Municipality of West Grey

Drinking Water Quality Management Standard (DWQMS)

Operational Plan

For the following systems:

Durham Drinking Water System

Neustadt Drinking Water System

Owned by:

Municipality of West Grey

Operated by:

Veolia Water Canada Inc.

Version 24
June 20, 2022

Table of Contents

Ownership and Operation

The Municipality of West Grey is the Owner and provides governance for all water systems within. Each system is described within Element 6. The Municipality utilizes the services of an independent contract Operating Authority (Veolia Water Canada Inc.) who operates and maintains all water systems on behalf of the Municipality. Under the QMS, the Operating Authority is responsible for implementing and maintaining the QMS in partnership with the Municipality.

Element 1. Quality Management System (QMS)

This Operational Plan describes the contents of the Drinking Water Quality Management System for both the Durham Drinking Water System and the Neustadt Drinking Water System. The contents of this Operational Plan are based upon the requirements of the *Drinking Water Quality Management Standard (Version 2.0 February 2017)*

This Operational Plan has been reviewed and endorsed by both the Owner and the Operating Authority.

Element 2. QMS Policy

The QMS Policy is posted at both the Durham and Neustadt water systems and a copy is posted on the Owner's website. It can also be found in Appendix F

Communication of the QMS Policy is described in the Communications Procedure (WG-ADMIN-1200).

Element 3. Commitment & Endorsement

This Operational Plan has been reviewed and endorsed by the Operating Authority and the Owner. The signatures below are evidence of the Owner and OA commitment and to ensure that the Quality Management System is regularly assessed to confirm its ongoing applicability and relevance.

Owner endorsement will be shown by Town Council endorsement (See Appendix D). Top Management endorsement can also be found in Appendix D. Owner endorsement is updated when council changes. Top Management endorsement is typically obtained prior to Council endorsement. Additional Top Management endorsement(s) are obtained if there are significant changes to the plan.

Top Management ensures the Operating Authority is aware of all applicable legislative and regulatory requirements. Top Management ensures that a QMS is in place that meets the requirements of the Standard, and that the QMS is communicated by following the Communications Procedure.

Top Management can determine, obtain or provide the resources needed to maintain and improve the QMS, as demonstrated through records created under the QMS, and through the

Management Review Process. The Review and Provision of Infrastructure procedure describes how a need for resources may be identified, documented, and followed through.

WG-ADMIN-1200	Communications Procedure
WG-ADMIN-1400	Review and Provision of Infrastructure Procedure
AW-ADMIN-2000	Management Review Procedure

Element 4. QMS Representative

The QMS representative is the Project Manager. Top Management appoints, authorizes and maintains the QMS representative (refer to Appointment Letter). As the QMS Representative, this person has both the responsibility and authority to:

- Administer the QMS by ensuring that processes and procedures needed for the QMS are established and maintained,
- Report to Top Management on the performance of the QMS and any need for improvement.
- Ensure that current versions of documents required by the QMS are being used at all times,
- Ensure that all personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the West Grey water systems,
- Promote the awareness of the QMS throughout the Operating Authority

Element 5. Document and Records Control

Procedures are in place for QMS Document Control and Record Control. These procedures describe how documents and records are controlled.

AW-ADMIN-500	Document Control Procedure
AW-ADMIN-510	Record Control Procedure

Element 6. Drinking-Water System

All water systems listed below are owned by the Municipality of West Grey and operated by Veolia Water Canada Inc.

Drinking Water System description-Durham

The Durham Drinking Water System is owned by the Municipality of West Grey and is operated by Veolia Water Canada Inc. The system consists of three wells. Well #2 and 2A are both

groundwater wells under the direct influence of surface water (GUDI), while Well #1B was reclassed as strictly a groundwater well in 2022.

Well #1B is located within a pumphouse at 172 South Street E in the Town of Durham. It consists of a 300mm diameter drilled well to an approximate depth of 78m. The well is equipped with a submersible pump, with a variable frequency drive, capable of delivering 17L/s (**1020L/min**).

Well #2 is located within a pumphouse at 54**3** George Street East. It consists of a 300mm diameter drilled well to an approximate depth of 75m. The casing extends into the limestone bedrock at a depth of approximately 13m. The well contains a submersible pump, with a variable frequency drive, rated for 17L/s. Well #1 has a system capacity of 1375m^3/d while #2 has a capacity of 1636m^3/d (this data is found in the MDWL).

Well #2A is also located within the same pumphouse as Well #2. It is a 250mm diameter well about 68m deep. The variable speed submersible pump has a capacity of 1134L/min. The capacity of the wellhouse has not changed.

The raw water quality is typically very good. It is very rare for there to be any instances of bacteriological growth. Well #1B typically has a turbidity of 0.1-0.3NTU, while well #2 usually has turbidity between 0.1-0.4NTU. The turbidity in well #2A is typically between 0.2-0.4NTU and is now part of the duty pump rotation. For annual daily use information, please refer to the most recent water system Annual Report.

Other than the usual water usage increases in the summer months (where flows are still within system capacity), there are no operational challenges due to event-driven fluctuations. There are no critical upstream or downstream processes that are relied upon to provide safe drinking water.

The Well #1B treatment facility was upgraded in the Winter/Spring of 2005. The upgrades included the installation of two cartridge filters (4.5 micron in size), each having a treatment capacity of 18.9L/s (**1134L/min**), a primary disinfection system consisting of two UV disinfection reactors (one duty and one standby) and a sodium hypochlorite secondary disinfection system. The UV equipment is provided with a quartz cleaning system and an on-line UV intensity monitor with alarm. The facility is also equipped with a 70kW standby diesel engine generator set.

The Well #2 Pumphouse (containing the same equipment as well #1B) was upgraded twice in 2017, first to add the new well and then in the fall to include a new contact chamber to meet CT. The pumphouse contains two cartridge filters, each having a treatment capacity of 18.9L/s and equipped with a 4.5 micron size filter cartridge. A primary disinfection system, consisting of two UV disinfection reactors (one duty and one standby) was installed. The system is also equipped with a quartz cleaning system and an online UV intensity monitor with alarm. The secondary disinfection chlorination system consists of two chemical feed pumps (one duty, one standby) and a 200L chemical storage tank with low level alarm.

The Durham distribution system services the Town of Durham. Storage capacity for the system is provided by a 2,273m^3 concrete reservoir and a 909m^3 steel standpipe located at the north end of town. The system is set up as a two tier system due to the differences in elevation from the north and south end of town. The south end (lower tier) is supplied by the three production wells and water is directed to the reservoir, which provides pressure for the lower tier. A pump transfers the water from the reservoir to the standpipe for the upper tier. A booster station is used to boost pressure (for upper tier).

Treated water from Well #1B enters the distribution system through a 200mm diameter water main along South Street and Well #2/2A discharges water to a contact chamber (to meet CT) and then to the distribution system through a 150mm diameter water main along George Street East. There are about **120** hydrants in the Durham distribution system.

Drinking Water System description-Neustadt

The Neustadt Drinking Water system is owned by the Municipality of West Grey and is also operated by Veolia Water Canada Inc. The system consists of three wells, all groundwater wells under the direct influence of surface water (GUDI). Well #1 is located on part lot 2, concession 12 in the Township of West Grey. It is a 200mm diameter steel cased, 38.1m deep groundwater well. The well is equipped with a submersible pump capable of delivering 3.2L/s. The well is cemented into the bedrock at an approximate depth of 20m.

Well #2 is located on Lot 4, Concession 12. It is a 200mm diameter, steel cased, 29.6m deep groundwater well on the north side of pumping station #2. It is capable of delivering 10.6L/s.

Well #3 is located on Lot 4, Concession 12. It is a 150mm diameter, steel cased, 30.8m deep bedrock groundwater well located on the north side of pumping station #2. The well is equipped with a submersible pump capable of delivering 6.1L/s.

The well duty is rotated each week between the three wells unless there are issues with a well.

The raw water quality is typically very good. There are usually no issues with bacteriological growth. Well #1 has turbidity levels typically between 1.0-3.0 NTU, Well #2 0.2-0.8 and #3 1.0-2.5NTU. For the average daily use information, please refer to the current water system Annual report on the West Grey Google shared drive.

Other than the usual water usage increases in the summer months (where flows are still within system capacity), there are no operational challenges due to event-driven fluctuations. There are no critical upstream or downstream processes that are relied upon to provide safe drinking water.

Pump station #1 is located on Part lot 2, Concession 12 in West Grey. It consists of the following:

- A cartridge filter system which consists of one (“rough”) cartridge (with 5 micron filters), one filter with a one micron size (“finished”) filter cartridge, and is certified for 2.0 log Cryptosporidium oocysts removal. There is an online turbidity meter on the discharge line from the pumphouse and a raw turbidity meter (well #1 only)
- Ultraviolet disinfection system consisting of two UV disinfection reactors (one duty and one standby), each with a flux density of at least 40mJ/cm^2, a quartz cleaning system and an online UV intensity monitor with alarm.
- Disinfection using chlorination consisting of two chemical feed pumps (one duty and one standby) each rated at 0.9L/hr and a 100L chemical storage tank with a low level alarm

Pump station #2 is located on Part Lot 1, Concession 13 in the Township of West Grey. It houses 75mm process piping from well #2 and well #3, an air release valve on the head from well#2 and well #3, four pressure gauges (two on each header), flow control valves on each header, two 75mm diameter mechanical flow meters rated at 0-20L/s with totalizer, a 75mm test

line to waste and isolation valves for each well supply, and pump controls and instrumentation for each well. Turbidity meters are in place for each well to measure raw turbidity.

The water tower is located east of County Rd 10 on Part Lot 1, Concession 13. The volume of the tower is 1200m^3. It is equipped with an on-line chlorine analyzer. Post chlorinators are in place to booster chlorine levels leaving the tower, if required. A flow meter was installed on the inlet side of the tower in 2022 for additional monitoring

The Neustadt distribution system, installed in 1995, services the Village of Neustadt and contains **55** hydrants. The water mains are mainly comprised of six inch PVC piping.

For process diagrams for both Durham and Neustadt, refer to Appendix A

Element 7. Risk Assessment

The procedure entitled Risk Assessment describes the method of hazard identification, risk assessment, and critical control point determination for both the Durham and Neustadt water systems.

AW-ADMIN-700	Risk Assessment Procedure

Element 8. Risk Assessment Outcomes

The results of the Risk Assessment are documented in the Risk Assessment spreadsheet.

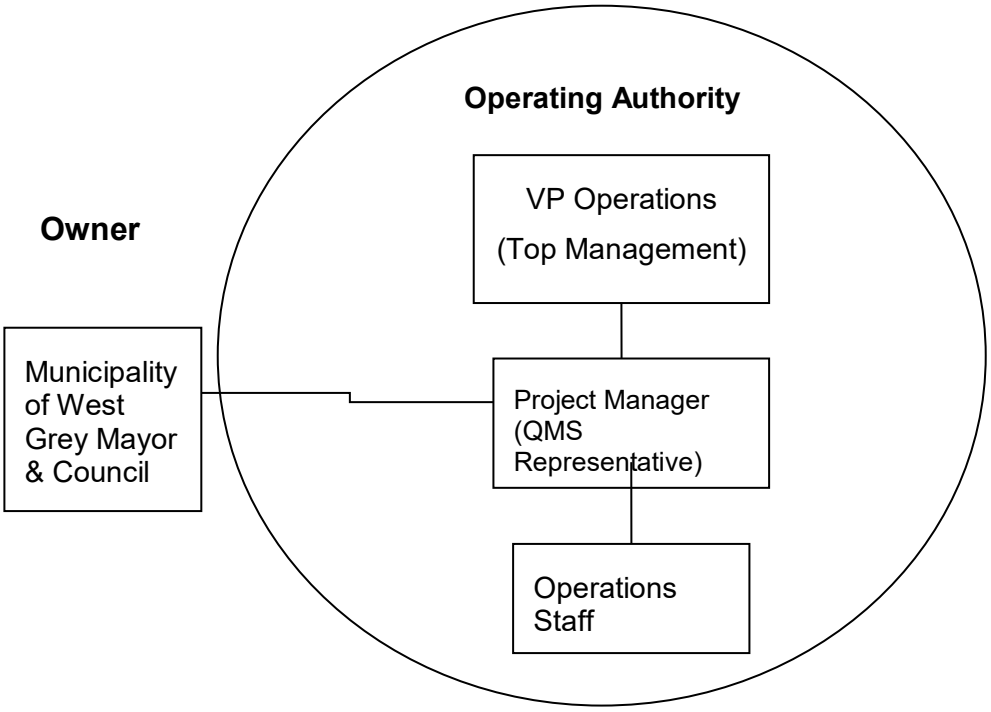
Controlled conditions for each CCP identified in the Risk Assessment spreadsheet are described in detail in the CCP procedures.

Risk Assessment Spreadsheets (Appendix B)	Durham Drinking Water System Neustadt Drinking Water System
CCP procedures (Appendix C)	designated by a 'WG-CCP" prefix in their title,

Element 9. Organizational Structure, Roles, Responsibilities & Authorities

The organizational structure, roles, responsibilities and authorities for the Operating Authority, corporate oversight Operating Authority roles, and Top Management are described in the Structure and Responsibilities Procedure.

QMS Organizational Chart



AW-ADMIN-900 Organizational Structure, Roles, Responsibilities & Authorities Procedure

Element 10. Competencies

The Training Procedure describes how competencies are identified, maintained, and documented. It also describes activities to ensure personnel are aware of the relevance of their duties and how they affect safe drinking water.

AW-ADMIN-1000 Competencies

Element 11. Personnel Coverage

The method to ensure sufficient personnel coverage at all sites is documented in the procedure:

WG-ADMIN-1100 Personnel Coverage

Element 12. Communications

The Communication Procedure, WG-ADMIN-1200, describes how the QMS is communicated between Top Management and the Owner, Operating Authority personnel, suppliers, and the public.

Element 13. Essential Supplies & Services

A list of all supplies and services deemed essential to the delivery of safe drinking water can be found in WG-ADMIN-1300. The list typically includes a primary and a secondary supplier to ensure the procurement of essential and critical supplies and services. Standard order quantities and order set points may also be included.

Where applicable, supplies must meet NSF and ANSI standards. Supplies are verified against the order requisition when received. In the case of any discrepancies, the delivery may not be accepted. Integrity of the supplies is also checked at time of delivery.

Element 14. Review & Provision of Infrastructure

A procedure has been created to review the adequacy of infrastructure and the resources necessary to operate and maintain the drinking water system safely and effectively.

WG-ADMIN-1400 Review and Provision of Infrastructure

Element 15. Infrastructure Maintenance, Rehabilitation & Renewal

Maintenance of the raw water and treatment facilities is the responsibility of the Operating Authority. All distribution system maintenance is the responsibility of the Owner.

Infrastructure maintenance, rehabilitation, and renewal are addressed by the following:

Planned Maintenance: Planned maintenance is set up by the Operating Authority on an as-needed basis. These tasks are set up in a computerized maintenance management system (CMMS). Scheduled tasks are typically defined by manufacturer's literature when available and revised (or created) as needed according to operator experience/observations. Planned maintenance tasks that have financial cost to the Owner are communicated from the OA to the Owner prior to work being done. Completed tasks are recorded and closed out in the CMMS.

Unplanned Maintenance: Unplanned maintenance tasks result from equipment malfunction or breakage.

Major (coordinated between Owner and OA) unplanned maintenance is authorized by the Owner of the affected facility. Minor unplanned maintenance can be performed without the consent of the Owner, but notification is made to the Owner as quickly as possible. The OIC typically responds to unplanned maintenance during normal working hours while the on-call operator responds during off-hours. Documentation of unplanned maintenance tasks is

recorded in the logbooks. Documentation of unplanned maintenance during off-hours may also be included in operator call-in reports.

Any unplanned (unscheduled) maintenance can be documented in the CMMS as a corrective work order.

Measures to prepare for and expedite unplanned maintenance include equipment redundancy (back-up units), spare parts inventory, as well as documented repair and safety procedures.

The Owner maintains a budget for unplanned maintenance items. The OA does not have any control over this budget.

Rehabilitation/Renewal/Capital Upgrades: Replacement of aging fixed heavy equipment, as well as upgrades, expansions, and in-ground systems improvements are planned by the Owner, in discussion with the operations staff. All major maintenance is coordinated by the Owner and the expenses are the responsibility of the Owner. Long-term major infrastructure maintenance, rehabilitation and renewal activities are conducted at least annually, either via discussion with Owner and/or in operations reports.

O. Reg. 588/17 is a new regulation related to infrastructure maintenance. The Owner is following the requirements in this regulation to implement an Asset Management Plan to better monitor long term infrastructure needs

A system maintenance review and relevant infrastructure items (i.e. infrastructure review) are communicated to the Owner via an operations report, issued quarterly.

Effectiveness of the CMMS is determined by how frequently preventative maintenance is required. If it is found that maintenance is being conducted too frequently, or not often enough, the task schedule can be adjusted. This would be done by the QMS Rep. after communication from operations staff

Element 16. Sampling, Testing & Monitoring

Please refer to WG-ADMIN-1600 for the Sampling, Testing and Monitoring procedure

Element 17. Measurement & Recording Equipment Calibration & Maintenance

Methods of measurement and recording equipment calibration and maintenance are described in detail in the procedure WG-ADMIN-1700.

WG-ADMIN-1700 Measurement & Recording Equipment Calibration & Maintenance

Element 18. Emergency Management

Please refer to procedure WG-ADMIN-1800 for Emergency Management.

Element 19. Internal Audits

The Internal Audit Procedure AW-ADMIN-1900 describes how conformity of the QMS is evaluated on an annual basis. The procedure describes how audit criteria, frequency, scope, methodology and records are identified. It also describes how corrective actions are initiated as a result of an internal audit, and provides references to the Continual Improvement Procedure.

Other procedures relating to the Internal Audit are:

AW-ADMIN-1910 Internal Audit Checklist

AW-ADMIN-1920 Continual Improvement Procedure

Element 20. Management Review

The Management Review Procedure describes the procedure for management review, including instructions related to all of the required inputs to the meeting. The procedure also describes how Top Management considers results, identifies deficiencies, and records and forwards results to the Owner and to other key personnel.

AW-ADMIN-2000 Management Review Procedure

AW-ADMIN-2010 Management Review Checklist

Element 21. Continual Improvement

The Operating Authority and Owner of the West Grey water systems strive to continually improve the Quality Management System through the use of the QMS Policy, Internal Audits, Corrective Actions, Management Review, and the Analysis of Process Data.

The Continual Improvement Procedure (AW-ADMIN-1920) describes how QMS-related corrective or preventive actions are documented, and how steps are followed when implementing corrective and preventive actions.

Table of Revisions

Date (mm/dd/yyyy)	***Description of Revision***
09/15/2014	Removed Compliance Manager from Organizational Chart in Element 9
09/29/2015	Minor edit to Unplanned Maintenance (bold)
03/02/2016	Removed reference to AW-ADMIN-1930 In Element 11, changed name of procedure to WG-ADMIN from AW-ADMIN

	Added number of hydrants in Durham to DWS descriptions
01/04/2017	Removed an additional “and” from the end of Element 4 Removed ‘primary’ from Neustadt disinfection description (element 6)
05/04/2017	Element 8: included Appendix location for CCPs Element 15: included fire hydrant flushing in Planned Maintenance
11/14/2017	Updated Org chart in Element 9
01/09/2018	Updated Durham drinking water system description to include well #2 Updated where QMS policy can be found
04/07/2018	Added reference to AW-ADMIN-1920 under Element 21
06/18/2018	Updated Element 15 to include new reference to long term forecasting of infrastructure maintenance, etc.
09/10/2018	Changed references to American Water to Veolia. Updated Well Supply systems to Drinking Water Systems Element 9: changed TM from Regional Director to VP Operations
01/22/2019	Element 6: Updated turbidity information for Durham and Neustadt Converted reservoir storage from imperial to metric units Updated Durham distribution system information Updated Neustadt filter information
12/19/2019	Element 1: Updated reference to new Standard (2.0)
05/01/2020	Updated Element 2. Removed QMS policy and added to Appendix F Changed references to Corrective Action procedure to Continual Improvement procedure
05/25/2020	Element 3: added when endorsements are typically obtained Element 6: changed Durham filter size to 4.5 micron Element 6: Removed reference to pressure tanks in Neustadt
05/31/2021	Element 6: changed typically well #1 raw turbidity
06/01/2022	Element 6: updated classification of Durham well #1B Updated capacity for Durham reservoir Updated location of annual reports Added installation of Neustadt water tower flow meter Updated typical Neustadt raw turbidity numbers Element 15: added statement about O. Reg. 588/17
06/20/2022	Element 6: added L/min equivalent to the L/s numbers; updated number of fire hydrants in both systems Removed a few lines from the Table of Revisions (2010-2013)

	Title	Document No.
VEOLIA	OPERATIONAL PLAN TABLE OF CONTENTS	WG-ADMIN-TC
	Approved By: 	Effective Date/Version Sept 27, 2022

The signature above shows approval of all of the following Administrative procedures:

Operational Plan Section	Approval Date (dd/mm/yr)	Revision Number
AW-ADMIN-500 *DOCUMENT CONTROL*	22/01/2019	15
AW-ADMIN-510 *RECORDS CONTROL*	21/09/2018	9
AW-ADMIN-700 *RISK ASSESSMENT*	19/12/2019	8
AW-ADMIN-900 *ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES*	24/05/2019	7
AW-ADMIN-1000 *COMPETENCIES*	22/01/2019	10
WG-ADMIN-1100 *PERSONNEL COVERAGE*	31/05/2021	3
WG-ADMIN-1200 *COMMUNICATIONS*	10/09/2018	4
WG-ADMIN-1300 *ESSENTIAL SUPPLIES & SERVICES*	27/09/2022	29
WG-ADMIN-1400 *REVIEW AND PROVISION OF INFRASTRUCTURE*	10/09/2018	4
WG-ADMIN-1600 *SAMPLING, TESTING AND MONITORING*	01/06/2022	8
WG-ADMIN-1700 *EQUIPMENT CALIBRATION AND MAINTENANCE*	10/09/2018	5
WG-ADMIN-1800 *EMERGENCY MANAGEMENT*	10/09/2018	7
AW-ADMIN-1900 *INTERNAL AUDIT*	28/04/2020	9
AW-ADMIN-1910 *INTERNAL AUDIT CHECKLIST*	03/05/2018	2
AW-ADMIN-1920 *CONTINUAL IMPROVEMENT*	12/12/2019	12
AW-ADMIN-2000 *MANAGEMENT REVIEW*	28/04/2020	6
AW-ADMIN-2010 *MANAGEMENT REVIEW CHECKLIST*	24/09/2018	1

Appendices	Approval Date (mm/dd/yr)	Revision Number
Appendix A: Process Flow Diagrams – Durham Neustadt	09/24/2018 11/04/2020	5 5
Appendix B: Risk Assessments – Durham	06/07/2022	N/A

Neustadt	06/07/2022	N/A
Appendix C: Critical Control Procedures Disinfection Control	 05/31/2021	10
Appendix D: Owner/Top Management Endorsement Municipal (Council) Endorsement Top Management Endorsement	 08/06/2019 06/14/2022	 N/A N/A
Appendix E: Emergency Contact List(s)	06/14/2022	N/A
Appendix F: QMS Policy	09/28/2018	N/A

Purpose

This procedure defines the actions and responsibilities of the Operating Authority staff to control creation, approval, distribution and revision of all documents related to the Quality Management System (QMS).

Creating, revising, approving and releasing documents must be performed in a consistent manner, so that documents can be easily retrieved, stay current and accurate, and are available to the user. All obsolete documents must be promptly removed from use. Proper maintenance of documents is critical for conformance with the Drinking Water Quality Management Standard (DWQMS), and also for compliance with drinking water legislation.

Definitions

"Document" – an official paper that gives information about something or that is used as proof or support of something

References

Drinking Water Quality Management Standard Element 5

Procedure

Who

- The QMS Representative (or designate), shall be responsible for the control of QMS documents.
- The QMS Representative (or designate) creates, edits, and releases QMS documents, and controls obsolete documents

What

The following QMS documents are controlled under this procedure:

- Internally created QMS documents include:
    - Operational Plan ("QMS manual")
    - QMS Procedures (Administrative Procedures)
    - QMS Work Instructions (Standard Operating Procedures)
    - Blank forms (excluding work orders), checklists
    - Risk Assessments and Critical Control Point Procedures

- Externally created QMS documents include:

- Applicable federal, provincial and municipal legislation
- Industry standard procedures
- Permits, licenses, approvals or other legal documents filed at the facilities

The methods by which control over records will be exercised are described in the Record Control Procedure.

Maintenance Documents

Maintenance documents such as Equipment Manuals will be kept on-site, typically within the Operations and Maintenance Manuals

Reviewing/Approving

- As required, the QMS rep (or designate) reviews QMS documents for any required updates or modifications
- The QMS rep may delegate document modifications if needed
- If a designate creates or edits a document, the QMS rep must be notified and approve the revised document prior to its release
- If the document is not approved or requires additions, the QMS rep will work with the designate to create an approved document
- The QMS Rep approves all newly created and edited QMS procedures prior to their release, by signing in the signature block of the document or Administrative Procedure Table of Contents
- All internal QMS documents are electronically controlled, with only the QMS rep, or designate, having access to the master documents
- Edits to the document are summarized in the Table of Revisions located within the body of the document
- At the time procedures are reviewed associated forms must also be reviewed. If any changes are required to the form, they will be recorded in the associated procedure revision table.
- Electronic calendars can be programmed to generate reminder to prompt review of any revised documents, as needed

Format

- The QMS rep, or designate, creates internal QMS documents, or makes appropriate edits
- The format of the procedures shall cover the following:
    - the ‘who’, ‘what’ and ‘when’
    - related documentation
    - how documents are filed
    - purpose and reason
    - A QMS header including document name, document number, effective date of current revision, and version number.
    - A footer indicating “Internal Use Only”, “Uncontrolled Copy if Printed” and page number and total pages
    - Format of created internal documents shall include the document name, form number, effective date
    - Table of revisions and summary of revisions

- Document numbers are allocated by the QMS rep, considering the following layout as a guide. The format should be an alphanumeric code consisting of three segments (XX-OOOOO-####)
    - Segment 1 ("XX") indicates applicability of the procedure to the project
    - Segment 2 ("OOOOO") indicates type of document, using identifiers listed in table below
    - Segment 3 ("####") is a 3 or 4 digit numeric identifier with the first two digits referring to the applicable DWQMS element number.

Segment 1 "XX"	System Owner	Segment 2	Type	Segment 3	Identifier
AW	All Veolia (previously American) Water Canada contract locations	ADMIN	Administrative	### or ####	3 or 4 digit identifier
		CCP	Critical Control Point	###	

Releasing

- All internal QMS documents are electronically controlled with only the QMS rep or Administrative Assistant having electronic access to modify them
- QMS rep shall notify appropriate staff of updated documents to be released and will update electronic version
- These issuance of these updated documents are controlled by the QMS Rep
- Operations staff, or the QMS rep, has access to the revised Operational Plan on the Google Drive
- Printed versions of Internal QMS documents are considered 'uncontrolled'
- Electronic copies are available in applicable Google Drive folder
- All QMS documents are filed at the main work area for each contract location or other locations as designated by the QMS rep
- External documents of a legal nature, including DWWP, MDWL and other permits, may be controlled by the Owner, and copied to the main work location and the Project Manager
- Printed legislation and other governmental publications are uncontrolled. When referring to these documents, the QMS rep, or designate, shall refer to the online resources, rather than printed copies

Electronic File Retention and Obsolete Copies

- All files are stored on Google Drive
- Obsolete electronic documents and obsolete legislation may be stored in a separate file, archived or deleted
- Printed QMS documents that are obsolete shall be promptly removed from use by operations staff and disposed of

Retention Time

Documents are retained until newer (updated) versions are available

Protection from Damage

- Hard copies of documents are kept protected at the main work area.
- All electronic QMS documents reside in the applicable Google Drive folder

Associated Documents

AW-ADMIN-510 Records Control

Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
03/04/2009	Bullet #7 under Reviewing and Approving-changed the way a procedure is approved
03/18/2009	Added a note (Bullet #3) under 'Reviewing and Approving'
05/22/2009	Removed bullets referencing a chain from the QMS rep to the PM; they are the same person
05/27/2009	Under 'What' added SOPs to Work Instructions Under 'What' removed 'Hazard Analysis' and added 'Risk Assessment', inserted Critical Control Point Procedures Under 'What' added reference to Master List of Documents Removed Equipment Manuals and O&M Manuals from Associated Documents
01/26/2010	Added "of any revised documents, as needed" to reference to electronic calendars under 'Reviewing/Approving" Deleted bullet "how documents are filed' under 'Format' Added bullet to define who is responsible for distributing revisions of controlled documents (Releasing section) Added bullet defining who controls the release of updated documents (Releasing section)
02/03/2010	Removed reference to Administrative Assistant
02/18/2010	Under 'Releasing' removed reference to having printed copies on site Added where electronic versions can be found Removed 'stored in binders' from 'Protection from Damage'; referencing S: only
03/09/2011	Removed requirement of status and approver name in header
01/12/2012	Removed reference to C of A and added MDWL and DWWP
04/15/2014	Added a definition of Document
09/10/2014	Added Retention Time
09/23/2015	Removed references to Master List of Documents
09/30/2015	Removed references to Compliance Manager
09/07/2018	Updated table under Format Updated document logo
01/22/2019	Updated how documents are released, how Electronic/Obsolete copies are handled and where documents are stored

Purpose

This procedure defines the mechanism for maintaining records generated from the Quality Management System (QMS).

Definitions

“Record” - A record is a ‘snapshot’ of the conditions of the drinking water system.

Procedure

Who

- Records are filed as prescribed in QMS procedures

Filing of Records

Type of Record	Filing Location(s)	Responsible Person	Retention
Operator records (i.e. logbooks)	At water system and/or other location as appropriate	QMS Rep or Operations Personnel	5 Years (as per O. Reg. 128/04)
QMS records (i.e. daily/monthly log sheets)	At water system and/or another location as appropriate	QMS Rep/Operations Personnel	At least 5 years
Government compliance (inspection) reports	At water system and/or another location as appropriate	Project Manager/Operations Personnel	All are retained
Operator Training records	At water system and/or another location as appropriate	Operators/Project Manager	5 Years (as per O. Reg. 128/04)
QMS Audit results (Internal or third-party)	Electronically filed	QMS Rep or designate	At least 5 Years
Records of maintenance (i.e. work orders)	At water system and/or other location as appropriate	QMS Rep or Operations Personnel	At least 5 Years
Risk Assessments	Included in Operational Plan	QMS Rep	All are retained
Management Review meeting minutes	Electronically filed	QMS Rep or designate	5 Years
Laboratory results (includes adverse results)	At water system or another location as	QMS Rep or Operations staff	2 Years (as per O. Reg. 170/03)

	appropriate		
Purchase Order/receipts	At water system and/or other location as appropriate	QMS Rep or Operations staff	At least 5 years

*Though regulatory requirements are listed in the table above, it is recommended that records be retained at least six (6) years to cover two cycles of DWQMS accreditation by a registrar

Special Requirements for Log Books

- Retained as per legislative requirements

Electronic Records

- Electronic QMS records reside on the OA central network drive or in a designated area as required
- Electronic Maintenance records reside on the CMMS, if applicable
- Water quality records reside in an electronic data management system
- Electronic backup of the data management system is performed according to the vendor's internal data storage policy
- Electronic backup of the CMMS, if applicable, is performed according to the vendor's internal data storage policy

SCADA or Continuous monitoring records

- Continuous monitoring data is retained on SCADA computer
- Daily summary reports are generated for operators to review and these are stored in a designated area

Hard Copy or Paper Records

- All paper copies are properly stored (clean, dry, organized) in a designated area as outlined in the "filing of records" section of this procedure
- All written records must be legible and identifiable
- Records are identified by some form of a description (written or computer generated) that is included with the record

Retrieval of Records

- Anyone can make requests to the Operations staff or the QMS rep for the retrieval of records
- Operations staff, or QMS rep properly re-files all paper records retrieved

Disposal of Records

- Hard copies of records are disposed of by the QMS rep, or designate, as required
- Electronic records are deleted by QMS rep, or designate

Associated Documents

CMMS user documents and service agreement
Electronic data management system user documents and service agreement
Ontario Regulation 128/04
Ontario Regulation 170/03

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
10/03/2009	Added '(Internal or third-party)' to QMS Audit results under 'Type of Record' in table
27/05/2009	Removed reference to Project Manager. Using QMS rep for consistency Revised definition of 'Record' Added Purchase Orders/receipts and Risk Assessments to list of records
03/02/2010	Reviewed; no changes made
18/11/2010	Removed reference to WaterTrax in two bullets under Electronic Records Changed where SCADA data is retained; added Daily summary sheet bullet Replaced 'QMS Rep' with Project Manager as person responsible for Government inspection reports Changed how hard copies are disposed
20/10/2011	Under 'Hard Copy or Paper Records', identifiable is added to bullet #2 Also, a third bullet is added in this section explaining how records are identified
15/04/2014	Updated filing location from some records
12/09/2014	Added note under Table to indicate recommendation to keep documents for at least six years
11/03/2015	Removed references to Compliance Manager. Removed administrative assistant from Retrieval section
21/09/2018	Removed references to S drive Removed reference to network backup under Electronic Records

Purpose

This procedure describes the DWQMS risk assessment process. By performing a risk assessment, hazards in the drinking-water system are identified, and the control measures to address those hazards are described. The critical process steps associated with the most significant hazards are identified, and control limits, monitoring, and response procedures are established to ensure deviations in those critical process steps are planned for. Conducting a risk assessment and keeping it updated is an excellent learning process, and helps staff be more aware of risk and hazards in the waterworks. **The risk assessment now includes the hazards included in the MECPs document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated Feb. 2017.**

Scope

This procedure applies to the processes, hazards and hazardous events of which the Operating Authority has control.

References

Drinking Water Quality Management Standard Elements 7 and 8

Procedure

The risks must be assessed at least once every thirty-six months. The QMS representative and the operational staff, herein called 'the group', shall perform the Risk Assessment.

The information in the Risk Assessment table shall be reviewed at least once a year for validity and currency, by the QMS representative, prior to the annual management Review. This exercise shall also be completed when a significant change occurs in operations, such as a change in the type of process chemical or a change of equipment. When a new risk assessment is complete, it will replace the old assessment. The old assessment will be kept on-file.

The Risk Assessment table shall be used to record the information collected and decided upon in this procedure.

Hazard Identification and Control Measures

- Using process flow diagrams and process knowledge as a guide, the group shall discuss and review the basic waterworks projects, areas, process steps and sub-steps, within the scope of the Operating Authority responsibilities.
- The group shall review and modify as required the existing list of hazards/hazardous events, nature of hazard, potential effects, and make additions or edits as required.
- Special attention shall be given to areas within the process where changes have occurred since conducting the previous risk assessment exercise.
- The group shall also identify control measures in place, where they exist, for each hazard/hazardous event.
- The reliability and redundancy of equipment shall be considered during this exercise, especially when identifying control measures.
- All hazards shall be identified, whether they can be prevented within the scope of the Operating Authority responsibilities or not. For hazards that cannot be prevented with control measures, the inability to control shall be documented in the 'Control Measures' column and response procedures may be created under Emergency Management.

Risk Assessment

The group shall assign each hazard or hazardous event a numeric value ranging from 1 to 5 in three different categories: likelihood, severity, and detectability (see tables below).

LIKELIHOOD

Level	*Descriptor*	*Example Description*
5	Almost certain	Is expected to occur in most circumstances - occurs more frequently than monthly
4	Likely	Will probably occur in most circumstances - occurs monthly to quarterly
3	Possible	Might occur at some time/the event should occur at some time - once or twice per year
2	Unlikely	Could occur at some time, but less than once per year
1	Rare	May occur only in exceptional circumstances

SEVERITY

Level	*Descriptor*	*Example Description*
1	Insignificant	Insignificant impact, little disruption to normal operation, low increase in normal operations costs
2	Minor	Minor impact for small proportion of population, some manageable operation disruption, some increase in operating costs
3	Moderate	Minor impact for larger proportion of population, significant modification to normal operation but manageable, operation costs increased, increased monitoring
4	Major	Major impact for small proportion of population, systems significantly compromised and abnormal operation if at all, high level of monitoring required

5	Catastrophic	Major impact for large proportion of population, complete failure of essential systems

DETECTABILITY

Level	*Descriptor*	*Example Description*
1	High Detectability	automatic response AND alarm
2	Moderate Detectability	alarm/pager OR automatic response
3	Detectable	Visually detectable on operator's rounds; Regular maintenance would discover the problem
4	Poor Detectability	Visually detectable, but not inspected on a regular basis; Would not be detected before a problem was evident; Lab tests that are not done on a regular basis (e.g. quarterly)
5	Undetectable	Cannot detect

Determination of Critical Control Points

The three assigned numbers for each event shall be summed to determine the overall risk value. The highest overall risk values are typically indicators of critical events, associated with a critical control point (or critical process step).

Based on a review of the overall risk values and the associated events, a threshold risk value shall be chosen such that all process steps associated with risk values which are equivalent to or greater than the threshold value shall be considered CCPs. See table below for the selected threshold values:

Level of Likelihood + Severity+ Detectability	*Risk Category*
3 – 5	Low
6 - 8	Moderate
9 - 15	High – CCP

- In the case where a process step having a higher calculated risk value is not determined by the group to be critical, an explanation of the reasoning for this distinction shall be documented in the table.
- However, areas that cannot be preventively controlled should not be considered CCPs, regardless of their score

- An explanation of the reasoning shall also be documented when the group deems a process step associated with a lower calculated risk as critical.
- Note that inadequate primary disinfection is always critically hazardous to water quality, and shall always be associated with CCPs
- CCPs require the establishment of controlled conditions, including: critical control limits, monitoring, responses, reporting and recording procedures.

Critical Control Limits

- Critical limits shall be established for indicators that a critical control point is **outside of normal limits**. The limits provide staff with a range of acceptable values within which no corrective actions are required. Critical limits define the point at which staff must take action to prevent escalation of the critical event or to correct the critical event.
- Critical limits may be determined based on regulatory requirements, process monitoring capabilities, off-hours response time, and historical plant performance. Process alarms (if available) are normally set at, or near critical limits. Responses to breached critical limits are detailed in the Operations Manual and/or in the critical control procedure
- Critical control limits shall be documented in the associated CCP monitoring and/or response procedures.

Critical Control Monitoring and Response Procedures

- A procedure or series of procedures shall be established and implemented for monitoring the indicators against the critical control limits and for response if the critical control limits are exceeded.
- These procedures shall include or refer to reporting and recording instructions, related to the response actions.
- These procedures shall be referenced in the Risk Assessment table.

Associated Documents

Risk Assessments

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
27/02/2009	Changed 'Risk Assessment Consolidated' to 'Risk Assessment'
27/05/2009	Edited group description under Procedure Added bullet regarding uncontrollable hazards not being CCPs Removed turbidity and pressure from mandatory CCPs
18/11/2010	Under 'Procedure', changed 'annually' to 'once a year' Under 'Critical Control Liimits', added 'and/or in the CCP to bullet #2
08/03/2012	Revised descriptions for Levels 2 & 3 under Likelihood Revised footer
14/09/2017	Revised statement on how often risks are to be assessed
21/09/2018	New Veolia logo inserted in Header

22/01/2019	Updated bullet #1 under Critical Control Limits
19/12/2019	Included reference to MECP document regarding potential hazardous events

Purpose

This procedure describes the structure of key personnel within the QMS, and their roles, responsibilities, and authorities. This procedure clearly shows how information and responsibility is structured in the QMS. This procedure is critical in defining paths for communicating QMS information and assigning responsibilities.

References

Drinking Water Quality Management Standard Element 9

Procedure

Role	Responsibilities	Authorities
Owner (can include Public Works Manager, Council, Mayor)	• Supply clean drinking water to the public • Ensure Water Systems are properly operated • Prescribe requirements and monitor the operation of the Water Systems, as per the Contract between the Operating Authority and the Owner • Represent the Water Systems to the public • Provide resources or infrastructure as necessary • Endorsing the Operational Plan for the Drinking Water Systems.	• Provide for management or delegated management of utility assets • Review, revise and approve proposed and existing bylaws, expenditures, user fees, and taxation rates • Provide / review / approve administrative policy direction • To prescribe requirements and monitor operations, as per the operating Contract • To provide resources as per the operating Contract • To provide resources to ensure the proper implementation and continuance of the QMS, including access to personnel, access to equipment, and financial resources
Operating Authority (OA)	• Operate the Drinking Water Systems • Perform the operations as per the Contract between the OA and the Owner	• To perform its required operative duties as per the Operating Contract • To recommend

	• Obtain resources or infrastructure as necessary • Responsible for endorsing the QMS for the Drinking Water Systems • Undertaking the development, maintenance and Management Review of the QMS.	improvements or changes, as per the operating Contract • To implement improvements or changes, as per the operating Contract • To provide resources as per the operating Contract
OA – VP-Operations (Top Management)	• Participate in Management Reviews of the QMS • Respond to Owners requests as required • Communicating with the Owner, the public, regulatory authorities on behalf of the OA • Assigning responsibility of QMS rep	• To recommend improvements or changes, as per the operating Contract • To provide resources as per the operating Contract
OA – Project Manager/**QMS representative (reports to VP-Operations/Top Management**)	• Responsibilities of QMS rep as per Element 4 of Operational Plan • Establish, implement and maintain the QMS in accordance with the Drinking Water Quality Management Standard • Communicate the status, progress and need for improvement of the QMS to Top Management • Read and act upon non-conformances • Arrange, chair and provide necessary information to Top Management for the Management Review • Report the performance of the QMS to Top Management • Respond to Owner's requests as required • Represent the OA to internal or external parties with regards to the QMS including any external environmental communications • Review/approve relevant QMS documents, applications, etc. and ensure that the most current versions of documents required by the QMS are being used at all times • Ensure that personnel are aware of all current regulatory requirements that pertain to their duties with the operation of the drinking water system • Promote awareness and effectiveness of the QMS throughout the operating authority • Identify the need for resources or infrastructure	• To perform all defined responsibilities under the QMS • May assign a designate to perform any of the listed responsibilities

	• Manage laboratory results and sampling programs • May assign a designate to complete duties in his/her absence	
OA – Operations personnel (report to Project Manager)	• Carry out applicable QMS tasks • Plan and manage operations, and perform maintenance tasks for the water systems • Report and act upon non-conformances • Follow procedures, complete forms • File records • Laboratory sampling • Attend training • Keep records of external complaints and communicate them to Owner, if required • Regularly communicate to the QMS Representative • Carry out required operations and maintenance activities • Operators must maintain licenses	• To perform the required QMS duties

Associated Documents

Operating contract between the Owner and Operating Authority

Table of Revisions

Date (mm/dd/yy)	Description of Revision
02/03/2010	Added 'assigning responsibility of QMS rep' to Regional Director responsibilities Added examples to Owner reps.
03/09/2011	Removed AW-ADMIN-002 from Associated Documents
08/19/2013	Updated how external complaints are received by Operations personnel
09/15/2014	Removed reference to Projects Director; changed reference to Compliance Mgr to Compliance Mgr OR QMS Rep
11/03/2015	Removed references to Compliance Manager and revised QMS Rep responsibilities
09/21/2018	Updated logo; changed TM reference to VP-Operations
05/24/2019	Combined QMS/Project manager roles

Purpose

The table below lists the minimum levels of competencies required of trained **Veolia Water Canada** staff whose performance may have a direct impact on drinking water quality

References

Drinking Water Quality Management Standard Elements 10

According to O. Reg. 128/04, all operators (not including the ORO) are required to possess, at a minimum, a valid OIT certificate in Water Treatment and Water Distribution.
The ORO must hold, at a minimum, a certificate matching the class of the facility.

Operator Training Hours

- For an operator to maintain his/her license, a certain number of training hours are needed. This is dependant on the class of facility. Refer to MOE Guideline 4.5
- Training can be provided by the OA or a qualified third-party contractor
- In addition to the regulatory requirements to maintain licensing, all water system operations staff must complete the following training within a reasonable period of time within beginning employment, unless scheduling does not permit (more for remote locations):

Role	Competency Expectations
Overall Responsible Operator	Minimum licensing to the level of the system classification Understanding of DWQMS
Operator in Charge	Minimum Class I Water Distribution & Class I Water Treatment Understanding of DWQMS
Operator	Minimum OIT in Water Distribution & Water Treatment Understanding of role within DWQMS

Satisfying Competencies

- Operator competency is initially assessed through the Operating Authority Human Resources hiring policies and procedures
- All full time employees participate in an annual performance and development review process to promote the expectations of the company
- Records of an interim and final performance review are maintained by the Operating Authority

  Project manager is responsible for maintaining competencies listing
- Operator training is maintained electronically

- Both on the job training and CEU training is included as per O. Reg. 128/04
- For new staff, competency is monitored by the lead operator or ORO
- On-the-Job training, including annual DWQMS review for update and understanding, is provided by Veolia Water Canada or other contractors
- Relevant on-the-job training sessions are determined by project manager, or designate
- Resources are provided by Veolia Water Canada for external training
- It is the responsibility of both the operator and Veolia Water Canada to ensure competency expectations are met
- If an employee is hired without the full competency requirements, they are not assigned full duties (as a condition of employment), and then regular internal / external training is conducted to acquire the competency requirements

Other Expectations

- Throughout the hiring process and subsequent employment of staff, other qualities are also desirable, including, but not limited to:
    - Ability to follow instructions/procedures
    - Problem solving
    - Ability to work independently or as part of a team
    - Managing time and schedule
    - Respond to customer needs
    - Supporting company goals

Relevance of Duties

- New employees are introduced to the DWQMS during on-the-job training
- Annual review of QMS reinforces relevance of operator duties
- The DWQMS policy is posted at a central operations location

Training Records

- Accurate training records are the responsibility of the operator
- Training records are maintained at the main work area

Other

Other employees (i.e. QMS Rep., internal auditor, Project Manager) are made aware of the relevance of their duties via verbal and/or electronic (email) updates

Associated Documents

O. Reg. 128/04 Certification of Drinking Water System Operators and Water Quality Analysts
MOE Guideline 4.5 O. Reg. 128/04 Phase-In of New Training Requirements

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
10/03/2009	Added bullets under Satisfying Competencies and who can provide training under

	Operator Training Hours
22/05/2009	Removed reference to *www.oetc.ca* in Associated Documents
03/02/2010	Added reference to other OA employees in 'Other'
22/11/2010	Under 'Satisfying Competencies' bullet added regarding initial operator competency Also two bullets regarding Competency form added
19/12/2011	Removed reference to Competency Form Changed satisfying competency for new employees
09/11/2012	Added 'Other Expectations' Added reference to company performance review process
27/11/2015	Removed reference to training booklet in Relevance of Duties
06/04/2016	Removed reference to Orientation booklet. Added item about annual review of QMS and relevance of duties
21/09/2018	Updated logo in header and changed AWCC to Veolia Water Canada
22/01/2019	Removed reference to AWCC in Satisfying Competencies

Purpose

This procedure describes how to ensure sufficient personnel meeting the identified competencies are available for duties that directly affect drinking water quality

Procedure

Veolia Water Canada Inc. ("Veolia") employs licensed operators, all of whom are required to hold certificates for water treatment and/or water distribution, as per AW-ADMIN-1000.

Veolia provides sufficient daily coverage, as per each Operations and Maintenance contract, typically an eight hour day. Off-hours on-call coverage is also provided 24 hours a day.

On-Call Coverage

- Off hours emergencies are addressed by the designated on-call operator
- The on-call schedule is typically set by the operator in charge
- Typical on-call emergencies can be handled by the sole on-call operator

Water systems are monitored by an alarm system, which notifies the operator when alarm conditions are encountered. Each alarm must be acknowledged by an operator otherwise another operator will be contacted, based on set programmed list set up in dialer system. This will continue until the alarm has been acknowledged. **In any rare instance where a Veolia operator is unable to respond to an alarm, a West Grey Public Works employee contact number is also included in the call out list.** Operators respond to alarm conditions, within a time period set forth by the Contract, to investigate and rectify any outstanding issues. Conservative alarm set points plus multiple monitoring and treatment barriers are in place to reduce risk to public health.

If circumstances arise where additional staff is required, assistance can be requested from any of the other off-duty licensed operators. Contact information for additional back-up is in the Emergency Contact List.

Associated Documents

AW-ADMIN-1000 Competencies
Emergency Contact List
Operations and Maintenance Contracts between Veolia and Owner

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
29/09/2015	Initial issue of document (previously used AW-ADMIN-1100)

10/09/2018	Updated to Veolia logo and changed reference to Veolia in Associated Documents and Procedure
22/01/2019	Removed reference to on-call schedule being posted
31/05/2021	Included comment that West Grey Public Works employee contact number is also entered into the alarm callout list

Purpose

This procedure describes the communication of QMS issues by Top Management amongst Operating Authority staff, the water system Owners, Suppliers and the public.

References

Drinking Water Quality Management Standard Elements 12

Procedure

Who

- For both internal and external communication, the QMS Representative and Top Management serve as the main pipeline for QMS communication
- Top management may designate communication responsibilities to the QMS rep via an appointment letter
- Internal QMS communication mainly occurs between the QMS Rep. and OA operations staff and Owner's designate
- External QMS communication may occur between the Owner's staff, the OA head office, other water treatment systems, suppliers, lawyers, consultants, regulators, DWQMS accreditation agencies, consumers, community groups, neighbours, and other interested parties.

Communication with the Owner:

- Management review meetings (as per AW-ADMIN-2000, Management Review Procedure)
- Regular administration meetings, including maintenance and operations reports submitted as per operations contract between Owner and OA
- Informal meetings (direct telephone contact, e-mail, site visits)

Communication with Personnel:

- Postings in the central work location at the water system
- Informal meetings (informal discussions, e-mail, memos, phone contact)
- QMS reviews

Communication with Suppliers:

- Written and verbal commitments related to purchasing (purchase orders)
- Verbally communicated to suppliers directly from Operators

- Essential Supplier/Contractor letter of notification (details included in WG-ADMIN-1300)

Communication with Consumers:

- Phone inquiries, complaints, and concerns from the public typically come to Owner and then are passed on to OA as required. OA will follow up with consumer.
- Annual compliance reports may be posted on Owner's website
- Notification of water system emergencies and alerts
- Press releases as required (issued by the Owner)
- All public documents are made available to the public upon request to the Owner
- Public information posted as required at municipally-owned buildings

Associated Documents

- Contract between Operating Authority and Owner
- Management Review (AW-ADMIN-2000)
- Essential Supplier/Contractor notification letter

Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
06/01/2009	Initial Issue of Document
11/17/2010	Removed Quarterly safety meetings and Review of operators log books from 'Communication with Personnel'
01/16/2012	Removed 'Communication with Top Management' Revised Purpose Included Top Management being able to delegate responsibility to QMS rep
04/09/2018	Added reference to WG-ADMIN-1300 under Communication with Suppliers
09/10/2018	Updated company logo in header

A. Purpose

This procedure identifies the supplies and services essential for the delivery of safe drinking water.

B. References

Drinking Water Quality Management Standard Elements #13

C. Procedure

- Suppliers for Water System Equipment and Chemicals deal in NSF/ANSI supplies only
- Letters are sent, on a three year basis, to primary suppliers notifying/reminding them that their products/services are considered 'essential' under the QMS
- Letters are sent to Other Suppliers, if their services are used
- Agreements with Suppliers/Service providers are of an open purchase order agreement
- Operations staff, through experience, makes the orders when required.
- Upon receipt, staff inspects the delivery and compares to packing slip to ensure accuracy. Packing slips are kept on-file at the water system.
- Generators (at Well #1 and the booster station) have fuel to run 1-2 days. Spare fuel is readily available through Owner

Supply or Service	**Primary Supplier**	**Other Suppliers**
Accredited Laboratory Services	SGS Laboratories 657 Consortium Court London, ON 1-877-848-8060	Bureau Veritas Labs 6740 Campobello Rd Mississauga, ON 905-817-5700 Toll Free: 1-800-563-6266
SCADA	Selog 79 Moutainview Road North Unit #1 Georgetown, ON L7G 4J6 905-873-7373	Capital Controls 10-830 Industrial Ave. Ottawa, ON K1G 4B8 613-248-1999
Disinfectant (Sodium hypochlorite)	Juzti Water Technologies 525 Wright Blvd Stratford, ON 519-814-9283	Brenntag Canada Inc 43 Jutland Road Etobicoke, Ontario M8Z 2G6 Tel: 514-636-9230

Filters	General Filtration 441 Applewood Cr. Concord, ON L4K 4J3 905-761-9000	Pall (Canada) Ltd 3450 Ridgeway Dr Unit 6 Mississauga, ON L5L 0A2
Flowmeter calibration	**Flowmetrix Technical Services Inc. (SCG Flowmetrix)** 2088 Jetstream Road London, ON N5V 3P6 519-870-3569	Summa Engineering Ltd 3230A American Dr Mississauga, ON L4V 1B3 905-678-3388
Instrumentation Calibration	**Flowmetrix Technical Services Inc**.(see above)	Summa Engineering Ltd 3230A American Dr Mississauga, ON L4V 1B3 905-678-3388
Well Driller	International Water Supply 342 Bayview Dr Box 310 Barrie, ON L4M 4T5 705-733-0111	Highland Well Drilling 225 Elm St. E Durham, ON N0G 1R0 519-369-6363
Electrician	Dewar Electric 1 Victoria St Mount Forest, ON N0G 2L1 519-323-9000	Wayne's Electric Ltd 570 1st St. Hanover, ON 519-364-4020
Instrumentation Parts (Metering pumps, online analyzers, etc.)	**Smith Cameron Process Solutions** (previously Metcon Sales & Engineering Ltd) 15 Connie Cres Unit #5 Concord, ON L4K 1L3 905-738-2355	Carson Plumbing Supply 1071 Goderich St. N Port Elgin, ON 519-389-6245
Reagents for sampling	Hach Sales and Service Canada 3020 Gore Rd London, ON N5V 4T7	Cleartech Industries 1500 Quebec Ave Saskatoon, SK S7K 1V7
UV lights	Trojan Technologies 3020 Gore Rd London, ON N5V 4T7 519-457-3400	H2Flow Equipment Inc. 580 Oster Lane Vaughan, ON L4K 2C1 905-660-9775
Diesel Fuel (Durham #1B and booster station)	Municipality of West Grey 519-369-4343	

D. Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
11/17/2010	QMS Rep reviewed procedure with staff. No changes required

05/11/2011	Added reference to contractor letters being sent every three years
12/01/2011	Added UV light vendor, backup lab services
12/19/2011	Added diesel fuel, updated Durham SCADA
02/02/2012	Added when letters are sent to Other Suppliers Toromont removed from primary suppliers
02/15/2012	Updated address for Coulter Water Meter Service
06/14/2012	Removed Millenium Control for Neustadt water
11/22/2012	Added Well Driller and Electrical contractors
09/15/2014	Removed 'verbal' from the supplier agreement bullet
05/25/2015	Changed name for Hach contact
01/12/2016	Added "booster station" to diesel fuel line
01/15/2016	Added line about gensets/fuel in Procedure
04/01/2016	Removed Ken Gould from Filters contact list
05/06/2016	Revised Coulter vendor name
04/06/2017	Replaced ERTH with Flowmetrix
05/15/2017	Updated Electrician contacts; updated contact info for Emerson; added backup meter calibration contact
03/05/2018	Updated SCADA and UV contact addresses
07/12/2018	Updated Filter vendor
09/10/2018	Updated logo in header
01/22/2019	removed US filter from Instrumentation. Added Canada Colors as backup hypo supplier
12/06/2019	Updated General Filtration, Flowmeter Calibration, Instrumentation Calibration, UV Lights
02/18/2019	Updated business name of primary lab
06/05/2020	Updated backup suppliers for SCADA, disinfectant, flowmeters, instrumentation, well driller. Updated primary supplier for instrumentation parts
11/04/2020	Added a line for reagents
05/31/2021	switched primary and 'Other' lab suppliers, well driller, UV lights Section C: added language that the supplies/services are essential
04/25/2022	Updated contact information for Disinfectant Primary Supplier
06/01/2022	Updated company name for flowmeter calibration and instrument calibration
09/27/2022	revised names for flowmeter and instrument calibration as well as Instrumentation parts

Purpose

This procedure defines the process used by Veolia Water Canada Inc. to review the adequacy of the infrastructure and resources necessary to operate and maintain the drinking water system safely and effectively. This procedure ensures periodic evaluation of the condition and capacity of infrastructure components. The results of the evaluation are used to prioritize future resource allocation.
This procedure is applicable to all Veolia Water Canada infrastructure components that fall under the scope of the QMS

References

Drinking Water Quality Management Standard Element #14

Procedure

- The need for infrastructure will be communicated to the Owner on an as-needed basis, but at least once per calendar year
- Outcomes of the risk assessment must be considered when communicating infrastructure needs
- Communication methods can include verbal, e-mail and system summary reports
- Quarterly system reports include infrastructure review items
- There is frequent informal contact between Owner and Operating Authority (operations staff)
- The Owner maintains notes of discussions regarding infrastructure
- The named managers and staff shall consider previous MOE Compliance Inspection Reports, flow data trends, water quality reports and maintenance records to determine priority needs

Determining Priorities

- The Owner maintains plans to determine how the area will grow, both short term and long term, and where they believe infrastructure and resources will be necessary. These plans are development-driven
- MOE Compliance reports will often include infrastructure items (i.e. watermains in the distribution system) and will sometimes include recommendations
- Areas of concern will also be recognized based on past issues (i.e. watermain breaks)
- Based on all of these items, priorities can be set for the provision of resources for infrastructure

Associated Documents

MOE Compliance Inspection Reports

Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
06/01/2010	Initial Issue of Document
11/17/2010	Added bullets #3 and #5 under 'Procedure'
04/21/2011	Added 'Quarterly Reports include infrastructure items' Deleted annual discussion bullet
09/14/2017	First bullet under Procedure: added once per calendar year Added the need to consider outcomes of risk assessment
09/10/2018	Added Veolia logo to header. Changed AW references to Veolia

Purpose

This procedure describes the sampling schedule and analytical program used for monitoring the water quality for all West Grey drinking water systems. It outlines the responsibilities of operators and outside laboratories in regards to analyses performed and reporting duties.

Regular and strict adherence to a schedule is required to meet legislated and regulatory requirements and to ensure all operators are aware of their responsibilities regarding the required timing of sampling.

All sampling and analysis is required to comply with Ontario Regulation 170/03, or to monitor additional parameters that affect water quality or aid in process control.

References

Drinking Water Quality Management Standard Elements 16

Responsibility

Only operators with valid Drinking-Water Operator certificates are permitted to sample drinking water and conduct laboratory analyses. The operator on duty performs the drinking water sampling, as well as the daily analyses. All other analyses must be performed by the staff of an accredited laboratory.

Procedure

Veolia Water Canada Inc. uses a sampling program for all its water systems, based on legislative requirements. Sample schedules are available on the West Grey Google Drive. Operators sample according to the AWWA Standards for Disinfecting Drinking Water Mains throughout any maintenance project undertaken within any Veolia (previously American Water) water system.

Free chlorine residual results are acquired from in-house analysis (a portable chlorine analyzer) conducted by the operator. Biological and chemical lab results are obtained from a selected accredited laboratory, though samples are collected by the operator. In-house results are entered into monthly spreadsheets by the operator and kept on-file. Bacteriological and chemical results from the accredited laboratory are provided in electronic format and are kept on file. All results are uploaded by qualified laboratory staff to HachWIMS where pertinent operations staff can review, if required

A list of all applicable parameters (except for free chlorine) can be found in O. Reg. 169/03

Continuous Monitoring

- Raw water turbidity (Neustadt only), treated water turbidity and treated water free chlorine residual are monitored continuously with online analyzers
- The operator on duty shall verify online treated water chlorine residual by comparing to portable chlorine analyzer results, usually about once a week
- Chlorine and turbidity analyzers shall be adjusted when necessary per manufacturer's instructions
- UV dosage is monitored continuously by the SCADA system
- All systems have a method to monitor and log daily continuous information (SCADA) that is reviewed as per O. Reg. 170/03
- Daily max and min POE free chlorine residual, obtained from SCADA, is recorded in HachWIMS

Routine Sampling and Analysis

- Online analyzer readings (chlorine, UV and turbidity) shall be visually checked daily at the plant by the operator on duty
- SCADA data is reviewed on a daily basis, and filed at the plant, or at a central location. Portions of this data are also uploaded to the HachWIMS database
- Regulatory distribution samples are collected and tested for free chlorine residual as per O. Reg. 170/03. Distribution samples can be taken from various points in the distribution system. The sampling location and result are recorded on the daily log sheets. These values are entered into the HachWIMS database
- If there is a problem with an internal result, it is recorded and re-tested. If the problem is confirmed, and it is below or above a regulatory limit, it must be reported as per the Contingency Plan

Weekly Sampling and Analysis

- Weekly bacteriological samples are collected from raw water, treated water and from various points in the distribution system as per O. Reg. 170/03 and sent to an accredited laboratory. Each sample is tested for *Escherichia coli*, total coliforms, and the general bacteria population expressed as background colony counts or heterotrophic plate count (HPC). A minimum of 25% of the distribution samples must be tested for HPC.
- Treated water samples are collected from a point within the treatment system that occurs after the chlorine injection point
- Distribution samples shall be collected from any of several points throughout the system.
- Bacteriological samples shall be delivered in designated coolers to the accredited laboratory within the prescribed hold time
- A Chain of Custody form, including the sample details and the free chlorine residual of the samples, shall be completed and submitted to the laboratory with the samples. A copy of this form stays with the operator and is filed at the plant, or at a central location.

Monthly Sampling and Analysis

- As per the Municipal Drinking water licenses for the drinking water systems, monthly UV transmittance monitoring is conducted and recorded
- Duty UV sensors are checked against a reference UV sensor as per the MDWL

Quarterly Sampling and Analysis

- Every three months, drinking water from the distribution system shall be tested for Trihalomethanes (THMs) and Haloacetic Acids (HAA). THM samples must be collected nearest to the furthest point in the distribution system as possible. HAA sampling locations must follow MOE recommendations. Nitrates/Nitrites samples are collected from the treated water tap. Samples are sent to accredited laboratory for analysis
- Other sampling for any additional internal or external testing shall be performed as per the waterworks applicable Drinking Water Works Permit (DWWP) or Municipal Drinking Water License (MDWL)

Lead Sampling

- Sampling and testing for lead shall be performed and documented as per the regulatory requirements (Schedule 15.1 of O. Reg. 170/03).
- Sampling frequency for lead is conducted on a schedule identified in Schedule 15.1 of O. Reg. 170/03

Annual Sampling and Analysis

- Samples are collected every 12 months as per Schedule 13 of O. Reg. 170/03 and analyzed for inorganics (Schedule 24) and organics (Schedule 23). Samples to be analyzed shall be collected from a point within the treatment system occurring after chlorine injection.
- There may be other sampling required as per individual DWWP or MDWL

Sampling and Analysis required on an Infrequent Basis (60 months)

- Treated water collected from the treated water tap must be analyzed for sodium and fluoride as per Schedule 13-8 and 13-9 of O. Reg. 170/03

Upstream Sampling

No upstream sampling, testing or monitoring is required for these systems.

Delivery of Samples

Samples are collected by operations staff and left at a satellite location where they are picked up by a driver from the laboratory and then delivered to the lab. The QMS rep is notified via text when the samples have been picked up. Staff is also notified by the lab electronically (via email) when samples are logged

Adverse Results

If the accredited laboratory discovers adverse quality (refer to O. Reg. 169/03), they are obligated to notify as per Schedule 16-6(3) of O. Reg. 170/03. Operations staff is to follow the steps in the Contingency plan for Adverse Water Quality notification

Reporting Results

Copies of bacteriological and chemical analytical results are sent to the Owner (by the laboratory) and then provided (by the Owner) to members of the public in the Public Information binder located in the Municipality office. In house laboratory results may also be provided upon request. Other monitoring results are summarized in the Annual Report as per O. Reg. 170/03 (Section 11 and Schedule 22)

All yearly analytical results are summarized and are discussed in the Annual Reports, which is provided to the owner and made available to the public on the Municipality website, or upon request

Associated Documents

O. Reg. 170/03
AWWA Standards for Disinfecting Drinking Water Mains
DWWP/MDWL
O. Reg. 169/03
Contingency Plans
Operations and Maintenance Manuals

Table of Revisions

Date (mm/dd/yyyy)	**Description of Revision**
11/18/2010	Added that sample schedules can also be found posted at a central location Added AWWA Standards to Associated Documents Added that lab results are kept on file Replaced 'WaterTrax' with 'HachWIMS' Deleted where distribution sample locations can be found Replaced info under Monthly sampling with reference to UV transmittance monitoring Added bullet defining sampling frequency for lead sampling Removed the reference to Sched. 23&24 sampling under 'Infrequent' testing
04/21/2011	Added bullet referring to SCADA FCR data under 'Continuous Monitoring'
11/19/2012	Updated how UV dosage is monitored Updated UV transmittance information Removed 'Twice Yearly' from Lead Sampling
09/15/2014	Added section on Delivery of Samples
01/12/2016	Added email notification of sample receipt in Delivery of Samples section
09/10/2018	Changed company logo in header Removed references to American Water and Certificates of Approval and replaces with Veolia and MDWL/DWWP, respectively Updated quarterly sampling to include HAA
06/05/2020	Update location where sampling schedules can be found Updated analyzer and distribution system readings in Routine section Removed Large Municipal systems from Weekly Updated first bullet in weekly section Changed monthly UV transmittance to include both systems; added item about reference sensor
06/01/2022	Updated Delivery of Samples section

Purpose

This procedure describes the method used by **Veolia** Water Canada Inc. (previously American Water Canada) to ensure that all measurement and recording equipment in the West Grey water systems is calibrated and maintained. Accuracy of this equipment is essential to providing quality drinking water to the consumer with confidence that the characteristics of the water meet or exceed legislated requirement and internal targets set forth by **Veolia**.

References

Drinking Water Quality Management Standard Element 17

Procedure

Operations staff shall ensure that all calibration and maintenance for all equipment is performed at the required frequency.

This procedure is applicable to the following types of equipment in use at the drinking water facilities owned by the Municipality of West Grey:

- Continuous chlorine residual analyzers
- Continuous turbidimeters
- Portable colorimeters
- Portable turbidimeters
- Flow meters
- pH meters
- UV sensors
- Any other devices measuring and monitoring process conditions, whose data is used for process control

- Operations staff keep track of when calibration of measurement and recording equipment is required using the JobCal computerized maintenance management system (CMMS) and communicate with contractor prior to requiring calibration
- A qualified staff member or contractor will ensure the proper calibration of the equipment (refer to Element 13: Essential Supplies and Services)
- The frequency of calibration shall be at least that which is required by O. Reg. 170/03, or according to manufacturer's recommendations, whichever is more often.
- All calibration and maintenance shall be performed according to manufacturer's instructions
- All third-party flow meter calibration reports shall be filed in a designated area

- Regular and corrective maintenance for equipment is also recorded and tracked in the CMMS

Associated Documents

O. Reg. 170/03
Equipment O&M manuals
Work Orders / Calibration Reports

Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
11/18/2010	Removed reference to Calibrations list and added reference to JobCal CMMS Removed level sensors from list
05/04/2011	Added bullet for regular and corrective maintenance items Added CM tracking forms to Associated Documents
11/19/2012	Deleted pressure gauges from list Removed Corrective Maintenance tracking forms from Associated Documents
01/27/2015	Added UV sensors to equipment list
09/10/2018	Updated logo and changed AW references to Veolia

Purpose

This procedure describes how Veolia Water Canada maintains a state of emergency preparedness

References

Drinking Water Quality Management Standard Element #18

Procedure

Procedures for Emergency Conditions are found in the Contingency Plans in the O&M manuals found at each site.

Conditions covered may include:

- Adverse water quality
- Major Power Failure
- Raw water contamination
- Spills
- Low pressure
- Pipeline breaks

Emergency Response and Recovery

- Operations staff may provide first response to an emergency, though Owner staff may do so as well
- Contingency Plan identifies OA responsibilities in an emergency
- Overall response can be carried out by OA or public works employees, or in some combination, depending on the emergency
- If the OA is the first to become aware of an emergency, the OA will notify the Public Works Manager, or designate, of the emergency within a reasonable period of time (this will depend on the emergency)
- Communications with the public is directed through the Public Works Manager or designate
- The Public Works Manager will inform council and water committee members at the appropriate time depending on the scope and magnitude of the emergency
- Details to assess and address the emergency can be found in the Contingency Plan

Emergency Contacts

- A list of emergency contacts are posted at each facility and are included in Appendix E
- The operations staff, along with the QMS rep, will keep this list up to date

Emergency Response Training and Testing

- Contingency plans are reviewed at least annually to ensure they are complete and up-to-date
- Diesel generator in Durham is tested on at least quarterly to test for response to power outages
- Alarm call outs to operators are evidence that the alarm system works as it should
- At least annually, a written test is issued to the operators regarding various emergency scenarios
- Operators response to the emergency is based on experience, which includes on-the-job training
- Operator response to actual (real time) emergency situations (i.e. low chlorine alarm) partly meets testing requirement
- If any procedural changes are required as a result of any emergency response, it is the OA's responsibility to document the changes
- Emergency events are recorded in the Operators log book

Associated Documents

Contingency Plans for Durham and Neustadt
Operators Log book

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
20/10/2010	Changes made within Emergency Response and Recovery and Emergency Response Training and Testing
18/11/2010	Added 'Durham only' to bullet #2 for ERTandT
15/12/2011	Added item regarding alarm call outs Removed unauthorized entry and 'other situations' from alarm conditions
22/12/2011	Removed bullet re: testing non-compliance item and one OP item Added item regarding ERP test Added header to both pages for easier identification
22/11/2012	Added that contingency plan can be found in Appendix E Added actual emergency situations to emergency response testing/training
06/01/2014	Changed Durham diesel genset testing from quarterly to "at least quarterly
10/09/2018	Updated logo and references from AWCC to Veolia

Purpose

This procedure describes the process used by Veolia Water Canada ("Veolia") to conduct internal audits of the Quality Management System (QMS). Internal audits are conducted to evaluate conformity of the QMS with the requirements of the Ministry of the Environment's Drinking Water Quality Management Standard.

References

Drinking Water Quality Management Standard Element 19

Procedure

Responsibilities

- The QMS Representative shall manage the overall performance of internal QMS audits,
- Performance of audits may be subcontracted to qualified external auditor(s), or a qualified auditor from within the company
- The Lead auditor shall prepare an audit plan and report and manage the audit

Audit Schedule and Frequency

- QMS audits (all elements audited) are performed at least once every calendar year
- Partial audits (only some elements) can be conducted as long as all elements are audited in every calendar year
- Revisions to the audit schedule may be based on the results of prior audits
- Audit frequency will be established on a priority basis, taking into account previous audit results and the relative importance of the area or department, and will not be less that once per year for each location
- Audit schedule is maintained by the QMS Rep or designate

Auditors

- The QMS Representative shall arrange for an auditor or an audit team
- The team will consist of a Lead Auditor, and may consist of additional auditors
- An audit team may be formed whose membership is outside the day to day operational staff for each facility
- This independence will be documented by indicating on the audit report or other audit record the organization to which the auditors belong

Audit team may consist of the person(s) with the following qualifications:

- Veolia employees who have completed internal audit training,

- Anyone who has completed internal auditor training or, at the very least, have a background in Quality Management Systems
- Consultants with demonstrated experience in internal auditing of QMS

Audit Plan

- The audit plan may include scope, criteria, schedule, auditors, and a description of methodology
- Audit scope and criteria will be established prior to each audit
- The audit criteria for QMS internal audits is the Drinking Water Quality Management Standard
- The audit plan shall be submitted to the Project Manger prior to the audit for review

Audit Checklists

- Performance of audits shall be documented by the auditors using the Audit Checklist (AW-ADMIN-1900), or a suitable alternative
- The checklist shall be reviewed for suitability prior to each audit by the Lead Auditor, and distributed to any other auditors

Audit Methodology

- The QMS rep will forward a copy of the current Operational Plan (and any previous audit results) to the auditor for review prior to the first day of the audit
- The auditor shall review any non-conformances identified in previous QMS audits (internal and external)
- To begin the audit, the lead auditor shall review audit plan with staff
- **All onsite audits** shall include a visit to representative areas of the water system being audited **(*NOTE* in the unusual case where an onsite audit cannot be conducted, a remote audit may be possible and a portable device could be used to show the auditor a live image of the areas)**
- Auditors shall record audit information, including
    - areas visited
    - items checked
    - individuals interviewed
    - documents or records reviewed
    - concerns identified
- For completeness, no areas in the checklist may be left blank
    - If an item is Not Evaluated, it is marked ‘NE’
    - If it is Not Applicable, it is marked ‘NA’
- Upon completion of an internal audit, the auditors shall review their findings together, and the Lead Auditor shall decide on non-conformances and opportunities for improvement

Reporting Findings /Follow-Up

- A closing meeting may be held, where the Lead Auditor presents findings to the OA
- The Lead Auditor shall prepare a report of the findings, or forward a completed copy of the auditor’s checklists with the front summary page completed
- The Lead Auditor shall submit the report to the QMS Representative

- Findings will also be submitted to Top Management during Management Review
- Top Management, or the QMS Rep, is responsible for reporting the results to the Owner
- The QMS Representative shall handle the non-conformances by following the **Continual Improvement** procedure (AW-ADMIN-1920)
- The QMS representative is responsible for documenting any approved action plans and closing out non-conformances

Records

- Completed auditor checklists are retained by the auditors
- Audit reports are filed by the QMS Representative with QMS records
- Audit plans are filed by the QMS Representative with QMS records
- Completed Corrective Action Forms are filed as per the **Continual Improvement** Procedure (AW-ADMIN-1920)
- Audit schedules are retained by the QMS Rep

Associated Documents

- Internal Audit Checklist (AW-ADMIN-1910)
- Internal Audit Schedule
- **Continual Improvement** Procedure (AW-ADMIN-1920)
- Internal Audit Reports

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
22/05/2009	'and QMS representative' removed from last bullet in Audit Plan
18/11/2010	Internal auditor can also come from within the company ('Responsibilities') Audit schedule maintenance changed to QMS Rep from PM For bullet #3 under 'Auditors'-'shall' replaced with 'may' Added: QMS Rep can report Audit findings to Owner
24/04/2012	Defined '12 months' and clarified Audit Frequency Updated beginning of Audit Methodology
15/09/2014	Added bullet to Report Findings about action plans and closing out NC
08/03/2016	Removed reference to AW-ADMIN-1930 in Associated Documents
14/09/2017	Changed "12 month period" to "calendar year" Removed definition of "12 months"
25/10/2017	Updated first bullet under Audit Schedule and Frequency (bold)
24/09/2018	Updated to Veolia logo and changed any reference from AW to Veolia
28/04/2020	Changed references to AW-ADMIN-1920 (Continual Improvement procedure) Added additional language under Audit Methodology about the possibility of remote audits

Internal Audit Checklist

DATE OF INTERNAL AUDIT:	
AUDITOR NAMES:	
DRINKING WATER SYSTEM:	
AREA(S)/FACILITY VISITED:	
PEOPLE INTERVIEWED:	
DOCUMENTS VIEWED:	

DWQMS Requirement	Notes	Findings (see footer for definitions)
1. Quality Management System PLAN – The Operational Plan shall document a Quality Management System that meets the requirements of this Standard.		
DO – The Operating Authority shall establish and maintain the Quality Management System in accordance with the requirements of this Standard and the policies and procedures documented in the Operational Plan.		
2. Quality Management System Policy PLAN – The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and: a) includes a commitment to the maintenance and continual improvement of the Quality Management System, c) includes a commitment to the consumer to provide safe drinking water, d) includes a commitment to comply with applicable legislation and regulations, and e) is in a form that can be communicated to all Operating Authority personnel, the Owner and the public.		 a) b) c) d) e)
DO – The Operating Authority shall establish and maintain a Quality Management System that is consistent with the QMS Policy.		
3. Commitment and Endorsement PLAN – The Operational Plan shall contain a written endorsement of its contents by Top Management and the Owner.		

DWQMS Requirement	Notes	Findings (see footer for definitions)
DO – Top Management shall provide evidence of its commitment to an effective Quality Management System by:		
a) ensuring that a Quality Management System is in place that meets the requirements of this Standard,		a)
b) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,		b)
c) communicating the Quality Management System according to the procedure for communications, and		c)
d) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.		d)
4. Quality Management System Representative PLAN – The Operational Plan shall identify a Quality Management System representative.		
DO – Top Management shall appoint, and authorize a Quality Management System representative who, irrespective of other responsibilities, shall:		
a) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained,		a)
b) report to Top Management on the performance of the Quality Management System and any need for improvement,		b)
c) ensure that current versions of documents required by the Quality Management System are being used at all times,		c)
d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and		d)

DWQMS Requirement	Notes	Findings (see footer for definitions)
e) promote awareness of the Quality Management System throughout the Operating Authority.		e)
5. Document and Records Control PLAN – The Operational Plan shall document a procedure for document and records control that describes how: a) documents required by the Quality Management System are: i. kept current, legible and readily identifiable ii. retrievable iii. stored, protected, retained and disposed of, and b) records required by the Quality Management System are: i. kept legible, and readily identifiable ii. retrievable iii. stored, protected, retained and disposed of.		 a)i. a)ii. a)iii. b)i. b)ii. b)iii.
DO – The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes: a) the Operational Plan and its associated policies and procedures, b) documents and records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and c) the results of internal and external audits and management reviews.		 a) b) c)
6. Drinking-Water System PLAN – The Operational Plan shall document, as applicable: a) for the subject system:		 i.

DWQMS Requirement	Notes	Findings (see footer for definitions)
i. the name of the Owner and Operating Authority ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection A. a description of the system including all treatment system processes and distribution system components B. a Treatment System process flow chart C. a description of the water source, including: I. general characteristics of the raw water supply II. common event-driven fluctuations and III. any resulting operational challenges and threats iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection: A. a description of the system including all Distribution System components, and B. a description of any procedures that are in place to maintain disinfection residuals b) if the subject system is an operational subsystem, a summary description of the municipal residential drinking-water system it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems c) if the subject system is connected to one or more other drinking-water systems owned by different owners, a summary description of those systems which: i. indicates whether the subject system obtains water from or supplies water to those systems,		ii. iii. iv. i. ii. iii. v. b) c) i. ii.

DWQMS Requirement	Notes	Findings (see footer for definitions)
ii. names the Owner and Operating Authority of those systems, and iii. identifies which, if any, of those systems that the Subject System obtains water from are relied upon to ensure the provision of safe drinking water		
DO – The Operating Authority shall ensure that the description of the drinking-water system is kept current.		
7. Risk Assessment PLAN – The Operational Plan shall document a risk assessment process that: a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at www.ontario.ca/drinkingwater b) identifies potential hazardous events and associated hazards, c) assesses the risks associated with the occurrence of hazardous events, d) ranks the hazardous events according to the associated risk, e) identifies control measures to address the potential hazards and hazardous events, f) identifies critical control points, g) identifies a method to verify at least once every calendar year, the currency of the information and the validity of the assumptions used in the risk assessment, h) ensures that the risks are assessed at least once every thirty-six months, and h) considers the reliability and redundancy of equipment.		 a) b) c) d) e) f) g) h)

DWQMS Requirement	Notes	Findings (see footer for definitions)
DO – The Operating Authority shall perform a risk assessment consistent with the documented process.		
8. Risk Assessment Outcomes PLAN – The Operational Plan shall document: a) the identified potential hazardous events and associated hazards, b) the assessed risks associated with the occurrence of hazardous events, c) the ranked hazardous events, d) the identified control measures to address the potential hazards and hazardous events, e) the identified critical control points and their respective critical control limits, f) procedures and/or processes to monitor the critical control limits, g) procedures to respond to deviations from the critical control limits, and h) procedures for reporting and recording deviations from the critical control limits.		 a) b) c) d) e) f) g) h)
DO – The Operating Authority shall implement and conform to the procedures.		
9. Organizational Structure, Roles, Responsibilities and Authorities PLAN – The Operational Plan shall: a) describe the organizational structure of the Operating Authority including respective roles, responsibilities and authorities, b) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple subject systems,		 a) b)

DWQMS Requirement	Notes	Findings (see footer for definitions)
c) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review described in Element 20, d) identify the person, persons or group of people, having Top Management responsibilities required by this Standard, along with their responsibilities, and e) identify the Owner of the subject system.		c) d) e)
DO – The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.		
10. Competencies PLAN – The Operational Plan shall document: a) competencies required for personnel performing duties directly affecting drinking water quality, b) activities to develop and/or 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.		 a) b) c)
DO – The Operating Authority shall undertake activities to: a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.		 a) b)

DWQMS Requirement	Notes	Findings (see footer for definitions)
11. Personnel Coverage PLAN – The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.		
DO – The Operating Authority shall implement and conform to the procedure.		
12. Communications PLAN – The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and: a) the Owner, b) Operating Authority personnel, c) Suppliers that have been identified as essential under Plan (a) of Element 13 of this Standard, and d) the public.		 a) b) c) d)
DO – The Operating Authority shall implement and conform to the procedure.		
13. Essential Supplies and Services PLAN – The Operational Plan shall: a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and b) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.		 a) b)
DO – The Operating Authority shall implement and conform to the procedure.		

DWQMS Requirement	Notes	Findings (see footer for definitions)
14. Review and Provision of Infrastructure PLAN – The Operational Plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the subject system that: a) Considers the outcomes of the risk assessment documented under Element 8, and b) Ensures that the adequacy of the infrastructure necessary to operate and maintain the Subject System is reviewed at least once every calendar year.		
DO – The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.		
15. Infrastructure Maintenance, Rehabilitation and Renewal PLAN – The Operational Plan shall document: (a) a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system, and (b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities.		
DO – The Operating Authority shall: a) keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current, b) ensure that the long term forecast is reviewed at least once every Calendar year c) communicate the programs to the Owner, and d) monitor the effectiveness of the maintenance program.		a) b) c)

DWQMS Requirement	Notes	Findings (see footer for definitions)
16. Sampling, Testing and Monitoring PLAN – The Operational Plan shall document: a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system, b) a description of any relevant sampling, testing or monitoring activities that take place upstream of the subject system, and c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.		 a) b) c)
DO – The Operating Authority shall implement and conform to the procedures.		
17. Measurement and Recording Equipment Calibration and Maintenance PLAN – The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.		
DO – The Operating Authority shall implement and conform to the procedure.		
18. Emergency Management PLAN – The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes: a) a list of potential emergency situations or service interruptions, b) processes for emergency response and recovery, c) emergency response training and testing requirements,		 a) b) c)

DWQMS Requirement	Notes	Findings (see footer for definitions)
d) Owner and Operating Authority responsibilities during emergency situations, e) references to municipal emergency planning measures as appropriate, and f) an emergency communication protocol and an up-to-date list of emergency contacts.		d) e) f)
DO – The Operating Authority shall implement and conform to the procedure.		
19. Internal Audits PLAN – The Operational Plan shall document a procedure for internal audits that: a) evaluates conformity of the QMS with the requirements of this Standard, b) identifies internal audit criteria, frequency, scope, methodology and record-keeping requirements, c) considers previous internal and external audit results, and d) describes how Quality Management System corrective actions are identified and initiated.		 a) b) c) d)
DO – The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every calendar year.		
20. Management Review PLAN - The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of: a) incidents of regulatory non-compliance, b) incidents of adverse drinking-water		 a) b) c) d)

DWQMS Requirement	Notes	Findings (see footer for definitions)
tests, c) deviations from critical control point limits and response actions, d) the effectiveness of the risk assessment process, e) internal and third-party audit results, f) results of emergency response testing, g) operational performance, h) raw water supply and drinking water quality trends, i) follow-up on action items from previous management reviews, j) the status of management action items identified between reviews, k) changes that could affect the Quality Management System, l) consumer feedback, m) the resources needed to maintain the Quality Management System, n) the results of the infrastructure review, o) Operational Plan currency, content and updates, and p) staff suggestions.		e) f) g) h) i) j) k) l) m) n) o) p)
DO – Top Management shall implement and conform to the procedure and shall: a) ensure that a management review is conducted at least once every calendar year, b) consider the results of the management review and identify deficiencies and actions items to address the deficiencies, c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.		 a) b) c) d)

DWQMS Requirement	Notes	Findings (see footer for definitions)
21. Continual Improvement **PLAN** – The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by: a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment and Climate Change and available on www.ontario.ca/drinkingwater, at least once every thirty-six months; b) documenting a process for identification and management of Quality Management System Corrective Actions that includes: i. investigating the cause(s) of an identified non-conformity, ii. documenting the action(s) that will be taken to correct the non-conformity and prevent the non-conformity from re-occurring, and iii. reviewing the action(s) taken to correct the non-conformity, verifying that they are implemented and are effective in correcting and preventing the re-occurrence of the non-conformity. c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes: i. reviewing potential non-conformities that are identified to determine if preventive actions may be necessary, ii. documenting the outcome of the review, including the action(s), if any, that will be taken to prevent a non-conformity from occurring, and iii. reviewing the action(s) taken to prevent a non-conformity, verifying that they are implemented and are effective in preventing the occurrence of the non-conformity. DO- The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System by		

DWQMS Requirement	Notes	Findings (see footer for definitions)
implementing and conforming to the procedure.		

Purpose

This procedure describes defines the responsibilities and process for identifying and investigating non-conformances, as well as opportunities for improvements (OFIs) for taking action to mitigate any negative impacts caused, and for applying corrective actions. **It also addresses ways to identify and implement preventive actions to eliminate potential non-conformances**

References

Drinking Water Quality Management Standard Element **21**

Procedure

How to Handle a Nonconformance

What Is a Non-conformance?
A nonconformance is a situation where:

- A documented requirement doesn't meet the Drinking Water Quality Management Standard
- Actual practice doesn't meet a documented procedure
- The actual practice isn't effective
- Evidence is missing, or
- A significant critical control point is missing

What is an Opportunity for Improvement?
An OFI is a recommendation given by an auditor, top management, or anyone else associated with the drinking water system that could potentially improve the QMS

Who

- Depending on the nature of the nonconformance, the corrective actions for a nonconformance may be handled by the Operator, QMS Rep, Owner, or some combination
- The QMS Rep is responsible for documenting QMS corrective actions, and communicating the actions required to the responsible parties

How Are They Handled

- If the initial observer is operations staff employed by the Operating Authority, the observer must notify the QMS rep, or designate
- QMS rep enters the information into the CAF Tracking Form detailing the non-conformance or OFI, the Type of Nonconformance, and the Description
- To fill out the Tracking Form, the following information is required:
    - Source of Finding/Action Item

- Whether it was an Internal or External source (in case of a DWQMS Audit)
- Audit/Inspection/Meeting Date
- The date the Finding/Action Item was issued
- A description of the Finding/Recommendation
- The type of finding (non-conformance, OFI, recommendation) and an identification #
- Indicate the root cause of the problem, if applicable. A pick-list of common root causes is provided for assistance. Try to ask "Why did this happen?" and go back as far as possible.
- Identification of an action item, where applicable
- Whether the action item was discussed at a management review, and who is responsible for the Action Item
- An Action Item deadline
- A corrective action completion date, if applicable
- A List of any QMS updates (e.g. updates to an operating procedure) that were modified as a result of the action
- Any other Comments
- Once the action item is completed, a 90 day check due date, completion date and comments can also be added

- It is critical that root cause be investigated, even for seemingly obvious non-conformances
- Changes in QMS documents may be tracked on the form or in the Table of Revisions, and handled by the QMS Rep, or designate
- QMS Rep ensures corrective measures are applied
- When applicable, the QMS Rep, or designate, reviews effectiveness of the corrective actions, by revisiting the non-conformance within three months, and recording comments on the form
- If not working effectively, the QMS Rep must implements further actions.

<u>Handling OFIs</u>

- Opportunities for Improvement are also documented in the CAF Tracking form
- The QMS rep will determine whether the OFI requires a response
- The QMS will use their best judgment as to whether or not there should be a follow through on the recommendation.
- If the QMS rep feels the OFI does not required a response, an explanation will be given as to why

<u>Tracking Corrective Actions</u>

- The QMS Rep maintains a spreadsheet to track corrective actions and their follow-up. The spreadsheets follows which Corrective Actions are open and which are closed
- The tracking spreadsheet is reviewed monthly and outstanding 90-day checks are completed. A monthly reminder is scheduled into the QMS Rep's electronic calendar
- The CAF Tracking Spreadsheet is saved on the applicable Veolia Google drive

Ministry Inspections

- Findings (non-compliances or best practice recommendations) from regulatory inspections can also be included in the corrective action tracking template

Considering Best Practices

- At least every thirty-six months, applicable best management practices identified internally and during MECP drinking water inspections (including any published by the MECP and available on www.ontario.ca/drinkingwater) will be reviewed and considered

Preventing Non-conformances

- **Trending of lab results are reviewed at least annually (as part of the management review) to identify possible issues**
- **Results of other Veolia QMS system audits can be used to review and mitigate potential non-conformances in other systems**

Procedure Updates

- If Operations staff or the QMS Rep identify the need to update a procedure, these are not considered to be non-conformances or OFIs. QMS Rep will update and issue procedures as required.

Associated Documents

Operator Log Book
Operations Reports to Owner
CAF Tracking Form

Table of Revisions

Date (dd/mm/yyyy)	Description of Revision
22/05/2009	Bullet edited (4th from bottom) under 'How the are Handled
18/02/2010	Revised where CAF Tracking Spreadsheet can be found
17/02/2011	Reviewed procedure. No edits required
15/03/2011	Revised 'How they are Handled' differing between findings from an operator vs. anyone else
30/01/2012	Added 'Handling OFIs' and 'What is an Opportunity for Improvement?' Other OFI items added Removed project manager; added QMS rep
12/04/2012	Added item regarding procedure changes
25/03/2014	Revised "How are they Handled" to show current practice Removed reference to the Corrective Action Tracking Form (AW-ADMIN-1930) and how to complete it Added references to CAF tracking template

	Updated Handling of OFIs
14/09/2017	Added Section ‘Considering Best Practices’ Added bullet under How they are Handled: Identification of an action item
24/09/2018	Updated to Veolia logo in header
22/01/2019	Updated Bullet #4 under Tracking Corrective Actions (bold)
2/8/2019	Minor wording changes. Also added item about Ministry inspection findings
12/12/2019	Changed title of document Included reference to preventive action in Purpose Changed Reference to Element 21 Included section called Preventing non-conformances

Purpose

This procedure describes the process of conducting the Management Review required by the Drinking Water Quality Management System.

References

Drinking Water Quality Management Standard Element 20

Procedure

At least once **every calendar year**, the QMS is reviewed by Top Management, to stay informed, and to ensure it is:

- suitable to operations
- adequately managing quality issues and meeting the DWQMS and internal requirements,
- performing this management effectively, and
- adequate resources are provided

If Top Management does not feel the QMS is meeting these criteria, changes are recommended and resources are allocated to make improvements.

The Internal Auditor and operations staff may participate in the meetings at the request of the QMS Rep.

Frequency of Management Reviews

- Full Management Review may not be covered in one meeting, but rather by spreading agenda items over the course of several meetings during the period under review
- All of the review items shall be covered at least **every calendar year** but can be covered more frequently due to changes in legislation, circumstances, or at the request of Top Management

How does the QMS Representative Prepare for Management Review

- Arranges meeting time with participants
- Compiles necessary records and documents for review, including information about actions taken based on recommendations from past management reviews (may assign a designate to compile the information)
- Reviews the DWQMS element for Management Review to ensure that all items will be addressed.
- Forwards agenda, detailing which review items will be covered, to meeting participants

- Forwards supporting information to meeting participants, providing time for review of these documents before the meeting
- Guides the meeting participants through the review items on the agenda, and discusses the QMS

QMS Items to Be Reviewed At Least Annually

Items included in the Management Review:

- Incidents of regulatory non-compliance
- Incidents of adverse drinking-water tests
- Deviations from critical control point limits and response actions
- The efficacy of the risk assessment process
- Internal and third-party audit results
- Results of emergency response testing
- Operational performance
- Raw water supply and drinking water quality trends
- Follow-up on action items from previous management reviews
- The status of management action items identified between reviews
- Changes that could affect the Quality Management System
- Consumer feedback
- The resources needed to maintain the Quality Management System
- Results of the infrastructure review
- Operational Plan currency, content and updates
- Staff suggestions

If all items on the Management Review Checklist are not addressed, the QMS Representative must identify the need to hold a future review meeting to ensure that all items are identified at least once annually.

How Management Review Happens

- Agenda items are discussed
- Recommendations are made based on agenda items, and other key issues discussed (especially if the QMS is not felt to be suitable, adequate or effective), including:
    - identification of specific action items
    - personnel responsible for delivering those action items
    - proposed timelines for implementation of the action items
    - the improvement of the QMS and its procedures
    - the improvement of the operating authority's ability to implement consistently the QMS
    - human and financial resource needs

Documentation

- Minutes for the Management Review Meeting are taken by a meeting participant, usually the QMS rep.

- The QMS rep shall prepare a report including recommendations above and submit to Top Management
- A time for follow up on the recommendations (typically around 30 days after the initial review) will be scheduled by the QMS rep
- Top Management, or the QMS rep., will report the results of the review, the identified deficiencies, decisions and action items to the Owner
- In the minutes, a record of any decisions and actions shall be recorded, including the details mentioned above in “How Management Review Happens”

Associated Documents

- **Continual Improvement Procedure** (AW-ADMIN-1900)
- Corrective Action checklist
- Internal Audit Records
- Management Review Meeting Minutes
- Management Review Checklist (AW-ADMIN-2010)

Table of Revisions

Date	Description of Revision
April 1, 2009	Initial Issue of Document
February 3, 2010	Removed Project Manager from list of people who can participate in meeting
March 9, 2011	Added QMS rep. as a person who can report review results to Owner
March 21, 2012	Added bullet to Documentation regarding a follow up meeting
March 9, 2016	Removed AW-ADMIN-1930 from Associated Documents
September 24, 2018	Updated to Veolia logo in header
April 28, 2020	Changed “annually” to “every calendar year” Updated name of AW-ADMIN-1920

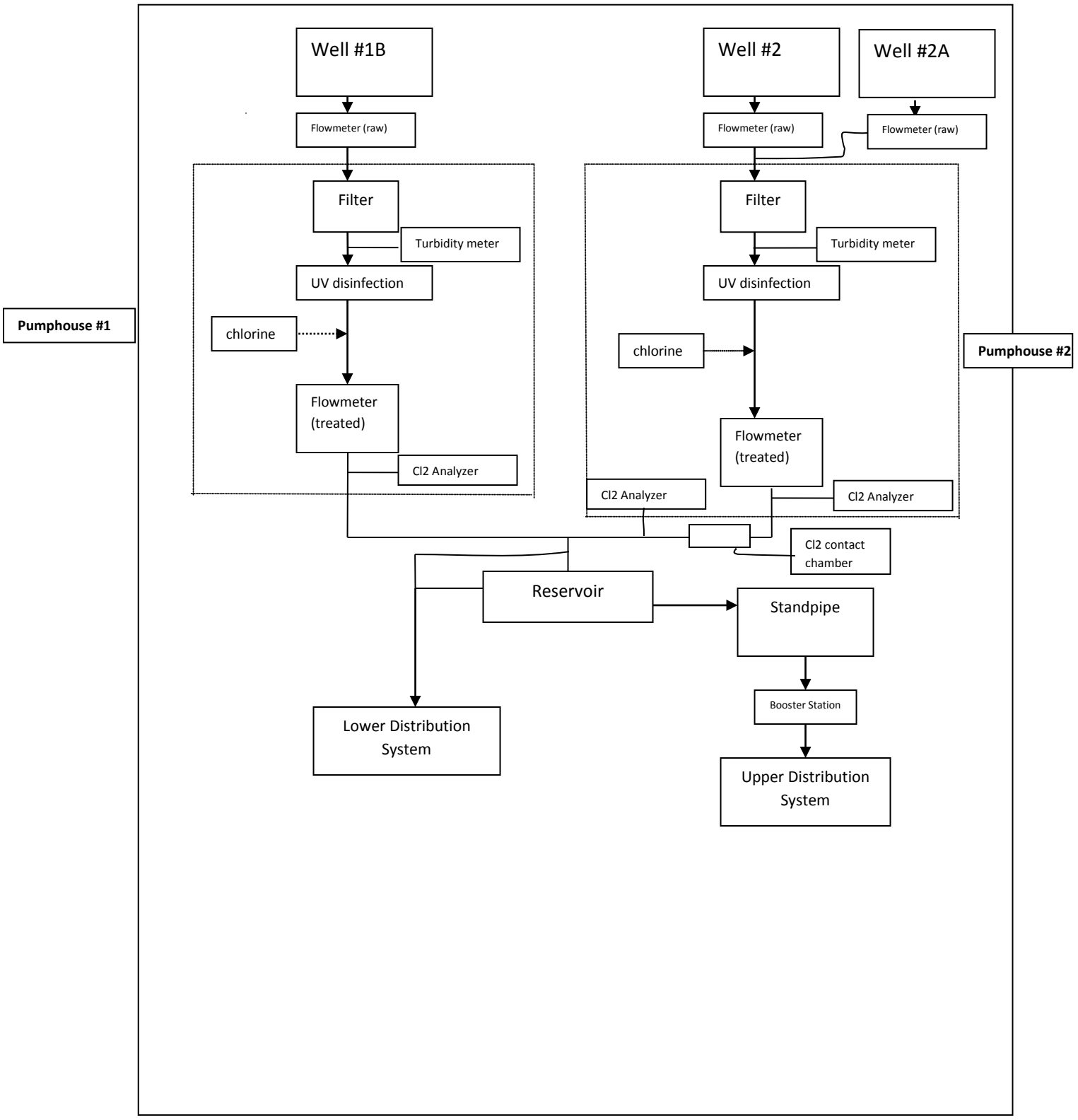
Procedure Name:	***MANAGEMENT REVIEW CHECKLIST***		
Procedure No.:	***AW-ADMIN-2010***		
Effective Date:	September 24, 2018 v1	*Revision Frequency:*	As Required

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

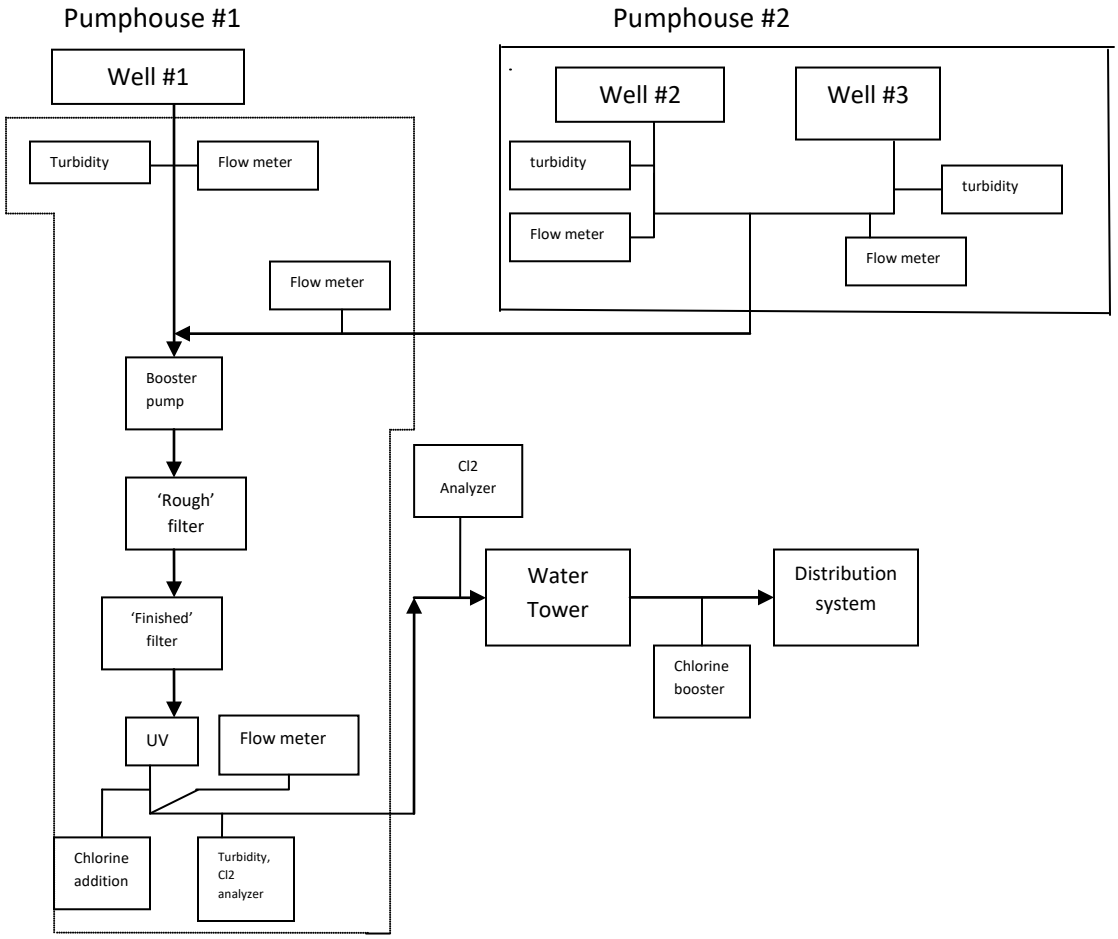
Appendix A:

Process Flow Diagrams

VEOLIA	Title: Durham Well Supply Process Flow	Revision No. 5 Effective Date September 24, 2018



VEOLIA	Title: Neustadt DWS Process Flow	Revision No. 5 Effective Date November 4, 2020



Appendix B:

Risk Assessments

Area	Process Step	Activity or Sub-Process Step	Nature of Hazard	Hazard / Hazardous Event	Potential Effect	Comments	Likelihood (A)	Severity (B)	Detectability (C)	A + B + C	Risk	CCP?	Prevent / Control Measures	Monitoring / Response Notes (use as basis for proc's)	CCP Limits (use as basis for proc's)	CCP Procedure Reference
Well #1B	drawing water		Physical	well casing collapse	loss of raw water	multiple duty wells in place	1	2	1	4	Low	No	Owner has well maintenance plan. Wells inspected by camera in 2018.	at least one monthly sample is taken by staff and tested for turbidity. Operator could see an issue on the SCADA screen or on the daily report	n/a	n/a
Well #1B	drawing water		Biological/chemical	source contamination	loss of raw water	assumes known contamination. Backup wells from different acquifer. Source is now groundwater	1	2	2	5	Low	No	Well heads kept secure. Wells could be disinfected if consistent bacti content is found	raw water bacti testing weekly. Rare to get any positive bacteriological results. Schedule 23/24 testing completed annually Refer to Contingency Plan	n/a	n/a
well #1B	drawing water		Physical	well table/level issues	source water supply shortfall	backup wells in place	1	2	1	4	Low	No	Owner has well maintenance plan. Wells inspected by camera in 2018.	static and pumping levels checked daily. Alarm limits on low pumping levels	n/a	n/a
well #1B	drawing water		Physical	well pump failure	loss of raw water	backup wells (2, 2A) in place. Spare well pump available. Current pump less than 10yrs old	1	2	1	4	Low	No	Owner to create an Asset Management Plan to meet new regulatory requirements	alarm to staff for no flow. Backup duty well in place	n/a	n/a
well #2	drawing water		Physical	well casing collapse	loss of raw water	multiple duty wells in place	1	2	1	4	Low	No	Owner has well maintenance plan. Well inspected by camera in 2018.	at least one monthly sample is taken by staff and tested for turbidity. Operator could see an issue on the SCADA screen or on the daily report	n/a	n/a
well #2	drawing water		Biological/chemical	source contamination	loss of raw water	assumes known contamination. Backup well (#1B) from different acquifer	2	2	2	6	Moderate	No	Well heads kept secure. Wells could be disinfected if consistent bacti content is found	raw water bacti testing weekly. Rare to get any positive bacteriological results. Schedule 23/24 testing completed annually Refer to Contingency Plan	n/a	n/a
well #2	drawing water		Physical	well table/level issues	source water supply shortfall	backup duty wells in place	1	2	1	4	Low	No	Owner has well maintenance plan. Wells inspected by camera in 2018.	static and pumping levels checked daily. Alarm limits on low pumping levels	n/a	n/a
well #2	drawing water		Physical	well pump failure	loss of raw water	backup system. One spare well pump available	1	2	1	4	Low	No	Owner to create an Asset Management Plan to meet new regulatory requirements	alarm to staff for no flow. Backup duty well in place	n/a	n/a
well #2A	drawing water		Physical	well casing collapse	loss of raw water	multiple duty wells in place	1	2	1	4	Low	No	new well in 2017	at least one monthly sample is taken by staff and test for turbidity. Operator could see an issue on the SCADA scree or on the daily report	n/a	n/a
well #2A	drawing water		Biological/chemical	source contamination	loss of raw water	assumes known contamination. Backup well (#1B) from different acquifer	2	2	2	6	Moderate	No	Well heads kept secure.	raw water bacti testing weekly. Schedule 23/24 testing completed annually Refer to Contingency Plan	n/a	n/a
well #2A	drawing water		Physical	well table/level issues	source water supply shortfall	Backup well from different acquifer	1	2	1	4	Low	No	new well in 2017	static and pumping levels checked daily. Alarm limits on low pumping levels	n/a	n/a
well #2A	drawing water		Physical	well pump failure	loss of raw water	backup system. One spare well pump available	1	2	1	4	Low	No	Owner to create an Asset Management Plan to meet new regulatory requirements	alarm to staff for no flow. Backup duty well in place	n/a	n/a
general	drawing water		physical	Algal blooms	contamination of raw water	algal blooms are not present in ground water	1	2	2	5	Low	No	N/A	raw water sampled weekly. Algal blooms are not an issue in groundwater systems	n/a	n/a
well #1B pump station	Filtration		Physical	cartridge filter plugging	interference with disinfection (high turbidity)	Spare filters available. Filtration no longer a requirement now that well has been reclassed to groundwater, but system is still using filters. Well is clean. Filters last several months, sometimes up to a year	2	1	2	5	Low	No	n/a	pressure differential monitored. When pressure diff reaches 32psi, filter is replaced	n/a	n/a
well #1B pump station	Filtration		Physical	filter breakthrough	interference with disinfection (high turbidity)	breakthrough could cause high turbidity alarm (but pressure differential would drop). See above re: requirement for filters	2	2	1	5	Low	No	filters are changed when pressure difference gets high	pressure differential monitored. When pressure diff reaches 32psi, filter is replaced. Spare filters available. Alarm for high turbidity	n/a	n/a
well #1B pump station	UV disinfection		Biological	UV bulb/sensor failure	inadequate primary disinfection	spare bulbs/lamp system. Units are made up of 8 bulbs. Each bulb is monitored individually by the panel. Minor/Major alarms in place. System can continue with a minor alarm	3	1	3	7	Moderate	No	PM at 40 W/m2 (alarm at 35). Auto well pump shut off at alarm level. Duty UV banks are rotated about once a month	bulb failure shows up on UV display screen	n/a	n/a
well #1B pump station	UV disinfection		Biological	UV unit failure	inadequate primary disinfection	spare bulbs/lamp system. Backup UV system requires manual switch over	3	1	2	6	Moderate	No	PM at 40 W/m2 (alarm at 35). Auto well pump shut off at alarm level	alarm for low UV intensity (35W/m2). Operator would respond to switch to backup UV system	n/a	n/a
well #1B pump station	UV disinfection		Biological	inadequate UV dosage/intensity	inadequate primary disinfection	spare bulbs/lamp system	3	2	1	6	Moderate	YES	PM at 40W/m2 (alarm at 35). Auto well pump shut off at alarm level. FORCED CCP	well pump won't run without adequate UV intensity	40W/m2	WG-CCP-801

well #1B pump station	POE turbidity		Biological	on-line turbidimeter failure	non-compliance with quality monitoring	Pump may shut off if there is no turbidity reading. System alarm for turbidity below 0.01NTU	2	2	1	5	Low	No	Annual calibration on turbidmeters by third party. Staff verify readings weekly	n/a	n/a	n/a
well #1B pump station	Chlorination		Biological	chlorine system failure (pump, injector, etc.)	inadequate disinfection	Low chlorine reading will shutdown the system. Manual switch to backup chlorine system	4	2	1	7	Moderate	Yes	regular maintenance on chlorine system. Spare parts available. FORCED CCP	alarm for low chlorine. Auto pump shut off at that level. Refer to Contingency Plan	Well #1 0.50mg/L	WG-CCP-801
well #1B pump station	Chlorination		Biological	inadequate chemical quality	inadequate disinfection	NSF appoved chemical required. Stock rotated consistently. Certificate of analysis received with each delivery	1	2	3	6	Moderate	No	inspecting chemical on delivery. One supplier used. Stock rotated consistently	n/a	n/a	n/a
well #1B pump station	Chlorination		Biological	inadequate chemical supply	inadequate disinfection	operator calls when inventory drops to about 10 (20L) pails	1	3	3	7	Moderate	No	operator checks inventory on daily rounds	orders are made when inventory is down to around 10 pails (including to day tank being full)	n/a	n/a
well #1B pump station	Chlorination		Aesthetic	high chlorine	not a regulated limit	aesthetic objective of 3.0mg/L	2	3	2	7	Moderate	No	daily checks. Regular maintenance done on Cl system	alarm for POE FCR at 3.0mg/L	n/a	n/a
well #1B pump station	General operations		Physical	Power outage	loss of water supply	generator automatically starts after 5sec loss of power and then transfers 20 sec later. Has fuel for 1-2 days and spare fuel is readily available	4	1	1	6	Moderate	No	generator run conducted monthly on load. Monitor run times	alarm sent to operators when genset runs. Operator must respond to reset dialler	n/a	n/a
well #2 pump station	Filtration		Physical	cartridge filter plugging	interference with disinfection (high turbidity)	pressure differential monitored. Cartridge filter. Spares available onsite	4	1	2	7	Moderate	No	n/a	pressure differential monitored. When pressure diff reaches 32psi, filter is replaced.	n/a	n/a
well #2 pump station	Filtration		Physical	filter breakthrough	interference with disinfection (high turbidity)	breakthrough would cause high turbidity alarm	3	2	1	6	Moderate	No	filters are changed when pressure difference reaches 32psi	pressure differential monitored. When pressure diff reaches 32psi, filter is replaced. Spare filters available. Alarm for high turbidity	n/a	n/a
well #2 pump station	UV disinfection		Biological	UV bulb/sensor failure	inadequate primary disinfection	spare bulbs/lamp system. Units are made up of 8 bulbs. Each bulb is monitored individually by the panel. Minor/Major alarms in place. System can continue with a minor alarm	3	1	3	7	Moderate	No	PM at 40 W/m2 (alarm at 35). Auto well pump shut off at alarm level	bulb failure shows up on UV display screen	n/a	n/a
well #2 pump station	UV disinfection		Biological	UV unit failure	inadequate primary disinfection	spare bulbs/lamp system. Backup UV system requires manual switch over	3	1	2	6	Moderate	No	PM at 40W/m2 (alarm at 35). Auto well pump shut off at alarm level	alarm for low UV intensity. Operator would respond to switch to backup UV system	n/a	n/a
well #2 pump station	UV disinfection		Biological	inadequate UV dosage/intensity	inadequate primary disinfection	spare bulbs/lamp system	3	2	1	6	Moderate	No	PM at 40W/m2 (alarm at 35). Auto well pump shut off at alarm level	well pump won't run without adequate UV intensity	40W/m2	WG-CCP-801
well #2 pump station	POE turbidity		Biological	on-line turbidimeter failure	non-compliance with quality monitoring	backup well. Pump may shut off if there is no turbidity reading. System alarm for turbidity below 0.01NTU	2	2	1	5	Low	No	Annual service on turbidmeters by third party. Staff verify readings weekly. Turbidimeter connected to backup UPS	alarm to staff if turbidimeter has no readings	n/a	n/a
well #2 pump station	Chlorination		Biological	chlorine system failure (pump, injector, etc.)	inadequate disinfection	automatic switch to backup chlorine system	4	2	1	7	Moderate	Yes	regular maintenance on chlorine system. Spare parts available. FORCED CCP	alarm for low chlorine and auto pump shut off at that level. Refer to Contingency Plan	(first analyzer) 0.65mg/L, second analyzer (CT) 0.50mg/L	WG-CCP-801
well #2 pump station	Chlorination		Biological	inadequate chemical quality	inadequate disinfection	NSF appoved chemical required. Stock rotated consistently. Certificate of analysis received with each delivery	1	2	3	6	Moderate	No	inspecting chemical on delivery. One supplier used. Stock rotated consistently	n/a	n/a	n/a
well #2 pump station	Chlorination		Biological	inadequate chemical supply	inadequate disinfection	operator calls when inventory drops to about 10 pails (of total inventory)	1	3	3	7	Moderate	No	operator checks levels on daily rounds	orders are made when inventory is down to 10 pails (plus full day tank)	n/a	n/a
well #2 pump station	Chlorination		Aesthetic	high chlorine	not a regulated limit	n/a	2	3	2	7	Moderate	No	daily checks. Regular maintenance done on Cl system	alarm for POE FCR at 3.0mg/L	n/a	n/a
well #2 pump station	General operations		Physical	Power outage	loss of water supply	no generator but a portable generator can be hooked up. Generator can be acquired fairly quickly. System can run from well #1	4	3	1	8	Moderate	No	backup UPS runs PLC and online analyzers. Owner purchased backup data collection systems. Data is backed up every month	n/a	n/a	n/a
well houses	Treatment		Biological	equipment failure	inadequate secondary disinfection	not applicable. Chlorination/UV are both considered primary disinfection							n/a	n/a	n/a	n/a
well houses	Treatment		physical	sudden change to raw water characteristics	changes in water quality	groundwater system. pH not likely to change suddenly. System uses filtration for turbidity	1	3	3	7	Moderate	No	Raw water turbidity checked manually on monthly basis. Possibly more frequent filter changes	filter effluent turbidity is continuously monitored	n/a	n/a

well houses	Treatment		biological	high turbidity	non-compliance with O. Reg. 170	4.5 micron filter in use	2	3	1	6	Moderate	No	System shuts down when turbidity exceeds 1.0NTU for 10 min	alarm is set at 1.0NTU (regulatory limit; has to be over 15min to be adverse)	n/a	n/a
Distribution	Reservoir		Physical	level sensor failure	loss of water supply	float system. One high and one low.	2	3	2	7	Moderate	No	n/a	high and low level alarms. Low alarm set when reservoir reaches 5.0m. No automatic response	n/a	n/a
Distribution	Reservoir		Biological	Stagnation	bacteriological contamination	no mixer.	3	2	3	8	Moderate	No	Last reservoir inspection in 2018.	Regulatory sampling is done weekly for bacti	n/a	n/a
Distribution	Reservoir		All	Structural integrity issue allowing infiltration of contaminants	bacteria or contaminants or loss of water level	n/a	2	2	3	7	Moderate	No	Last reservoir inspection in 2018.	POE sampling is done weekly for bacti. Weekly distribution sampling conducted	n/a	n/a
Distribution	Reservoir	Transfer pump	Physical	Transfer pump failure	loss of water supply	This only affects the water from the reservoir to the standpipe. A portion of the distribution system can be serviced without the standpipe but potentially not the entire system, though possibly with lower pressure. No backup pump	2	1	2	5	Low	No	n/a	failure of transfer pump would be indicated by standpipe level. Alarm level set at 21m in standpipe	n/a	n/a
Distribution	Booster station		Physical	pump failure	loss of water supply	pumps controlled by pressure. Four pumps available and could all run. Generator onsite	2	1	2	5	Low	No	No regular maintenance on pumps. Genset tested every month	pump failure alarm. Other booster pumps automatically run. SCADA system monitors pressure	n/a	n/a
Distribution	Booster stations		Physical	Power failure	loss of water supply	generator on site at large booster station but also wired into smaller station (transfer pump). Generators hold fuel for 1-2 days. Spare fuel readily available	3	1	1	5	Low	No	genset tested monthly on load. Run times monitored	Booster station starts after five seconds and transfers seven seconds later	n/a	n/a
Distribution	Standpipe		Biological	contamination from pests or unknown sources	bacteria or contaminants	sealed with overflow pipe	1	3	4	8	Moderate	No	Operating Authority can not control this hazard. Camera inspection conducted about every five years (with reservoir). Last completed in 2018	weekly bacti sampling in distribution system	n/a	n/a
Distribution	Standpipe		Physical	level sensor failure	loss of water supply	float system. One high and one low.	2	2	2	6	Moderate	No	n/a	tower level monitored on SCADA. Alarm for low and high levels	n/a	n/a
Distribution	Standpipe		Biological	Stagnation	bacteria	no mixers, bottom feed, bottom draw	2	3	3	8	Moderate	No	video inspection every five years. Last completed in 2018	weekly bacti testing; daily chlorine testing in the distribution system. Standpipe can be bypassed	n/a	n/a
Distribution	Distribution main		Physical / bacteriological	main break	loss of pressure, introduction of bacteria	Town is responsible for repair and leak detection but operations staff review flows daily	3	3	2	8	Moderate	No	leak detection program in place and flows review dailly. Most of system was assessed by a third party in 2021. Owner staff is following new rules for main breaks	Customer complaints. Low pressure or high flows are monitored by system. Limited ability to isolate areas. Refer to Contingency Plan	n/a	n/a
Distribution	General Distribution		Biological/chemical	Negative pressure from cracks/breaks/unplanned uses of water-allowing infiltration	bacteria or contaminants	infiltration possible; could introduce bacteria. Caused from main break or shutdown of pumps though tower maintains pressure even when pumps are off	1	4	3	8	Moderate	No	OA can not exercise control over this hazard. Pump at all times to maintain pressure	pressure is continuously monitored leaving booster station. Response to breaks in Contingency Plan. Consumer complaints	n/a	n/a
Distribution	General Distribution		Biological/chemical	low chlorine	inadequate disinfection	POE FCR is usually around 1-1.25mg/L from both wellhouses	2	5	3	10	High	Yes	hydrant flushing annually	residual monitoring in distribution system daily	response limit 0.20mg/L regulatory limit is 0.05mg/L	WG-CCP-801
Distribution	General Distribution		Biological/chemical	Backflow/cross connection	bacteria or contaminants	all new buildings are required to have backflow preventers. Not aware of any contact with sewage system	2	5	4	11	High	No	Municipality relies on building codes for control of backflow/cross connections. OA exercises no control over this hazard	Town inspected backflow preventers in 2019	n/a	n/a
Distribution	General Distribution		biological	build up of biofilm, slime in pipe	interference with disinfection	n/a	2	2	3	7	Moderate	No	Annual hydrant flushing	weekly bacti testing; daily FCR testing in distribution system	n/a	n/a
Distribution	General		Chemical	conditions allowing leaching of lead	lead contamination	Limited testing completed twice per year as per Regulation. No issues of lead in system	1	3	4	8	Moderate	No	No control measures in place for OA	legislative testing. Reduced sampling in place	n/a	n/a
Distribution	General		Pressure	sustained pressure loss	loss of pressure in system	Possibly caused by large, prolonged main break. Could lead to infiltration/backflow. Booster station can usually maintain pressure	1	4	3	8	Moderate	No	Booster station to provide additional pressure	no automated pressure monitoring other than at booster station. Detectability likely based on complaints from users	n/a	n/a

General	General operations		All	communications failure	various	radio communications in place are more reliable than phone lines	2	2	2	6	Moderate	No	visible to operations staff on main computer screen. Owner has purchased backup data recording systems and data is backed up monthly	communication failure alarm sent to operators after 500sec	n/a	n/a
General	PLC		All	Control system failure	various	severe storm, lightning, circuit board failure	2	4	2	8	Moderate	No	UPS with surge protection. Manually download data onto backup computer once a month	callout alarm signals communication failure. All system equipment could be run manually (hand), if necessary	n/a	n/a
General	General Distribution		Physical	Catastrophic failure. Loss of infrastructure due to severe storm	loss of water supply	loss of tower, booster station, well house	1	5	2	8	Moderate	No	2 well houses approx. 1km apart	series of alarms	n/a	n/a
General	Maintenance Operations		Biological/chemical	Using non-NSF equipment during maintenance and repairs	various	could cause contamination of water	1	4	3	8	Moderate	No	Supplies and equipment are purchased from NSF approved locations whenever possible	qualified operator oversees maintenance. Repairs would follow applicable AWWA standards	n/a	n/a
General	Maintenance Operations		Biological/chemical	Inadequate disinfection after maintenance	bacteria or contaminants	AWWA standards in place	1	4	3	8	Moderate	No	Follow AWWA procedures and practices. Overseeing contractor activities	qualified operator oversees maintenance. Repairs would follow applicable AWWA standards	n/a	n/a
General	General operations		All	Vandalism	various	understood to be lesser than terrorism; damaging buildings, turning valves, etc.	1	4	2	7	Moderate	No	Locked reservoir hatches. Town has talked about adding fences around buildings (wellhouses). Areas are lit at night. OA does not exercise control over this hazard	Town has an emergency plan in place By-law 27-2003	n/a	n/a
General	General operations		All	Terrorism	various	would be difficult to detect	1	5	3	9	High	No	Locked reservoir hatches. Town has talked about adding fences around buildings. Areas are lit at night. OA does not exercise control over this hazard	Town has an emergency plan in place By-law 27-2004	n/a	n/a
General	General Operations		All	Extreme weather events (i.e. tornado, ice storm)	loss of tower or WTP	two well houses; if standpipe was lost, treatment facilities could provide at least a portion of the system with water.	2	5	1	8	Moderate	No	backup power available	weather monitoring during poor weather condiitions	n/a	n/a
General	General Operations		All	sustained extreme temperatures	various	equipment could overheat. Shouldn't be any issues with GW temps. Tower temps could increase. Buildings are heated	2	4	1	7	Moderate	No	measures can be taken to keep water moving in extreme cold	flows are monitored for excess usage. Owner has water restriction bylaws in place	n/a	n/a
General	General Operations		All	Long term impacts of climate change	increased or decreased temps	only very gradual changes, if at all	1	3	2	6	Moderate	No	low level well alarms if usage is high	continuous well level monitoring	n/a	n/a
General	Sampling		Biological	Contamination of DW samples	bacteria or contaminants	staff sample both sewage and DW systems	2	3	3	8	Moderate	No	DW and WW samples are usually collected on different days. Staff follow proper protocol when handling samples	n/a	n/a	n/a
General	Staffing		all	inadequate coverage	all	includes illness, injury. Two FTE and support is available from neighbouring Veolia projects	3	1	1	5	Low	No	Other off-site staff could help in emergency. Rotating on-call schedule when two FT staff are available	n/a	n/a	n/a
General	Sampling		Non-Compliance	sample not delivered to lab/delivered past hold time	non-compliance with O. Reg. 170/03	Lab has their own courier that delivers DW samples directly to the lab on the same day	2	3	1	6	Moderate	No	lab uses 'Engage' website for uploading documents when samples are received at lab, along with copy of completed CofC. Reminder to check for notifications added to calendar of PM	operations staff and PM receive notifications. Weekly samples can be taken every 5-10 days as per Reg.	n/a	n/a
General	IT		Cybersecurity	System is hacked where control is lost	loss of water supply	system is password protected. Only operations staff and IT tech can make changes to system	1	5	2	8	Moderate	No	system is password protected		n/a	n/a

Revision History (mm/dd/yyyy)
1/23/2019
1/21/2020
3/30/2020
1/27/2021
1/27/2021
1/28/2022
4/25/2022
6/2/2022

Area	Process Step	Activity or Sub-Process Step	Nature of Hazard	Hazard / Hazardous Event	Potential Effect	Comments	Likelihood (A)	Severity (B)	Detectability (C)	A + B + C	Risk	CCP?	Prevent / Control Measures	Monitoring / Response Notes (use as basis for proc's)	CCP Limits (use as basis for proc's)	CCP Procedure Reference
Source water	Drawing water		Physical	well casing collapse-any one well	loss of raw water	3 wells available. One should be sufficient to run the entire town for a short time. Wells 2 & 3 can not run at the same time. More than four days storage in reservoir	1	3	2	6	Moderate	No	Owner has well maintenance plan in place. Well #2 was inspected in 2021; others last done in 2006 but scheduled for 2022	raw turbidity is measured constantly when pump is running. Not alarmed but visual on daily rounds. Pump failure alarm	n/a	n/a
Source water	Drawing water		Physical	well pump failure (any well)	loss of raw water	3 wells available. One should be sufficient to run the entire town for a short time. Wells 2 & 3 can not run at the same time. More than four days storage in reservoir	1	2	2	5	Low	No	well #1 pump replaced in 2010	Refer to Contingency Plan	n/a	n/a
Source water	Drawing water		Physical	well table/well level issues	source water supply shortfall	3 wells available. One should be sufficient to run the entire town for a short time. Wells 2 & 3 can not run at the same time. More than four days storage in reservoir	1	1	2	4	Low	No	Owner has well maintenance plan in place. Well #2 was inspected in 2021; others last done in 2006 but scheduled for 2022	well depths monitored by SCADA and alarmed	n/a	n/a
Source water	Drawing water		biological/chemical	source contamination	contamination of source water	assumes a known hazard. GUDI wells	2	2	2	6	Moderate	No	No control measures in place for OA	bacti sampling in raw water weekly Refer to Contingency Plan	n/a	n/a
Pump house #1	Filtration		biological	cartridge filter clogging	high turbidity	system runs on pressure differential. Sufficient water storage at tower if system needs to be shut down	4	2	2	8	Moderate	No	replacement of raw filters at 32 psi/220kPa difference(can run at 50psi). Spare filters on site	system runs on pressure differential. System alarms at 250kPa and shuts system down	n/a	n/a
Pump house #1	Filtration		biological	filter breakthrough	high turbidity	system runs on pressure differential. Sufficient water storage at tower	3	2	2	7	Moderate	No	replacement of raw filters at 32 psi/220kPa difference(can run at 50psi). Finished filters are replaced about every six months. Spare filters on site	system runs on pressure differential. System alarms at 250kPa and shuts system down	n/a	n/a
Pump house #1	UV disinfection		biological	UV bulb/sensor failure	inadequate primary disinfection	UV units contain four bulbs. Can run if one bulb is weak	3	1	3	7	Moderate	No	bulbs replaced when lamp alarm occurs. Auto well pump shut off at alarm level (28W/m2)	UV bulb failure would be found on operator rounds Alarm at below 35W/m2. System will shut down	n/a	n/a
Pump house #1	UV disinfection		biological	UV unit failure	inadequate primary disinfection	Backup UV unit requires manual switch over. System does not run without UV in operation	2	2	2	6	Moderate	No	bulbs replaced on UV intensity. Replaced before the 35W/m2 system shutdown limit (28 is the regulatory limit). Sensors cleaned regularly	Alarm at 35W/m2 shuts off well pumps. Operator needs to manually switch to backup UV unit	n/a	n/a
Pump house #1	UV disinfection		biological	Inadequate UV intensity	inadequate primary disinfection	Backup UV unit available. System does not run without UV running	3	2	2	7	Moderate	Yes	bulbs replaced on UV intensity. Replaced before the 35W/m2 system shutdown limit. Sensors cleaned regularly. FORCED CCP	Alarm at 35W/m2 shuts off well pumps. Operator needs to manually switch to backup UV unit	40mJ/cm2	WG-CCP-801
Pump house #1	Chlorination		Biological	chlorine system failure (pump, injector, etc.)	inadequate disinfection	operator has to respond to manually switch to backup chlorine system	4	2	1	7	Moderate	Yes	regular maintenance on chlorine system. Spare parts available. FORCED CCP	alarm for low chlorine and auto pump shut off at that level Refer to Contingency Plan	0.50mg/L	WG-CCP-801
Pump house #1	Chlorination		Biological	inadequate chemical quality	inadequate disinfection	NSF approved chemical required. Inventory turns over approximately every 45 days	3	2	3	8	Moderate	No	inspecting chemical on delivery. One supplier used. Stock rotated consistently	Certificate of Analysis available for each shipment of chemical	n/a	n/a
Pump house #1	Chlorination		Biological	inadequate chemical supply	inadequate disinfection	operator orders as required, usually when inventory is down to approx 2-3 pails	1	3	3	7	Moderate	No	operator checks levels on daily rounds	orders are made when inventory is down to approx. 10 pails	n/a	n/a
Pump house #1	Chlorination		Physical	high chlorine	Aesthetic	not a regulated limit (aesthetic obj. of 3.0mg/L) but complaints tend to rise with higher FCR	2	3	2	7	Moderate	No	daily checks. Regular maintenance on chlorine system	alarm for POE FCR at 3.00mg/L	n/a	n/a
Pump house #1	POE turbidity		Biological	on-line turbidimeter failure	interference with disinfection (high turbidity)	Turbidity connected to UPS so if power goes out, meter will still read	2	2	3	7	Moderate	No	Annual service on turbidmeters by third party. Staff verify analyzer readings weekly and are at site each day	manual readings required every 15 min if analyzer fails, unless otherwise directed by MECP	n/a	n/a
Pump house #1	POE turbidity		Biological	high turbidity (>1.0NTU)	non-compliance with O. Reg. 170/03	rough (5 micron) and finished (1 micron) filters in place. Brief (<15min) turbidity spikes regularly occur on pump startup	4	3	1	8	Moderate	No	System shuts down when turbidity exceeds 1.0NTU for 10 min	alarm is set at 1.0NTU (regulatory limit; has to be over 15min to be adverse)	n/a	n/a

Pump house #1	Booster Pump		Physical	pump failure	loss of water supply	well pumps are strong enough to push through filters (approx. 4L/s); booster pump required to protect well pumps (only one in place)	1	2	2	5	Low	No	Could get a replacement pump in ~2days	About 10 days storage in tower. Alarm if booster is called to run and doesn't	n/a	n/a
Pump house #1	Transmission line		Physical	Pipeline break	loss of water supply	pipeline break between well house #1 and #2. Well #1 provides about 3L/s	1	2	3	6	Moderate	No	flows monitored daily. Increase in well pump run time may indicate a problem. System can run off of tower	Wells 2 and 3 would not be available if the line broke between the two pumphouses Refer to Contingency Plan	n/a	n/a
Pump house #1	Transmission line		Physical	Pipeline break	loss of water supply	pipeline break between well house and tower. Tower will drain.	1	4	2	7	Moderate	No	Manual valve on tower inlet line could be closed to avoid loss of water	main repair ASAP. Isolate tower so flow does not back feed out the break. Alarm for tower level	n/a	n/a
well houses	Treatment		physical	sudden change in raw water characteristics	changes in turbidity	groundwater system. pH not likely to change suddenly but is not measured. System uses filtration for turbidity	1	3	3	7	Moderate	No	Turbidity monitoring on raw water.Possibly more frequent filter changes	filter effluent turbidity is continuously monitored	n/a	n/a
Pump house #1	General operations		Physical	Power Failure	loss of water supply	No backup power. On a different power grid from tower. New flowmeter on outlet side of the tower is on a different grid from meter in well house	2	2	2	6	Moderate	No	n/a	More than 4 days storage in tower	n/a	n/a
Distribution	Water Tower		Physical	Power Failure	loss of water supply	On a different power grid from pumphouse. Portable generator available on site but needs to be connected. Regulatory chlorine meter here	2	3	2	7	Moderate	No	n/a	alarms in place	n/a	n/a
Distribution	Water Tower		Physical	Level transducer failure	loss of water supply	SCADA alarm on low level reading	2	2	3	7	Moderate	No	Systems operates in high range of reservoir. Current level transducer installed in 2019	tower level continuously monitored and alarmed at 4.0m	n/a	n/a
Distribution	Water Tower		Biological	Stagnation	Bacteriological contamination	none	1	3	2	6	Moderate	No	Designed to maximize mixing. Separate inlet/outlet and overflow	Weekly bacti testing. Daily chlorine testing in distribution system. Chlorination system (post-reservoir) available.	n/a	n/a
Distribution	Distribution main		Physical / bacteriological	main break (distribution system)	loss of pressure, introduction of bacteria	Town is responsible for repair and leak detection	3	3	2	8	Moderate	No	leak detection procedure in place if required	Customer complaints. High flows are monitored by system. Limited ability to isolate areas Refer to Contingency Plan	n/a	n/a
Distribution	General		Pressure	sustained pressure loss	loss of pressure in system	Unlikely to happen unless there is an issue with the tower. could lead to backflow	1	4	3	8	Moderate	No	tower provides system pressure	no automated pressure monitoring. Detectability likely based on complaints from users	n/a	n/a
Distribution	General operations		Biological	Use of hydrants on main between pumphouse and tower, causing inadequate CT	bacteria	hydrants used for flushing only	1	5	2	8	Moderate	No	Metal bands on hydrants to restrict use. Line from pumphouse to tower flushed annually using one hydrant	n/a	n/a	n/a
Distribution	General Distribution		Biological/chemical	Negative pressure from cracks/breaks/unplanned uses of water-allowing infiltration	bacteria or contaminants	infiltration possible; could introduce bacteria. Caused from main break	1	4	3	8	Moderate	No	OA can not exercise control over this hazard. New provincial main break procedure in place	Response to breaks in Contingency Plan. Consumer complaints	n/a	n/a
Distribution	General Distribution		Biological/chemical	low chlorine	inadequate disinfection	POE FCR is usually around 1-1.25mg/L	2	5	3	10	High	Yes	hydrant flushing annually is only minimal help. Regulatory samples collected close to dead ends	residual monitoring in distribution system daily	response limit is 0.20mg/L regulatory limit is 0.05mg/L	WG-CCP-801
Distribution	General Distribution		Biological/chemical	Backflow/cross connection	bacteria or contaminants	All new buildings are required to have backflow preventers installed. Possibly only one currently in the system	1	5	4	10	High	No	Municipality relies on building codes for control of backflow/cross connections. OA exercises no control over this hazard	Backflow preventers not regularly inspected	n/a	n/a
Distribution	General Distribution		biological	build up of biofilm, slime in pipe	interference with disinfection	n/a	2	2	3	7	Moderate	No	Annual hydrant flushing	weekly bacti testing; daily FCR testing in distribution system	n/a	n/a
Distribution	General		Chemical	conditions allowing leaching of lead	lead contamination	testing completed twice annually as per Reg. No issues of lead; system is exempt from residential sampling	1	3	4	8	Moderate	No	No control measures in place for OA	legislative testing. Reduced sampling in place	n/a	n/a
General	General operations		All	communications failure	various	radio communications in place	2	2	2	6	Moderate	No	visible to operations staff on main computer screen	communication failure alarm. Manual reset of system required	n/a	n/a

General	PLC		All	Control system failure	various	severe storm, lightning, circuit board failure	2	4	2	8	Moderate	No	UPS with surge protection. Data is manually backed up onto a spare computer monthly	callout alarm signals communication failure. All equipment could be run manually (hand), if necessary. System can run off tower	n/a	n/a
General	General Distribution		Physical	Catastropic failure. Loss of infrastructure due to severe storm	loss of water supply	loss of tower, booster station, well house	1	5	2	8	Moderate	No	n/a	series of alarms	n/a	n/a
General	Maintenance Operations		Biological/chemical	Using non-NSF equipment during maintenance and repairs	various	could cause contamination of water	1	4	3	8	Moderate	No	Supples and equipment are purchased from NSF approved locations whenever possible	qualified personnel oversees maintenance. Repairs done per AWWA standards	n/a	n/a
General	Maintenance Operations		Biological/chemical	Inadequate disinfection after maintenance	bacteria or contaminants	AWWA standards in place	1	4	3	8	Moderate	No	Follow AWWA procedures and practices. Qualified personnel overseeing contractor activities	n/a	n/a	n/a
General	General operations		All	Terrorism	various	would be difficult to detect	1	5	3	9	High	No	Tower access is locked. Tower and well houses are fenced. Areas are lit at night. OA does not exercise control over this hazard	Town has an emergency plan in place By-law 27-2004	n/a	n/a
General	General operations		All	Vandalism	various	understood to be lesser than terrorism; damaging buildings, turning valves, etc.	1	4	2	7	Moderate	No	Tower access is locked. Tower and well houses are fenced. Areas are lit at night. OA does not exercise control over this hazard	Town has an emergency plan in place By-law 27-2003	n/a	n/a
General	General Operations		All	Long term climate change	increased or decreased temps	only very gradual changes, if at all. Water system buildings aren't in danger of flooding	1	3	2	6	Moderate	No	n/a	continuous well level monitoring. Water taking is monitored daily	n/a	n/a
General	General Operations		All	extreme weather events (i.e. tornado, ice storm)	loss of tower or WTP	two well houses; if tower was lost, treatment facilities may not be able to provide system with water. No backup power in Neustadt but 10 day supply of water in tower	2	5	1	8	Moderate	No	n/a	weather monitoring during poor weather condiitions	n/a	n/a
General	General Operations		All	sustained extreme temperatures	various	equipment could overheat. Shouldn't be any issues with groundwater temps. Tower temps could increase. Buildings are heated	2	4	1	7	Moderate	No	measures can be taken to keep water moving in extreme cold	flows are monitored for excess usage	n/a	n/a
General	Sampling		Biological	Contamination of DW samples	bacteria or contaminants	staff sample both sewage and DW systems	2	3	3	8	Moderate	No	DW and WW samples are usually collected on different days. Staff follow proper protocol when handling samples	n/a	n/a	n/a
General	Staffing		all	inadequate coverage	all	includes illness, injury. Two FTE and available support from neighbouring Veolia projects	3	1	1	5	Low	No	Other off-site staff could help in emergency. Rotating on-call schedule when two FT staff are available	n/a	n/a	n/a
General	Sampling		Non-Compliance	sample not delivered to lab/delivered past hold time	non-compliance with O. Reg. 170/03	new lab being used as of Dec. 2020. Lab has their own courier that delivers DW samples directly to the lab on the same day	2	3	1	6	Moderate	No	lab uses 'Engage' website for uploading documents when samples are received at lab, along with copy of completed CofC. Reminder to check for notifications added to calendar of PM	operations staff and PM receive notifications. Weekly samples can be taken every 5-10 days as per Reg.	n/a	n/a
General	IT		Cybersecurity	System is hacked where control is lost	loss of water supply	system is password protected. Only operations staff and IT tech can make changes to system	1	5	2	8	Moderate	No	System is password protected		n/a	n/a

Revision History (mm/dd/yyyy)
6/7/2018
1/23/2019
1/22/2020
3/30/2020
2/9/2021
1/28/2022
4/25/2022

Appendix C:

Critical Control Procedures

Purpose

This procedure describes the control of disinfection for West Grey water systems. Both chlorination and UV disinfection are considered to be primary disinfection for the drinking water systems in both Durham and Neustadt.
Proper Point of Entry disinfection and chlorine residual in the distribution system were identified as CCPs on the Hazard Analysis spreadsheet. Both forms of disinfection therefore need to be controlled. If either chlorination or the UV was to fail, there is potentially a major impact to a large portion of the population.

Critical Limits

Legislated Primary Disinfection

- Primary disinfection is a process or series of processes intended to inactivate pathogens potentially present in raw water before the water is delivered to the first consumer
- Primary disinfection is legislated under O. Reg. 170/03 and *The Procedure for the Disinfection of Drinking Water in Ontario* as adopted by reference by O. Reg. 170/03
- Primary disinfection must be capable of at least 99.**9**% removal or inactivation of viruses by the time the water leaves the point of entry treatment units (entry of water into distribution system)

Legislated Secondary Disinfection

- Secondary disinfection is the maintenance of a chlorine residual in the distribution system
- Legislated under O. Reg. 170/03 and *The Procedure for the Disinfection of Drinking Water in Ontario* as adopted by reference by O. Reg. 170/03
- At all times and at all locations within the distribution system there must be at least a free chlorine residual of 0.05mg/L (at pH 8.5 or lower)
- The recommended minimum target for free chlorine residual in the distribution system is at least 0.2mg/L (at pH 8.5 or lower)
- The Ultraviolet (UV) system must be running at all times that water is entering the distribution system

Monitoring and Testing

Point of Entry chlorine residual and UV intensity are monitored by the SCADA system and will alarm if the residual goes outside the desired operational parameters or if the UV system shuts down

- Alarm set points are based on legislation, contractual obligations and operational limits

- The typical target for treated water chlorine residual is listed in Table 1 for each water system
- A critical alarm will be generated if the treated water chlorine residual drops below the Critical level designated in the Table
- A critical alarm will be generated if the UV intensity goes below 40mJ/cm^2 (at either drinking water system) and the system will shut down
- UV intensity and dosage is monitored daily, either on site, or via SCADA computer
- Another alarm will be received at the Lock Out level as designated in Table 1
- Periodic monitoring of the chlorine residual is outlined in Procedure WG-ADMIN-1600 (Sampling, Testing & Monitoring)

Table 1: Summary of Limits (all limits in mg/L)

Water System		**Regulatory Limit**	**Critical (lock out) Limit (mg/L)**	**Normal Range**
Durham Well Supply	Point of Entry well #1B	n/a	0.50	1.0-1.4
	Point of Entry Well #2	n/a	0.50	1.0-1.4
	Distribution	0.05	0.20	0.5-0.8
Neustadt Well Supply	POE	0.05	0.50	0.8-1.1
	Distribution	0.05	0.20	0.5-0.8

***The normal range of the UV intensity can vary, but typically runs from 50-70W/m^2 in Durham, with a critical lock out limit at 32W/m^2 and 45-50W/m^2 in Neustadt with a lock out limit at 28W/m^2**

Operator Control

The operator records the treated water and distribution system chlorine residual on a daily basis as per the Sampling, Testing & Monitoring Procedure (WG-ADMIN-1600)

The operator manually adjusts the chlorination pump set points, based on experience, on-the-job training and circumstance, which affects the chlorine residual in the treated water.

- Authorization to change the critical points is limited so that the operators can not change alarm set points to provide unchlorinated water
- The operator can manually adjust the chlorine dosage and can change the critical alarm set point, if required
- The operator adjusts the chlorine dosage based on their experience and on-the-job training
- The operator documents all dosage changes in the log book
- The operator does not exercise any control in regards to UV dosage/intensity

Abnormal Operating Conditions and Response Requirements

The steps taken require some discretion of the operator and reliance on their practical experience depending on the circumstance. These conditions do not require emergency response procedures to be initiated. Occurrence of abnormal operating conditions and the resulting response and recovery is recorded by the operator in the Log Book.

The disinfection systems are automated and the operator can step in to control abnormal operating conditions. The operator can monitor residual in the treated water by monitoring the POE chlorine analyzer

Low Treated Water Chlorine Residual

- If the treated water chlorine drops to the Critical value listed in Table 1 or below, this is considered to be an abnormal operating condition
- The Operator will receive an alarm which must be acknowledged
- If low chlorine is detected in the treated water the following steps should be taken:
    1. Determine if the problem lies within the chlorination process or the analyzer by confirming chlorine residual with portable chlorine analyzer (using HACH test kit)
        - If the portable chlorine analyzer shows normal chlorine levels while the on-line analyzer shows low levels, the problem is probably with the on-line analyzer
        - If the portable analyzer confirms the low chlorine level, the problem is probably with the chlorination process
    2. Manually check the chlorine injection point to make sure sufficient chlorine is being added to the system. Manually switching to backup chlorination pump may be required
    3. **If necessary**, manually increase chlorination rate by approximately 10% or a rate deemed sufficient using operator experience
    4. Once the chlorine conditions have returned to normal, reduce chlorination rate to normal levels. This is done according to operator experience and the operating conditions at the time:
        - If chlorine level is increasing rapidly due to the manual changes, change the injection rate manually back to normal more quickly

Low chlorine in the distribution system

If the chlorine in the distribution system is less than 0.20mg/L at any time, the following steps should be followed:

- Confirm (double-check) with handheld that the reading is correct
- If so, find the closest location (i.e. hydrant) to flush the system. Do this until the residual is restored to normal operating conditions
- Check chlorine residuals in nearby areas to ensure residual has been restored
- Log actions and all residual results in the logbook

Chlorination System failure

To control a chlorination system failure, the following controls have been put in place:

- Planned maintenance on chlorination components, at a frequency deemed necessary by operations staff
- Backup dosage pumps are in place at all facilities
- Backup chlorine pump will start automatically if duty pump fails
- Operator visits to site for inspection of facility and equipment

UV system failure

- When UV intensity approaches 40mJ/cm^2, staff will clean or replace bulbs, as needed
- System shuts down until UV disinfection is restored

Emergency Conditions and Response Requirements

Low Chlorine

- Refer to Contingency Plan (Low Chlorine Alarm)
- When critical level is reached, alarm is sent out and operator responds

Reporting and Recording

- If an Emergency Response Procedure related to disinfection is initiated, corrective actions are documented as required in the Contingency Plan
- These corrective actions are reviewed by Management at the next management review meeting, as described in the Management Review Procedure

Associated Documents

Operator Log book
Risk Assessment Spreadsheet
The Procedure for the Disinfection of Drinking Water in Ontario
Contract between **Veolia** and system Owner
WG-ADMIN-1600 Sampling, Testing & Monitoring
Contingency Plans
AW-ADMIN-2000 Management Review

Table of Revisions

Date (mm/dd/yyyy)	Description of Revision
11/24/2010	Changed 'Hazard Analysis' spreadsheet to 'Risk Assessment'
06/20/2011	Updated Table 1
03/22/2012	Reviewed and revised procedure footer
04/08/2013	Changed title to Disinfection Control, to account for UV disinfection Added a number of updates relating to UV
01/06/2014	Updated Normal Range column in Table 1 for POE values
03/26/2014	Added distribution system critical limit of 0.2mg/L to Table Added actions to take for Low Chlorine in the Distribution System

01/09/2018	Critical lockout limits changed in Table 1 Primary Disinfection changed to 99.9% UV operating range changed (under Table 1) Under Operator Control; changed bullet #2 Added bullet under Chlorination System failure about auto start of backup pump
09/24/2018	Updated logo. Changed AWCC in Associated Documents to Veolia
04/01/2020	Updated comment under Table 1
05/31/2021	Added “if necessary” in Step 3 under Low Treated Water Chlorine Residual

Appendix D:

Owner/Top Management Endorsement

Corporation of the Municipality of West Grey
Resolution

Moved by: Beth Hamilton **No.** 440-19

Seconded by: Doug Hutchinson **Session:** August 6, 2019

Be it resolved that, the Council of the Municipality of West Grey hereby endorses the Drinking Water Quality Management Standard Operational Plan as presented by Veolia during the May 7, 2019 Committee of the Whole meeting, as recommended by the Committee of the Whole.

Carried ✓ **Defeated** _____ **Mayor** Christine Robinson

	For	Against
Beth Hamilton	☐	☐
Rebecca Hergert	☐	☐
Doug Hutchinson	☐	☐
Tom Hutchinson	☐	☐
Christine Robinson	☐	☐
Geoffrey Shea	☐	☐
Stephen Townsend	☐	☐

Declaration of pecuniary interest or the general nature thereof:

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June 14, 2022

DWQMS Top Management Endorsement

As per DWQMS Element 3-Commitment and Endorsement, Veolia Water Canada is committed to an effective Quality Management System by

a) Ensuring that a QMS in in place that meets the requirements of the Standard
b) Ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements
c) Communicating the QMS according to the procedure for communications, and
d) Determining, obtaining, or providing the resources needed to maintain and continually improve the QMS

As Top Management, the signature below indicates commitment to the Quality Management system for Chalk River, Moosonee and West Grey (Durham and Neustadt)

Marco Fontana-Giusti
VP Operations
Veolia North America, Canada

Veolia North America, Canada
555 Rene-Levesque Blvd West
Suite 1450
Montreal, QC H2Z 1B1

Appendix E:

Emergency Contact List(s)

WEST GREY DRINKING WATER SYSTEM EMERGENCY CONTACTS

EMERGENCY CONTACT LIST

Veolia Water Canada Inc.	Fei Xue, Lead Operator Steve Walmsley, Operator	519-369-6655 (Office) 519-369-8179 (Cell)
Municipality of West Grey	Brent Glasier, Public Works Manager Steve Ayerhart, PW lead	519-369-2200 (Office) 519-369-4343
GSS Engineering	Rakesh Sharma	519-372-4828 (Office)
WSP Group (Engineer)	Chris Wilson	519-376-7612 (Office)

GOVERNMENT CONTACT LIST

Ministry of the Environment, Conservation and Parks (MECP)	Spills Action Centre	(T) 1-800-268-6060 (F) 1-800-268-6062
MECP	Area Office	519-371-2901
MNR District Office, Owen Sound	General	519-376-3860
Grey Bruce Health Unit, Owen Sound	Support Staff (Day Hours) Ask for Inspector on Call (After Hours)	519-376-9420 (Day Hours) 519-376-5420 (After Hours)
Ministry of Labour	General Inquiry	1-877-202-0008
MCCR (Fuel Safety Branch)	General Inquiry	1-800-682-8772
Ontario Provincial Police (Mount Forest)	General Inquiry	519-323-3130
MTO (Regional or District Office), Owen Sound	General Inquiry	519-376-7350
Saugeen Valley Conservation Authority		519-367-1255

ADDITIONAL CONTACTS

Name	Contact Name	Phone No.
Veolia Water Canada Inc.	Greg Prangley (Project Mgr.)	905-975-8669 (cell)
Veolia North America, Canada	Marco Fontana-Giusti (VP-Operations)	587-336-6509 (cell)
Veolia IT assistance		1-888-477-8778
Hydro One, Emergency		1-877-363-7464
Equipment Rental Companies	Sunbelt Rentals (Owen Sound)	519-376-8555
Selog (SCADA)	Peter Chung	905-873-7373
Metcon	Service	905-738-2355
Prominent	Office	519-836-5692

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WEST GREY DRINKING WATER SYSTEM EMERGENCY CONTACTS

	Technical Assistance	1-888-709-9933
Hach	Service	1-800-665-7635
Trojan (UV)		1-800-291-0213
H2Flow (Filters)		905-660-9775
General Filtration		1-888-233-1969 905-761-9000
Call One (Locates)		1-800-400-2255
SGS (Accredited Lab)		519-672-4500
DH Jutzi (Sodium hypochlorite)		519-271-9831
Dewar Electric (Electrician)		519-323-9000

Appendix F:

QMS Policy

Quality Management Policy

EFFECTIVE DATE: September 28, 2018

TO BE REVISED: As required

Veolia Canada Inc. (Veolia), on behalf of the Municipality of West Grey, is committed to supplying a safe, consistent drinking water supply while maintaining strict adherence to all applicable legislative and regulatory requirements. We strive to achieve these goals through the implementation of a management system comprised of policies, procedures, instructions and forms that demonstrate risk-based treatment process, evaluation, staff competency, open communication, workplace safety, and appropriate contingency/emergency response procedures.

Together, the Municipality of West Grey and Veolia are committed to:

- Managing and operating the drinking water systems in a responsible manner in accordance with documented quality management policies and procedures.
- Providing the customer with clean, safe drinking water
- Maintaining and continually improving each quality management system
- Complying with applicable regulations and legislation

The Municipality and Operating Authority are committed to accomplishing our goals through the dedication, support and participation of all, and through the maintenance and continual improvement of the Quality Management Systems.