Works' from the manual and ensure only Infrastructure Services is used Remove last sentence of section 2.2 in Appendix O, not enough staff to assign Internal Auditors and Team Leaders Section 2.4 of Appendix O should say 'once per calendar year' Remove Internal Audit Schedule table, small system can be audited in 1 day and use the checklist Update Internal Audit Checklist to Reflect Elements and Conformance Update NC Log if any are received from this audit, as well as the CAR log Appendix P, section 2.1 to say 'once per calendar year' Add Risk Assessment Checklist to Internal Audit	N/A	BS	MT

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
May 15, 2015	Update Revision Control Table with below edits Update Commitment and Endorsement Form with new Mayor and have signed, Appendix A Remove name from section 4.2, QMS Rep. and Impl. Lead Edits to section 9.3 Table, QMS Rep. and Impl. Lead listed under Assistant Director of Infrastructure Services Appendix B Document list to have version number changed to 1.5 Appendix D, change version number to 1.5 Appendix N, Table 5 update contact number, Mayor, MOE Appendix O, update NC log Appendix Q, update CAR log	N/A	BS	MT
July 28, 2015	Update Revision Control Table with below edits Header of Document, changed version number to 2.0 Section 5.2, changed electronic file location to \\WAWAFILE\wawa\file\Home\jneufeld\Water and Sewer/DWQMS Section 6.2, changed Contact Information in Schedule “C”, replaced Mark Toffner’s information with James Neufeld’s information. Appendix B Document list to have version number changed to 2.0 Appendix D, change version number to 2.0	N/A	BS	JN

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
October 8, 2015	Update Revision Control Table with below edits Header of Document, changed version number to 2.1 Section 6.2, added Raw Water Source Characteristics Appendix B Document list to have version number changed to 2.1 Appendix D, change version number to 2.1 Appendix O, update NC log Appendix Q, update CAR log	N/A	BS	JN
January 29, 2016	Update Revision Control Table with below edits Header of Document, changed version number to 2.2 Section 4.2, changed Assistant Director to Director Section 6.2, changed Contact Information in Schedule “C”, replaced Brian Sheridan’s information with Chris Wray’s information. Section 9.3, change responsibilities for CAO and PW Appendix B Document list to have version number changed to 2.2 Appendix D, change version number to 2.2 Appendix I, Table 4, change suppliers information for Disinfectant (Sodium Hypochlorite) Appendix N, Table 5, changed Mayor (Ron Rody) cell number.	N/A	CW	JN

Revision Date	Revision Issued	Effective Date	Reviewed By	Revised By
June 30, 2016	Update Revision Control Table with below edits Header of Document, changed version number to 2.3 Section 4.2, Added Temporary Alternant during absence of Director. Section 5.2, changed electronic file location to \\WAWAFILE\wawa\file\Home\dbeach\Water and Sewer/DWQMS Section 6.2, revised Water Treatment Plant Flow Chart, added Chlorine Contact Chamber and Reservoir to chart. Section 6.2, changed Contact Information in Schedule "C", replaced James Neufeld's information with Jim Harmar's information. Section 9.3, added Temporary Alternant during absence of Director. Appendix B Document list to have version number changed to 2.3 Appendix D, change version number to 2.3 Appendix I, Table 4, change suppliers information for Disinfectant (Sodium Hypochlorite)	N/A	CW	JN
October 21, 2016	Update Revision Control Table with below edits Header of Document, changed version number to 2.4 Appendix B Document list to have version number changed to 2.4 Appendix D, change version number to 2.4 Appendix O, update NC log Appendix Q, update CAR log	N/A	CW	JH

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November 10, 2016	Update Revision Control Table with below edits Header of Document, changed version number to 2.5 Section 6.2, changed Contact Information in Schedule "C", and replaced Jim Harmar's information with Cory Stainthorpe's information. Appendix B Document list to have version number changed to 2.5 Appendix E, summary of Risk assessment, Table 1. Clearwell checked as additional CCP Appendix D, change version number to 2.5 Appendix O, update NC log Appendix Q, update CAR log	N/A	CW	CS
July 19, 2017	Update Revision Control Table with below edits Header of Document, changed version number to 3.1 Updated Table of Contents Appendix B Document list to have version number changed to 3.1 Appendix D, change version number to 3.1 Updated Appendix O, NC log Appendix Q, update CAR log Section 5.2, changed electronic file location to \\WAWAFILE\wawa\file\Home\cstainthorpe\Water and Sewer\DWQMS Added definition of "Calendar Year 5.2.1 Document Changes – changed once per year to once per calendar year. Added Definition of "Preventive Action" Removed "is appropriate for the size and type of the subject system" from Element 2	N/A	CW	CS

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	Addition of new plan 'A' under Element 7 that requires consideration of potential hazardous events and associated hazards identified by the ministry. Long term forecast of major infrastructure maintenance, rehabilitation and renewal activities added to Appendix K infrastructure maintenance, rehabilitation and renewal. QMS Representative Temporary alternate during absence changed from Environmental Coordinator, Shelby Environmental to Kresin Engineering Corporation 9.2 organizational Structure updated 9.3 Roles, Responsibilities and Authorities updated Appendix J Infrastructure Review updated to include Risk Assessment under Element 8 20.2 Management Review adjusted – Removed Director of Infrastructure due to being QMS Representative and Lead Emergency Contact List Appendix N updated			
July 10, 2018	Update Revision Control Table with below edits Header of Document, changed version number to 3.2 Appendix B Document list to have version number changed to 3.2 Appendix D, change version number to 3.2 Updated Appendix O, NC log Appendix Q, update CAR log Emergency Contact List Appendix N updated – Water Sewer Assistant phone # Appendix I, Table 4, change suppliers information for Sodium Hypochlorite to from united supply to Pepco, distribution parts & supplies from Northern to Corix Water Supply Limited Appendix G - Update the Memorandum of Understanding	N/A	CW	CS

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June 4, 2019	Header of Document, changed version number to 3.3 Appendix B Document list to have version number changed to 3.3 Appendix D, change version number to 3.3 Updated Appendix O, NC log Appendix Q, update CAR log QMS Policy not in document – review and add Drinking water system description – change IS as entity to corp. municipality of Wawa, reference source water. Equipment Calibration – populate a table and add procedure Page 40 - Update the Endorsement Appendix N: Update Table 5 w/s contact & change CEMC to Clerk Change all areas where MOE is mentioned to MECP Add Blue/green algae under possible outcomes to source/intake on risk assessment review Add climate change i.e. rainfall run off under possible outcomes source/intake Correct spelling appendix O – Implementation Lead to NCR Appendix Q: Remove report # from form 4.2 Emergency Response – update MOE to MECP & review procedure Keep using acronym QMS throughout document Update document control file to w/s network Update Appendix E: Risk assessment & risk assessment outcomes - include climate change and green/blue algae under source Change wording on Essential supplies and services under Pepco from Chemical to additives	N/A	CK	CS

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	Sampling, testing & monitoring – include green/blue algae Emergency Management – include a fire evacuation plan			
August 1, 2019	Header of Document, changed version number to 3.4 Appendix B Document list to have version number changed to 3.4 Appendix D, change version number to 3.4 Updated Appendix O, NC log Appendix Q, update CAR log E-7 Reference to "ministry" changed to Ontario Ministry of Environment E-18 wording "This procedure is applicable to the emergency situations that result in the Municipality's ability to maintain a supply of safe drinking water to the consumers" was changed to be clearer E-21 procedure was amended to include a Preventative Actions Report & root cause analysis breakdown for process for identifying and implementing preventive actions. Also added was reference to consideration of best management practices every 36 months during internal audit. Table 5 updated emergencies contact lists Table 2 – Alarms changed to a range instead of exact measurement. 6.2 Drinking Water Systems - Water Treatment Plant Flow Chart was updated to include Michipicoten River Village and MRV Water Tower Appendix K Procedure was amended and signed off by staff. Appendix I Table 4 Supplier List Table – updated Corix to Iconix Updated Risk Assessment to include Fluoridation process	N/A	CK	CS

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November 9, 2020	Header of Document, changed version number to 3.5 Appendix B Document list to have version number changed to 3.5 Appendix D, change version number to 3.5 Section 5.2, changed electronic file location to P:\Water\DWQMS\DWQMS 2019 6.2 Drinking Water Systems - Water Treatment Plant Flow Chart was updated to include aluminum sulphate Section 6.2, changed Contact Information in Schedule "C", and replaced Cory Stainthorpe's information with Dan Beach's information. E-6 Updated the Drinking Water System Description to include the coagulant process. Appendix I Table 4 Supplier List Table – added coagulant (aluminum sulphate) and updated Allan Carrol's phone number. Appendix M Table 5 – removed Lab Spectrometer, updated turbidity sensor and meter information and added alum metering pumps. Appendix N Table 5 – removed Director and revised Assistant Director to Acting Director. Updated Appendix O, NC log Appendix Q, update CAR log	N/A	RW	RW
January 14, 2022	Header of Document, changed version number to 3.6 Section 1.4, revised Owner to include Mayor Section 4.2, separated Director, Infrastructure Services and temporary alternant to provide clarity Section 5.2, removed electronic file location and added location of hard copy available for public viewing Section 6.2, added THM seasonal challenges and revised Aluminum Sulphate text in flow chart and changed ORO.	N/A	RW	RW

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	Section 9.2, revised Owner, Senior Management and QMS Representative Alternate in organizational flow chart Section 9.3, added Director of Infrastructure Services to 'Top Management'. Section 17.2, revised title Section 19.2, revised title Appendix A, added Senior Management's commitment and endorsement as well as space for Director of Infrastructure Services' signature Appendix B, document list to have version number changed to 3.6 and added 'Daily Alum Monitoring Sheet' Appendix D, change version number to 3. 6 and added 'Daily Alum Monitoring Sheet' Appendix E, added text to section 2.10 for recording of participants at Risk Assessments and added section 2.11 Appendix G, added summer shift work schedule (section 2.6) Appendix M, revised Calibration dates above Table 5 Appendix N, revised text under section 4.0 referring to last page of Appendix and added text under section 4.5 for recording potential emergency situation tested. Appendix P, added text to 2.2 d) regarding validity of assumptions/currency of information Appendix O, revised Internal Audit checklist, updated NC log Appendix Q, added text under section 2.10 for assessing impacts and effectiveness of previous QMS improvements, updated CAR log			

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January 2023	Header of Document, changed version number to 3.7. Section 4.2, revised the QMS representative to Assistant Director, Infrastructure Services. Section 6.2, clarified the distinction between Owner and Operating Authority of the drinking water system. Section 9.2, revised QMS Representative to Assistant Director, Infrastructure Services to Organizational Structure flow chart. Section 9.3, removed "receives management review" from Responsibility column under Top Management; replaced Director of Infrastructure Services (Public Works) with Assistant Director of Infrastructure Services under Infrastructure Services Staff and moved QMS Representative and Implementation Lead responsibilities and authorities to Assistant Director of Infrastructure Services. Section 15.2, added text regarding the Municipality's Asset Management Plan as well as location of hydrant record sheets. Appendix B, document list to have version number changed to 3.7; non-conformance log report removed from OP. Appendix D, records to have version number changed to 3.7 Appendix E, added Table 3 Risk Assessment Table Revisions. Appendix F, removed certifications and competencies not directly affecting drinking water quality from Table 1. Appendix H, revised Section 1.0 to include communication between Operating Authority's Senior Management and only the four (4) target parties; revised Director of Infrastructure Services to Assistant Director of Infrastructure Services for communication procedure with Senior Management under "Owner".	N/A	CK	RW

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	Appendix I, procedure 2.9 added. Added citric acid and sodium hydroxide as chemicals and contingency suppliers added for laboratory, chemicals and fuel supplier in Table 4. Appendix L, added text to procedure 2.3 regarding most challenging conditions. Appendix M, revised calibration years to 2022 / 2023, revised Metcon to SCG Process and noted that Hatch and SCG Process calibrate equipment in Table 5. Appendix N, revised phone numbers in Table 5. Appendix O, removed NC Log. Appendix P, revised sub-section 2.2 to section 3.0, added description of DWS, accuracy of infrastructure renewal programs and consideration of best management practices to agenda and replaced “appropriate municipal staff” with “DWS Owner” under sub-section 3.2 (formerly 2.4). Appendix Q, updated CAR log; MECP Inspection and OFI logs added.			
March 2024	Header of Document, changed version number to 3.8 and date to March 2024. Section 6.2, revised Pall to Aria Filtra (formerly Pall Water). Section 8.1, added item b) “identify additional potential hazardous events and associated hazards”. Section 12.1, revised item c) to “essential suppliers”. Section 15.2, revised location of WTP equipment and pump service records to plant logbook. Appendix B, revised version number of documents to 3.8. Appendix D, revised version number of records to 3.8. Appendix E, removed “Fluoridation system” from section 2.4 and Table 2, revised Table 1 and Table 2 as per	N/A	CK	RW

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	document titled "36-month Risk Assessment" (dated July 20, 2023), and updated Table 3. Appendix F, revised Intake Structure competencies for Director and Assistant Director to "desired" in Table 1. Appendix G, schedule during summer months removed. Appendix I, removed name/phone numbers of specific supplier contacts, revised Metcon Sales and Eng. to SCG Process and revised Pall Technology to Aria Filtra (formerly Pall Water) in Table 4. Appendix K, revised work requests (non-breakdown) procedure under section 2.2 as well as how the effectiveness of the maintenance program is monitored and deleted Water Treatment Plant Work Order and Water Distribution Work Order. Appendix M, revised calibration years to 2023 / 2024 and deleted the Serial Number column in Table 5. Appendix N, added row for "Systems Control and Data Acquisition" to Table 4.1, identified Lead Hand as ORO, added Director and Assistant Director cell phone numbers, updated cell phone number of Water/Sewer Assistant #1 and removed Water/Sewer Assistant #2 in Table 5. Appendix O, removed "Risk Assessment Review during Internal Audit" table. Appendix P, removed item i) "Accuracy of infrastructure renewal programs". Appendix Q, updated MECP Inspection Log and Opportunity for Improvement (OFI) Log.			
March 2025	Header of Document, changed version number to 3.9 and date to March 2025. Section 6.2, revised the distance offshore and depth, inner diameter and pipe material of the raw water intake under the "Source Water" heading. Section 15.2, revised CAO to "Operating Authority" with regards to whom the Director of Infrastructure Services	N/A	RS	RW

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	consults with to determine the areas that money will be spent for improvements to the drinking water supply system. Appendix B, revised version number of documents to 3.9 and changed designated location for the operational Plan to SCADA Room – Cabinet "B". Appendix D, revised version number of records to 3.9. Appendix E, added "(Refer to SOP)" to "Respond to, report and record deviations from the critical control limits" under Procedure 2.9. Appendix M, revised calibration years to 2024 / 2025. Appendix N, revised the last sentence of Section 2.0 to remove "…manual and nearest exits. Appendix O, reference to "management review report" revised to "management review minutes" under Element #15 and #20 in the Internal Audit Checklist. Revised Element #20 (3.) by referencing all personnel identified under Section 1.4 of the DWQMS. Revised Element #21 by separating the actions for OFIs and preventative maintenance (NC/CAR). Appendix Q, updated Opportunity for Improvement (OFI) Log.			

Terms and Definitions

Accreditation - in the context of the municipal drinking water licensing program, accreditation is the verification by a third-party accreditation body that an operating authority (OA) has a Quality Management System (QMS) in place for a specific drinking-water system that meets the requirements of the Drinking Water Quality Management System (DWQMS).

Accreditation body - a person designated or established as an accreditation body under Part IV of the Safe Drinking Water Act, 2002 (SDWA).

Application date - the day on or before which the owner of a municipal drinking water system shall apply for a drinking water works permit and a municipal drinking water license under Section 33 of the Safe Drinking Water Act, 2002.

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

Audit Frequency - the number of times that an audit occurs per unit time (i.e. once per year).

Audit Scope - a description of the extent and boundaries of the audit. Scope usually describes physical locations and organizational activities that are to be covered in the audit.

Calendar Year - the period of 365 days (or 366 days in leap years) starting from the first of January, used for reckoning time in ordinary affairs.

Competence - the combination of observable and measurable knowledge, skills, and abilities which are required for a person to carry out assigned responsibilities.

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

Consumer -the drinking water end user.

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

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

Critical Control Limit - the point at which a Critical Control Point (CCP) response procedure is initiated.

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

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

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

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

Drinking Water Quality Management Standard (DWQMS) - is a standard that specifies minimum requirements for the Quality Management System (QMS) of an Operating Authority (OA) for a subject system. The DWQMS is a 'made-in-Ontario' management system standard developed specifically by the drinking-water sector for municipal residential drinking-water systems. Its requirements are similar to ISO-based quality management standards, but no equivalent to.

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

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

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

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

Hazardous Event - an incident or situation that can lead to the presence of a hazard. Hazards and hazardous events can result from natural or technological causes, or from human activities.

Likelihood – the probability of a hazard or hazardous event occurring

Monitoring - includes any checks or systems that are available to detect hazards or the potential for hazards.

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

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

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

Non-conformance - is the non-fulfillment of a DWQMS requirement.

Non-compliance - is a failure under the Safe Drinking Water Act, 2002 (SDWA), the Ontario Water Resources Act, or any regulations or instruments under these Acts which are associated with drinking water.

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

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

Operational plans date - means the day on or before which the owner of a municipal drinking water system shall provide a copy of all operational plans for the system to the Director under subsection 16 (2) of the Safe Drinking Water Act, 2002.

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

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

Preventive Action - a change implemented to address a weakness in a management system that is not yet responsible for causing nonconforming product or service.

Primary Disinfection - is a process or series of process intended to remove or inactivate pathogens such as viruses, bacteria and protozoa in water.

Public - is the subject system consumers and stakeholders.

Quality Management System (QMS) - is a system to

a) Establish policy and objectives, and to achieve those objectives; and
b) Direct and control an organization with regard to quality.

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

Risk - is the probability of identified hazards causing harm, including the magnitude of that harm and/or its consequences?

Risk Assessment - is an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluation their significance.

Safe Drinking Water Act, 2002 (SDWA) - is a comprehensive legislative framework established by the Ontario government to protect the safety and quality of Ontario's drinking water. The SWDA regulates the treatment and distribution of drinking water.

Secondary Disinfection - is a process intended to provide and maintain a disinfectant residual in a drinking-water system's distribution system.

Senior Management – a person, persons or a group of people at the highest management level within an operating authority that makes decisions respecting the QMS and recommendations to the owner respecting the subject system or subject systems.

Subject System – means:

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

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

Key Acronyms

CAR	Corrective Action Report
CCP	Critical Control Point
DWWP	Drinking Water Works Permit
DWQMS	Drinking Water Quality Management Standard
GIS	Geographic Information System
MECP	Ministry of Environment, Conservation and Parks
NCR	Non-Conformance Report
OP	Operational Plan
ORO	Overall Responsible Operator
PTTW	Permit to Take Water
QMS	Quality Management System
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act, 2002
WTP	Water Treatment Plant

1.0 Quality Management System

1.1 Requirement

Element 1 of the Drinking Water Quality Management Standard (DWQMS) requires the Municipality of Wawa to establish and maintain a QMS that conforms to the standard, and to document this QMS in an Operational Plan.

1.2 Operational Plan

This document is the Municipality's Operational Plan for its drinking water QMS. It consists of two parts:

- a short summary of the system that describes how the QMS meets the requirements of the DWQMS;
- an appendix containing Element procedures, Reviews and Outcomes, Standard Operating Procedures, and other documents and records as required.

The Operational Plan (OP) is the primary instrument for communicating the Municipality's QMS from the Infrastructure Services Department (Public Works) to Council, and from Council to Ontario's Ministry of Environment and to the public. It is endorsed by QMS Senior Management and Council, accredited by the provincially-appointed Accreditation Authority and accepted by the MECP.

1.3 Purpose

The purpose of this Operational Plan is to describe in detail the QMS developed and implemented by the Infrastructure Services Department (Public Works) for the operation of the drinking water system owned by the Municipality of Wawa. The policy and procedures outlined in this Operational Plan are in accordance with the requirements of DWQMS.

1.4 QMS Scope

The DWQMS prescribes roles and responsibilities for the drinking water system owner and operating authority, including top management. Accordingly, the scope of the Municipality of Wawa's QMS extends to the following:

- Owner – Municipality of Wawa Mayor and Council
- Operating Authority – The Infrastructure Services Department
- Operating Authority Top Management (herein called 'Senior Management') – CAO and Director of Infrastructure Services as well as other designates

- Operating Authority staff as defined in QMS procedures (staff with a direct impact on drinking water quality and safety are defined as 'QMS personnel')

2.0 QMS Policy

2.1 Requirement

Element 2 of the DWQMS requires the inclusion of a QMS Policy in the Operational Plan. The Policy must be accessible to all QMS personnel, Council, and the public.

2.2 QMS Policy

The Municipality of Wawa owns, maintains and operates the Wawa Water Supply and Distribution System.

The Municipality is committed to:

- ensuring a consistent supply of safe, high quality drinking water,
- maintaining and continuously improving its QMS, and
- meeting or surpassing applicable regulations and legislation.

This quality policy has been developed in accordance with the objectives of the Ministry of the Environment's Drinking Water Quality Management Standard.

3.0 Commitment and Endorsement

3.1 Requirement

Element 3 of the DWQMS requires written endorsement of the Operational Plan from QMS Senior Management and Council. As well, it requires Senior Management to ensure a QMS is in place, ensure that QMS personnel are aware of applicable legislative and regulatory requirements, communicate the QMS as required, and determine, obtain or provide resources to maintain and continually improve the QMS.

3.2 Commitment and Endorsement

Senior Management and the Owner must annually sign and date a Commitment and Endorsement form that clearly expresses endorsement of the Operational Plan and commitment to fulfilling its requirements. Evidence of this commitment is achieved primarily through the Management Review process, and by appointing and supporting a QMS Representative. Council receives the Plan through an annual staff

report, and endorses it by enacting a confirmatory by-law. Applicable meeting minutes represent written endorsement.

Appendix A contains the signed Commitment and Endorsement form.

4.0 QMS Representative

4.1 Requirement

Element 4 of the DWQMS contain the requirements for Senior Management to appoint and authorize a QMS Representative to carry out the following:

a) administer the QMS by ensuring the processes and procedures needed for the QMS are established and maintained,

b) report to the Owner on the performance of the QMS and any need for improvement

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 their duties for the operation of the drinking water system, and

e) promote awareness of the QMS among staff of the Municipality of Wawa as applicable.

The QMS Representative must be identified in the Operational Plan.

4.2 QMS Representative

The Municipality of Wawa has designated the following individuals that shall complete the duties of the QMS Representative and Implementation Lead, irrespective of other responsibilities:

QMS Representative and Implementation Lead

Position:	Assistant Director, Infrastructure Services
Temporary alternant:	Kresin Engineering Corporation (during absence of Assistant Director)

5.0 Document and Records Control

5.1 Requirement

Element 5 of the DWQMS requires a procedure for document and record control that describes how documents are kept current, and how documents and records are kept legible and identifiable, retrieved, stored, protected, retained and disposed of.

5.2 Document Control

Controlled documents include the Operational Plan and its associated policies procedures (including applicable Standard Operating Procedures), forms, exhibits, flowcharts or other documents that are subject to revision and are maintained on the Document Master List (Appendix B).

Controlled documents (excluding drawings) of both internal (refers to document created by the Owner) or external origin are included on the Document Master List. The QMS Representative and Implementation Lead are responsible for maintaining an electronic list and ensuring an updated hard copy is included in the Operational Plan.

Documents have revision numbers and a date listed on them to identify the current version. The reference to Version 1.2, 1.3 etc. accounts for the first 3-year cycle of the DWQMS program. This will change with the 3-year cycle represented by the first number (i.e. a 2 will be in place for edits in the 2nd 3-year cycle) whereas the second number represents edits to the plan during that cycle.

Electronic documents are normally in PDF, Excel, or MS Word format and are located on a network (SCADA) drive (P:\Water\DWQMS\). If the document is printed from an electronic source, then the document is considered uncontrolled as shown in the footer and not subject to revision. All documents are backed up on a second hard drive in the Municipality.

A hard copy of this Operational Plan is available for public viewing at the Municipality of Wawa Town Hall.

The QMS Representative and Implementation Lead determine the distribution list to whom the Operational Plan is to be made available. The distribution list (along with the title and revision number) is recorded on the Document Master List.

All staff are responsible for ensuring that documents remain legible and readily identifiable. If a document has been damaged or made illegible, staff are responsible for downloading the most current version for replacement.

Documents that are only available in hard copy are kept in a safe, dry location that will ensure no damage or deterioration.

5.2.1 Document Changes

Any employee can make a request for the creation or a change to a QMS document (e.g., system procedures in the Operational Plan). Changes to documents can be a result of procedural changes, audit results or suggestions for improvement.
The request is recorded on Part A on a Document Change Form (Appendix C). Suggested changes can also be attached to the Document Change Form.

The Document Change Form is then sent to the QMS Representative and Implementation Lead who will forward the Form to the appropriate management staff (responder) who initially approved the document.

Prior to processing document changes the QMS Representative and Implementation Lead will be responsible for ensuring that the changes will not affect the integrity of the QMS or the processes.

The responder notes the decision on the Document Change Form and forwards the form to the QMS Representative and Implementation Lead.

If the request is denied, the responder will send notification to the requester advising of the decision and the reason why.

The QMS Representative and Implementation Lead then updates the Document Master List (Appendix B) and then sends an email explaining what has changed in the document to all management affected by the change. Management is responsible for advising any staff affected by the change.

Obsolete documents must be marked “Obsolete” if retained for legal and/or historic purposes.

The QMS Representative will review the Document Master List a minimum of once every calendar year to verify that any documents that have not been revised since the previous review are still adequate.

5. 2.2 Records

The Records Master List (Appendix D) identifies all of the records that this procedure applies to. Records may be paper or electronic.

The electronic documents and records associated with the QMS are maintained on a network drive which is backed up daily with a weekly rotation of tapes.

The QMS Representative and Implementation Lead, in consultation with department management, determines the retention time (active and storage) for records.

The person completing the record must ensure the record it legible, accurate and complete with regard to recording requirements.

When records are removed from the active filing system, they are logged by the QMS Representative and Implementation Lead on the Records Master List form and put into inactive storage. They are identified,

packed in suitable containers and stored in a safe, dry location that will ensure no damage or deterioration.

Disposal of records, where applicable, is approved by the department management in consultation with the QMS Representative and Implementation Lead. Management determines the method of disposition at the time that the records are no longer required.

5.2.3 Drawings

The Infrastructure Services Department (Public Works) is responsible for maintaining electronic and paper copies of drawings. Drawings are kept for the life of the asset. All drawings (including maps) are stored digitally.

Distribution drawings are maintained by the department. Paper copies of drawings are located in the Water Treatment Plant and made available to operational staff.

Original physical plant drawings are stored at the Municipal Office. Paper copies are located in the Water Treatment Plant.

6.0 Drinking Water System Description

6.1 Requirement

Element 6 of the DWQMS requires a description of the Municipality's drinking water system, including treatment processes and distribution components, as well as a process flow chart and summary descriptions of any connected drinking water systems.

6.2 Drinking Water System

Description of the Corporation of the Municipality of Wawa Drinking Water System

The Municipality of Wawa owns and operates a Class 2 water treatment system and a Class 1 distribution system for delivering a continuous supply of safe drinking water to consumers in the Town of Wawa and Michipicoten River Village.

The water treatment plant consists of a membrane filtration process. Raw water source is Wawa Lake which is pumped from the low lift station to a common header which feeds three Aria Filtra (formerly Pall Water) membrane systems, each consisting of a feed and backwash tank, feed/recirculation and reverse filtrate pump, 0.4 mm strainer and 30 cartridge membrane racks. Prior to the feed tanks, aluminum sulphate solution (alum) can be mixed into the raw water using a static mixer to coagulate dissolved organic carbon for removal in the Aria Filtra (formerly Pall Water) membrane skids as a method for decreasing disinfection by-product formation potential in the distribution system. It is anticipated that this may only be required on a seasonal basis (e.g. summer and fall). Filtered water is discharged to an

under-floor reservoir where chlorine is injected to provide the necessary disinfection CT prior to discharge to the distribution system. Sodium hypochlorite is used for primary and secondary disinfection, and membrane cleaning. Hydrofluorosilic acid is also added to the filtered water for dental health protection. Residue from the filter backwash and acid cleaning can be discharged to the municipal sanitary sewer system or to the storm sewer (if it meets the discharge criteria).

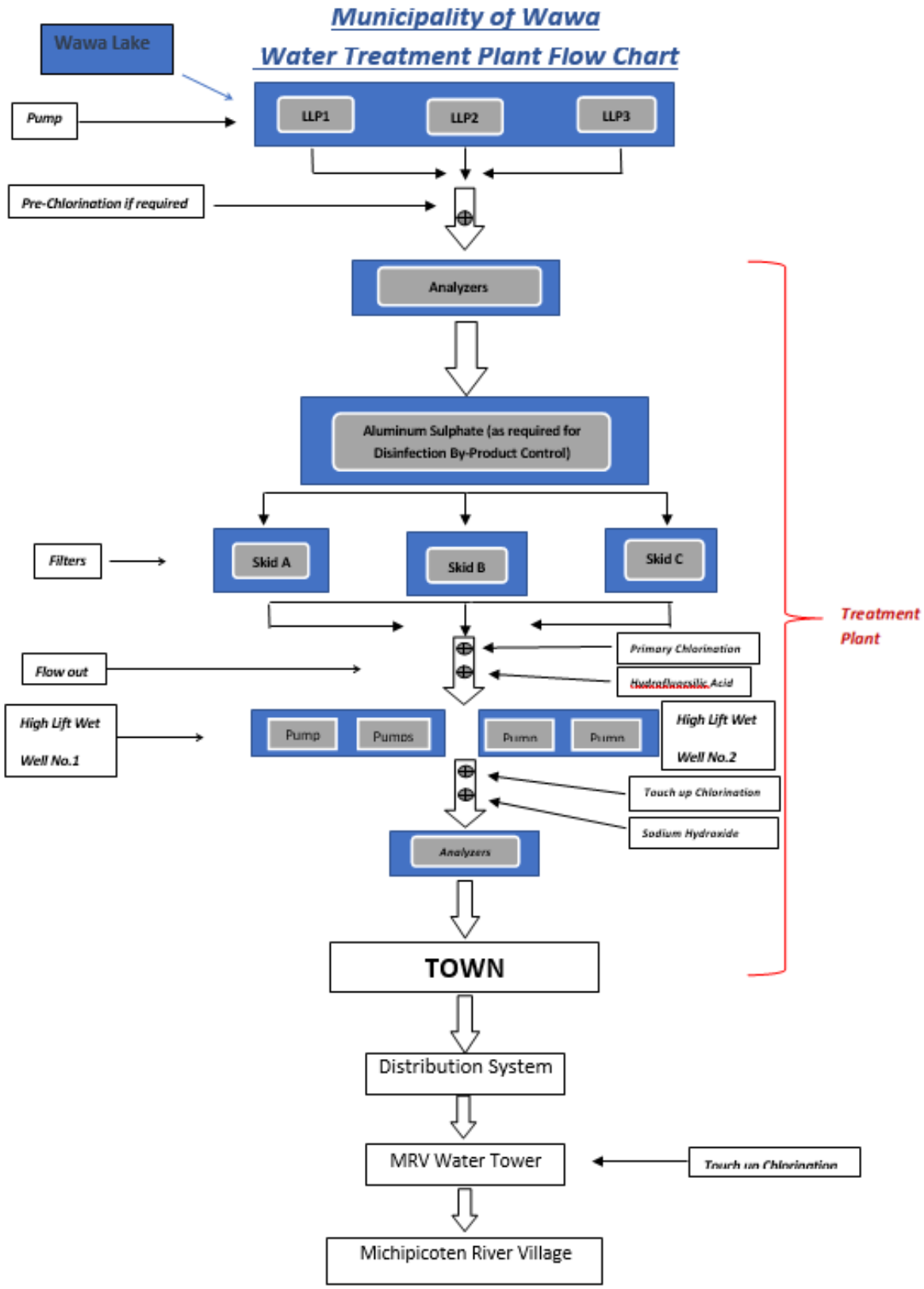
Continuous analyzers are in place for turbidity, chlorine residual and fluoride monitoring. Flow meters are used to monitor raw and treated flow as well as flow into each filter train.

The distribution system provides water for both domestic consumption and fire protection. It consists of approximately 1350 service connection with only a portion of the water consumption being metered (there are meters on the Pinewood Drive Section and Michipicoten River Village). A new main was installed to connect Michipicoten River Village to the Wawa system in November 2006. This line has pressure reducing valves located prior to connecting to a 455 m^3 storage tower. Chlorination equipment is available at the tower for the purpose of trimming the secondary disinfection as required. The wells and pump house for the old MRV system were decommissioned in 2007.

THM formation in the Wawa DWS varies seasonally, with increases in the late summer/fall, and is considered to be an event driven fluctuation that can present operational challenges. Alum dosing has been implemented at the Wawa WTP to reduce TOC/DOC levels in the treated water and, in-turn, distribution system THM levels. Considering the historical seasonal nature of elevated THM levels in the Wawa distribution system, the addition of alum can also occur on a seasonal basis.

The Corporation of the Municipality of Wawa (Mayor and Council) is defined as Owner of the drinking water system and Infrastructure Services (CAO and Director of Infrastructure Services) is the drinking water Operating Authority.

Flow Chart of the Municipality of Wawa Water Treatment Plant



Schedule “C”

Schedule "C"

Subject System Description Form
Municipal Residential Drinking Water System

Owner of Municipal Residential Drinking Water System:[1]	The Corporation of the Municipality of Wawa
Name of Municipal Residential Drinking Water System:[2]	Muncipality of Wawa Drinking Water Distribution System

Subject Systems

Name of Operational Subsystems (if Applicable)[3]	Name of Operating Authority [5]	DWS Number(s)[6]
☐ Check here if the Municipal Residential Drinking Water System is operated by one operating authority. Enter the name of the operating authority in adjacent column [4]	Not Established Yet	210000050
Operational Subsystem 1:		
Operational Subsystem 2:		
Operational Subsystem 3:		
Operational Subsystem 4:		

Add attachments if there are additional 'Operational Subystems'

Contact Information [7]

Name	Title	Phone Number	e-mail address
Dan Beach	Director of Infrastructure	705-856-2244	dbeach@wawa.cc
David Lowe	ORO – Water/Sewer Lead Hand	705-856-2244	dlowe@wawa.cc

Source Water

The intake for the water supply is located approximately 155 m offshore in Wawa Lake, at a depth of approximately 12 m below water level. The intake is housed in a timber crib structure, equipped with course screens. The 600 mm I.D. corrugated steel pipe (CSP) discharges by gravity to a wet well at the low lift pump house. Three 45.6 L/s VFD pumps are used to supply raw water to the treatment plant. A line from the treatment plant provides sodium hypochlorite to the low lift discharge header for pre-chlorination, if required.

The following table includes the raw water characterization based on samples collected in 2018. The concentrations of the constituents in the table are not expected to vary significantly since minor fluctuations only have historically been recorded.

Characteristic	Minimum	Maximum	Annual Average
Temperature (ºC)	**0**	**22.6**	**6.8**
Turbidity (NTU)	**0.00**	**10.00**	**0.9**
pH	**0**	**8.47**	**7.88**
E. coli (MPN/100ml)	**0**	**6**	**1.4**
Total Coliforms (MPN/100ml)	**<1.0**	**602**	**24**

7.0 Risk Assessment

7.1 Requirement

Element 7 of the DWQMS requires a risk assessment process that:

a) identifies potential hazardous events and associated hazards identified by the Ontario Ministry of Environment,

b) assesses the risk associated with potential events,

c) ranks the events according to the associated risk,

d) identifies control measures,

e) identifies critical control points,

f) a method to verify the validity of the assumed risks and events,

g) considers the reliability and redundancy of equipment, and

h) ensures that the risks are assessed at least once every thirty-six months.

7.2 Risk Assessment Process

The Municipality of Wawa has established, implemented and maintains a risk assessment and risk assessment outcomes procedure to determine potential hazards and critical control points that exists within the subject system. The purpose of the procedure is to define the method used to assess and rank

risks to the drinking water system and identify critical control points. In general, the procedure describes how to:

• identify and rank potential hazards to the drinking water system

• identify control measures to address hazards

• identify Critical Control Point (CCPs) and associated work instructions

The Municipality shall perform a risk assessment that is consistent with the documented process outlined in the OP. Senior Management annually reviews the validity of the process as part of Management Review (Element 20).

Appendix E contains the procedure for the risk assessment program.

8.0 Risk Assessment Outcomes

8.1 Requirement

Element 8 of the DWQMS requires the OP to document:

a) the identified potential hazardous events,

b) identify additional potential hazardous events and associated hazards,

c) the assessed risks associated with potential events,

d) the ranked events according to the associated risk,

e) the identified control measures,

f) the identified critical control points and their critical control limits,

g) procedures and/or processes to monitor the critical control limits,

h) procedures to respond to deviations from the critical control limits, and

i) procedures for reporting and recording deviations from the critical control limits.

8.2 Risk Assessment Outcomes

The Municipality of Wawa conducts a risk assessment for the Municipality's drinking water system once every 36 months during the internal audit. The risk assessment outcomes are recorded and communicated to Senior Management as part of the Management Review (Element 20).

Appendix E contains the procedure for the risk assessment program.

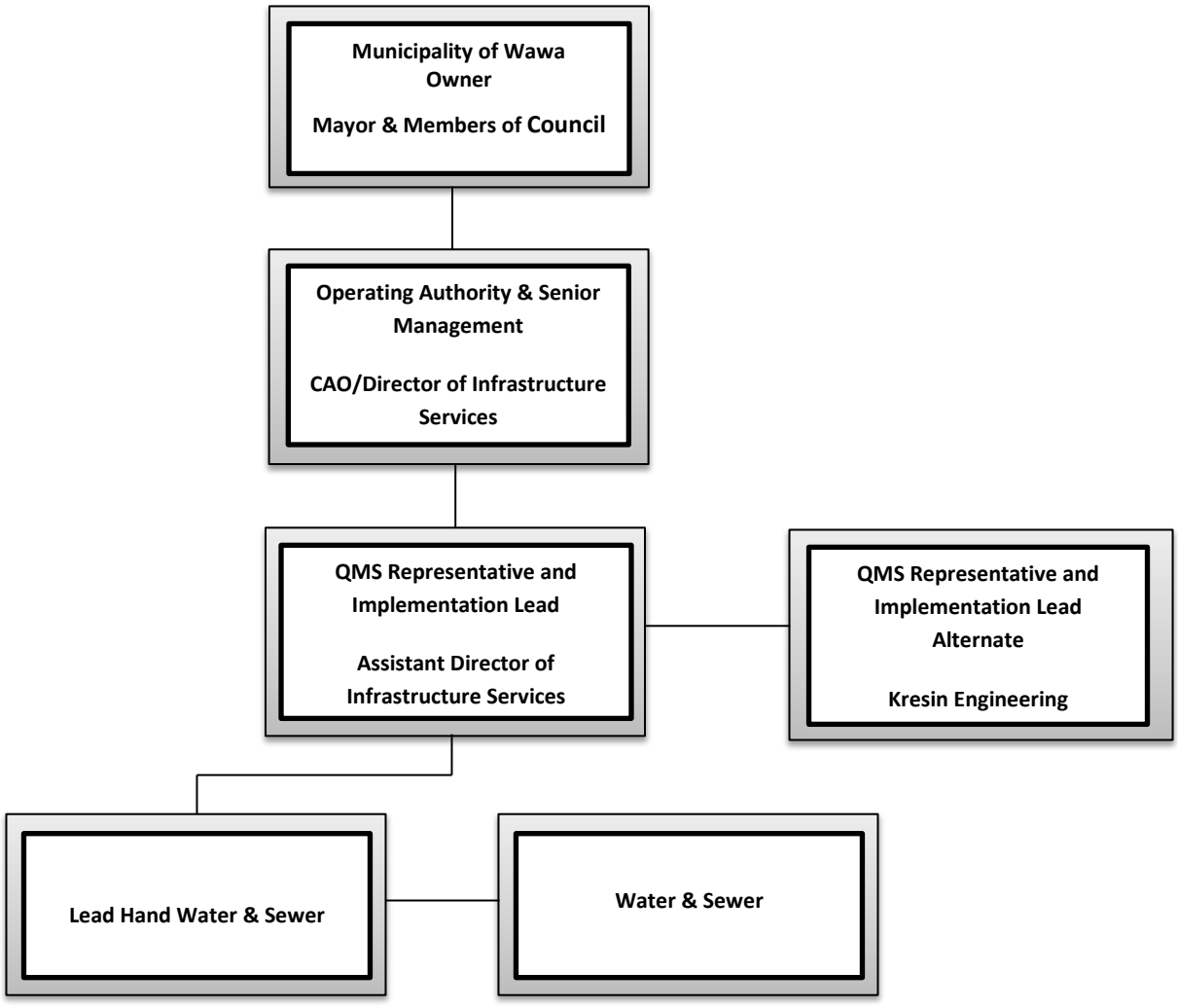
9.0 Organizational Structure, Roles, Responsibilities and Authorities

9.1 Requirement

Element 9 of the DWQMS requires that the OP describe the organizational structure of the Operating Authority and include the roles, responsibilities and authorities.

9.2 Organizational Structure

The Municipality of Wawa has established an organizational flow chart as shown below.



9.3 Roles, Responsibilities and Authorities

Role/Title	Responsibility	Authority
Owner	Assumes applicable responsibilities and authorities outlined in the Safe Drinking Water Act, 2002 and the DWQMS.	
• **Mayor** • **Councillors**	• ensuring Operating Authority is accredited • commitment and endorsement of QMS • development of financial plans • decision making and public correspondence during an emergency situation affecting the drinking water quality	• perform listed responsibilities • recommend changes or improvements to the QMS
Senior Management	Ensuring the QMS is established and maintained.	
• **Chief Administrative Officer (CAO)** • **Director of Infrastructure Services (PW)**	• commitment and endorsement of QMS • completion of Management reviews • appointment of QMS Rep. and Implementation Lead	• evaluation of the suitability, adequacy and effectiveness of the QMS on an annual basis
Infrastructure Services Staff	Operation of the drinking water system QMS Rep and Implementation Lead To administer the QMS to the Operating Authority	
Assistant Director of Infrastructure Services (PW)	• ensuring sufficient resources for the QMS • decision making, job delegation and communication with the Owner during an emergency situation affecting the drinking water quality • administer QMS • preparing reports to Owner (Members of Council) • ensure QMS policies and procedures are established and maintained • report status of QMS to the Owner and Senior Management • ensure current versions are being used	• perform listed responsibilities, recommend changes or improvements to the QMS • implement improvements to the QMS development of facility budget • implementation of improvements of QMS under the direction of Senior Management • changes to the QMS present corrective action

Role/Title	Responsibility	Authority
	• ensure personnel are aware of all applicable requirements of the QMS • promote awareness of QMS internal audits	
Lead Hand Water/Sewer	• maintains regulatory compliance • monitors water quality and demand • overall responsible operator • schedules work assignments • maintains certification • supervises operations and staff • job delegation and communication with Senior Management during an emergency situation. Response and recovery during an emergency situation	• overall responsible operator • perform listed responsibilities • approves and directs other staff to follow QMS • reports adverse water quality to regulatory agencies, owner, senior management, QMS Rep. and public • recommend changes or improvements to the QMS
Water/Sewer Assistant	• performs operations and maintenance activities to ensure safe drinking water • report and acts upon non-conformance • operator in-charge when designated • follows procedures, policies, forms, checklists, sops • files records • attends training • receives and communicates external complaints • communicates to Lead Hand on a regular basis • Response and recovery during an emergency situation	• performs listed responsibilities • recommend changes or improvements to the QMS

10.0 Competencies

10.1 Requirement

Element 10 of the DWQMS requires documentation of competencies for drinking water personnel, and of activities for developing and/or maintaining these competencies and for ensuring personnel are aware of the relevance of their duties. It also requires that competencies are achieved and records of the activities are maintained.

10.2 Competencies

The outcomes of this Element are identified competencies (knowledge, skills, and abilities), training needs and training activities for all Operating Authority personnel whose duties directly affect drinking water quality. QMS Awareness Training for all Operating Authority personnel communicates the relevance of specific duties and positions with respect to drinking water safety.

Appendix F contains the procedure for meeting this requirement as well as a table of required and desired competencies for QMS personnel.

11.0 Personnel Coverage

11.1 Requirement

Element 11 of the DWQMS requires a procedure for ensuring sufficient trained personnel are available to maintain the Municipality's drinking water system.

11.2 Personnel Coverage

The Infrastructure Services department (Public Works) ensures that a Certified Operator is always available to operate the Municipality's drinking water system. In addition, administrative staffs from the department are available on-call and to fill in for each other to ensure respective duties can be fulfilled. Element 11 is reviewed annually to ensure personnel coverage is sufficient. In addition, Appendix G includes a MOU between the Union and the Municipality that explains coverage of the WTP in the event of a labour dispute.

Appendix G contains the procedure for meeting this requirement.

12.0 Communications

12.1 Requirement

Element 12 of the DWQMS requires the OP document a procedure for communications that describes how the relevant aspects of the QMS are communicated between Senior Management and:

a) the Owner,

b) operating authority personnel,

c) essential suppliers, and

d) the public.

12.2 Communications

The Municipality of Wawa's communications procedure describes the process for ensuring relevant aspects of the QMS are communicated between Senior Management and the Owner, Waterworks Staff, suppliers and the public.

Appendix H contains communication procedure.

13.0 Essential Supplies and Services

13.1 Requirement

Element 13 of the DWQMS requires the identification of essential supplies and services needed for the delivery of safe drinking water as well as a procedure to ensure the quality of the essential supplies and services. In addition, it requires the means to ensure its procurement.

13.2 Essential Supplies and Services

Those supplies and services deemed essential for the Municipality to deliver safe drinking water to consumers are identified from a master list of supplies and services maintained by the Infrastructure Services department. This master list includes alternate or contingent contacts (where possible) to ensure essential supplies and services can be procured whenever necessary.

Quality requirements for supplies and services are determined and ensured through the Municipality's purchasing practices.

Appendix I contains the procedure for meeting this requirement as well as a table that lists essential supplies and services and supplier contact information, and a process for setting and meeting quality requirements.

14.0 Review and Provision of Infrastructure

14.1 Requirement

Element 14 of the DWQMS requires a procedure for the annual review of the drinking water infrastructure once per calendar year.

14.2 Infrastructure Review

The Municipality must review the adequacy of the infrastructure to operate and maintain the system, to further determine the infrastructure that is in need of repair or replacement. The outcomes of the annual review shall be communicated to the Owner through Staff reports. The status and adequacy of the Municipality's drinking water infrastructure is assessed by the Waterworks Staff on an on-going basis. Resource requirements for maintaining adequacy are determined and communicated annually through the budget process.

Together, the CAO and Director of Infrastructure Services review the annual data that is collected by the Waterworks Staff and establish the future infrastructure needs based on population growth, intrusive testing, and observations during works, break rates and aging materials.

The infrastructure review procedure describes the process for the review of the infrastructure adequacy.

Appendix J contains the procedure for infrastructure review.

15.0 Infrastructure Maintenance, Rehabilitation and Renewal

15.1 Requirement

Element 15 of the DWQMS requires a summary of infrastructure maintenance, rehabilitation and renewal programs. The Operating Authority is required to keep this summary current, communicate it to Council, and monitor the effectiveness of its maintenance program.

15.2 Infrastructure Maintenance, Rehabilitation and Renewal Programs

Maintenance, rehabilitation and renewal programs are guided by the Municipality's Asset Management Plan (AMP), a copy of which is available through the Assistant Director of Infrastructure Services. The AMP is updated on an as needed basis. The Municipality of Wawa has implemented a preventative

maintenance program for the Water Treatment Plant. Preventive maintenance schedules and procedures for the WTP are described in the operations manual. Equipment and pumps at the WTP are regularly serviced and documented records are kept at the WTP in the plant logbook. Details of the procedures can be found in the operations manual.

Preventative maintenance on the distribution system is performed on a regular schedule as listed in the operations manual. Distribution system maintenance consists of flushing of hydrants. When hydrants are flushed, the isolation valves are occasionally inspected along with hydrant markers and identification signage. This information is documented on hydrant record sheets copies of which are maintained in the second drawer of Cabinet A located in the SCADA Room.

Rehabilitation and renewal of the drinking water supply system is performed on an as-needed schedule. Capital and operational money is allocated and budgeted for each year for improvements to the system. The Director of Infrastructure Services (Public Works) determines the areas that money will be spent in consultation with the Operating Authority. In addition, consumer complaints and water quality trends are taken into consideration when the schedule for rehabilitation and renewal is being assembled.

A report detailing infrastructure maintenance, rehabilitation and renewal programs are summarized and communicated to Council, following review through the annual QMS report.

Appendix K contains the procedure for infrastructure maintenance, rehabilitation and renewal.

16.0 Sampling, Testing and Monitoring

16.1 Requirement

Element 16 of the DWQMS requires a procedure for process control that details sampling, testing and monitoring requirements and activities, and how results are communicated to Council. Relevant upstream sampling, testing and monitoring activities must also be described.

16.2 Sampling, Testing and Monitoring

The Municipality of Wawa Infrastructure Services department (Public Works) maintains procedures for performing sampling, testing and monitoring activities required under the applicable legislation and regulations. Outcomes from these activities are communicated to the Owner through annual and summary reports as required by O. Reg. 170/03.

The sampling, testing and monitoring procedure describes procedures for sampling, testing and monitoring performed at the waterworks.

Appendix L contains the sampling testing and monitoring procedure.

17.0 Equipment Calibration and Maintenance

17.1 Requirement

Element 17 of the DWQMS requires the OP to document a procedure for the calibration and maintenance of measurement and recording equipment.

17.2 Equipment Calibration and Maintenance

Applicable standard operating procedures contain instructions for calibration and maintenance of measurement and recording equipment. Calibration and maintenance is performed either in house or by the manufacturer or contractor, in accordance with relevant legislative requirements and/or manufacturers' specifications.

Appendix M contains the procedure for meeting this requirement as well as an equipment calibration and maintenance table.

18.0 Emergency Management

18.1 Requirement

Element 18 of the DWQMS requires a procedure for maintaining a state of emergency preparedness that identifies potential emergencies and covers response and recovery, training and testing, responsibilities, and communications.

18.2 Emergency Management

The Municipality of Wawa, through the QMS Risk Assessment and Risk Assessment Outcomes (Elements 7 & 8) identified potential hazardous situations and service interruptions that could potentially affect the safety of drinking water. However, emergency situations are listed in the emergency management procedure along with up-to-date internal and external contact lists.

Municipal staff is trained to deal with emergencies and to follow applicable procedures in accordance with provincial and municipal regulations. Where possible, emergency procedures are tested and emergency equipment inspected, maintained, and replaced as needed.

Appendix N contains the procedure for meeting this requirement.

19.0 Internal Audits

19.1 Requirement

Element 19 of the DWQMS requires the OP to document a procedure for internal audits that evaluates the conformity of the QMS requirements, identifies audit criteria, frequency, scope, methodology, record-keeping requirements, considers previous internal and external audit results and described how QMS corrective actions are identified and initiated.

19.2 Internal Audits

Once per calendar year, the QMS Representative and Implementation Lead ensure an Internal Audit program that evaluates conformity with the requirements of the provincial Drinking Water Quality Management Standard. This program is set up in accordance with QMS procedures that outline how the audit should be conducted, who will perform the audit, when it will occur, and how the outcomes will be recorded and communicated.

Appendix O contains the system procedure for meeting this requirement and a standard operating procedure for conducting Internal Audits.

20.0 Management Review

20.1 Requirement

Element 20 of the DWQMS requires a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the QMS.

20.2 Management Review

QMS Senior Management is required to evaluate the suitability, adequacy and effectiveness of the QMS on an annual basis. This evaluation occurs through the Management Review process:

- The QMS Representative collects QMS information, such as Internal Audit and Risk Assessment outcomes, and distributes it to Senior Management for review during annual management review.
- At a meeting or series of meetings, Senior Management provides feedback, direction, and recommendations to the QMS Representative regarding the status and improvement of the system

Outcomes of the annual Management Review are communicated to the Municipality's Council in the annual QMS staff report.

Appendix P contains the procedure for management review.

21.0 Continual Improvement

21.1 Requirement

Element 21 of the DWQMS requires the Operating Authority to continually improve the effectiveness of its QMS through the use of corrective actions.

21.2 Continual Improvement

The Municipality of Wawa has established and will maintain a QMS that will be regularly reviewed. Through corrective action the Operating Authority will continually improve the QMS by modifying, updating and adjusting processes and procedures, where and when necessary to improve the operation of the drinking water system and provide greater consumer satisfaction. Should improvements be made to the QMS, the OP will be amended to reflect the improvements, applicable parties will receive the updated procedures, Senior Management and the Owner will be notified through staff reports and management review.

Appendix Q contains the procedure for continual improvement.

Appendix A

QMP-01 Commitment and Endorsement

Commitment and Endorsement

The Owner and Senior Management endorse the Operational Plan through a Resolution. The Owner and Senior Management's commitment to an effective QMS is evidenced by the resources provided during implementation and maintenance of the Operational Plan and QMS.

The Owner and Senior Management are committed to the implementation, maintenance, and continual improvement of a QMS that meets the requirements of the Drinking Water Quality Management Standard. The QMS for the drinking water system is documented in the Operational Plan. Endorsement by the Owner and Senior Management acknowledges the need for and supports the provision of sufficient resources to maintain and continually improve the QMS.

Date:	**Signature and Title**
	_____ Mayor (Owner)
	_____ Maury O'Neill, CAO/Treasurer (Senior Management)
	_____ Dan Beach, Director of Infrastructure Services (Senior Management)

Appendix B

QMP-02 Document Master List

Name of Document	Type	Version	Distribution	Designated Location
Operational Plan	Doc	3.9	D, AD, OP, P, O, TM	SCADA Room – Cabinet "B"
Standard Operating Procedures	Doc	None	OP	SCADA Room – Cabinet "B"
Document Master List	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Document Change Form	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Records Master List	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Essential Suppliers and Services List	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Sampling Schedule	Doc	None	OP	SCADA Room – Cabinet "A"
List of Sampling Locations – Distribution System	Doc	None	OP, D	SCADA room Cabinet "A" – O/M Manual
Internal Audit Schedule	Doc	3.9	D, AD, OP	SCADA Room – Cabinet "A"
Internal Audit Checklist	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Internal Audit Report	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Non-conformance Report		3.9	D, AD, OP	SCADA Room – Cabinet "A"
Non-conformance Report Log	Doc	None	OP	SCADA Room – Cabinet "A"
Management Review Agenda/Minutes	Doc	3.9	D, AD, OP, TM	SCADA Room – Cabinet "A"
Report on QMS to Owner	Doc	None	O, D, AD, TM	SCADA Room – Cabinet "A"
Corrective Action Report	Form	3.9	D, AD, OP	SCADA Room – Cabinet "A"
CAR Log	Doc	3.9	D, AD, OP, P, O	SCADA Room – Cabinet "A"
Operations Manuals, Wawa WTP Operations Manual	Doc	See Manual	OP	Office – Cabinet "D"
Water Infrastructure Map (Distribution and Treatment)	Doc	None	D, AD, OP	SCADA Room – Cabinet "C" CD form Town Garage – Paper copy
Distribution System Chlorine Residual	Logbook	None	OP	SCADA room – cabinet "B"
Daily Round Checklist	Form and Record	None	OP	SCADA Room –Cabinet "C"
Chemical Consumption	Logbook	None	OP	SCADA Room –Cabinet "A"
Daily Alum Monitoring Sheet	Form and Record	None	OP	SCADA Room – Cabinet "A"

Name of Document	Type	Version	Distribution	Designated Location
Valve Inspection Sheet	Form and Record	None	OP	SCADA room – Cabinet "A"
Hydrant Inspection Form	Form and Record	None	OP	SCADA room – Cabinet "A"
Measurement and Recording Equipment Calibration Schedule (Record)	In Logbook	None	OP	SCADA room – Cabinet "B"
Equipment Manuals	Doc	See manual	OP	Office – Cabinet "D"
Municipal Emergency Plan	Doc	5.1	D, AD, OP, O, TM	Office – Cabinet "B"
PTTW, DWWP and License/ Certificates of Approval, (other treatment components)	Document Change Forms	3.9	SCADA Room – Cabinet A	Operator
Operator Certificates	Internal Audit Checklist	3.9	SCADA Room – Cabinet A	Operator
MECP Drinking Water Quality Management Standard	Internal Audit Report	3.9	SCADA Room – Cabinet A	Operator
Job Descriptions	Non-conformance Report	3.9	SCADA Room – Cabinet A	Operator
Complaint Form	Report on DWQMS to Owner	None	SCADA Room – Cabinet A	Operator
Notification of Adverse Results	Corrective Action Report	3.9	SCADA Room – Cabinet A	Operator
Engineers Drawings	Doc	None	D, AD, OP	On the network with IT, hard copies at WTP

Relevant Corporate Retention Periods

Type of Document/Record	Minimum Retention Time	Requirement Reference
DWQMS Operational Plan	10 years	Directors Direction under SDWA
Internal Audit Reports	10 years	Wawa Requirement
Management Review Minutes	10 years	Wawa Requirement
Other documents and records retained as per applicable legislation		SDWA O. Reg. 170/03, O. Reg. 128/04
Annual and Summary Reports	5 years	O. Reg. 170/03

Note:
D – Director of IS, AD – Assistant Director of IS, OP – Water Operators, O – Owner, P – Available to Public, TM – Top Management

Appendix C

QMP-03 Document Change Form

Document Change Form

Part A: Request for Change or Creation of Document (To be completed by employee):
(Fill in the information below from the document you would like changed)

Document Title:
_____

Document Reference Number:
_____

Revision Number: _____ Revision Date:
_____

Detail change requested or attach document with changes marked and initialled.

_____
_____
Name and Signature Date

Forward to QMS Representative and Implementation Lead

Part B: Approval (To be completed by responder)

Creation/change has been ( ) DENIED - Reason (Responder to Notify Original Requestor of Denial)

_____
__

( ) APPROVED

Responder's Name and Signature:
_____

Forward to QMS Representative and Implementation Lead

Part C – QMS Representative and Implementation Lead

( ) Make changes to electronic documents

( ) Update the List of Official Documents Records
( ) Provide a copy of the changes and/or updated document to the distribution list for the document
( ) Advise managers that are affected by the change
( ) File Document Change Form as per List of Official Documents Records

Notes:

Any employee can make a request for the creation or change to a document or data form. Changes to documents can be a result of a change in procedure, results of an audit, or suggestion for improvement.

Employee

- The employee completes Part A of the Document Change Form. Suggested changes can also be attached to the Document Change Form.
- After completing Part A of the Document Change Form, submit it to the QMS Representative and Implementation Lead who directs the form to the appropriate management staff (Responder).

Responder

- The responder evaluates the request and notes the decision on the Document Change Form and forwards the form to the QMS Representative and Implementation Lead.
- If the request is denied the Responder will send notification to the requester advising of the decision and reason why.

Supervisor

- The supervisors are responsible for advising any staff affected by the change after being notified of the change by the QMS Representative and Implementation Lead.

Appendix D

QMP-04 Records Master List

Records Master List

Record Name	Version	Location	Maintained By
Annual and Summary Reports		SCADA Room – Cabinet A	Operator
Training Certificates	None	WTP - Lobby	Operator
Document Change Forms	3.9	SCADA Room – Cabinet A	Operator
Internal Audit Checklist	3.9	SCADA Room – Cabinet A	Operator
Internal Audit Report	3.9	SCADA Room – Cabinet A	Operator
Non-conformance Report	3.9	SCADA Room – Cabinet A	Operator
Report on DWQMS to Owner	None	SCADA Room – Cabinet A	Operator
Corrective Action Report	3.9	SCADA Room – Cabinet A	Operator
Treatment Log Books	None	SCADA Room – Cabinet B	Operator
Daily Report	None	SCADA Room – Cabinet A	Operator
Lab Worksheet	None	SCADA Room – Cabinet A	Operator
Distribution Chlorine Residual	None	Logbook	Operator
Daily Round Checklist	None	SCADA Room – Cabinet C	Operator
Generator Run Logs	None	SCADA Room – Cabinet C	Operator
Chemical Consumption	None	Logbook	Operator
Daily Alum Monitoring Sheet	None	SCADA Room – Cabinet A	Operator
Valve Inspection Sheet	None	SCADA Room – Cabinet A	Operator
Hydrant Inspection Form	None	SCADA Room – Cabinet A	Operator
Measurement and Recording Equipment Calibration	None	SCADA Room – Cabinet B	Operator
3rd Party Calibration Records	None	SCADA Room – Cabinet B	Operator
Chain of Custody (lead, microbiological, chemical)	None	SCADA Room – Cabinet B	Operator
Lead Sampling Program	None	SCADA Room – Cabinet B	Operator
Chlorine Analyzer Alarm Tests/Alarm Lock Outs	None	SCADA	Operator
Analyzer Weekly Checks	None	Logbook	Operator
Equipment Maintenance Records	None	SCADA Room – Cabinet A	Operator
MECP Compliance Inspection Reports	None	SCADA Room – Cabinet A	Operator

Appendix E

QMP-05 Risk Assessment Procedure

Risk Assessment Procedure

1.0 Purpose

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

2.0 Procedure

2.1 The Assistant Director of Infrastructure Services (or designate) assigns personnel to conduct the risk assessment.

2.2 Identification of hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water in Table 1 (below) for each activity/process step.

2.3 For each of the hazardous events, specify control measures currently in place that eliminate the hazard or prevent it from becoming a threat to public health. Note: some hazards/hazardous events may have step-by-step contingency plans associated with them.

2.4 To ensure that potential drinking water health hazards are addressed and minimum treatment requirements as regulated by SDWA O. Reg. 170/03 and the *Procedure for Disinfection of Drinking Water in Ontario* are met, the Municipality has established mandatory Critical Control Points (CCPs).

As a minimum, the following must be included as CCPs:

- Processes necessary to achieve the required log removal or inactivation of pathogens (i.e., chemical and/or UV disinfection system, filtration process for surface water and GUDI systems)
- Processes necessary for maintaining a disinfectant residual in the distribution system (includes re-chlorination points)

Identify the above processes (as they apply) as mandatory CCPs in the 'CCP?' column in Table 1.

2.5 To determine if there are any additional CCPs for the system, evaluate and rank the hazardous events (as set out below in steps 2.6 and 2.7) for the remaining activities/process steps (i.e., those not included as the Municipality's minimum CCPs).

2.6 Taking into consideration existing control measures (including the reliability and redundancy of equipment), assign each hazardous event a value for the likelihood and a value for the consequence of that event occurring based on the following criteria:

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

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

The "likelihood" and "consequence" values are multiplied together to determine the risk value (ranking) of each hazardous event and record all values in Table 1.

2.7 Review the hazardous events and rankings documented in Table 1 and identify any activity/process step as an additional CCP if all of the following criteria are met:

- ✓ The associated hazardous event has a ranking of 10 or greater
- ✓ The associated hazardous event is reduced to an acceptable level through control measure(s)
- ✓ Operation of the control measures can be monitored and corrective actions can be applied in a timely fashion
- ✓ Specific control limits can be established for the control measure(s)
- ✓ Failure of the control measures would lead to immediate notification of Medical Officer of Health (MOH) or Ministry of the Environment (MECP) or both.

2.8 List identified CCPs (required minimum and any additional CCPs established by the risk assessment) in Table 2. Set related critical control limits (e.g., limits for turbidity, chlorine residual, temperature, and pH) for each CCP as appropriate.

2.9 Ensure procedures have been developed and implemented to:

- Monitor the critical control limits.
- Respond to, report and record deviations from the critical control limits. (Refer to SOP)
- Ensure notification of adverse results.

List these procedures in Table 2.

2.10 The information recorded in the Summary of Risk Assessment Outcomes is maintained on an ongoing basis and is reviewed at least annually. The Assistant Director of Infrastructure Services (or designate) ensures that a risk assessment is conducted and documented at least once every thirty-six months.

2.11 Senior Management annually reviews the validity of the process as part of the Management Review meeting and consists of evaluating the currency of the information and the validity of the assumptions used in the risk assessment. The QMS representative is responsible for facilitating the risk assessment review and for recording the results of the review in the minutes of meeting. The review may consider:

1. whether any changes have occurred to the system that would affect the risk assessment, including the addition of new infrastructure/equipment, new monitoring and/or control measures, discarding old equipment, planned maintenance and repair of key pieces of infrastructure, etc.;
2. whether any regulatory changes have affected the current risk assessment outcomes;
3. whether any new hazardous events should be identified and assessed;
4. whether the rankings for high-risk hazardous events and for events that are below but close to the threshold value are current;
5. whether the identified critical control limits are current;
6. how the risk assessment outcomes should inform future emergency response training and testing sessions and emergency response procedure development over the next year; and,
7. whether there are any suggestions for improvement to the risk assessment process

The QMS Representative shall monitor the results of risk assessment reviews conducted between triennial risk assessments and shall ensure that the results of all reviews are incorporated into the next triennial risk assessment.

Summary of Risk Assessment Outcomes

Table 1: Risk Assessment Table

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source/Intake	Spill of biological or chemical material. i.e. blue/green algae, zebra mussels, chemical into storm drain etc.	Contamination of source water	Inline turbidity meter/pH meter – When notified, staff would take appropriate action.	3	3	9	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No
	Breakage/blockage of single intake pipe	Loss of water supply	Review of pump operation and pressures/ head gain, turbidity indicators	1	3	3	
	Climate Change	Excessive run off, increasing organics in water, or causing increased turbidity etc.	Review turbidity meters and monitor DOC/TOC, backwashing membrane filter as required and routine maintenance	3	3	9	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No
Low Lift Station	Low lift pump failure	Loss of water supply	Redundancy (2 back-up pumps), automatic switch-over, scheduled maintenance activities, back-up generator for loss of power situations.	3	1	3	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No
Filtration Process (includes coagulation,	Membrane failure	Ineffective removal of pathogens (minimum treatment requirements not met)	Redundancy (two trains), operator inspections (tank levels, membrane integrity test), scheduled maintenance activities, membrane failure alarms.				☒Yes- Mandatory CCP ☐Yes – Additional CCP identified

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
membrane filtration	Backwash failure	Increased transmembrane pressures (TMPs), system shutdown, ineffective removal of pathogens	Filter redundancy (3 trains)				☐No
	Chemical soak clean failure	Increased TMPs, ineffective removal of pathogens	On-line monitoring of TMPs and turbidity alarm (Filters effluent Hi-alarm = 0.5 NTU, Hi-Hi alarm = 1.10 NTU. Hi-alarm waits 180 seconds to alarm after it has detected high turbidity to confirm event before dialing out), redundancy (3 filter trains), and manual addition of chemicals.				
	Turbidity meter failure	Unknown turbidity levels	SOPs and auto shutdown, filter redundancy, scheduled maintenance activities, handheld readings, operator inspections				
Sodium Hypochlorite System (for primary disinfection)	Feed pump failure	Low chlorine residual, inadequate inactivation of pathogens	Redundancy (back-up pump), on-line monitoring with alarms, handheld residual readings and dosage calculations, scheduled maintenance activities.				☒Yes- Mandatory CCP ☐Yes – Additional CCP identified ☐No
	Analyzer failure	Unknown chlorine residual levels, potential for inadequate inactivation of pathogens	Alarms, handheld residual testing, scheduled maintenance activities.				
	Low supply of sodium hypochlorite	Low chlorine residual, inadequate inactivation of pathogens	Operator checks				

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Clearwell	Clearwell out of service for maintenance, repair	Potential for not meeting CT	Redundancy (2 clearwells), increase chlorine dosage.	3	1	3	☐Yes- Mandatory CCP ☒Yes – Additional CCP identified ☐No
	Clearwell Contact Chamber	Potential for not meeting CT	Alarms set points set above critical CT range. Water making process set points well above alarm set points.	2	1	2	☐Yes- Mandatory CCP ☒Yes – Additional CCP identified ☐No
High Lift Station	High lift pump failure	Low pressure in distribution system, possible biological contamination due to infiltration	Redundancy (3 pumps), on-line pressure monitoring and alarms (entry to system), back-up generator for loss of power situations.	3	3	9	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No
Distribution	Loss of residual	Failure to control biofilm and pathogens	System-wide residual testing, residual monitoring at high lift header discharge, annual scheduled flushing and emergency flushing when required.				☒Yes- Mandatory CCP ☐Yes – Additional CCP identified ☐No
	Main/pipe break	Reduced flow/inability to meet demand, low pressure, possible biological contamination due to infiltration	Standard construction methods, system is maintained by the infrastructure services personnel	3	3	9	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No
	Cross connection	Biological/chemical contamination	Approved backflow preventers and annual inspections. By-Law on cross connections and backflow valves	2	4	8	Municipal Procedure Water & Sewer – 004 Cross Connection – Back

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Tower Freezing	Low tower level, inability to meet peak demand, low pressure	Tower and system can be filled manually, operator inspections, water tower level fluctuations, water agitator, system can be run without the tower	3	3	9	Flow Preventer Failures Control
	Major municipal fire	Low clearwell level, inability to meet demand, low/no pressure in sections of the distribution	Water Treatment Plant can be started manually, alarms, flow testing.	3	3	9	
System Control and Data Acquisition	Cyber breach of systems.	Effective and compliant operation of treatment and disinfection systems can be adversely impacted.	Physically isolate WTP system by disconnecting internet connection.	2	4	8	Municipal IT Disaster Recovery Plan – Including Cyber Incident Response Plan.
Fluoridation	High finished water fluoride levels	At levels of 2.5mg/L or higher increased risk of skeletal fluorosis	Continuous monitoring of Fluoride level in treated water 1.15mg/L maximum	2	3	6	☐Yes- Mandatory CCP ☐Yes – Additional CCP identified ☒No

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Filtration Process	• Trans membrane pressures (TMP) low alarm – NONE • TMP high alarm: 275 kPa • Turbidity NTU (each filter): 0.1 is high alarm and 0.3 is the high high alarm	• Daily system checks • Continuous turbidity monitoring • Redundancy (back-up train)	• Adverse Water Quality Reporting SOP • Alarm SOP (Facility Emergency Plan)
Sodium Hypochlorite System	• Free chlorine residual: 0.3 mg/L (low) 3.00 mg/L (high) • Clearwell Contact Chamber: 0.35mg/L (CT_{in} low) 2.8mg/L (CT_{in} high) 0.4mg/L (CT_{out} low) • 3.0mg/L (CT_{out} high) • Daily visual inspection	• Online monitoring • Daily system checks • Continuous monitoring • Redundancy (back-up pump)	• CT Calculations/ Minimum Free Chlorine Residual SOP
Loss of Residual	• Free chlorine residual (0.05 mg/l) is the minimum	• Distribution chlorine residuals monitored as per O. Reg. 170/03	• Adverse Water Quality Reporting SOP

Table 3: Risk Assessment Table Revisions

Revision Date	Revision Issued	Revised By	Reviewed By
January 2023	• Added "System Control and Data Acquisition" as an Activity/Process Step in Table 1.	RW	CK
March 2024	• Revised Existing Control Measures to "backwashing membrane filters as required" for Source/Intake – Climate Change. • Revised Activity/Process description to "Filtration Process (includes coagulation, membrane filtration)". • Revised Possible Outcome (Hazards) to "increased TMPs" for Filtration Process (includes coagulation, membrane filtration) – Backwash Failure. • Revised Existing Control Measures to "Filter redundancy (2 trains)" for Filtration Process (includes coagulation, membrane filtration) – Backwash Failure. • Revised Possible Outcome (Hazards) by removing "increased turbidity" and adding "increased TMPs" for Filtration Process (includes coagulation, membrane filtration) – Chemical Soak Clean Failure. • Revised Possible Outcome (Hazards) to "on-line monitoring of TMPs and turbidity alarm (Filters effluent Hi-alarm = 0.5 NTU, Hi-Hi alarm = 1.10 NTU. Hi-alarm waits 180 seconds to alarm after it has detected high turbidity to confirm event before dialing out), redundancy (3 filter trains), and manual addition of chemicals" for Filtration Process (includes coagulation, membrane filtration) – Chemical Soak Clean Failure. • Merged the Clearwell rows, revised the Likelihood (3) and Risk Value (3) for Clearwell – Clearwell out of service for maintenance, repair and Likelihood (2) and Risk Value (2) for Clearwell – Clearwell Contact Chamber. • Revised the Consequence (3) and Risk Value (9) for High Lift Station – High lift pump failure. • Revised the Consequence (3) and Risk Value (9) for Distribution – Main/pipe break. • Revised the title of Activity/Process to "High lift pump failure". • Removed reference to pressure monitoring at the water tower under Existing Control Measures for High Lift Station – High lift pump failure. • Added "residual monitoring at high lift header discharge" under Existing Control Measures for Distribution – Loss of Residual. • Added "standard construction methods" under Existing Control Measures for Distribution – Main/pipe break. • Added "water tower level fluctuations and water agitator" under Existing Control Measures for Distribution – Tower Freezing. • Revised Existing Control Measures to "Water Treatment Plant can be started manually" for Distribution – Majoy Municipal Fire. • Added Fluoridation as an Activity/Process Step in Table 1.	RW	CK

Appendix F

QMP-06 Competencies Procedure

Competencies Procedure

1.0 Purpose

To document a procedure that identifies:

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

b) activities to develop and maintain competencies for personnel performing duties directly affecting drinking water quality, and

c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.

2.0 Procedure

2.1 The Director of Infrastructure Services (or designate) is responsible for identifying required competencies for employees performing duties directly affecting drinking water quality as per Table 1 below. The minimum levels of competencies required for personnel with duties affecting drinking water quality are identified in job descriptions.

2.2 Individual competency is assessed by the Director or Infrastructure Services (or designate) through consideration of the education, training, skills, experience and licence level of each employee. Continuing competency is maintained through periodic assessment of training needs.

2.3 Each individual employee is responsible for maintaining their individual licences. This includes advising the Director of Infrastructure Services (or designate) of potential training needs.

2.4 Copies of current operator licences are posted as well as maintained and filed as per QMS 04 (Appendix D).

2.5 Competency requirements can be satisfied through the use of in-house, off-site, or online training, attendance at seminars/conferences, presentations by subject matter experts, internal training sessions related to emergency and/or standard operating procedures, or on-the-job training.

2.6 New or transferred employees are required to undertake a Drinking Water Quality Management Standard (DWQMS) awareness session. The following types of information are included in such a session:

- introduction to QMS Representative and Implementation Lead;
- review of pertinent procedures and Standard Operating Procedures; and
- review of QMS policy and ensuring personnel are aware of their relevance of their duties and how they affect safe drinking water.

Table 1: Required competence

Competency Area	Job Title				
	Director of Infrastructure Services (Public Works)	Assistant Director of Infrastructure Services	Lead Hand Water/Sewer	Water/Sewer	Operator –in-Training
Certifications:					
Water Treatment Certification	D	D	R	R	R
Water Distribution Certification	D	D	R	R	R
Competencies:					
QMS Awareness	R	R	R	R	R
Laboratory & Chemical Handling	D	D	R	R	D
Fluoridation	D	D	R	R	R
Filtration	D	D	R	R	D
Chlorination	D	D	R	R	D
Intake Structures	D	D	R	R	D
Adverse Events Response	R	R	R	R	D
Disinfection	D	D	R	R	D
Ancillary Systems & Equipment	D	D	R	R	D
Source Water	D	D	R	R	D

R = Required; D = Desired

Note: Ontario Regulation 128/04 includes requirements to maintain competencies for Operators.

Appendix G

QMP-07 Personnel Coverage Procedure

Personnel Coverage Procedure

1.0 Purpose

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

2.0 Procedure

2.1 The Operations Manager (or designate) ensures that personnel meeting the competencies identified in the Operational Plan are available for duties that directly affect drinking water quality.

2.2 The operational staff business hours are as follows:

Water Distribution:

- Monday to Friday 7:30 a.m. to 4:00 p.m.
- A staff member is on call after hours and on weekends to respond to alarms.

Water Treatment:

- Monday to Friday 7:30 a.m. to 4:00 p.m.
- Saturday and Sunday 7:30 a.m. to 10:00 a.m. A staff member is on call after hours and on weekends to respond to alarms.

2.3 The on-call operator is the designated OIC. A designated OIC for each shift is responsible for the daily operations of the system.

2.4 During regular hours operators are available to conduct inspections, calibrations, investigations, sampling and monitoring, maintenance, and other work as assigned at the Water Treatment Plant, including the distribution system.

2.5 The Director of Infrastructure Services (Public Works) is responsible for approving vacation time and training for staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties. This is recorded on the Vacation/Training Schedule.

2.6 If an after-hours situation requires work on the distribution system and/or equipment operators, the on-call staff member will notify the Director of Infrastructure Services (Public Works) to make arrangements for remediation.

2.7 After 60 days of the O.R.O. being absent an alternate ORO is designated by the Director of Infrastructure Service (Public Works)

THE CORPORATION OF THE
MUNICIPALITY OF WAWA

MEMORANDUM OF UNDERSTANDING

The parties agree that in the unlikely event of a labour disruption, the Union and the Employer will meet to agree on the necessary protocol to continue operations of the water and wastewater systems compliance with the Legislation, Regulations and the Municipal Drinking Water License.

Such agreement will provide for the Municipality of Wawa Licensed Operators to remain available to work in accordance with the protocol.

Aug 3/18
DATED

Signature, Mayor Ron Rody,
On behalf of the Municipality of Wawa

Cathy Cyr, Acting CAO

Signature
On behalf of the United Steelworkers Local 9246

Appendix H

QMP-08 Communications Procedure

Communications Procedure

1.0 Purpose

To describe how the Quality Management System (QMS) is communicated between the Operating Authority's Senior Management (CAO and Director of Infrastructure Services) and:

- Owner (Mayor and Council);
- Personnel (Assistant Director of Infrastructure Services, Lead Hand, Water/Sewer Assistant);
- Suppliers; and
- Public.

2.0 Procedure

The QMS Policy is made available to all operating authority personnel and the public as it is posted in the Water Treatment Plant and other designated municipal sites.

The QMS is communicated between Senior Management and the owner, personnel, suppliers and the public through various methods, such as: meetings (formal and informal), emails, telephone calls, website postings, log books, memos, and continual improvement forms, etc. The communication with each group varies and is described below.

1) **Owner**

Communication is through regular communication with municipal staff and/or Council, emails, 'Summary and Annual Report' and Annual Inspections (as required by the Ministry of the Environment). As well, contact during emergency situations may be made directly between Senior Management and the applicable municipal staff/official.

Communication from Senior Management to the Assistant Director of Infrastructure Services (Public Works) could be through emails, and Council meetings etc.

2) **Personnel**

Communication with personnel may occur through meetings, memos, emails, work instructions, etc. These communications will keep staff informed of the DWQMS progress and revisions.

Both the Director and Assistant Director of Infrastructure Services (Public Works) apprise staff of pertinent information and are responsible for relaying specific information to staff. Information sessions (such as the DWQMS awareness session for new/transferred employees) are an additional means of communication.

Communication with the QMS Representative and Implementation Lead is through similar means as outlined above. Additional communication is outlined in the Management Review section.

3) **Suppliers/Contractors**

Communication is described in Essential Supplies and Services procedure. Examples of the means of communication include purchase orders and contracts. Communication with suppliers is also through emails, phone call, and meetings.

4) **Public**

Summary and Annual Report (as required by the Ministry of the Environment) will be made available in the Municipal office. The Operational Plan will be available for public viewing at the Municipal Office as well as the library. The QMS policy and a description of the DWQMS are accessible to all customers. Information is communicated to the public through notices, advertisements, email campaigns and postings on the Municipality's website.

Communication may also be through direct telephone calls or emails. The public may call the Municipal office directly and those calls received by the Municipal office that cannot be resolved are forwarded to the Director of Infrastructure Services (or designate).

Appendix I

QMP-09 Essential Supplies and Services Procedure

Essential Supplies and Services Procedure

1.0 Purpose

To describe the Municipality's procedures for procurement and for ensuring the quality of essential supplies and services.

2.0 Procedure

2.1 Essential Supplies and Services for the Wawa Water Treatment and Distribution System are identified in Table 4 below. The table is maintained by the Infrastructure Services department (Public Works) and is reviewed and updated as required by the Director of Infrastructure Services in consultation with the QMS Representative and Implementation Lead.

2.2 Purchasing is conducted in accordance with the Municipality's procedures and guidelines.

2.3 Contractors are selected based on their qualifications and ability to meet the Municipality's needs without compromising operational performance and compliance with applicable with legislation and regulations.

2.4 Contracted personnel including suppliers may be requested or required to participate in additional relevant training/orientation activities to confirm conformance with the DWQMS.

2.5 If necessary, appropriate control measures are implemented while contracted work is being carried out and communicated to all relevant parties to minimize the risk to the integrity of drinking water system and the environment.

2.6 All third-party drinking water testing services are provided by accredited and licensed laboratories.

2.7 Calibration services are provided by qualified personnel.

2.8 The Municipality orders and receives ongoing deliveries of additives to satisfy current short-term needs based on processing volumes and storage capacities.

2.9 At the time of ordering (or by standing instruction) Certificates of Analysis (COA) are requested from the supplier of every treatment chemical. When received at the WTP, the receiver circles the batch or lot number on the packing list and COA to indicate a match. The receiver also initials against each quality parameter, including NSF certification and percent concentration on the packing list, COA and vessel (i.e. product drum).

2.10 Verification of process components/equipment is conducted with suppliers to ensure their compliance with applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

Table 4: Essential Supplies and Services

Essential Supply or Service	Primary Supplier	Contingency Supplier
Accredited Laboratory Services	ALS Laboratory Ltd. 1081 Barton Street Thunder Bay, ON 1-800-668-9778	Testmark Laboratories 7 Margaret Street Garson, ON 1-888-282-0422
Distribution Parts and Supplies	Wamco Waterworks Northern 1771 Old Falconbridge Rd. Sudbury, ON 1-800-567-0100	Iconix Water Products Limited 465 Second Line East Sault Ste. Marie, ON 1-705-254-7182
Disinfectant (Sodium Hypochlorite) Coagulant (Aluminum Sulphate) Citric Acid Sodium Hydroxide	Pepco 2031 Riverside Drive Timmins, ON, P4R 0A3 1-844-360-4355	Reliable Maintenance Products 45 White Oak Drive East Sault Ste. Marie, ON P6B 4J7 1-705-949-9969
Instrument Parts (online analyzers, etc.)	SCG Process 15 Connie Crescent Concord, ON 1-905-738-2355	HACH Sales and Service Canada Ltd. #1-400 Britannia Road East Mississauga, Ontario L4Z 1X9
Metering Pumps and Supplies	US Filters Siemens Watertech Inc. Markham, ON 1-905-944-2800	SCG Process 15 Connie Crescent Concord, ON 1-905-738-2355
Instrument Calibration	SCG Process 15 Connie Crescent Concord, ON 1-905-738-2355	HACH Sales and Service Canada Ltd. #1-400 Britannia Road East Mississauga, Ontario L4Z 1X9
Fuel Supplier for Back-Up Generator	Donald L Davidson Fuels 54 Pinewood Drive Wawa, ON 1-705-856-2166	McDougall Energy 421 Bay Street Sault Ste. Marie, ON 1-705-256-9969
Plant Membrane Filters, Parts, and Supplies	Aria Filtra (formerly Pall Water) 1-866-475-0115	McLeod Brothers Mech. 65 White Oak Drive Sault Ste. Marie, Ontario 1-705-945-8459

Appendix J

QMP-10 Infrastructure Review Procedure

Infrastructure Review Procedure

1.0 Purpose

To describe the annual review process that results in the provision of drinking water infrastructure. The objective is to annually review what infrastructure is necessary to operate and maintain the drinking water system and to determine if that infrastructure is in place as needed. The procedure also describes how the findings of the review are communicated to the Owner.

2.0 Procedure

2.1 On an annual basis, the Infrastructure Services department conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system and review the outcomes of the risk assessment documented under Element 8.

2.2 The output of the review is an Annual Capital Forecast that is submitted to the Owner for review and comment. Together with the Owner and QMS Representative and Implementation Lead, timelines and responsibilities for implementation of priority items are determined and documented.

2.3 Annual Review

2.4 The Infrastructure Services department ensures that results of the review are included as input as part of the Management Review process.

Appendix K

QMP-11 Infrastructure Maintenance, Rehabilitation and Renewal Procedure

Infrastructure Maintenance, Rehabilitation and Renewal Procedure

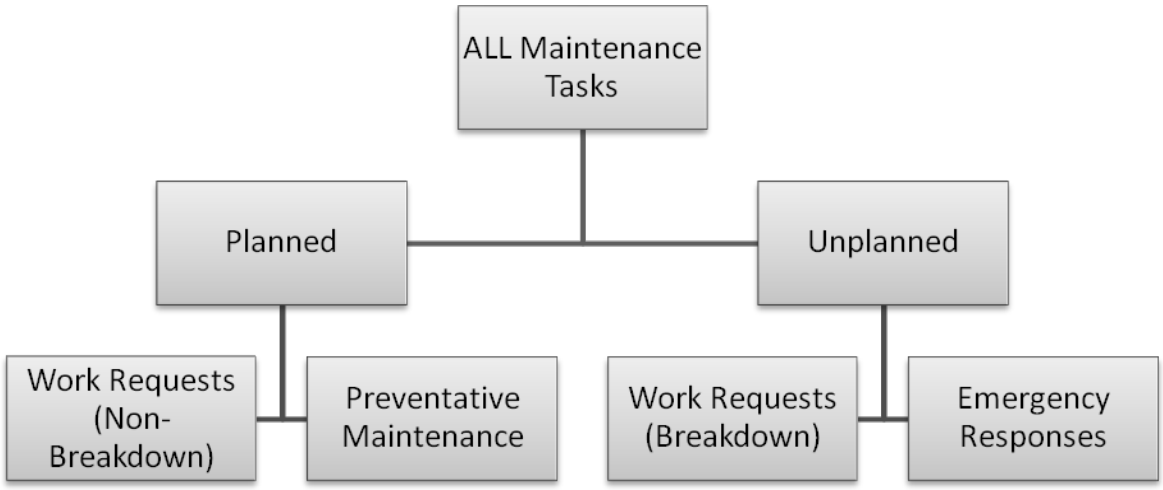
1.0 Purpose

To document a procedure for infrastructure maintenance, rehabilitation, and renewal programs for the drinking water system. This is a continuation from the review and provision of infrastructure and is a summary of the infrastructure rehabilitation, renewal and maintenance program and activities that are undertaken.

2.0 Procedure

2.1 The maintenance program includes planned and unplanned maintenance, renewal and rehabilitation of infrastructure.

2.2 Maintenance tasks are categorized as planned or unplanned as illustrated below:



Planned

Work Requests (Non-Breakdown)

- When a staff member recognizes the need for maintenance work to be performed (that is not an emergency), they shall send an email to the Overall Responsible Operator (O.R.O.).
- The O.R.O. shall review the email and approve or reject.

- If approved, the Director shall assign the work based on criticality and relative priority to the overall operations.

- The assigned staff shall perform the required work based on instructions, applicable manuals, and competence.

Preventative Maintenance:

- Maintenance programs are developed based on requirements established by the Operating Authority taking into account manufacturer's instructions, regulatory requirements, industry best practices and/or standards.

- Standard Operating Procedures (SOPs) exist for some of the maintenance activities and these are available to staff that are required to complete maintenance activities.

Unplanned

Work Requests (Breakdown):

- See above process for non-breakdown work requests. The difference is that breakdown work requests are "unplanned" and non-breakdown work is "planned".

- If the breakdown is considered an emergency, the Process for Emergency Maintenance (below) takes precedence.

Process for Emergency Maintenance:

- Emergency Maintenance can be defined as a maintenance issue that requires immediate attention due to its possible effects on water quality, water production, compliance or safety.

- If a maintenance issue which requires immediate attention should arise during regular business hours, staff shall contact the Director of Infrastructure Services (Public Works) or designate and apprise them of the situation. The Director shall assess the situation and contact the required personnel, if necessary.

- If a maintenance issue which requires immediate attention should arise during off-hours, staff shall immediately contact on-call personnel and follow the directions given.

- After the work is completed, an emergency response record shall be created. The emergency response record details a brief summary of the problem encountered and the work

completed. It also summarizes other information such as the date, and location of the problem, employees that attended to the situation and the hours of labour worked.

Monitoring the Effectiveness of the Maintenance Program:

Effectiveness is tracked through:

- percentage of overdue planned maintenance activities
- frequency of unplanned maintenance activities

Maintenance activities with capital expenditures are summarized and presented to Council during scheduled bi-monthly meetings as required.

Long Term Forecast:

Due to annual inspections on major infrastructure maintenance and equipment and preventative maintenance, the Director of Infrastructure Services (Public Works) is able to determine condition and life expectancy of equipment and when repairs, upgrades, and replacements are required. The Asset Management Plan for the Municipality of Wawa includes information on priority, expected life and replacement years/costs.

Communication to the Owner:

A description of the maintenance program and its effectiveness shall be included as part the Management Review. All management review results shall be summarized by the QMS Representative and Implementation Lead and included as part of the annual report to Council.

Appendix L

QMP-12 Sampling, Testing and Monitoring Procedure

Sampling, Testing and Monitoring Procedure

1.0 Purpose

To document a procedure for sampling, testing and monitoring for process control and finished drinking water quality.

2.0 Procedure

2.1 For the purposes of this procedure, "sampling" is defined as the process of collecting water samples for laboratory analysis, and "testing" is considered to be the laboratory analysis. "Monitoring" consists of on-site data collection and analysis.

2.2 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03 or more often.

2.3 Samples are taken at various locations throughout the system to ensure the water meets environmental guidelines. Furthermore, to ensure disinfection, operators collect water samples at various points for microbiological analyses and chlorine residuals including at locations representative of most challenging conditions.

2.4 In-house process control activities are conducted on a regular basis by the certified operator(s) on duty. In-house samples are analyzed and the results of these activities are recorded on the corresponding daily round sheet.

2.5 Analytical results are compared to the MECP Ontario Drinking Water Standards (ODWS, O. Reg. 169/03) and other applicable drinking water standards. The analytical results are compiled annually and listed along with the Maximum Acceptable Concentration (MAC), which is based on the ODWS and limits set by the Municipality for each parameter that is tested.

2.6 Samples are submitted to an accredited and licensed lab. All results from the lab are maintained as per the Document and Records Control Procedure.

2.7 Monitoring is completed by operators, and when controlled by the SCADA system the on-call operator is notified of alarms indicating when control limits are exceeded. All parameters for the SCADA system designs are reviewed by the Infrastructure Services Operating Staff to ensure monitoring requirements are met.

2.8 Raw water turbidity, treated water turbidity and treated water chlorine residual are monitored continuously with online analyzers. Operators verify online treated water chlorine residual by comparing to handheld equipment.

3.0 Annual Review

3.1 Sampling, testing and monitoring results are readily accessible to the Owner.

3.2 At a minimum, the Owner is provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 section 11, and through the Management Review procedure.

3.3 Summary reports are provided and located at the Municipal Office, with an emphasis on outlining problems/issues (abnormal conditions) that have occurred during the past year. The summary report includes a spreadsheet showing a summary of the results.

Appendix M

QMP-13 Measurement and Recording Equipment Calibration and Maintenance

Measurement and Recording Equipment Calibration, Verification and Maintenance Procedure

1.0 Purpose

To document the procedure for the calibration, verification and maintenance of measurement and recording equipment.

2.0 Procedure

2.1 All measurement and recording equipment calibration, verification and maintenance activities must be performed by appropriately trained and qualified personnel or by a qualified third-party calibration service provider.

2.2 Measurement and recording equipment are maintained and calibrated as per equipment manufacturer's specification or as required by O. Reg. 170/03, whichever is more frequent.

2.3 The frequency and responsibility for calibration and maintenance of each equipment type is summarized in Table 5 below.

2.4 Calibration, verification and maintenance records and maintenance/equipment manuals are maintained as per the Document and Records Control procedure.

2.5 Annual Review

2.6 At least once per year the Director and the QMS Representative and Implementation Lead review the equipment calibration, verification and maintenance activities to ensure information is up to date.

Table 5: Measurement and Recording Equipment Maintenance and Calibration Schedule

Calibrations – 2024 / 2025 **page 1 of 3**

Equipment Description	Make/Model	Location	Tag #	Inspection Frequency	Calibration/Verification Method
Fluoride Analyzer	Hach / CA610	Plant – CT In		Yearly	Manufacturer and Calibration - Hach
Portable Turbidimeter	Hach / 2100P	Low Lift		Yearly	Manufacturer and Calibration - Hach
Pocket CLRMTR Chlorine system	Hach / POCII / Chlorine	Plant		Yearly	Manufacturer and Calibration - Hach
Particle Counter	Hach / 2200 PCX	Skid C		Yearly	Manufacturer and Calibration – Hach
Particle Counter	Hach / 2200 PCX	Skid B		Yearly	Manufacturer and Calibration - Hach
Particle Counter	Hach / 2200 PCX	Skid A		Yearly	Manufacturer and Calibration - Hach
Pocket CLRMTR Fluoride	Hach / POC II / Fluoride	Plant		Yearly	Manufacturer and Calibration - Hach
Turbidity Sensor	Hach / db ee TU5300sc	Skid C	AIT-2C	Yearly	Manufacturer and Calibration – Hach
Turbidity Sensor	Hach / db ee TU5300sc	Skid A	AIT-2A	Yearly	Manufacturer and Calibration - Hach
Turbidity Sensor	Hach / db ee TU5300sc	Skid B	AIT-2B	Yearly	Manufacturer and Calibration - Hach
Chlorine Free / PH	Prominent / DIC	Plant – treated water	AIT 6901	Yearly	Sales and Calibration – SCG Process
Chlorine Free / PH	Prominent / DICAW1C11014G000E	Plant – CT In	AIT 5401	Yearly	Sales and Calibration – SCG Process
Chlorine Free / PH	Prominent / DICAW1C11014G000E	Plant – CT Out	AIT 5301	Yearly	Sales and Calibration – SCG Process
Chlorine Total / PH	Prominent / DICAW1C11014G000E	Plant – Backwash Waste	AIT 3601	Yearly	Sales and Calibration – SCG Process

Calibrations – 2024 / 2025 **page 2 of 3**

Equipment Description	Make/Model	Location	Tag #	Inspection Frequency	Calibration/Verification Method
Chlorine Free / PH	Prominent / DICAW1C1101G000E	Mission Tower	n/a	Yearly	Sales and Calibration – SCG Process
PH	Prominent / DICAW1P52001G000E	Low Lift Station	AIT 1702	Yearly	Sales and Calibration – SCG Process
Fluoride / Temp.	Prominent / DICAW1F12011G000B	Plant – treated water	AIT 6902	Yearly	Sales and Calibration – SCG Process
ORP	Prominent / DICAW1R10101G000E	Plant – Backwash Waste	PLCFU28	Yearly	Sales and Calibration – SCG Process
Turbidity	HF Scientific / MTOL	Plant – Treated Water	AIT 6904	Yearly	Sales and Calibration – SCG Process
Turbidity	ABB / 7997201	Old Mission Plant	n/a	Yearly	Sales and Calibration – SCG Process
Flowmeter	ABB	Mission Tower	n/a	Yearly	Sales and Calibration – SCG Process
Flowmeter	Krone / IFC020	Plant – Raw Water	FIT 1801	Yearly	Sales and Calibration – SCG Process
Flowmeter	Krone / IFC020	Plant – Treated Water to Dist.	FIT 6901	Yearly	Sales and Calibration – SCG Process
Flowmeter	Krone / IFC010	Plant – Backwash waste to sewer	FIT 3601	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Plant – finished water reservoir	LIT 6001	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Plant – finished water reservoir	LIT 6101	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Plant – waste reservoir	LIT 3401	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Plant – waste reservoir	LIT 3501	Yearly	Sales and Calibration – SCG Process

Calibrations – 2024 / 2025 **page 3 of 3**

Equipment Description	Make/Model	Location	Tag #	Inspection Frequency	Calibration/Verification Method
Level	Miltronics / Siemens	Plant – raw water reservoir	LIT 5502	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Plant – raw water reservoir	LIT 5501	Yearly	Sales and Calibration – SCG Process
Level	Miltronics / Siemens	Low lift station	LIT 1001	Yearly	Sales and Calibration – SCG Process
Alum Feed System	ProMinent / GMXA0414PVT2Q000UDC1300EN	Plant – Raw Water	N/A	Yearly	Sales and Calibration – SCG Process
Alum Feed System	ProMinent / GMXA0414PVT2Q000UDC1300EN	Plant – Raw Water	N/A	Yearly	Sales and Calibration – SCG Process

Appendix N

QMP-14 Emergency Management

Emergency Management Procedures

1.0 Purpose

This procedure identifies emergencies that can occur within the Wawa Water Works System including the owner/ operating authority responsibilities, municipal emergency planning measures, steps for response, testing and training requirements, communication protocol, and emergency contact information for emergency management.

2.0 Scope

This procedure is assisting with being prepared for emergency situations that could result in the loss of our ability to maintain the supply of safe drinking water to consumers. By being prepared for emergencies, the Municipality must identify what could happen in our system to cause an emergency, and ensure that processes and procedures are in place to prepare for and respond to such emergencies. Should a water systems emergency go beyond the scope of this procedure, the municipality's Emergency Plan shall take precedence. In case of fire, the Water treatment plant has a fire evacuation plan.

3.0 References

DWQMS Element 18 – Emergency Management

4.0 Standard Operating Procedure

See last page of this Appendix.

4.**1 Identifying Potential Emergencies**

The Risk Assessment Outcomes shall be used for identifying potential emergency situations that may arise. The Risk Assessment is reviewed every 36 months and if any additional emergencies are identified they shall be added to the list shown in Appendix E– Risk Assessment Outcome, (Table 1), below is an expanded Table for Emergency Management.

Activity/ Process Step	Potential Emergencies or Service Interruptions	Possible Outcome (Hazards)	Response and Recovery
Source/Intake	Spill of biological or chemical material.	Contamination of source water	1. Shut low lift station down 2. Try to contain the spill 3. Call Spills Action Centre

Activity/ Process Step	Potential Emergencies or Service Interruptions	Possible Outcome (Hazards)	Response and Recovery
	Breakage/blockage of single intake pipe	Loss of water supply	1. Shut low lift station down 2. Follow description in Section 6.3.9 of Wawa WTP Operations Manual 3. Determine blockage/breakage and repair 4. Bring WTP back online
Low Lift Station	Low lift pump failure	Loss of water supply	1. Isolate failed pump 2. Remove failed pump from rotation in SCADA 3. Call a pump contractor to investigate and repair pump 4. Bring pump back online
Filtration Process (includes filtration)	Membrane failure	Ineffective removal of pathogens (minimum treatment requirements not met)	1. Filtration shuts down due to failure and alarm is sent to operator 2. Operator verifies which Process have failed 3. Backwash the filtration system and test 4. If test fails complete chemical backwash and test 5. If test fails again, complete a chemical clean and place to each skid individually and test 6. If test fails, located failed membrane filter and remove from train, carry-on with 29 other membranes for that skid 7. Re-initialize membrane test, if passed produce water 8. If failed repeat steps 6 and 7 and test 9. If test fails again sample water in clear well. If water is not adverse contact manufacturer to diagnose the problem. 10. If the water is adverse a call is placed to the MECP and Officer of Health as per Reg. 170/03
	Backwash failure	Increased turbidity, system shutdown, ineffective removal of pathogens	
	Chemical soak clean failure	Increased turbidity, ineffective removal of pathogens	
	Turbidity meter failure	Unknown turbidity levels	1. If one meter fails, skid shuts down and produce water with remaining skids, repair meter and bring back online 2. If all three meters fail a call is placed to the MECP and Officer of Health as per Reg. 170/03.

Activity/ Process Step	Potential Emergencies or Service Interruptions	Possible Outcome (Hazards)	Response and Recovery
Sodium Hypochlorite System (for primary disinfection)	Feed pump failure	Low chlorine residual, inadequate inactivation of pathogens	1. When pump fails, alarm is sent to operator and back-up pump starts automatically 2. Troubleshoot and repair failed pump and bring back online 3. If both pumps fail, shut down water production until one or both are repaired
	Analyzer failure	Unknown chlorine residual levels, potential for inadequate inactivation of pathogens	1. If analyzer fails alarm is sent to operator 2. Shut down filtration process and send water from clear to distribution 3. Follow manual CT calculation on page 8-2 of the Operations Manual 4. Perform grab samples as required by Reg.170/03 5. Repair or replace analyzer and bring back online
Fluoridation Process	Feed pump failure	Low fluoride dose, inadequate treatment dosage	1. When pump fails, alarm is sent to operator and back-up pump starts automatically 2. Troubleshoot and repair failed pump and bring back online 3. If cannot repair immediately, remove fluoride process from drinking water and contact Ministry/APH
	Analyzer failure	Unknown fluoride levels, potential risk, could cause drinking water advisory	1. If analyzer fails alarm is sent to operator 2. Shut down fluoride process and send water from clear to distribution 3. Follow manual fluoride calculations or testing 4. Repair or replace analyzer and bring back online
High Lift Station	High lift pump failure for extended period of time	Low pressure in distribution system, possible biological contamination due to infiltration	5. Alarm is sent to operator 6. Automatic start-up of redundant pumps to maintain pressure 7. If pressure drops below 20 psi a call is placed to the MECP and Officer of Health as per Reg. 170/03.
Distribution	Loss of residual	Failure to control biofilm and pathogens	1. As per Reg. 170/03, a call is placed to the MECP and Officer of Health for instruction 2. Follow instruction

Activity/ Process Step	Potential Emergencies or Service Interruptions	Possible Outcome (Hazards)	Response and Recovery
	Main/pipe break	Reduced flow/inability to meet demand, low pressure, possible biological contamination due to infiltration	1. Locate pipe break 2. Isolate by closing main valves 3. Dig and repair pipe 4. Flush pipe 5. Open main valves, slowly, and bring system back online
	Cross connection	Biological/chemical contamination	1. As per Reg. 170/03, a call is placed to the MECP and Officer of Health for instruction 2. Follow instruction
	Tower Freezing	Low tower level, inability to meet peak demand, low pressure	1. If operator determines tower is frozen, shut off valve feeding tower and distribution runs under pressure from treatment plant 2. Thaw tower if possible with a contactor
	Major municipal fire	Low clearwell level, inability to meet demand, low/no pressure in sections of the distribution	1. Monitor pressure in the system 2. Request Fire Department to draft from Wawa Lake or other water body 3. If pressure drops below 20 psi a call is placed to the MECP and Officer of Health as per Reg. 170/03.
System Control and Data Acquisition	Cyber breach of systems.	Effective and compliant operation of treatment and disinfection systems can be adversely impacted.	1. Physically isolate WTP system by disconnecting internet connection.

4.1.1 Other sources of information for identifying potential emergencies include:

- Corporate Audits
- Insurance company reviews
- Records of past emergencies
- New reports about emergencies in other agencies
- Ministry of Environment Inspections

4.2 Emergency Response

Overall emergency response and recovery shall be the responsibility of the on-call Water Systems Operators and the Water Systems Lead Hand (ORO), Assistant Director of Infrastructure Services, Director

of Infrastructure Services. Algoma Public Health and MECP & Spill's Action Centre shall be notified in the event that the water quality poses an acute health risk to consumers.

4.2.1 Standard Operating Procedures and the Municipal Emergency Plan cover the following information:

- Assessing the situation;
- Protecting consumers, employees, equipment and other assets.
- Communication;
- Shut down and start-up operations;
- Restoring operations.

4.3 Emergency Contacts

An up-to-date Emergency Contact list (Table 5 below) shall be maintained by the Water System Lead Hand (ORO), and available to all Infrastructure Services Staff assigned to operate the Water Works.

4.4 Emergency Response Training

All Water Works Staff shall receive training in emergency response, by participating in a tabletop exercise or mock disaster response annually. Refer to chapter 13 Wawa Municipal Emergency Plan. Training may be provided by in-house staff, external training providers or by qualified contractors/trainers. This training shall include, but not be limited to a review of the Water System Emergency Plan. But will include the operations manual as well as Standard Operating Procedures.

4.5 Emergency Response Testing

Different testing methods may be used including mock tests, tabletop exercises and classroom and quiz and actual emergencies. Testing shall be managed, arranged and recorded by the Assistant Director of Infrastructure Services, including the specific potential emergency situation tested for from Appendix N.

5.0 Associated Documents:

- Emergency Contact List –Table 5 (below)
- Municipal Emergency Plan for the Municipality of Wawa
- Adverse Water Quality Procedure SOP

Table 5: Wawa Emergency Contact Listing

Name	Reason	Phone Number
Infrastructure Services Department		
Director		**Office # 1-705-856-2244 Ext: 252** **Cell #1-705-914-0952**
Assistant Director		**Office # 1-705-856-2244 Ext: 251** **Cell #1-705-914-0543**
Lead Hand Water/Sewer **ORO**		**Office # 1-705-856-2244 Ext: 280** **Cell # 1-705-914-0291**
Water/Sewer Assistant #1		**Cell # 1-705-852-4444**
Ministry		
Spills Action Centre	Adverse/Spill	**1-416-325-3000** **Toll-free: 1-800-268-6060**
Algoma District Health Unit		**1-866-892-0172**
MECP		**1-800-965-9900**
Wawa Emergency		
Police		**911**
Fire Department		**911**
Ambulance		**911**
Wawa Officials		
CAO		**Office # 1-705-856-2244 Ext: 223** **Cell # 1-705-914-0429**
Community Emergency Management Coordinator		**Office # 1-705-856-2244 Ext: 223** **Cell # 1-705-914-0429**
Suppliers and Maintenance Contacts		
See Appendix I, Table 4 for supplier list and contact information		

Emergency Response Standard Operating Procedure

1. Assessment of situation

- The OIC is notified of an emergency situation
- Assessment nature of situation and potential imminent threat
- Report to Overall Responsible Operator (ORO) and Director of Infrastructure Services (DIS) or Assistant Director of Infrastructure Services (ADIS)
- Water Staff commence investigation of nature of treat, extent, potential consequences of situation

2. Protecting Consumers, employees, equipment and other assets

- Determination of impact of situation and extent
- Determination of notification necessary to protect public
- Designation of response lead, (ORO, DIS, ADIS)
- Development of response corrective action plan
- Determination of internal response and resources necessary to manage address and correct situation
- Determination of external resource required
- Communicate to acquire necessary response resources
- Implement action plan and communications

3. Communications

- Notification by ORO to MECP Spills Action Centre and APH
- Notification to municipal officials, (Mayor, Council, CAO)
- Designation of communications contact
- Notification of public, (radio announcements, delivery of notice of actions necessary)

4. Shut down and start-up operations

- ORO, DIS and ADIS determine level of response required to protect infrastructure and public
- Development of alternative option to replace shut down equipment
- Shut down operations or portion of operations as determined
- Implements alternative option(s) identified
- Undertake corrective action per action plan
- Develop procedure for start-up following corrective actions completions

5. Restoring operations

- Determine operational impact of situation and changes to monitoring results, equipment operation
- After situation corrected, replace monitors and equipment as necessary
- Test monitors and equipment for performance
- Implement operation of monitors and equipment
- Sampling and monitoring of operations and equipment to ensure compliance with operations manual and performance standards

Appendix O

QMP-15 Internal Audits

Internal Audits Procedure

1.0 Purpose

To document the procedure for internal audits that:

- Evaluates conformity of the QMS with the requirements of the DWQMS,
- Identifies internal audit criteria, frequency, scope, methodology, and record keeping requirements,
- Considers previous internal and external audit results, and
- Describes how QMS corrective actions are identified and initiated.

2.0 Procedure

2.1 Audit Team Structure and Roles

The audit team roles are as follows:

- The ***QMS Representative*** and Implementation Lead acts as a liaison between the audit team (through the Lead Auditor) and the auditees.
- The ***Lead Auditor(s)*** is responsible for overseeing the internal audit process and ensuring qualified auditors conduct internal audits.
- The ***Audit Team Leader*** is the auditor responsible for managing the internal audit of a specified element or process. The Lead Auditor can also act as a Team Leader.

Auditors work with the Audit Team Leader to prepare for and conduct internal audits.

2.2 Auditor Qualifications and Selection

The Lead Auditor and Auditors must meet the following criteria:

- Knowledge of the DWQMS and drinking water QMS;
- Independent of the work that is to be audited;
- Ability to make objective observations and record the results

2.3 Audit Process

2.4 Each element of the drinking water QMS must be audited a minimum of once per calendar year.

Additional audits can be scheduled based on the importance of the process or area, or in response to the results of previous audits (internal/external). Typically, the internal audit focuses on the previous calendar year.

2.5 The Lead Auditor(s) create a schedule using the Audit Schedule form below with the assistance of the QMS Representative and Implementation Lead. The Lead Auditor appoints an Audit Team Leader and Auditor(s) for each element or process and ensures that auditors do not audit their own work. The Lead Auditor or QMS Representative and Implementation Lead forwards the results of the internal audits to the Director of Infrastructure Services (Public Works) for review.

2.6 Written notification of the audit schedule is sent out by the QMS Representative and Implementation Lead to the Director of Infrastructure Services (Public Works) at least one week in advance.

2.7 The Audit Team Leader works with the QMS Representative and Implementation Lead to prepare the Internal Audit Checklist Form below or other similar documents that record questions asked and points verified. The checklist defines the scope of the audit and audit criteria (i.e. manuals and standards).

2.8 The internal audit is performed by the auditing team using the Audit Checklist Form or applicable document. Observations that provide evidence of conformance or non-conformance are noted on the Form. The checklist reflects the current policies and procedures of the area that is being audited. A copy of the procedures with the points highlighted that are going to be checked can be attached to the checklist and referenced for the audit.

2.9 The results of the audit are reviewed by the Audit Team. Agreement is reached under the leadership of the Audit Team Leader. The Auditors complete the summary of findings on the Audit Report Form below or similar document.

2.10 The Lead Auditor(s) records non-conformances from the internal audit on the Non-Conformance Report Form below. The QMS Representative and Implementation Lead tracks the internal audit non-conformances by recording the NCR number in the Non-Conformance Report Log below.

2.11 The results of the audit are presented at the closing meeting, if one is held. The closing meeting would include all of the following:

- Thank staff for their cooperation
- Review the commendable features – what is effective, what needs improvement and what is unsatisfactory
- Ensure the issue is understood and get agreement on a response date for the Corrective Action for each finding or NCR with the person responsible for the area audited
- Record the NCR number on the Audit Report to ensure audit results are understood

2.12 The Auditors draw up an Internal Audit Report (see form below) and fill out Corrective Actions that may be required from the audit. The report has to be signed by the Audit Team Leader and the person responsible for the area audited. A copy is given to the Director of Infrastructure

Services (Public Works) and the QMS Representative and Implementation Lead; the original is kept by the Lead Auditor and filed according to the Document and Records Control Procedure.

2.13 Audit Follow Up and Report

The Lead Auditor makes sure that the follow up audit is carried out. The follow up audit has to be carried out to ensure that the action has been taken and that it is effective. The results of the follow up are recorded in the original Internal Audit Report and the QMS Representative and Implementation Lead on the NCR Log including the date closed.

The results of the internal audits and follow up audits are by management at the annual Management Review meeting as per the Management Review procedure, or more frequently if required.

Internal Audit Checklist

Process/DWQMS Element:	**Page # of**
Scope & Audit Criteria	
Lead Auditor:	**Date of Audit:**
Auditee:	
Audit Leader and Audit Team Members:	

C = Conformance

NC = Non-conformance (indicate Major or Minor)

OFI = Opportunity for Improvement

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
1	1. With the exception of any identified nonconformities and potential nonconformities, the QMS generally conforms to the Standard and is being maintained.				
2	1. A QMS Policy is in place and it includes the required commitments. 2. Personnel are able to locate the QMS Policy. 3. Specific examples can be provided which demonstrate that the system is meeting its QMS Policy commitments.				
3	1. The Plan includes a written endorsement by Senior Management and the Owner. 2. Senior Management can provide examples of ensuring that the operating authority is aware of all applicable legislative and regulatory requirements. 3. Senior Management can provide examples of determining, obtaining or providing resources needed to continually improve the QMS.				
4	1. A QMS Representative is identified for the system and personnel can identify the Representative.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	2. The QMS Representative can provide examples of QMS administration, including facilitating required QMS processes, updating QMS policies and procedures, and coordinating and responding to the findings of external audits. 3. The QMS Representative can provide examples of ensuring that personnel are aware of all applicable legislative and regulatory requirements 4. The QMS Representative can provide examples of promoting awareness of the QMS throughout the operating authority, including providing annual refresher training during the internal audit, employee participation in QMS processes. 5. The QMS Representative can provide examples of reporting to Senior Management on the performance of the QMS and any need for improvement (i.e. management reviews).				
5	1. There is a procedure for document and records control that describes how documents and records are kept current (documents only), legible, readily identifiable, retrievable, stored, protected, retained and disposed of. 2. The scope of control includes the Operational Plan, DWQMS policies and procedures, internal and external audit results, management reviews, and other documents and records that are needed to ensure the effective planning, operation and control of operations. 3. Any handwritten records (e.g. facility logbooks) are legible and permanently ink or nonerasable marker is used. 4. All relevant current approvals (Municipal Drinking Water Licence, Drinking Water Works Permit, Permit to Take Water at the treatment plant. 5. Equipment O&M manuals and engineering plans, schematics and drawings are available at the treatment plant.				
6	1. The Plan includes a complete system description. 2. The Plan states the names of the Owner and Operating Authority.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	3. The Plan describes the water source, including general characteristics, common event-driven fluctuations and any resulting operational challenges and threats. 4. Personnel can describe the system and the description is consistent with the Plan. 5. Personnel can describe event-driven fluctuations in the source water and any resulting operational challenges or threats, and the description is consistent with the Plan. 6. The description of the drinking-water system is kept current.				
7/8	1. There is a documented risk assessment process that identifies potential hazardous events and associated hazards, assesses risks, ranks hazardous events, identifies control measures, identifies critical control points, and considers reliability and redundancy of equipment. 2. The procedure considers the hazardous events and associated hazards as identified by the MECP document titled "*Potential Hazardous Events for Municipal Drinking Water Systems*" and includes a method for identifying additional potential hazardous events and associated hazards. 3. A risk assessment has been conducted in accordance with the procedure in the previous 3 years, and the risk assessment identifies hazardous events and associated hazards, the assessed risks, the ranked events and control measures to address the potential hazards and hazardous events. 4. The currency of the information and the validity of assumptions used in the risk assessment has been verified at least once every calendar year (coincident with the management review). 5. There are documented processes for monitoring critical control limits. 6. The risk assessment identifies critical control points and respective critical control limits, and the critical control limits are current (e.g. current alarm set points are within identified ranges).				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	7. There are documented procedures to respond to deviations from the critical control limits, and there are procedures for reporting and recording deviations from the critical control limits.				
9	1. The organizational structure of the Operating Authority is described, including respective roles, responsibilities and authorities 2. Corporate oversight roles, responsibilities and authorities are delineated. 3. Persons within the management structure responsible for undertaking the Management Review are identified. 4. Persons having Senior Management responsibilities are identified, along with their responsibilities 5. System Owner is identified. 6. Personnel can state their position and describe their roles, responsibilities and authorities, and the descriptions are consistent with the policy. 7. The Operating Authority ensures that the description of the organization is kept current.				
10	1. There are documented competencies required for operations personnel. 2. There are documented activities to develop and maintain competencies 3. There are documented activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water. 4. Personnel can confirm how the Operating Authority helps to develop and maintain competencies associated with operator certification. 5. Personnel are certified (all certificates displayed at treatment plant) and any uncertified new personnel attained or will attain OIT certificates within three (3) months of being hired. 6. New Operators trained with an experienced Operator for the appropriate amount of time. 7. An ORO is assigned for the system.				
11	1. There is a procedure to ensure that sufficient personnel meeting the identified competencies are available for duties that directly affect drinking water quality.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	2. Detailed schedules are available for personnel coverage (i.e. schedules indicating normal and on-call coverage with specific names, vacation schedules, etc.) 3. Personnel can describe methods of personnel coverage (business hours, after hours, ORO/OIC/OIT, special circumstances). 4. The system has designated OROs and OICs in facility logbooks for every calendar day 5. Any OITs have adhered to established guidelines while working alone, and no operational decisions have been made without authorization and instruction from the ORO or OIC.				
12	1. There is a procedure for communications concerning how relevant aspects of the QMS are communicated between the OA and the Owner, OA personnel, suppliers and the public. 2. Personnel have access to QMS materials and can demonstrate how to access the materials. 3. Personnel were involved in QMS processes (internal audits, management reviews, audits, etc.) 4. Annual management review reports have been forwarded to the DWS Owner and the QMS was communicated to DWS Owner during the most recent endorsement of the Operational Plan. 5. Operational Plans are available on the public website and at Municipal Offices/libraries.				
13	1. There is a procedure that identifies essential supplies and services and describes methods for ensuring the procurement and quality of essential supplies and services 2. Alternate suppliers are available for treatment chemicals, drinking-water components and supplies, and alternate service providers are available where applicable for essential supplies and services identified in system-specific contact lists. 3. All chemicals, components and supplies that come into contact with drinking water are certified to the relevant standards or otherwise meet regulatory exemption criteria.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	4. All chemical deliveries are completed under Operator supervision and personnel promptly a) verify that products meet quality requirements where required, b) check shipment integrity, c) cross-reference the order with what has been received and what is indicated on the bill of lading before the deliverer leaves the site, and d) report any deficiencies to the Owner for rectification.				
14	1. There is a procedure for the annual review of the adequacy of infrastructure necessary to operate and maintain the subject system. 2. The infrastructure review considered the outcomes of the risk assessment under Element 8. 3. An infrastructure condition assessment was conducted in the previous year and a capital expenditure budget was developed and approved. 4. The previous management review evaluated the progress toward budget execution.				
15	1. Infrastructure maintenance, rehabilitation and renewal programs are documented. 2. A long term forecast of major infrastructure maintenance, rehabilitation and renewal activities is documented and has been reviewed in the previous year. 3. Maintenance records have been satisfactorily completed for the DWS. 4. The Operating Authority ensures that the description of the infrastructure maintenance, rehabilitation and renewal programs is kept current. 5. Infrastructure maintenance, rehabilitation and renewal programs for the subject system have been communicated to the DWS Owner (e.g. management review minutes).				
16	1. There is a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling and monitoring at the conditions most challenging to the subject system.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	2. The procedure describes how results are recorded and shared between the Operating Authority and the Owner. 3. The sampling, testing and monitoring programs described by personnel for the subject system are consistent with the procedure. 4. Water quality testing has been conducted at the frequency specified within the procedure. 5. Results have been promptly communicated to the DWS Owner in accordance with the procedure (e.g. the submission of monthly reports, annual reports, etc.).				
17	1. There is a procedure for the calibration & maintenance of measurement & recording equipment. 2. There is a method for ensuring that expired standards are not used in calibrations and verifications of measuring equipment. 3. There are no expired standards for any standard used in the calibrations and verifications of measuring equipment. 4. Calibration and maintenance records have been satisfactorily completed for all instruments. 5. Calibration verification certificates were available for flow measuring devices.				
18	1. There is a procedure that includes a list of potential emergency situations or service interruptions, processes for emergency response and recovery, emergency response training and testing requirements, Owner and Operating Authority responsibilities during emergency situations, references to municipal emergency planning measures, and an emergency communication protocol and an up-to-date list of emergency contacts. 2. Emergency response training and testing sessions have been conducted satisfactorily and at the required frequency. 3. Contact lists were updated in the previous calendar year. 4. Contact lists are displayed at facilities.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
19	1. There is a procedure for internal audits that evaluates conformity, identifies audit criteria, frequency, scope, methodology, and record-keeping requirements, considers previous audit results, and describes how corrective/preventive actions are identified/initiated. 2. An internal audit covering all DWQMS elements was conducted in the previous calendar year 3. The internal audit checklist was verified and/or updated prior to the previous internal audit 4. The on-site audit component concluded with a roundtable meeting involving the relevant Operations Manager, available Operators and internal auditor, and this meeting served as annual refresher training on the Standard and the QMS. 5. An internal audit report was developed and included an introduction, a discussion of previous audit results, a summary of internal audit results in tabular format and a discussion concerning all nonconformities and potential nonconformities. 6. Internal audit results were appropriately communicated to Senior Management and Operators. 7. Any and all nonconformities and potential nonconformities were addressed satisfactorily.				
20	1. There is a procedure for management reviews that evaluates the continuing suitability, adequacy and effectiveness of the QMS and considers all of the items included within the Standard 2. A management review was conducted in the previous calendar year and it included 1) all required topics as provided in the Standard, 2) a consideration of best management practices, 3) the annual review of risk assessment outcomes, 4) a consideration of the accuracy of the DWS description in the Operational Plan, and 5) a consideration of the accuracy of the description of infrastructure maintenance, rehabilitation and renewal programs in the Operational Plan 3. All personnel identified in Section 4.1 participated in the review and identified deficiencies and action items.				

ELEMENT #	Procedure/Question	C	NC	OFI	Comments
	4. A Management Review Minutes was prepared and included 1) an introduction with rationale for the review and meeting information, 2) a comprehensive summary of each topic and participant discussion, and 3) a record for decisions and action items related to the management review, including personnel responsible and proposed timelines for completion. 5. The Management Review Minutes were submitted to all meeting participants. Policy and program information related to Element 9 and Element 15 of the Standard was also communicated coincident with the delivery of the minutes. 6. Progress can be demonstrated toward achieving the management review action items.				
21	1. There is a procedure for tracking and measuring continual improvement of the QMS that reviews and considers best management practices, documents a process for identifying and managing corrective actions, and documents a process for identifying and implementing preventive actions. 2. Best management practices were reviewed and considered during the most recent management review. 3. Nonconformities identified during internal audits and other processes were assigned corrective actions, and the actions taken to correct the nonconformity were effective. 4. Opportunities for improvement identified during internal audits and other processes were assigned preventive actions, and the actions taken to prevent the potential nonconformity were effective 5. Potential nonconformities (NC/CAR) identified during internal audits and other processes were assigned preventative actions, and the actions taken to prevent the potential nonconformity were effective.				

Internal Audit Report

Procedure/Section	Report #	Date of Audit
Audit Scope & Objectives		
Lead Auditor	Person Responsible for Area Audited	
Audit Team Leader and Audit Team Members		
Attended Closing Meeting		

Recommendations – summary of activity that is in conformance or other points that are well done
Summary of Audit Findings
Non-conformances and Corrective Action Reports Issued
Suggestions for Next Audit
Results of Audit ( ) OK ( ) Not OK – if not OK state date of follow up audit
Result of Follow Up Audit (if applicable) ( ) OK ( ) Not OK – state action to be taken

_____ _____

Lead Auditor Date

Non-Conformance Report

Part A – To be completed by Employee or Lead Auditor

Date:	NCR # (assigned by QMS Representative and Implementation Lead)
Initiator: (name, work, location)	
Source: ☐ Employee Suggestion ☐ Internal Audit – Audit Report Date: Audit Report #: ☐ Inspection ☐ Other – please specify: _____	
Describe the non-conformance and any action you can suggest (Additional sheets can be attached if more space is required)	

Part B – To be completed by QMS Representative and Implementation Lead

Describe the action taken in response to Part A
Is corrective or preventive action required? ☐ No ☐ Yes If No, explain If Yes, specify and include timelines, responsibility for action
Non-conformance report complete? ☐ Yes Date: QMS Representative and Implementation Lead Signature _____

Appendix P

QMP-16 Management Review

Management Review Procedure

1.0 Purpose

To document the procedure for ensuring the QMS will ensure its continuing suitability, adequacy and effectiveness. To ensure the necessary information is collected for Senior Management to review and to provide review output of any decisions and actions related to the QMS and maintain records or the reviews.

2.0 Procedure

2.1 The QMS Representative and Implementation Lead (or designate) determines a suitable frequency for Management Review meetings for the drinking water system. As a minimum, reviews must be conducted at least once per calendar year.

3.0 Management Review Agenda and Meetings

The standing agenda for Management Review meetings is as follows:

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

The QMS Representative and Implementation Lead coordinates the Management Review and distributes the agenda with identified responsibilities to participants in advance of the Management Review meeting along with any related reference materials.

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

3.2 The QMS Representative and Implementation Lead ensure that minutes of and action plans resulting from the Management Review meeting are prepared and distributed to the DWS Owner.

3.3 The QMS Representative and Implementation Lead (or designate) monitors the progress and documents the completion of action plans resulting from the Management Review.

Appendix Q

QMP-17 Continual Improvement

Continual Improvement Procedure

1.0 Purpose

To document the procedure established for the Operating Authority to strive to continually improve the effectiveness of its QMS through the use of the quality policy, audit results, corrective actions and management review.

2.0 Procedure

2.1 Review of updated applicable best management practices including any published by the Ministry of Environment, Conservation and Parks is available on www.ontario.ca/drinkingwater and shall be reviewed and documented at minimum once every 36 months as part of the internal audit review.

2.2 Corrective action involves taking measures to eliminate causes of identified quality problems to ensure the problems do not recur.

2.3 Preventative Actions involves taking measures to eliminate the risk of identified quality problems to ensure the problems cannot occur.

2.4 Determining a Root Cause shall be determined through a Root Cause Analysis:

- ✓ Identify Problem
- ✓ Define Problem
- ✓ Understand Problem (5 whys)
- ✓ Identify Root Cause - perform evidence-based analysis
- ✓ Corrective Actions (including follow up date)
- ✓ Monitor System(s) to ensure corrective action is effective

All documentation of the analysis & any reports/evidence as part of review shall be attached to the PAR/CAR.

2.5 Preventative actions & Corrective action may be initiated as a result of the following indicators of a breakdown in the QMS:

- Internal audits
- Management review
- External audits
- Customer complaints
- Trends identified in management reports
- Incident reports, including near miss reports

2.6 Any employee can initiate preventative action or corrective action by filling out the Preventative Action Report (PAR) or Corrective Action Report (CAR) form below.

2.7 The employee completes Part A of the PAR/CAR form and forwards it to the QMS Representative and Implementation Lead, who will issue a PAR/CAR number and determine who is assigned as Team Leader to address the issue. The QMS Representative and Implementation Lead records the PAR/CAR in the PAR/CAR Log below and notes the PAR/CAR number in the report.

2.8 The Team Leader is responsible for the process which includes:

- Describing and implementing the preventative or corrective action,
- Investigating who is involved in the preventative or corrective action,
- Determining the root cause of the problem,
- Identifying actions required to correct the non-conformance, or OFI (opportunity for improvement)
- Identifying the making changes to documentation as per the procedure for Document and Records Control,
- Ensuring the at the necessary action are taking in an appropriate timeframe,
- Completing the Corrective Action Report.

2.9 The Team Leader forwards the PAR/CAR to the QMS Representative and Implementation Lead to determine that the corrective action has been taken and is effective. The QMS Representative and Implementation Lead complete Part C of the PAR/CAR.

2.10 The QMS Representative and Implementation Lead review the PAR/CAR Log during the Management Review and determine if any further action is required. The QMS Representative and Implementation Lead conducts an assessment on the impacts and effectiveness of the improvements implemented during the previous audit period.

2.11 CARs/PAR and CAR/PAR Logs are maintained as per the procedure for Document and Records Control.

Corrective Action Report

CAR #:_____

PART A

Date:	Issue by:
Source: ☐ Internal Audit ☐ Management Review ☐ Non-conformance Report #: ☐ Other:	
Description of the issue/concern:	

PART B

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

PART C

Was action taken effective? Document Change complete ☐ Yes ☐ Not applicable
Is CAR complete? ____ _____ _____ Signature QMS Representative and Implementation Lead Date

Corrective Action Report (CAR) Log

CAR #	Description	Responsible	Date Due	Follow Up Date	Date Closed
1	Management Review	Mark Toffner	April 30, 2013	May 2013	
2	Commitment & Endorsement Form	Mark Toffner	April 30, 2013	May 2013	May 18, 2013
NCR 2013-01	Document Control	Mark Toffner	Oct 20, 2013	NA	Oct 28, 2013
NCR 2013-02	Flow Chart	Mark Toffner	Oct 20, 2103	NA	Oct 28, 2013
NCR 2013-03	Risk Assessment	Mark T/Marc L	Oct 20, 2013	NA	Oct 28, 2013
NCR 2013-04	Labour Dispute	Mark T/Brian S	Nov 15, 2013	Nov 15, 2013	
NCR 2013-05	Public Access to OP	Mark Toffner	Nov 15, 2013	Nov 15, 2013	
NCR 2013-06	Maintenance Program	Mark Toffner	Oct 20, 2013	NA	Oct 28, 2013
NCR 2013-07	Element 18	Jim Harmer	Oct 20, 2013	NA	Oct 28, 2013
NCR 2014-01	Commitment & Endorsement Form	Mark Toffner	Oct 21, 2014	NA	Sept 10, 2014
NCR 2014-02	Document Control	Mark Toffner	Oct 21, 2014	NA	Sept 10, 2014
NCR 2014-03	Risk Assessment	Mark Toffner	Oct 21, 2014	NA	Sept 30, 2014
NCR 2014-04	Mgmt. Review	Mark Toffner	Oct 21, 2014	NA	Sept 30, 2014
IA_Wawa_2015 NC #1(first)	Update Emergency Contact List	Mark Toffner	May 11, 2015	NA	May 15, 2015
IA_Wawa_2015 NC #1(second)	Perform Emergency Training table top	Mark Toffner/Jim Harmar	July 2015	August 1, 2015	July 3, 2015
CAR #2015-01	Add Description of Water Source and Characteristics of the Raw Water Supply	James Neufeld	October 20, 2015	NA	October 8, 2015
CAR #2016-01	Provide the signed and dated endorsement of the Operational Plan Version 2.4, Appendix A.	Jim Harmar	October 31, 2016	NA	October 21, 2016
CAR # 2016-02	Schedule Annual backflow preventer inspections, create bylaw for backflow and cross connection, review clearwell	Cory Stainthorpe	November 20, 2016	February 2017	November 16, 2016

CAR #	Description	Responsible	Date Due	Follow Up Date	Date Closed
CAR # 2016-03	Training completed for required employees, HR tracking system implemented	Cory Stainthorpe	November 20, 2016	NA	November 16, 2016
CAR # 2016-04	NSF-60 labels to be included on all shipments	Cory Stainthorpe	November 20, 2016	NA	November 16, 2016
CAR # 2016-05	Excel spreadsheet created to audit maintenance schedules and review effectiveness.	Cory Stainthorpe	November 20, 2016	NA	November 16, 2016
CAR # 2016-01	No record was found for the 36 month review of the risk assessment, Software to be purchased in 2017 for tracking.	Cory Stainthorpe	November 21, 2016	N/A	November 16, 2016
CAR # 1A Wawa 2017	Replaced Jim Harmar with Chris Kresin on Operational Plan	Cory Stainthorpe	July 27, 2017	N/A	July 27, 2017
CAR # 1A_Wawa_2018 #1	Update Suppliers List	Cory Stainthorpe	July 10, 2018	N/A	July 10, 2018
CAR# 1A Wawa 2018_ #2	Update contact list to have new w/s assistant #	Cory Stainthorpe	July 10, 2018	N/A	July 10, 2018
1A_Wawa_2019_#1	Ensure QMS Policy is in DWQMS and copy posted at WTP	Cory Stainthorpe	June 04, 2019	N/A	June 04, 2019
1A_Wawa_2019_#2	Update plane, remove entity of Infrastructure Services, add drinking water source	Cory Stainthorpe	June 04, 2019	N/A	June 04, 2019
1A_Wawa_2019_#3	Update operational plan and insert table for calibration equipment	Cory Stainthorpe	June 04, 2019	N/A	June 04, 2019
NCR# 2019-01	Third Party Audit – Sai Global – element 21 continual improve procedure required update.	Cory Stainthorpe	June 18, 2019	N/A	June 18, 2019
NCR# 2019-01	Third Party Audit – Sai Global – element 21 continual improve procedure required update.	Cory Stainthorpe	June 18, 2019	N/A	June 18, 2019

CAR #	Description	Responsible	Date Due	Follow Up Date	Date Closed
NCR# 2021-01	Third Party Audit- SAI Global – DWQMS requirement not addressed in the Operational Plan	Dan Beach	November 30, 2021	2022	November 26, 2021
NCR# 2022-01	Third Party Audit- SAI Global – chemicals essential to produce safe drinking water not included in list of essential supplies and no evidence of verifying the quality of these essential supplies delivered.	Rebecca Weatherall	September 25, 2022	2023	August 1, 2022

Preventative Action Report

PAR #:_____

PART A

Date:	Issue by:
Source: ☐ Internal Audit ☐ Management Review ☐ OFI (Opportunity For Improvement) Report #: ☐ Other:	
Description of the issue/concern:	

PART B

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

PART C

Was action taken effective? Document Change complete ☐ Yes ☐ Not applicable
Is PAR complete? ____ _____ _____ Signature QMS Representative and Implementation Lead Date

Preventive Action Report (PAR) Log

PAR #	Description	Responsible	Date Due	Follow Up Date	Date Closed

MECP Inspection Log

Date	MECP Inspector	Comments	Action/Revision
2022/2023	Stephen Rouleau Marnie Managhan	No indication of Best Management Practices	N/A

Opportunity For Improvement (OFI) Log

Date	Element	DWQMS Reference	Audit Document	Action/Revision
Dec 2023	2	Quality Management System Policy	SAI Global Re-Accreditation Audit (July 25, 2022)	Post copies of QMS Policy at the WTP and Municipal Office for public view.
	4	Quality Management System Representative	SAI Global Systems Audit (July 8, 2022)	Assigned position of QMS Rep to Assistant Director of Infrastructure Services.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	6	Drinking Water System	Internal Audit Checklist (May 31, 2022)	Clarified distinction between Owner and Operating Authority.
	8	Risk Assessment Outcomes	SAI Global Re-Accreditation Audit (July 25, 2022)	Added "Summary of Risk Assessment Outcomes revision table in Appendix E.
	9	Organizational Structure, Roles, Responsibility and Authorities	Internal Audit Checklist (May 31, 2022)	Bullet #2 removed in section 9.3 table, Top Management Row, Responsibility column.
			SAI Global Systems Audit (July 8, 2022)	Responsibility and Authorities added to section 9.3 table for Assistant Director of Infrastructure Services.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	10	Competencies	SAI Global Systems Audit (July 8, 2022)	Certifications and competencies not directly affecting drinking water quality removed from QMP-06 Table 1.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	12	Communications	SAI Global Systems Audit (July 8, 2022)	Communication between Operating Authority Top Management and 4 target parties included in Appendix H Section 1.0.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	13	Essential Supplies and Services	Internal Audit Checklist (May 31, 2022)	Alternate suppliers for laboratory, chemicals and fuel added to Appendix I Table 4.
			SAI Global Systems Audit (July 8, 2022)	Citric and sodium hydroxide added to verification process and supplies receiving procedure revised.
			SAI Global Re-Accreditation Audit (July 25, 2022)	Essential supplies verification procedure revised.
	15	Infrastructure Maintenance, Rehabilitation and Renewal	Internal Audit Checklist (May 31, 2022)	Location of hydrant field record sheets added to section 15.2. Schedule to track maintenance activities and records to be developed by Operating Authority.

Date	Element	DWQMS Reference	Audit Document	Action/Revision
				Description of maintenance, renewal and rehabilitation programs added to section 15.2.
	16	Sampling, Testing and Monitoring	Internal Audit Checklist (May 31, 2022)	Most challenging conditions clarified in Appendix L, sentence 2.3.
			SAI Global Re-Accreditation Audit (July 25, 2022)	Potential sampling location at the hospital to be added.
	17	Measurement and Recording Equipment Calibration and Maintenance	Internal Audit Checklist (May 31, 2022)	Metcon revised to SCG Process in Table 5 and equipment calibration by SCG Process and Hach noted. Operating Authority to request calibration certificates.
	18	Emergency Management	Internal Audit Checklist (May 31, 2022)	Contact numbers updated in Appendix N Table 5.
			SAI Global Re-Accreditation Audit (July 25, 2022)	Operating Authority to run gen set tests for 1 hour.
	19	Internal Audits	SAI Global Systems Audit (July 8, 2022)	Non-conformance (NC) log removed from Operational Plan.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	20	Management Review	Internal Audit Checklist (May 31, 2022)	Management Review agenda updated to include accuracy of infrastructure renewal programs, DWS description and BMPs.
			SAI Global Systems Audit (July 8, 2022)	Replaced “appropriate municipal staff” with “DWS Owner” in Appendix P, sentence 2.4.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
	21	Continual Improvement	SAI Global Systems Audit (July 8, 2022)	OFI and MECP Inspection logs added to Appendix Q.
			SAI Global Re-Accreditation Audit (July 25, 2022)	
March 2024	7/8	Risk Assessment	36-month Risk Assessment	• Removed “Fluoridation system” from section 2.4 of Risk Assessment Procedure **Table 1: Risk Assessment Table** • Revised Existing Control Measures to “backwashing membrane filters as required” for Source/Intake – Climate Change.

Date	Element	DWQMS Reference	Audit Document	Action/Revision
				• Revised Activity/Process description to “Filtration Process (includes coagulation, membrane filtration)". • Revised Possible Outcome (Hazards) to “increased TMPs” for Filtration Process (includes coagulation, membrane filtration) – Backwash Failure. • Revised Existing Control Measures to “Filter redundancy (2 trains)” for Filtration Process (includes coagulation, membrane filtration) – Backwash Failure. • Revised Possible Outcome (Hazards) by removing “increased turbidity” and adding “increased TMPs” for Filtration Process (includes coagulation, membrane filtration) – Chemical Soak Clean Failure. • Revised Possible Outcome (Hazards) to “on-line monitoring of TMPs and turbidity alarm (Filters effluent Hi-alarm = 0.5 NTU, Hi-Hi alarm = 1.10 NTU. Hi-alarm waits 180 seconds to alarm after it has detected high turbidity to confirm event before dialing out), redundancy (3 filter trains), and manual addition of chemicals” for Filtration Process (includes coagulation, membrane filtration) – Chemical Soak Clean Failure. • Merged the Clearwell rows, revised the Likelihood (3) and Risk Value (3) for Clearwell – Clearwell out of service for maintenance, repair and Likelihood (2) and Risk Value (2) for Clearwell – Clearwell Contact Chamber. • Revised the Consequence (3) and Risk Value (9) for High Lift Station – High lift pump failure. • Revised the Consequence (3) and Risk Value (9) for Distribution – Main/pipe break. • Revised the title of Activity/Process to “High lift pump failure”. • Removed reference to pressure monitoring at the water tower under Existing Control Measures for High Lift Station – High lift pump failure. • Added “residual monitoring at high lift header discharge” under Existing Control Measures for Distribution – Loss of Residual. • Added “standard construction methods” under Existing Control Measures for Distribution – Main/pipe break.

Date	Element	DWQMS Reference	Audit Document	Action/Revision
				• Added "water tower level fluctuations and water agitator" under Existing Control Measures for Distribution – Tower Freezing. • Revised Existing Control Measures to "Water Treatment Plant can be started manually" for Distribution – Majoy Municipal Fire. • Added Fluoridation as an Activity/Process Step in Table 1. **Table 2: Identified Critical Control Points (CCPs)** • Revised Critical Control Limits for Sodium Hypochlorite System to low free chlorine residual alarm of 0.3mg/L, revised low chlorine tank alarm to daily visual inspection, and added alarms for Clearwell (CT_{in} low: 0.35mg/L, CT_{in} high: 2.8mg/L, CT_{out} low: 0.4mg/L, CT_{out} high: 3.0mg/L). • Added online monitoring to Monitoring Procedures for Sodium Hypochlorite System. • Removed "Alarm SOP (Facility Emergency Plan) under Response, Reporting and Recording Procedures for Sodium Hypochlorite System. • Fluoridation removed. **Table 3: Risk Assessment Table Revisions** • Added January 2023 and March 2024 revisions.
	8	Risk Assessment Outcomes	Internal Audit Checklist (July 20, 2023)	Added item b) "identify additional potential hazardous events and associated hazards".
	10	Competencies	Internal Audit Checklist (July 20, 2023)	Revised Intake Structure competencies for Director and Assistant Director to "desired" in Table 1.
	11	Personnel Coverage	Internal Audit Checklist (July 20, 2023)	Schedule during summer months removed.
	12	Communications	Internal Audit Checklist (July 20, 2023)	Revised item c) to "essential suppliers".
	13	Essential Supplies and Services	Internal Audit Checklist (July 20, 2023)	Removed name and phone numbers of specific supplier contacts in Table 4.
	15	Infrastructure Maintenance,	Internal Audit Checklist (July 20, 2023)	Location of WTP equipment and pump service records revised to plant logbook.

Date	Element	DWQMS Reference	Audit Document	Action/Revision
		Rehabilitation and Renewal		
	17	Measurement and Recording Equipment Calibration and Maintenance	Internal Audit Checklist (July 20, 2023)	Revised calibration years to 2023 / 2024 and deleted the Serial Number column in Table 5.
	18	Emergency Management	Internal Audit Checklist (July 20, 2023)	Added row for "Systems Control and Data Acquisition" to Table 4.1, identified Lead Hand as ORO, added Director and Assistant Director cell phone numbers and updated cell phone numbers of Water/Sewer Assistants in Table 5.
	19	Internal Audits	Internal Audit Checklist (July 20, 2023)	Removed "Risk Assessment Review during Internal Audit" table.
	21	Continual Improvement	Internal Audit Checklist (July 20, 2023)	Appendix Q, updated MECP Inspection Log and Opportunity For Improvement (OFI) Log.
March 2025	2	Quality Management System Policy	Internal Audit Checklist (June 12, 2024)	Location of the Operational Plan updated to SCADA Room – Cabinet "B" in the Appendix B Document Master List.
	6	Drinking Water System Description	Internal Audit Checklist (June 12, 2024)	Distance offshore, depth, inner diameter and pipe material of the raw water intake revised in Section 6.2 under "Source Water".
	7	Risk Assessment	Intertek - SAI Global Surveillance Audit (July 9, 2024)	During future 36-month Risk Assessments, Management will re-do Table 1: Risk Assessment Table in Appendix E. Revisions in 36-month Risk Assessments will no longer be referred to as "Opportunities for Improvement" so as to not confuse with terminology used in audits. Future 36-month Risk Assessment or Risk Assessment review to be completed earlier than the Internal Audit.
	7/8	Risk Assessment/Risk Assessment Outcomes	Internal Audit Checklist (June 12, 2024)	Staff confirmed with Computrol that pumps will not shutdown with high alarms and that high alarms are enabled for the distribution system. The low alarm is currently disabled for the distribution system and Staff will inquire what will occur when low chlorine alarm is triggered.
			Internal Audit Checklist (June 12, 2024)	Staff confirmed that the high CT alarm for the chlorine contact chamber is disabled because it shuts the filter skids down.
			Internal Audit Checklist (June 12, 2024)	Added "(Refer to SOP)" to the second bullet under 2.9 (Procedure).

Date	Element	DWQMS Reference	Audit Document	Action/Revision
	8	Risk Assessment Outcomes	Intertek - SAI Global Surveillance Audit (July 9, 2024)	Management will ensure that the resolution date will be noted on all AWQI reports.
	15	Infrastructure Maintenance, Rehabilitation and Renewal	Internal Audit Checklist (June 12, 2024)	Reference to "CAO" revised to "Operating Authority" under Section 15.2 regarding whom the Director of Infrastructure Services consults with to determine the areas that money will be spent for improvements for the drinking water supply system.
	17	Equipment Calibration and Maintenance	Internal Audit Checklist (June 12, 2024)	Majority of expired standards have been removed.
	18	Emergency Management	Internal Audit Checklist (June 12, 2024)	Last sentence of Section 2.0 revised to remove "…manual and nearest exits" in Appendix N.
	19	Internal Audits	Intertek - SAI Global Surveillance Audit (July 9, 2024)	Management to ensure objective evidence is included in Internal Audit Checklist comments.
	20	Management Review	Internal Audit Checklist (June 12, 2024)	Reference to "Management Review Report" revised to "Management Review Minutes" under element #15 and #20 in the Audit Checklist (Appendix O). Revised Element #20 (3.) by referencing all personnel identified under Section 1.4 of the DWQMS.
	21	Continual Improvement	Internal Audit Checklist (June 12, 2024)	Actions for OFIs and preventative maintenance (NC/CAR) separated under element #21 in the Audit Checklist (Appendix O).

f