Drinking Water Quality Management Standard (DWQMS 2.0)

Internal Audit Report

For the period of:

April 7, 2021 to May 12, 2022

For:

Municipality of Lakeshore

Environmental Services Department

Lakeshore Drinking Water System

Conducted by:

acclaims ENVIRONMENTAL
acclaims.ca

Audit dates: May 10-12, 2022
Report date: May 16, 2022

1.0 Overview & Objectives

Acclaims Environmental Inc. was retained to conduct an internal audit of the Municipality of Lakeshore's quality management system (QMS) on May 10-12, 2022 to determine whether it conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0); and to assess whether the QMS is effectively implemented.

The internal audit was conducted with one lead auditor, Brigitte Roth of Acclaims Environmental Inc.

This report summarizes the audit results in section 2.0 Audit Findings, categorizing positive findings, non-conformities and opportunities for improvement.

1.1 Risks and Opportunities

The risk-based approach was used in conducting this audit; which considers risks and opportunities to ensure that the audit focuses on matters that are significant for the auditee and for achieving the audit program objectives.

In any audit, potential risks can include those related to *ineffective*: planning / identification of external and internal issues; resources; audit team; communication; audit program implementation / monitoring / improvement; control of documented information; and availability of auditee and/or evidence.

Also, opportunities can include *efficiencies* such as: allowing multiple audits to be conducted in a single visit; minimizing time and distances travelling to sites; matching competencies of audit team to competencies needed; and aligning audit dates with the availability of auditee's staff.

This audit was conducted remotely, using information and communications technology (ICT) for audit interviews. Potential risks in conducting audits remotely include: issues related to ICT availability / capability / reliability; auditee knowledge and familiarity with ICT; evidence presented might not be representative; and additional follow-up may be required. Opportunities in conducting this audit remotely: supports business continuity, allows for internal audits to be conducted in extraordinary times; improved efficiency with auditees' time; can follow-up with requested information.

1.2 Scope

This internal audit was performed remotely, using information and communications technology (ICT). The COVID-19 pandemic response (in implementing measures to prevent the spread of the virus) has presented unique opportunities for organizations to explore alternative approaches for business continuity. Conducting audits remotely was one of these opportunities and is a permitted practice under normal operating conditions through the province's Municipal Drinking Water Licensing Program and through ISO 19011:2018 Guidelines for auditing management systems.

The Operational Plan for the Lakeshore Drinking Water System was reviewed for conformity to the Drinking Water Quality Management Standard (DWQMS 2.0). This audit also reviewed Lakeshore's planned processes and programs to evaluate how well QMS requirements are integrated into them.

Process audits examine the resources (equipment, materials and people) used to transform the inputs into outputs, the methods (procedures and instructions) followed and the measures collected to determine process performance. Process audits check the adequacy and effectiveness of the process controls established by procedures, work instructions, training and process specifications.

As the last internal audit was conducted on April 5-6, 2021, this audit focused on the period between April 7, 2021 and May 12, 2022.

1.3 Methodology

The audit was conducted in accordance with ISO 19011:2018 – Guidelines for auditing management systems.

The list of all auditing criteria is included in Appendix "A" – Audit Plan. Appendix "B" – Interviews, Documents and Records lists persons interviewed, along with documents and processes reviewed. Appendix "C" – Audit Checklists includes the checklists used to conduct the audit.

In order to conduct audits within scope, time and budgetary constraints, audit evidence is based on a sampling of processes, programs, and information available. The size of the sample selected is appropriate to the size and scale of the operation and information available. Objective evidence collected is based upon the sampling.

The conclusions presented in this report are based on information presented during the internal audit.

1.4 Audit Program Monitoring and Reviewing

The implementation of the audit program was monitored and, at appropriate intervals, reviewed to assess whether the objectives have been met and to identify opportunities for improvement. The results of this review will be included in this report, if applicable.

Performance indicators were used to monitor characteristics such as:

- conformity with the audit program, schedules and audit objectives,
- the ability to implement the audit plan,
- feedback from top management, auditees, auditors and other interested parties, and
- adequacy of documented information in the whole audit process.

The audit program review considered:

a) results and trends from monitoring,
b) conformity with procedures,
c) evolving needs and expectations of relevant interested parties,
d) audit program records,
e) alternative or new auditing methods / practices,
f) effectiveness of the actions to address the risks and opportunities, and internal and external issues associated with the audit program, and
g) confidentiality and information security issues relating to the audit program.

Corrective actions and opportunities for improvement from the results of audit program reviews, if any, are included in the internal audit report's section 2.0 Audit Findings.

1.5 Auditors

The Lead Auditor was Brigitte Roth, who has extensive auditing experience and is a certified auditor with the Environmental Careers Organization of Canada (ECO Canada). Auditor qualifications are included in Appendix "D" – Auditor CV and Training Certificates.

1.6 Confidentiality

The information gathered by Acclaims Environmental Inc. is the property of Municipality of Lakeshore only and will not be transmitted to any third party without the prior written consent of an authorized representative. All documents provided by the organization prior to and during the assessment are kept only for the purpose of audit review and audit report preparation.

2.0 Audit Findings

2.1 Positive Findings

The following positive audit findings were noted during the audit:

Commitment

- Staff interviewed were knowledgeable about their processes and programs and their roles' impacts on achieving the commitments included in the QMS Policy.
- All staff interviewed felt they had the support from management and resources they needed to carry-out their jobs well.

Culture of continual improvement

- Consistently throughout the audit, improvements were noted with regards to achieving intended outcomes of drinking water system processes and programs.
- In-field capable technology has been deployed (e.g. tablets) to electronically record operational, maintenance, and compliance information, optimizing staff resources.

Effective Communications

- Improved communications between all team members (relating to out-of-ordinary conditions and notifications).
- Open and transparent communications were noted regarding the Force Majeure scenario experienced through the coagulant supplier – with risk-based decisions made to determine viable alternate coagulant suppliers.

2.2 Non-Conformities

One non-conformity was noted during the audit.

Management Review

DWQMS Element 20 Management Review requires that consideration of all items, a) to p), are considered in the evaluation of the continuing suitability, adequacy and effectiveness of the QMS.

- Not all items required in DWQMS Element 20 PLAN a) to p) were covered in Management Review in 2021.

2.3 Opportunities for Improvement

The following is a list of opportunities for improvement noted in conducting this audit:

Reference	Opportunity for Improvement – Description
QMS Rep appointment (El. 4)	Consider appointing the Water Compliance Coordinator as QMS Representative, as this is the role that is carrying out the QMS Rep duties.
Critical Control Limit (CCL, El. 8)	Consider increasing the CCL's related to distribution system chlorine residuals to a number higher than the regulatory minimums (currently 0.05 mg/L free chlorine). CCL's are the points at which you're asking staff to initiate a CCP response procedure (e.g. AWWA standard, 0.3 mg/L free chlorine residual and

Reference	Opportunity for Improvement – Description
	MECP's Watermain Disinfection Procedure updated in 2020 defines an acceptable disinfectant as 0.2 mg/L free chlorine residual).
Competencies (El. 10)	Consider describing qualifications required for ORO's and OIC's (e.g. based on class of systems, other types of competencies, etc.) and also confirm the annual hours and CEU's of training required for operators (as this is based on the highest class of system operators work under, per O. Reg. 128/04).
Personnel Coverage (El. 11)	Consider including references to updated pandemic response plans (based on actions taken to ensure personnel coverage in an outbreak) and describe key aspects physical separation of staff into cohorts at two plants / ops centre, etc. Also, consider adding references to O. Reg. 128/04 and O. Reg. 129/04 regulatory provisions that are in place for the use of emergency substitute operators (a summary of these provisions is outlined in OnWARN Continuity of Operations protocol.pdf, also available at www.onwarn.org)
Long-term forecast of major infrastructure maintenance… (El. 15)	Consider describing how long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities are reviewed once every calendar year. (e.g. In work order system, towers / reservoirs lists, etc.)

3.0 Conclusions

The results of the internal audit performed for the Municipality of Lakeshore confirm that the quality management system established is effective in conforming with the requirements of Drinking Water Quality Management Standard.

While a non-conformity and opportunities for improvement are cited in this audit report, they do not undermine the positive programs and attitudes already in place among Municipality of Lakeshore staff.

Brigitte Roth, BES, EP(EMSLA)

Appendix "A" – Audit Plan

Internal Audit Start Date:	May 10, 2022	Internal Audit End Date:	May 12, 2022

Date	Time	Auditor	Auditee	Process / Program	DWQMS Element – Standard and version: DWQMS 2.0																				
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
05-10/ 05-11	1:00 – 4:30	BR	Doc. Info.	Desktop review	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
05-10	1:00	BR	ALL	Opening meeting	x																		x		x
05-12	8:00	BR	KD	QMS & Compliance		x	x	x	x	x	x	x	x	x	x	x	x					x	x	x	x
05-12	10:00	BR	AD	Top Management responsibilities		x	x		x		x	x	x	x	x	x		x	x			x		x	x
05-12	11:00	BR	EH, KR	Water Treatment O&M		x			x		x	x	x	x	x	x	x		x	x	x	x			x
05-12	1:00	BR	MS, JM	Distribution O&M		x			x		x	x	x	x	x	x	x		x	x	x	x			x
05-12	2:00	BR	KD	Emergency Management		x			x		x	x	x	x	x	x	x			x	x	x			x
05-12	3:30	BR	ALL	Closing Meeting	x																		x		x

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

Auditee initials: AD-Albert Dionne, EH-Evan Haines, JM-Jason Marchand, KD-Kyle Davis, KR-Ken Robert, MS-Marshall Stevenson, ALL-anyone interested.

Appendix "B" – Documents and Records

The list of documents and records were reviewed and observations made during the audit include:

- Lakeshore Environmental Services staff interviews May 12, 2022 (organized by last name):
  - Kyle Davis, Compliance Coordinator
  - Albert Dionne, Division Leader of Water Management
  - Evan Haines, Water Treatment Operator
  - Jason Marchand, Water Distribution Operator
  - Ken Robert, Water Treatment Operator
  - Marshall Stevenson, Water Distribution Operator
- Operational Plan (OP) for the Municipality of Lakeshore
- OP-01 Quality Management System, dated February 22, 2022
- OP-02 Quality Management System Policy, dated February 22, 2022
- Availability of QMS Policy commitments online at: https://www.lakeshore.ca/en/municipal-services/water-and-wastewater-services.aspx#Water-Services (accessed on May 10, 2022)
- QMS Policy Statement, dated October 28, 2020
- OP-03 Commitment and Endorsement, dated November 3, 2021
- OP-04 Quality Management System Representative, dated February 24, 2022
- OP-05 Document and Records Control, dated February 24, 2022
- OP-05 Document and Record Control Document Retention Policy – Non-Regulatory, dated February 24, 2022
- By-law Number 21-2006, dated April 25, 2006
- By-law Number 22-2014, dated March 4, 2014
- OP-05 DWQMS Current & Relevant Documents and Records List, dated April 3, 2020
- OP-06 Drinking Water System, dated February 25, 2022
- OP-07 Risk Assessment, dated February 25, 2022
- OP-08 Risk Assessment Outcomes, dated February 25, 2022
- 36-month Risk Assessment meeting minutes, dated April 21, 2021
- OP-09 Organizational Structure, Roles, Responsibilities and Authorities, dated November 3, 2021
- OP-09 Lakeshore Water Services Personnel Responsibilities & Authorities table, dated November 10, 2021
- OP-10 Competencies, dated February 25, 2022
- Operator Licence Renewal Matrix (2022)
- CEU and OJT training reports for Marshall Stevenson, Jay Marentette and Bryon Unholzer
- OP-11 Personnel Coverage, dated January 29, 2020
- Water Distribution On-Call Schedule 2022, dated December 8, 2021
- OP-12 Communications, dated January 29, 2020
- ControlChem letter re: Declaring Force Majeure for supply of Poly Aluminum Chloride (PAC), dated March 22, 2022
- MECP E-mail (to MECP Inspector) re: Coagulant Supply Issue, dated March 31, 2022
- Council e-mail by Krystal Kalbol, Corporate Leader – Operations re: Water Treatment Chemical Supply, dated April 20, 2022
- MECP e-mail by Kyle Davis, Compliance Coordinator re: Municipality of Lakeshore John George WTP Coagulant change notification, dated April 28, 2022
- MECP e-mail by Kyle Davis, Compliance Coordinator re: Change of Coagulant Aid at Belle River WTP, dated September 8, 2021

- OP-13 Essential Supplies and Services, dated January 29, 2020
- Contingency / Emergency Plan Manual – Phone Number Contact Lists, dated May 10, 2022
- Essential Supplies and Services Contact List, dated January 29, 2020
- OP-14 Review and Provision of Infrastructure, dated January 28, 2020
- OP-15 Infrastructure Maintenance, Rehabilitation and Review, dated January 6, 2021
- OP-16 Sampling, Testing and Monitoring, dated February 7, 2020
- 2022 Sampling Schedule
- OP-17 Measurement and Recording Equipment Calibration and Maintenance, dated February 7, 2020
- SCG Flow, Pressure and Water Quality Instrumentation – Verification / Calibration Report, dated March 2021
- SCG Lakeshore WTP Flow Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Lakeshore WTP Handheld Water Quality Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Lakeshore WTP Online Water Quality Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Lakeshore WTP Reservoir Level Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Stoney Point WTP Flow Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Stoney Point WTP Handheld Water Quality Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Stoney Point WTP Online Water Quality Instrumentation – Verification / Calibration Report, dated July 2021
- SCG Stoney Point WTP Reservoir Level Instrumentation – Verification / Calibration Report, dated July 2021
- OP-18 Emergency Management, dated February 7, 2020
- Lakeshore's Waterworks Emergency Response Plan, last updated June 17, 2019
- Mock Emergency Review minutes, dated January 12, 2022
- Mock Emergency Situation – Watermain Break Along Comber Side Rd. presentation
- Contingency / Emergency Plan Manual – Phone Number Contact Lists, dated May 10, 2022
- OP-19 Internal Audits, dated February 7, 2020
- External Audit report by NSF-ISR, dated March 3, 2022 (for audit conducted Feb. 28-March 2, 2022)
- 2021 Internal Audit report by Acclaims Environmental Inc., dated April 9, 2021
- OP-20 Management Review, dated February 7, 2020
- Management Review Meeting minutes dated May 12, 2021
- Information Report to Council re: DWQMS Management Review Meeting, dated February 17, 2022
- Management Review Agenda, dated May 11, 2022
- OP-21 Continual Improvement, dated February 7, 2020
- CI Action log 2022

Appendix "C" – Audit Checklists

DOCUMENT REVIEW – DWQMS 2.0 *(Condition Expected)*	DOCUMENT REVIEW – Auditor Comments *(Condition Found)*
1. Quality Management System (QMS) **PLAN** – The OP shall ***document a QMS*** that ***meets the requirements*** of this Standard. **DO** – The OA shall ***establish and maintain the QMS*** in accordance with the requirements of this Standard and the ***policies and procedures*** documented in the OP. Director's Directions – Minimum Requirements for Operational Plans **(updated May 2021, no later than April 1, 2022)** also specifies: - Each municipal residential drinking water system shall have OP's that ***apply to all parts of the DWS***, that can ***incorporate by reference*** other documents deemed necessary by the owner or OA. - A ***single OP*** may be prepared for multiple DWS that have ***same owner*** and operated by ***same OA***. - For ***Limited Scope – Transitional*** (if applicable), shall contain Schedule B parts of DWQMS PLAN. - All OP's shall have: a. ***procedure for version control*** – ensuring ***version # and/or revision date*** on every page of any ***physical*** copy; ***version # and/or revision date*** recorded on or ***otherwise embedded*** in every ***electronic*** copy; or if in ***separate files***, up-to-date ***list or index*** maintained of ***all OP documents***, including ***version #'s and dates.*** b. ***a title*** that generally describes the ***municipal DWS('s)*** to which the OP's apply. c. ***A completed copy of Subject System Description Form in Schedule "C"*** that includes name of DWS's, MDWL #'s, operational subsystem to which plans apply - OP's submitted to Director shall be submitted ***electronically as a single file in PDF or other format acceptable*** to the Director; and be ***copied to the OA*** in charge of the DWS, if the OA is not the owner. - OP's subject to an audit by an accreditation auditor shall be ***retained for a minimum of 10 years*** by the ***owner*** of the OP's and the ***accredited OA***. Owners shall make OP's ***current version*** (hard copy) or reflecting "***major revision***" (electronic on website) of ***available for viewing*** by the public – at ***principal office*** of owner within the area served by the DWS and/or ***on a website*** that is accessible to the public (but not any part that could threaten H&S of an individual or safety and quality of drinking water, competitive position, or trade secrets, etc.)	Viewed the Operational Plan (OP) for the Municipality of Lakeshore – that is comprised of a series of OP-## documents, (with ## linking to the DWQMS Element numbers). Confirmed documented information meets the requirements of the DWQMS with supporting information provided in each of the sections of this checklist. Evaluated the OP conformity with the latest Director's Directions issued May 2021: - The Schedule C confirms the Owner, names of DWS's (Municipality of Lakeshore Drinking Water System – Belle River (MDWL #031-101), Stoney Point (MDWL #031-101), Union Distribution System (#041-101, operated by OCWA), and Tecumseh Distribution System (#040-101), operated by the Corporation of Tecumseh). Verbal note: Website mentions Tilbury-Wheatley as part of Lakeshore's water distribution service areas (OA is Chatham-Kent Public Utilities) - A single OP for the drinking water systems covered - No title – however Schedule C addresses this - Completed Schedule C - Acceptable format (organized by Element #) - Kept for 10 years, as per By-law Number 22-2014 - Verbal note: Describe how is the OP available to public Viewed OP-01 Quality Management System, dated February 22, 2022. Identifies owner / OA for the Municipality of Lakeshore Water Supply System. The documented QMS conforms to the requirements of the standard with noted **positive audit findings (POS)**, **non-conformities (NC's)** and **opportunities for improvement (OFI's)** within the designated areas of this checklist.
2. QMS Policy **PLAN** – The OP shall ***document a QMS Policy*** that provides the foundation for the QMS, and: a) includes a ***commitment*** to the ***maintenance and continual improvement of the QMS***, b) includes a commitment to the ***Consumer to provide safe drinking water***, c) includes a commitment to ***comply with applicable legislation and regulations***, and d) is in a form that ***can be communicated*** to all OA ***personnel***, the ***Owner*** and the ***Public***. **DO** – The OA shall ***establish and maintain a QMS*** that is consistent with the QMS Policy.	Viewed OP-02 Quality Management System Policy, dated February 22, 2022. Noted it includes the required commitments. Also viewed availability of QMS Policy commitments online at: https://www.lakeshore.ca/en/municipal-services/water-and-wastewater-services.aspx#Water-Services (accessed on May 10, 2022). Viewed QMS Policy Statement, dated October 28, 2020 signed by Krystal Kalbol, Corporate Leader of Operations.
3. Commitment and Endorsement **PLAN** – The OP shall contain a ***written endorsement*** of its contents by ***Top Management*** and the ***Owner***. **DO** – Top Management shall provide ***evidence*** of its ***commitment*** to an effective QMS by: a) ensuring that a ***QMS is in place that meets*** the requirements of this Standard, b) ***ensuring*** that the OA is aware of all applicable ***legislative and regulatory requirements***, c) ***communicating*** the ***QMS*** according to the procedure for communications, d) ***determining, obtaining or providing*** the ***resources needed*** to maintain and continually improve the QMS.	Viewed OP-03 Commitment and Endorsement, dated November 3, 2021 that is signed by Top Management (signed by Krystal Kalbol, Corporate Leader, Operations; Albert Dionne, Division Leader, Water Management; Garry Punt, Team Leader, Water Management; and Mayor Tom Bain). It includes commitments related to ensuring the DWQMS requirements are implemented into a QMS; that the QMS complies with all applicable legislation; and that the resources required to maintain and continually improve are identified and provided.
4. QMS Representative **PLAN** – The OP shall ***identify*** a ***QMS representative***. **DO** – Top Management shall ***appoint and authorize*** a QMS representative who, irrespective of other responsibilities, shall: a) ***administer*** the QMS by ***ensuring that processes and procedures needed*** for the QMS are ***established and maintained***, b) ***report to Top Management*** on the ***performance*** of the QMS and any need for ***improvement***, c) ensure that ***current versions of documents*** required by the QMS are being ***used at all times***,	Viewed OP-04 Quality Management System Representative, dated February 24, 2022 that identifies the Division Leader of Water Management as QMS Representative, with all listed responsibilities here. **OFI (re-issued from 2021 audit)**: Consider appointing the Water Compliance Coordinator as QMS Representative, as this is the role that is carrying out the QMS Rep duties.

DOCUMENT REVIEW – DWQMS 2.0 *(Condition Expected)*	DOCUMENT REVIEW – Auditor Comments *(Condition Found)*
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 e) promote ***awareness of the QMS*** throughout the OA.	
5. Document and Records Control **PLAN** – The OP shall document a procedure for Document and Records control that describes how: a) ***Documents required*** by QMS are: i. kept ***current, legible*** and readily ***identifiable*** ii. ***retrievable*** iii. ***stored, protected, retained and disposed of***, and b) ***Records required*** by the QMS are: i. kept ***legible***, and readily ***identifiable*** ii. ***retrievable*** iii. ***stored, protected, retained and disposed of***. **DO** – The OA shall implement and conform to the procedure for Document and Records control and shall ensure that QMS documentation for the Subject System includes: a) the ***OP*** and its associated ***policies and procedures***, b) Documents and Records determined by the OA 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.***	Viewed OP-05 Document and Records Control, dated February 24, 2022 that links to OP-05 Document and Record Control Document Retention Policy – Non-Regulatory, dated February 24, 2022. The Municipality has established a by-law (No. 21-2006) that outlines retention periods for various documents and records of the corporation, uses Compliance Science software for managing electronic formats, and filing cabinets in designated areas for hard copies. Lakeshore's Records Destruction Process is followed for documented information that have fulfilled retention periods. Viewed By-law Number 21-2006, dated April 25, 2006. TOMRMS (The Ontario Municipal Records Management System) is evidently used for the by-law, however some of the retention times specified for the Environmental Services' categories of records don't align with requirements of SDWA, O. Reg. 170/03, MDWL, DWWP, Director's Directions, etc Viewed By-law Number 22-2014, dated March 4, 2014 that amended the original by-law to ensure retention periods accurately reflect requirements of the SDWA, O. Reg. 170/03, O. Reg. 453/07, MDWL, DWWP, Director's Directions. Listing the following as - 5-year records: operational, sampling, testing, corrective actions, logbooks, SCADA records, training - 6-year records: A&S reports, sampling / testing (Schedules 13, 15.1) and corrective actions, financial plans - 10-year records: audited OP's, DWWP Forms 1, 2, 3 - 15-year records: Sched. 13 and corrective actions (60-month sampling) and corrective actions; Engineer's Reports Also viewed the OP-05 DWQMS Current & Relevant Documents and Records List, dated April 3, 2020 – which identifies key documented information, locations and retention periods. Verbal note: The "supporting documents" folder provided in this audit often includes files that are older (2018-2019 records) and older versions of the OP documents (opportunity to clear-out duplication and conflicting information).
6. Drinking Water System (DWS) **PLAN** – The OP shall ***document***, as applicable: a) for the Subject System: i. the name of the ***Owner*** and ***OA***, ii. if the system includes equipment that provides ***Primary Disinfection*** and/or ***Secondary Disinfection***: A. a ***description of the system*** including all applicable ***Treatment System processes*** and ***Distribution System components***, B. a Treatment System ***process flow chart***, C. a description of the ***water source***, including: I. general ***characteristics of the raw water*** supply, II. ***common event-driven fluctuations***, and III. any resulting ***operational challenges and threats.*** iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection: A. a description of the system including all Distribution System components, and B. a description of any ***procedures*** that are in place to ***maintain disinfection residuals***. b) if the Subject System is an Operational Subsystem, a summary ***description*** of the ***Municipal Residential Drinking Water System it is a part of*** including the name of the ***OA(OA's)*** for the other Operational Subsystems. c) if the Subject System is ***connected to one or more*** other Drinking Water Systems owned by different ***Owners***, a summary description of those systems which: i. indicates whether the Subject System ***obtains water from or supplies water to*** those systems, ii. names the ***Owner*** and ***OA(OA's)*** 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 OA shall ensure that the ***description*** of the Drinking Water System is ***kept current.***	Viewed OP-06 Drinking Water System, dated February 25, 2022. The Municipality of Lakeshore Drinking Water System (LDWS) is owned by the municipality and operated by the Municipality's Operations Department. The LDWS includes: - Lakeshore and Stoney Point WTP's - Distribution System that includes: Elevated Storage Tanks (Belle River and Maidstone), Reservoirs and Pumping Stations (County Road No. 35 / Haycroft and Comber) - Distribution System Sectors supplied with water from neighbouring drinking water systems: Tecumseh Water Service Area (supplied from Windsor DWS with Detroit River as water source) and the Union Service Area (supplied form Union Water Supply System with Lake Erie as water source) - Verbal Note: Not fully in line with description included in OP-01 – re: Tilbury-Wheatley OP-06 describes WTP locations, overview of WT at each, their daily capacity, PTTW limit, low lift and intake processes. Process flow diagrams for the facilities and distribution system maps are included in the supporting documents folders. Distribution system descriptions for 4 water distribution systems: Lakeshore Water Service Area (WSA), Stoney Point WSA, Union WSA, Tecumseh WSA. Source water characteristics (with table 1 summarizing data from 2019 WTP data), event-driven fluctuations include: wind strength, wind direction, stormwater run-off, algal blooms – and regarding these, operational challenges and threats: increased clarifier sludge blowdown requirements, dosage adjustments in coagulant and polymer dosages, reduced filter run times, decreased UV dosages, increased chlorine demand for primary disinfection (for Stoney Point WTP), increased activated carbon usage – with possible filter turbidity breakthrough and diminished water quality. Threats are affiliated with sources of raw water contamination and intake structure damages. Noted a description of how chlorine residuals are maintained throughout in the Distribution System section.

DOCUMENT REVIEW – DWQMS 2.0 *(Condition Expected)*	DOCUMENT REVIEW – Auditor Comments *(Condition Found)*
7. Risk Assessment **PLAN** – The OP shall document a risk assessment process that: a) Considers potential hazardous events and associated hazards, as identified in MOECC 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) ID's ***additional potential*** hazardous events & associated hazards, c) ***assesses*** the ***risks*** assoc. w/ 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 i) considers the ***reliability and redundancy of equipment***. **DO** – The OA shall ***perform*** a risk assessment ***consistent with the documented*** process.	Viewed OP-07 Risk Assessment, dated February 25, 2022. Noted the reference to the Ministry's "Potential Hazardous Events…" document as part of the process; along with evidence of consideration of the 13 items (cyber terrorism included) within the risk assessment outcomes record. In reviewing the Risk Assessment Outcomes (as documented in the next section), noted additional potential hazardous events and associated hazards (e.g. SCADA communications failure, staff availability – pandemic, etc.) Likelihood, Consequence and Detectability ratings are provided, which define "occurrence" ratings in light of reliability and redundancy of equipment (as per the procedure). The total ranking is a combination of these added ratings. Control measures available are noted throughout as part of the RA Outcomes record. CCP's are identified through Element 8 records. Noted that the currency of information and validity of assumptions was carried out in the last calendar year (as per the 36-month Risk Assessment meeting minutes, dated April 21, 2021).
8. Risk Assessment Outcomes **PLAN** – The OP 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. **DO** – The OA shall ***implement and conform*** to the procedures.	Viewed OP-08 Risk Assessment Outcomes, dated February 25, 2022 (last conducted April 21, 2021). Noted risks identified by activity / process step; listed potential hazardous events for each; potential risks of hazardous events; identified control measures throughout and the identification of high risks, CCP's and related CCL's. Viewed the 36-month Risk Assessment meeting minutes, dated April 21, 2021. Noted two action items were still open, updates were documented by facility – e.g. Stoney Point WTP – backwash vs. high lift pump correction, chlorine analyzer replacements, HAB Plan and sampling requirements in MDWL, frazil ice, alum dosage, cyber terrorism (i.e. Florida incident) and administrative changes; Belle River WTP – chlorine analyzer replacements, valve actuators on UV, HAB Plan and sampling requirements, cyber terrorism; Lakeshore WSA – considered CCL increase to 0.2 mg/L. Noted next 36-month risk assessment date is by 21 April 2024, and next annual review is planned for the following April. CCP's are identified for items (as applicable to each drinking water system) that impact achieving disinfection (coagulation / filtration processes, disinfection process itself incl. UV / chlorination) and distribution chlorine residual. **OFI (re-issued from 2021 audit)**: Consider increasing the CCL's related to distribution system chlorine residuals to a number higher than the regulatory minimums (e.g. 0.05 mg/L free chlorine). CCL's are the points at which you're asking staff to initiate a CCP response procedure (e.g. AWWA standard, 0.3 mg/L free chlorine residual and MECP's Watermain Disinfection Procedure updated in 2020 defines an acceptable disinfectant as 0.2 mg/L free chlorine residual).
9. Org. Structure, Roles, Responsibilities and Authorities **PLAN** – The OP shall: a) describe the ***organizational structure*** of the OA including ***respective roles, responsibilities and authorities***, b) delineate ***corporate oversight*** roles, responsibilities, authorities in the case where the OA operates multiple Subject Systems, c) identify the ***person, persons or group of people*** within the management structure of the org. 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, & e) identify the ***Owner*** of the Subject System. **DO** – The OA shall ***keep current*** the description of the organizational structure including respective roles, responsibilities and authorities, and shall ***communicate*** this information to OA ***personnel*** and the ***Owner***.	Viewed the OP-09 Organizational Structure, Roles, Responsibilities and Authorities, dated November 3, 2021; and OP-09 Lakeshore Water Services Personnel Responsibilities & Authorities table, dated November 10, 2021. References job descriptions for the listing of responsibilities by role as well as the OP-09 Lakeshore Water Services Personnel Responsibilities & Authorities table. Those with "management" responsibilities are members of Top Management and roles responsible for participating in Management Reviews have been defined as: Corporate Leader of Operations, Division Leader of Water Management, Team Leader of Water Management, Water Compliance Coordinator (designate), and Working Foreman (Treatment & Distribution). The roles / responsibilities / authorities table includes the Owner / Council responsibilities / authorities and for each position within Top Management and Environmental Services division. SDWA s.19 Standard of Care session with decision-makers (senior management and members of council) took place on March 5, 2020. This session was based on the province's Taking Care of Your Drinking Water Guide – "Check your knowledge" – answering the 20 or so questions on Lakeshore's DW system.
10. Competencies **PLAN** – The OP 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	Viewed OP-10 Competencies, dated February 25, 2022. Identifies OIT as minimum competency for working within the DWS. Records of training tracked in Compliance Science.

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c) activities to ensure that personnel are ***aware of the relevance of their duties*** and ***how they affect*** safe drinking water. **DO** – The OA 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.	**OFI (re-issued from 2021 audit)**: Consider describing qualifications required for ORO's and OIC's (e.g. based on class of systems, other types of competencies, etc.) and also confirm the annual hours and CEU's of training required for employee (as this is based on the highest class of system Operators work under, per O. Reg. 128/04). Awareness of relevance of duties assessed through this internal audit's interviews as well. Viewed Operator Licence Renewal Matrix (2022) – confirmed that renewals are underway and planned for operators with expiring certificates in 2022: Marshall Stevenson (Jun 30 WDS), Jay Marentette (Sep 30 WT), Bryon Unholzer (Sep 30 WT). Viewed CEU and OJT training reports for Marshall Stevenson, Jay Marentette and Bryon Unholzer to verify that they are on-pace for attaining the required training hours for their renewals within the next quarter. Bryon and Marshall have already attained the required 105 hours (min. 36 CEU hours / 3.6 CEU's + 69 OJT hours). Jay has attained the required CEU's (has 4.2 / 42 hours), but still requires approx.. 30 hours of OJT prior to his renewal in September. Some of the CEU hours (i.e. 6 hours) can be used as OJT, therefore a minimum of 24 hours OJT is required prior to application is due. The Compliance Coordinator is aware and will follow-up with Jay with this notice. Two-month reminders are provided by the Compliance Coordinator, who will also verify that applications have been submitted, Operators will follow-up within one week of send-in, OWWCO questions will be shared with Compliance Coordinator. One situation where an operator didn't have a certificate renewal on-time, was temporary re-allocated to non-operational work.
11. Personnel Coverage **PLAN** – The OP shall document a procedure to ensure that ***sufficient personnel meeting identified competencies*** are available for duties that ***directly affect*** drinking water quality. **DO** – The OA shall ***implement and conform*** to the procedure.	Viewed OP-11 Personnel Coverage, dated January 29, 2020. References regular working hours 7:00-3:30 – see element 8 for staff shortage reference, which would link to the town's emergency plan. After hours and weekend coverage is documented in current on-call/duty schedules for both treatment and distribution operations and are updated on an annual basis. Viewed the Water Distribution On-Call Schedule 2022, dated December 8, 2021. A security paging alarm company is used to help monitor the security of treatment and distribution facilities. Pandemic plans have been updated over the course of the pandemic, and water operations identified worker cohorts that do not mix with other cohorts. When an outbreak was experienced, two operators from the unaffected plant were sent to work at the other plant. If no operators were available, OCWA operators were a back-up and arranged with OCWA's District Manager for this area. **OFI (re-issued from 2021 audit)**: Consider including reference(s) to updated pandemic response plans (based on actions taken to ensure personnel coverage in an outbreak) and describe physical separation of staff into cohorts at two plants / operations centre, etc. Also, consider adding references to O. Reg. 128/04 and O. Reg. 129/04 regulatory provisions that are in place for the use of emergency substitute operators (a summary of these provisions is outlined in OnWARN Continuity of Operations protocol.pdf, also available at www.onwarn.org) Separated previous Water Quality & Compliance role into two… - now 9 water treatment operators – eventually will have a floater operator to train in both plants – trade-off – more operational staff.
12. Communications **PLAN** – The OP shall document a ***procedure*** for communications that describes ***how*** the ***relevant aspects of the QMS*** are ***communicated*** between Top Management and: a) the ***Owner***, b) OA ***personnel***, c) ***Suppliers*** that have been identified as essential under Plan (a) of Element 13 of this Standard, and d) the ***Public***. **DO** – The OA shall ***implement and conform*** to the procedure.	Viewed OP-12 Communications, dated January 29, 2020. Describes communications with: - owner (A&S Reports, Management Review minutes, OP, council reports, budgets); - staff (OP, relevant documents, staff meetings, intranet, training sessions, via "Compliance Science"), - essential suppliers (procurement processes, phone, e-mails), - public (website communication of policy, OP, complaints process via: e-mails, calls, letters). Viewed the ControlChem letter re: Declaring Force Majeure for supply of Poly Aluminum Chloride (PAC), dated March 22, 2022. It states that this has become necessary due to supply issues regarding key raw material and severe trucking shortages which limits supply to Canada (the "Force Majeure Event"), with circumstances beyond ControlChem's reasonable control. And effective immediately, all customers of PAC sourced from the US are placed on hold.

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	Viewed MECP E-mail (to MECP Inspector) re: Coagulant Supply Issue, dated March 31, 2022. The e-mail explained about the coagulant issue that is province-wide, with Lakeshore's supplier having declared "Force Majeure" for its supply of PAC sourced from the US. It describes investigating which product to use (potentially Sternpac 70), and also states there are currently 52 days of DelPac2020 supply on-hand. It only affects the Belle River WTP. The e-mail also asks what is required from the MECP's perspective (other than notification requirement as per Lakeshore's MDWL). Viewed Council e-mail by Krystal Kalbol, Corporate Leader – Operations re: Water Treatment Chemical Supply, dated April 20, 2022. The e-mail explained that the Lakeshore's WTP uses Del Pac 2020 supplied from ControlChem in Burlington -who issued a letter re: supply of product from the US and a force majeure to the current contract supply price and conditions that the municipality has with the supplier. It describes that alternate coagulant chemicals are being investigated (Stern Pac 70, manufactured in US and Hyper Ion, manufactured in Canada – however both are available for supply in Canada). Stern Pac 70 testing completed indicates a viable replacement option and Hyper Ion was still being evaluated / tested. Once both alternatives have both been deemed acceptable, costs and timing will be assessed as to what option will be proceeding with – with no change to the budget necessary. Staff are working with the MECP through this process and were made aware immediately upon notification. 30 days' supply was still available at the time and the decision will need to be made shortly on which option will be proceeded with. Viewed MECP e-mail by Kyle Davis, Compliance Coordinator re: Municipality of Lakeshore John George WTP Coagulant change notification, dated April 28, 2022 that provides a notice to the MECP that DelPac2020's loss of supply has resulted in the change to SternPac70 as the new coagulant, with 23 days' of DelPac2020 supply on hand (conservatively), with longer than 30 days if process flows do not increase and source water requires lower dosages. In-house and independent laboratory tests required time to be conducted (hence the shorter notice period). The NSF Drinking Water Treatment Chemicals Health Effects sheet was provided. Viewed MECP e-mail by Kyle Davis, Compliance Coordinator re: Change of Coagulant Aid at Belle River WTP, dated September 8, 2021 that provides a notice to the MECP that the polymer coagulant aids will be changing within 30-45 days (both are Ployacrylamide (PC) – with current Superfloc C-1592 PG and new product Zeta 8812 – NSF Drinking Water Treatment Chemicals Health Effects sheet was provided).
13. Essential Supplies and Services **PLAN** – The OP 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 OA ***ensures the quality*** of essential supplies and services, in as much as they may affect drinking water quality. **DO** – The OA shall implement and conform to the procedure.	Viewed OP-13 Essential Supplies and Services, dated January 29, 2020 and the Contingency / Emergency Plan Manual – Phone Number Contact Lists, dated May 10, 2022, that contains the contact numbers for essential supplies and services (among other contacts, e.g. emergency services, hospitals, agencies, Municipality contacts, outside agency contacts, etc.). Viewed the Essential Supplies and Services Contact List, dated January 29, 2020 that also describes contact information, and also procurement details (e.g. types of shipments, ordering timeframes, minimum supplies, specification and proof of these obtained). Suppliers are sent a letter outlining the municipality's procurement requirements for that service – along with a copy of the Drinking Water Works Permit and Municipal Drinking Water Licence are sent – who send back a signed letter, acknowledging the municipality's requirements. Parts and chemicals have corresponding documented verification showing conformity to applicable standards. New program for financial services – returning to PO's – e.g. chlorine supplies, alum – critical chemicals / parts – verify NSF certification once every 5 years – for each critical supplier with tender specifying quality requirements.
14. Review and Provision of Infrastructure **PLAN** – The OP 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 OA shall ***implement and conform*** to the procedure and ***communicate the findings*** of the review to the ***Owner***.	Viewed OP-14 Review and Provision of Infrastructure, dated January 28, 2020 – which links to the municipality's annual budget process – in which infrastructure reviews are planned through Master planning and Asset Management Plan processes, with results presented at Management Reviews. The summary of maintenance and capital recommendations is created and reviewed with consideration given to risk assessment outcomes. The Capital Budget History and Forecast Spreadsheet identifies and tracks if risk assessment outcomes were referenced in the process. Management Review meetings document recommendations and proposed timelines for budget / project implementation.

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	Lakeshore's Asset Management Plan is ongoing (will meet the 2022 deadline) – which accounts for the review of a number of factors (state of maturity, establishment of a corporate asset management policy, data collection & analysis, condition assessments, risk model development and project prioritizations, etc.) – that links to risk assessment outcomes and the system's highest risks. The AMP report summarizes annual requirements, identifies infrastructure backlog, asset replacement requirements; and includes a section on each municipal asset's portfolio.
15. Infrastructure Maintenance, Rehabilitation and Renewal **PLAN** – The OP shall document: a) a ***summary*** of the OA'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 OA 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.	Viewed OP-15 Infrastructure Maintenance, Rehabilitation and Review, dated January 6, 2021 (verbal note, PDF tab title is "attendance policy" related) – which references: - Distribution system maintenance activities: valve maintenance, hydrant flushing, work order tracking and asset management programs. - The Town's Water and Wastewater Master Plan – laying out maintenance, rehabilitation and renewal projects to be completed in the future. - System sampling, infrastructure repair, system flow testing and routine maintenance are aligned with guidelines and coordinated with software programs. - Communication of maintenance, rehabilitation and renewal programs to council by top management through annual budget reports. Effectiveness / efficiency of maintenance, rehab and renewal programs are assessed once every calendar year. **OFI (re-issued from 2021 audit)**: Consider describing how long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities are reviewed once every calendar year. In work order system – printout regularly – towers / reservoirs – list.
16. Sampling, Testing and Monitoring **PLAN** – The OP 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 ***relevant sampling, testing or monitoring*** activities, if ***any***, that take place ***upstream*** of the Subject System, and c) a procedure that describes how sampling, testing and monitoring results are ***recorded and shared*** between the ***OA*** and the ***Owner***, where applicable. **DO** – The OA shall implement and conform to the procedures.	Viewed OP-16 Sampling, Testing and Monitoring, dated February 7, 2020. References the Regulatory and Scheduled Sampling SOP. Viewed the 2022 Sampling Schedule – which identifies the dates on which the following samples are taken: bacti's, chlorine residuals, pH & alkalinity (Lead), quarterly / annual sample dates, microcystin, and chlorine residuals in general. Challenging conditions increase sampling, testing and monitoring – due to higher risk to drinking water quality. These conditions include: clarifier effluent turbidities, raw water testing (ensuring proper coagulant and polymer dosages in high turbidity events); filter influent and effluent – operational parameters – ensuring filter media is functioning as intended; microsystin presence (harmful algal blooms); and frazil ice blockages – with bubbler system used. No relevant upstream sampling, tesing and monitoring activities. Accredited labs' certificates are obtained for labs used. Results are shared in the annual and summary reports and shared online.
17. Measurement and Recording Equipment Calibration and Maintenance **PLAN** – The OP shall document a ***procedure*** for the ***calibration and maintenance*** of ***measurement and recording*** equipment. **DO** – The OA shall ***implement and conform*** to the procedure.	Viewed OP-17 Measurement and Recording Equipment Calibration and Maintenance, dated February 7, 2020. Describes how calibration and maintenance of measurement and recording equipment is carried out – with an index of calibration and maintenance and using the PM program software. Index is reviewed / revised every calendar year by the Team Lead / Foreman Treatment. Viewed the following measurement and recording equipment calibration and maintenance: - SCG Flow, Pressure and Water Quality Instrumentation – Verification / Calibration Report, dated March 2021 – with the summary of equipment list that passed verification / calibration testing during service contract. One device had "fail" as found, Endress + Hauser Liquisys M (S/N A2001E17G00). *** - SCG Lakeshore WTP Flow Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. One device had "fail" as found, Endress + Hauser Promag 53W (S/N 9618E019000). *** - SCG Lakeshore WTP Handheld Water Quality Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary of equipment list that passed verification / calibration testing during service contract. The following devices had "fail" as found: Ecosense pH10A (S/N JC009786, SN JC014878, TC009725). *** - SCG Lakeshore WTP Online Water Quality Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. The following devices had "fail" as found: PROMINENT Total Dulcometer (S/N 2007124335), PROMINENT Free DACB (S/N 2019337860 and S/N 2007124319, S/N 2019332500), HACH

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	NTU (SC200 S/N 1908C0189743 and SS7 S/N 110200391968), PROMINENT Free Dulcometer (S/N 2013000888). *** - SCG Lakeshore WTP Reservoir Level Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. - SCG Stoney Point WTP Flow Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. - SCG Stoney Point WTP Handheld Water Quality Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary of equipment list that passed verification / calibration testing during service contract. The following devices had "fail" as found: Ecosense pH10A (S/N JC014255, and one with no S/N). *** - SCG Stoney Point WTP Online Water Quality Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. The following devices had "fail" as found: PROMINENT Total Dulcometer (S/N 2009105482), PROMINENT Free Dulcometer (S/N 2009083164, S/N 2010126270, S/N 2003012559, S/N 2003012537, S/N 2003012773, S/N 2003012555, S/N 2003012506). *** - SCG Stoney Point WTP Reservoir Level Instrumentation – Verification / Calibration Report, dated July 2021 – with the summary equipment list all instruments that passed verification / calibration testing during service contract. ***Related to the "as found, fail" findings in the above verification / calibration reports, noted external audit finding related to reducing re-calibration intervals when as found is not as intended.
18. Emergency Management **PLAN** – The OP 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, d) ***Owner and OA responsibilities*** during emergency situations, e) ***references to municipal*** emergency planning measures as appropriate, and f) an ***emergency communication protocol*** and an ***up-to-date list*** of emergency ***contacts***. **DO** – The OA shall ***implement and conform*** to the procedure.	Viewed OP-18 Emergency Management, dated February 7, 2020 – potential emergency situations are listed in the risk assessment (with links to contingency plans), and references the waterworks emergency plan, the emergency contact list which includes the essential supplies and services list. Viewed Lakeshore's Waterworks Emergency Response Plan, last updated June 17, 2019 (being updated currently)– which describes, roles, responsibilities, incident levels of activations (and examples – which align with the risk assessment outcomes), contingency plans. Viewed Mock Emergency Review minutes, dated January 12, 2022 and Mock Emergency Situation – Watermain Break Along Comber Side Rd. presentation – regarding high flow alarm at Stoney Point WTP, watermain break assumed along Comber Side Road, break confirmed between Haycroft and Comber pumping stations, open interconnect between UWSS and Stoney Point WSA – however, UWSS does not permit due to high demand (possible mainbreak as well), Open interconnect to Belle River WSA, "Transfer of Treated Water" SOP involved, supply through trucking from Stoney Point. Noted OFI identified by NSF in their audit report about tracking OFI's from emergency test exercises. Viewed Contingency / Emergency Plan Manual – Phone Number Contact Lists, dated May 10, 2022.
19. Internal Audits **PLAN** – The OP shall document a ***procedure for internal Audits*** that: a) ***evaluates conformity of the QMS*** with the requirements of this Standard, b) identifies internal Audit ***criteria, frequency, scope, methodology and record-keeping*** requirements, c) considers ***previous internal and external Audit results***, and d) describes ***how QMS Corrective Actions are identified and initiated***. **DO** – The OA shall ***implement and conform*** to the procedure and shall ensure that internal Audits are conducted at ***least once every Calendar Year***.	Viewed OP-19 Internal Audits, dated February 7, 2020 – describes that audits are carried out once every calendar year; performed by qualified auditors who are independent of the areas being audited – reviewing previous audit results (as in this section of the checklist) – and compiling results into an audit report – that are reviewed at Management Review. Viewed last External Audit report by NSF-ISR, dated March 3, 2022 (for audit conducted Feb. 28-March 2, 2022) – no non-conformities were identified, and the following is a summary of status updates on the opportunities for improvement: - **EI. 1** – Include copy of Schedule C per Director's Directions – completed. - **EI. 8** – Risk assessment outcomes – incorporate minimum CCP's (e.g. secondary disinfection) and consistently documenting 12-/36-month reviews / changes via revision history. Plan to implement for next update - **EI. 17** – Reduce re-calibration intervals when "as found" condition is "out of tolerance" (e.g. UV reference sensor) and establishing a process for monitoring expiration dates of lab standards and reagents. To be discussed at Management Review meeting next week – discussed with Trojan Technologies staff. - **EI. 18/21** – Develop action / summary log to ensure timely follow-up on OFI's identified during emergency exercises. Clarify required frequency for emergency tests. Will be adopted through the Management Review meeting and will form part of the OFI/CAR tracking form.

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	- **EI. 20** – Ensure all required management review agenda items (a-p) are clearly referenced in management review records. Standard format for Management Reviews has been developed via Agenda – with questions established for each – Water Admin person will set-up standardized meeting minute formats (e.g. risk assessment, infrastructure review, management review). - **EI. 21** – Standardize CAR form (2 versions available), develop a summary log to track CAR's. One form has been implemented – identifying the source, and what type of opportunity it is (OFI/CAR) and tracked on single worksheet. Viewed 2021 Internal Audit report by Acclaims Environmental Inc., dated April 9, 2021. No non-conformities were identified and the following is a summary of status updates on the opportunities for improvement: - **EI. 4** – Consider appointing the Water Compliance Coordinator as QMS Representative, as this is the role that is carrying out the QMS Rep duties. Ongoing, was planned for 2021 implementation (re-issued this audit) – planned to be implemented following Management Review and approval by Director. Re-issued. - **EI. 8** – Consider increasing the CCL's related to distribution system chlorine residuals to a number higher than the regulatory minimums (e.g. 0.05 mg/L free chlorine). CCL's are the points at which you're asking staff to initiate a CCP response procedure (e.g. AWWA standard, 0.3 mg/L free chlorine residual. Planned to be implemented following the next Management Review. Re-issued. - **EI. 9** – Consider verifying the MECP documents are updated to reflect changes (e.g. DWS profile, Lab Services Notification form, Schedule C). Completed. - **EI. 10 –** Consider describing qualifications required for ORO's and OIC's (e.g. based on class of systems, other types of competencies, etc.) and also confirm the annual hours and CEU's of training required for employee (as this is based on the highest class of system Operators work under, per O. Reg. 128/04). Not yet completed. Re-issued. - **EI. 11** – Consider including reference(s) to updated pandemic response plans (based on actions taken to ensure personnel coverage in an outbreak) and describe physical separation of staff into cohorts at two plants / operations centre, etc. Planning to implement, not yet completed. Re-issued. - **EI. 15** – Consider describing how long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities are reviewed once every calendar year. In work order system – printout regularly – towers / reservoirs – list. Not completed. Re-issued. - **EI. 18** – rename "Communication of Boil Water Advisory" to "Responding to Water Advisories" to include chemical contamination scenarios – Is being reviewed this year. - **EI. 20 –** consider standard template for Management Reviews – ensuring items a) to p) are covered. Reviewed minutes – this will be implemented for the next Management Review.
20. Management Review **PLAN** – The OP shall document a ***procedure for management review*** that ***evaluates*** the continuing ***suitability, adequacy and effectiveness*** of the QMS and that includes consideration of: a) incidents of ***regulatory non-compliance***, b) incidents of ***adverse drinking water tests***, c) ***deviations from Critical Control Point limits*** and ***response actions***, d) the ***effectiveness of the risk assessment*** process, e) ***internal and third-party Audit*** results, f) ***results of emergency response testing***, g) ***operational performance***, h) ***raw water supply and drinking water quality trends***, i) follow-up on ***action items*** from ***previous management reviews***, j) the ***status*** of management ***action items*** identified between reviews, k) ***changes that could affect*** the QMS, l) ***Consumer feedback***, m) the ***resources needed*** to maintain the QMS, n) the ***results of the infrastructure review***, o) ***OP currency, content and updates***, and p) ***staff suggestions***. **DO** – Top Management shall ***implement and conform*** to the procedure and shall:	Viewed OP-20 Management Review, dated February 7, 2020 – all items a) to p) are listed in the procedure. Management Review Meeting minutes are included as an appendix to the Annual Summary Report – prepared by Top Management and presented to the owner on an annul basis. Viewed Management Review Meeting minutes dated May 12, 2021 (included notes on agenda items: a, b, c/d, e, f, g, h, m, n). – items not covered: i, j, k, l, o, p. Viewed the Information Report to Council re: DWQMS Management Review Meeting, dated February 17, 2022 NC: Not all items required in DWQMS Element 20 PLAN a) to p) were covered in 2021. Viewed updated template for the Management Review Agenda, dated May 11, 2022. Noted all items a) to p) included on the agenda.

DOCUMENT REVIEW – DWQMS 2.0 *(Condition Expected)*	DOCUMENT REVIEW – Auditor Comments *(Condition Found)*
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, and d) ***report*** the ***results of the management review, the identified deficiencies, decisions and action items to the Owner***.	
21. Continual Improvement **PLAN** – The OA shall develop a ***procedure*** for ***tracking and measuring continual improvement*** of its QMS 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 QMS ***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 QMS 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 OA shall ***strive to continually improve the effectiveness of its QMS*** by implementing and conforming to the procedure.	Viewed OP-21 Continual Improvement, dated February 7, 2020 – that outlines how improvements are tracked and measures through: - 36-month review of BMP's, including any published by the MECP - Investigations of causes of non-conformities - Actions taken documented to rectify and prevent the recurrence of the non-conformity - Review / verification that actions taken are effective at correcting / preventing the non-conformity - Potential non-conformances – and taking preventive actions Viewed the CI Action log 2022 that includes identified opportunities by area, action required, responsible person, date initiated, date due, status or % complete and comments related to completion of items. It currently lists operationally-relevant opportunities for improvement. Plan to also log opportunities from audits, as recommended through the external audit.

Process:	Auditee(s):	Audit Date:
1.0 Adequate Resources? (s. 9, 11, 13, 14-15) 1.1 What are the different roles and responsibilities involved? 1.2 What are the resources required to carry out this/these tasks? Such as: a. Staff (and adequate staff coverage) b. Supplies c. Equipment d. Facilities / space 1.3 Are there enough resources? 1.4 Are there special requirements for the resources? a. How do we ensure the quality of supplies / equipment?	**4.0 Process Under Control?** (s. 5, 17) 4.1 Do you rely on documents to provide details of what tasks are required? a. SOPs? Forms? WO's? MRF's? Standards or Guidelines? b. Are they current / legible / identifiable / retrievable / stored / protected / retained? 4.2 Are documents disposed of? Why? When? 4.3 Does the work area appear safe, organized and clean? 4.4 If resources include measurement and recording equipment, is this equipment calibrated and maintained? How?	**6.0 Who?** (s. 2, 3-4, 10) 6.1 What are the competencies for these duties? 6.2 What types of activities can develop competencies / experience? 6.3 Do staff involved know how their duties affect drinking water quantity / quality? 6.4 Do staff know what the quality policy states? 6.5 How do staff know what legal requirements apply to their tasks?
2.0 Process Input? 2.1What are your process inputs? a. Legal/other requirements b. Work orders or maintenance requests c. Internal or external customers 2.2 Is there a "previous process step" that feeds into this one? 2.3 Are you happy with the supplies / data / information provided by the previous step?		**7.0 Output?** (s. 5) 7.1 What is the output of your process? 7.2 What records do you produce? a. Are they legible / identifiable / retrievable / stored / protected / retained? b. Are they complete? 7.3 Are records disposed of? Why? When?
3.0 Measured? (s. 8, 12, 16) 3.1 What things do you check, sample, monitor or test? 3.2 Where do you record results? Are records complete? 3.3 Is the information reviewed, analyzed or checked for effectiveness (in meeting requirements)? 3.4 Do you communicate results? To whom? verbally? In Writing?	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) 5.1 What types of things can go wrong? (out-of-ordinary / emergencies / service interruptions) 5.2 What actions are taken when they do go wrong? 5.3 What notifications? To whom? 5.4 What do you document? Where? 5.5 Is there an emergency contact list? Is it maintained?	**8.0 Stakeholder Satisfaction?** (s. 12, 20) 8.1 Are relevant stakeholders satisfied with this work? a. internal / external customers, b. government agencies, c. public, d. owner, e. top management 8.2 How do you know?
		9.0 Evidence of Continual Improvement? (s. 21) 9.1 What are some improvements related to this process that you have seen / implemented in the past year? 9.2 Is there anything you'd like to change about this process?

<table>
<tr><td>Process: QMS Representative responsibilities</td><td>Auditee(s): Kyle Davis, Compliance Coordinator</td><td>Audit Date: May 12, 2022 9:00 AM</td></tr>
<tr><td>1.0 Adequate Resources?
(s. 9, 11, 13, 14-15)
Have adequate resources: people, equipment, facilities, space, time – need to manage time and priorities. When OFI’s are deferred (and not causing harm to personnel, facilities and public) - return to them.

Challenges with product from ControlChem – Force Majeure situation. Had to evaluate alternate options in back-up suppliers (due to US cross-border transportation issues and pandemic rules). Study the effects of the alternate products used over the long run.

Staff consult with Kyle re: maintenance options – a few students from UofT for their “studies and needs” – e.g. testing capability of granulated activated carbon – extending the life of the materials, being studied to ensure efficacy and process control.</td><td rowspan="2">4.0 Process Under Control? (s. 5, 17)

Spreadsheets tracking

Compliance Science program – reminders for reviews and training required

Equipment calibrations and work orders completed by operators and their foremen</td><td>6.0 Who? (s. 2, 3-4, 10)

Ensure everyone is on the same page. Make sure concerns are identified, or followed-up on for resolution.

Ensure DWQMS policies are updated, followed, comply with all applicable regulations and/or exceed.

As many competencies as possible + experience, including: able to critically and logically think and accept change. Asset: Class I Operator, understanding why something needs to be done – for the role.</td></tr>
<tr><td>2.0 Process Input?
Weekly notes
Sticky notes
Boards
DWQMS & legislated requirements – updates as needed, as changes occur
Sample programs and their related days
Sample calendar – weekly / monthly schedule
Schedule: Management Review, Infrastructure Review, Risk Assessments etc.</td><td>7.0 Output? (s. 5)

Operators’ records – completed checksheets
Lab reports
MECP inspections
Audit reports
Spreadsheets
Dream reports – Wonderware SCADA software – reports based e.g. monthly filter reviews – generated monthly – any anomalies, logbooks reviewed by operators, Compliance Coordinator CCP binder – corroborating with logbooks, etc.</td></tr>
<tr><td>3.0 Measured? (s. 8, 12, 16)
Via Spreadsheets:
Track / trend bacti samples, THM’s, HAA’s
Residuals
Raw / treated characteristics by internal labs
Filter assessments
Legislative requirements
Raw water permits to take water</td><td>5.0 What If Out-of-Control? (s. 7-8, 12, 18)

As Compliance Coordinator, have a critical function to ensure safe water & compliance work is carried-out in an open and transparent way by all team members. This could be challenging if any team member is not following this open / transparent / compliant way to work.</td><td>8.0 Stakeholder Satisfaction? (s. 12, 20)

The CAO ultimately – who has to answer to council. Director, Upper Management team
The public, council (responsible to the public).

Stakeholders are happy with Compliance Coordinator’s work. Ultimately responsible to reduce liability to the Town.</td></tr>
</table>

Process: QMS Representative responsibilities	**Auditee(s):** Kyle Davis, Compliance Coordinator	**Audit Date:** May 12, 2022 9:00 AM
	Out-of-control conditions relate to non-compliances and non-conformities. Job is to reduce or eliminate liability to the municipality – by following SDWA, orders, abnormal issues identified by the MECP.	**9.0 Evidence of Continual Improvement?** (s. 21) Improvements made re: adoption of SOP's, follow-up with Operators regarding their questions. Not constantly looking to improve, but when opportunities are presented, will discuss the possibility and determine best way to proceed.

Process: Top Management	**Auditee(s):** Albert Dionne, Division Leader of Water Management	**Audit Date:** May 12, 2022 10:00 AM
1.0 Adequate Resources? (s. 9, 11, 13, 14-15) Many changes – for items that Division Leader is responsible for, have required resources. Understand 21 elements, read through Compliance Science information provided. Pandemic-related coverage – met all inspections, audits, operational requirements – best we could was implemented. Work well together. With Force Majeure situation, found a viable alternate suppliers (three options) – verified through ongoing studies and jar tests, via labs. 2018 Water & Wastewater Master Plan – being updated. Identified considerations in that Plan. $2-$3 million for capital – lifecycle analysis with OCWA and own team. Capacity limits – accounting for new subdivisions and community growth. Environmental Assessments form part of the risk-based decisions. Prioritizing work. 5-year plan for water – 40-year plan exists. Tower planned for 5,800 m3 reservoir, 16" being upgraded from 12" to help with fireflows. improvements being implemented based needs.	**4.0 Process Under Control?** (s. 5, 17) Financial Plan, as part of MDWL Municipal Drinking Water Licence Four MECP Inspection reports – one for each drinking water system Previous / historical information Wastewater reports A&S Reports on website, reports to council – verification steps in place (Compliance Coordinator) Engineering projects – CLI-ECA's, etc. Process for ensuring nothing legally required is missed.	**6.0 Who?** (s. 2, 3-4, 10) Always looking to see re: fixing processes – e.g. updating turbidimeters – great team in place. Force Majeure re: coagulant – had jar testing for three weeks to verify efficacy of alternate coagulant. Team was able to adjust – very proud of the team. Staff within the utility (e.g. Compliance Coordinator and Foremen) are open and transparent with compliance information. Leadership training – EQ test, empathetic, self-actuating, share knowledge and experiences
2.0 Process Input? Budgets Master Plan Age of equipment and infrastructure Infrastructure needs – e.g. Ductile iron watermain material – RFP over three years, 7 km's – upsize from 200 mm to 300 mm, water tower Raw water sources, trunk mains, treatment needs, reservoir needs, efficiency opportunities Existing infrastructure (e.g. 50-year old vs newer) – their rehab / replacement needs and reallocation of resources		**7.0 Output?** (s. 5) Documentation Diaries Photographs

<table>
<tr><td>Process: Top Management</td><td>Auditee(s): Albert Dionne, Division Leader of Water Management</td><td>Audit Date: May 12, 2022 10:00 AM</td></tr>
<tr><td rowspan="2">3.0 Measured? (s. 8, 12, 16)

Ensure no adverses
Ensure adequate training, current
Monitoring – e.g. completion of documentation

Follow-up on improvement opportunities and non-conformities from internal and external audits

Follow-up on MECP inspection results</td><td rowspan="2">5.0 What If Out-of-Control? (s. 7-8, 12, 18)

A&S Reports to council – delayed by 3-4 months (originally due March 31, 2020 and 2021) – reminder systems in place now with Compliance Coordinator, and also message to Clerks re: no delays related to water reports.

Watermain breaks – completed within 3-4 hours, pull together as a team, well planned-out – all disinfection requirements known.

Paperwork – training planned re: continuity and consistency between operators ensuring everyone is doing things as expected.</td><td>8.0 Stakeholder Satisfaction? (s. 12, 20)

CAO + Council – good rapport, open and transparent. Will follow-up for anything unfamiliar with (when asked question).

e.g. meter replacement program - $1.5M payback within 5 years – related to water loss</td></tr>
<tr><td>9.0 Evidence of Continual Improvement? (s. 21)

Time spent on the review of systems, information, infrastructure – a good understanding of where problems and priorities are

Good relationships with MECP Inspectors, External Auditor, Internal Auditor

Communications, ensure all staff aware of expectations

Leadership development training – ongoing learning, new perspectives from which to learn, how to work with new workers / young workers, will involve newest employees “at the table”</td></tr>
</table>

Process: Water Treatment O&M	**Auditee(s):** Ken Robert, WT Operator, Evan Haines, WT Operator	**Audit Date:** May 12, 2022 11:00 AM
1.0 Adequate Resources? (s. 9, 11, 13, 14-15) Have Compliance Science – re: documentation, regulations – resources needed – nice to have them in a central location. Also have hard copy references available. E-copies as well. Having access to Compliance Coordinator – all in one building is nice now – improved access. If any resources are needed, obtained easily. Lab equipment resources, correct bottles for sampling. Contingency plans for emergency situations, newer staff have an idea of what an emergency would entail, who to call / contact. Easily accessible. SOP's. Documentation, easy to reference and locate – e.g. what historical practices were employed the last time events have occurred – e.g. turbine adjustments for certain events. – written down. Pandemic response – paired staff 2 by 2's – two weeks on-off. Field work paired up, minimizing exposures among team members. Illness now (aging staff) – enough staff to cover. Change in coagulant – jar testing on a couple different coagulants – to visually see differences. Alternate supplies available were pretty close, analysis so far is based on cold water temperatures, need to revisit studies for higher temperatures in the summer. In-house aluminum residual testing to determine how affecting water quality. Convenient with the timing of jar testing training. Chemical receiving process will involve staff verification of chemical to the paperwork – before signing off on it. Verify ourselves before accepting the delivery (incl. parts – same suppliers used consistently).	**4.0 Process Under Control?** (s. 5, 17) SCADA Operational Plan Daily tasks – same Alarms and alarm setpoints Repetitive routine followed Training to new operators Constant communication between operators – about any issues, about solutions re: major / minor problems Help each other – e.g. labwork – when completed, will provide information on results – discuss among impacted team members Operator every week in control of the plant – consistency all week – helping him while WO's and other projects are completed – relay information to the operator in charge that week Onboarding training – not new to WT – a few years' experience – learned layout of building, learned procedures – tagged along with another operator, was made aware of all aspects, learned about Compliance Science and how to locate information. Comfort – Compliance Science access (hard copies and electronic access). Training binder – learning from others – everyone helpful and great at answering questions, developing a comfort level. Offered and able to contact whenever needed – comfort level that you're not alone. e.g. This weekend at Stoney Point – not all staff trained on both plants. Andre – first on-call, two seasoned operators away for weekend. Ensured Ken would be available to help answer question (verified by several more senior staff).	**6.0 Who?** (s. 2, 3-4, 10) Continuous testing and monitoring, ensuring we're following all regulations and results are within regulatory limits. Ensure water supply and treated water supplied to customers are ample enough – not dangerous limits, in good quantity as well. Maintain MECP Licensing with CEU training. Minimum as OIT, to be OIC – need Class I Certificate, to be ORO – need Class II (for certain number of days / year). OTJ approx. 69 over thirty-six months and 4.2 CEU's. better training opportunities now with COVID-19 "behind us" – now able to get people in class.

Process: Water Treatment O&M	**Auditee(s):** Ken Robert, WT Operator, Evan Haines, WT Operator	**Audit Date:** May 12, 2022 11:00 AM
Staff are hands-on with maintenance activities, helping with awareness of what infrastructure / equipment needs might be necessary to address. Pass up through foreman, compliance coordinator (e.g. leaking generator). Operationally, noted aluminum rising fast – passed information along to more senior staff. Stoney Point – multiple large valves replacement - $7,000 each. Approved leaking valve – developed plan on how to shutdown plant / keep plant running – transition, start-up altogether. Went well, lift valves to second level – water moved from Belle River…	Double-check systems in place for each other in a helpful perspective. Common goal of producing safe drinking water. No one feels like they are on their own.	
2.0 Process Input? WO system – Darrin / Kyle – supply WO's to employees, assigned to be completed monthly Availability of supplies (e.g. chemicals and parts) Contractors' availability Large / major maintenance spreadsheet tracking when items are due		**7.0 Output?** (s. 5) Logbooks – e-logbook Plant inspection documentation – e.g. filter flow rates in April – copied logbook – valve installation project, seal, filter topped off, filters off-spec – filtered to waste for 30 minutes, captured on plant totalized flows. SCADA and reports Trending Analyzers recording readings SD cards recording back-up information
3.0 Measured? (s. 8, 12, 16) Daily rounds – entire plant – filters, clarifiers, flow, runtime hours, turbidity, chlorine analyzers, residuals CCP's – UV dosage (55 mJ/cm2), turbidity on filters (0.3 NTU 95% monthly average), chlorine residuals (1.25 mg/L), alum – 5kg/hour (no 15-minute gap w/out alum) / coagulant dosage, 20psi pressure	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) e.g. Formazine back-ordered by a month Watermain breaks Short staffing potentially during pandemic – to run plant, meet all regulatory requirements Parts / products when needed – now waiting on parts (e.g. was supposed to be in weeks ago).	**8.0 Stakeholder Satisfaction?** (s. 12, 20) Everyone! Business, medical facilities, MECP, schools, bosses, owner / town No complaints – stakeholders generally don't understand the complexity of the process in providing safe drinking water. Improving understanding over the years. Fact sheet developed for dealing with the public regarding complaints.

Process: Water Treatment O&M	**Auditee(s):** Ken Robert, WT Operator, Evan Haines, WT Operator	**Audit Date:** May 12, 2022 11:00 AM
Chemical levels, chlorine – important chemicals Low lift / pumps working Pressures / pumps – ensure all is ok Runtimes Any issues – communicate to foreman, with each other re: ideas / resolutions	Ordering as soon as you have the space / need it – considering expiry dates as well. Completed a lab checklist – when to order (e.g. two months prior to expiry date), how many to have on hand, etc. very inconsistent. As a new staff member, able to walk in and carry-out the lab checks. No approvals needed to order essential supplies.	**9.0 Evidence of Continual Improvement?** (s. 21) Water hauling procedure implemented Valves installed at Stoney Point plant Large clarifier upgrade (rehabilitation) at Stoney Point Lab checklist – on top of essential chemicals Documentation improved Compliance Coordinator – catching up and providing greater access Microcystin sampling procedure and cameras for monitoring potential blooms on the lake. University of Windsor and University of Toronto running studies on Blue-Green Algae / Algal Blooms

Process: Distribution O&M	**Auditee(s):** Jason Marchand, WD Operator; and Marshall Stevenson, WD Operator	**Audit Date:** May 12, 2022 1:00 PM
1.0 Adequate Resources? (s. 9, 11, 13, 14-15) Have adequate resources – access to resources. Generally, set-up to succeed. Constantly upgrading infrastructure and vehicles – accounting for budgets. Continual improvement is implemented. Cast iron watermains are mostly replaced with PVC. Improvement on watermain breaks (now mostly service valves and services). On-call rotation schedule exists for all licensed staff. Consistently set-up for 24/7 coverage. No staff coverage issues during the pandemic. Adjustments to entering residents' homes were made (unless emergency, then took precautions necessary). Currently have decent stock – e.g. fire hydrants (may not be any more until September). Locates supplies are back-ordered. If there, purchase all stock. Have reached-out to neighbouring municipalities to access their resources.	**4.0 Process Under Control?** (s. 5, 17) Training programs SOP's – for every job Everyone responsible to carry-out job properly Unless under direction of foreman or management Chlorine residuals recorded in logbooks Recorded in dead end flushing programs Personal logs – record residuals there Hach colorimeters – annually calibrated Monthly checksheet for verifications using secondary standards, records kept Labels are applied (annual calibrations) – date expiry Engineering consulting form – representative of the municipality oversees the project. Operators oversee the water quality – super-chlorination, backflow prevention devices, Compliance Science training for staff involved. Ensure the watermain is correctly super-chlorinated, pressure test, bacti samples 2x, exercising of valves (unless isolated, then contractors can exercise) – once commissioned, must be Certified Operators. Same for road reconstruction projects – water-specific aspects are verified by Certified Operators. Complete report sheets for commissioning of water lines. Tapping of water services done properly (verified by Engineering consultant who observes and provides those records).	**6.0 Who?** (s. 2, 3-4, 10) Maintain the integrity of the distribution system – repair any breaks, leaks, maintain sample stations, hydrants – any emergency, carry-out general maintenance and monitor chlorine residuals, carry-out weekly flushing, respond to residents' concerns. Proper disinfection protocols, categorizing Class I or II mainbreaks, maintain operator licences. Class I Operators, both have Class II certificates. Kyle – master spreadsheet – operators are responsible for own licences. Compliance Science also tracks this. OIT's can be hired – let them know what they're authorized to do and not do (e.g. adjustments of valves), foreman or OIC would be there to help advise them. OIT's would be paired with licensed operators.
2.0 Process Input? Construction season Locate requests Manpower can be stretched in construction Valve exercising program – 25% annually Hydrant inspections late summer / early fall Students paint hydrants Chlorine residuals weekly with weekly flushes Dead end flushing program – spring through summer New watermain commissioning		**7.0 Output?** (s. 5) Watermain break form Report sheets – updated frequently, categorizes break, who on-site Personal records SOPs related to the activities Who in-charge / superiors at the times of events Notify water treatment plants re: events (e.g. loss of water)
3.0 Measured? (s. 8, 12, 16) Chlorine residuals – not lower than 0.05 mg/L (regulatory), different systems – aim for 1.0 mg/L – Union is different, 0.8 mg/L free chlorine – understand what's representative of the area (e.g. at the POE, 1.8 mg/L free).	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) Valves not working properly – main issue currently – reported to management re: decisions moving forward Valves appear to function properly during the exercising program – but for construction projects,	**8.0 Stakeholder Satisfaction?** (s. 12, 20) Ratepayers – generally happy, unless directly impacted by a loss of service.

Process: Distribution O&M	**Auditee(s):** Jason Marchand, WD Operator; and Marshall Stevenson, WD Operator	**Audit Date:** May 12, 2022 1:00 PM
Will carry-out flushing activities more frequently and for longer times if the residuals appear to be declining. 6 auto-flushers currently functioning right now.	have encountered issues of them not seating properly. Albert is made aware for budgeting purposes. Struck watermains by contractors – locates program supports preventing these occurrences. High priority watermains are observed by the water distribution team.	**9.0 Evidence of Continual Improvement?** (s. 21) More programs Improved flushing programs New tools – applications on tablets tracking activities, WO system Valve operating arm mounted to a truck with hydraulic system Guillotine saw (asbestos cement pipe can be cut safely)

Process: Emergency management	**Auditee(s):** Kyle Davis, Compliance Coord.	**Audit Date:** May 12, 2022 2:00 PM
1.0 Adequate Resources? (s. 9, 11, 13, 14-15) Have adequate resources – set-up to succeed – initially had to locate all aspects of emergency preparedness resources. In the past week, located another document related to emergency preparedness (as a new team member). Non-continuity has contributed to the initial lack of set-up with all applicable informational resources. Alternate supplies situation – exceeded expectations, resources used with regulatory contacts, technical expertise in-house to facilitate initiatives.	**4.0 Process Under Control?** (s. 5, 17) Contingency plans SOP's Compliance Science program – with feedback provided by staff on changes (via comments field) Municipality's Emergency Plan	**6.0 Who?** (s. 2, 3-4, 10) Go-to person for emergency preparedness (to start). If an emergency happens, notifications to team members and management, ownership – based on who's available / not. Ensuring emergency situations are addressed in emergency procedures, SOP's. Prepare as best as we can, ensure everything stays safe. Training and debrief will follow events, as applicable. Recording OFI's from emergencies and tabletop scenarios.
2.0 Process Input? Changes to contacts Emergencies and out-of-ordinary conditions Annual emergency training & test – realistic scenario that could happen, or has happened historically		**7.0 Output?** (s. 5) E-mail chains (in out-of-ordinary situations) are retained in PDF and kept in file folders Debrief records (as necessary) Outcomes from the events – documented in E-mails
3.0 Measured? (s. 8, 12, 16) Triggers – water quality-related, residuals management, some notorious locations for low residuals – trigger flushing programs Avoiding AWQI's and unsafe water	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) UV transfer failure – never turned back on - $100,000 upgrade to system (that system failed due to brownouts – generator didn't come on, faulted out the valve automation) Abnormal observations Worked with the MECP – gas chlorine disinfection wasn't included in the treatment process description originally MDWL review was then completed, updated MDWL	**8.0 Stakeholder Satisfaction?** (s. 12, 20) Windsor-Essex County Health Unit, Essex Region Conservation Authority (move WTP due to location in floodplain), MECP, MNR, Oceans & Fisheries Ability to share data between government agencies – transfer data between groups – e.g. Algal Blooms communications with MECP, WECHU – all stakeholders impacted Research groups, universities, WCWC, - notifications and experiences shared, advised with data.

Process: Emergency management	**Auditee(s):** Kyle Davis, Compliance Coord.	**Audit Date:** May 12, 2022 2:00 PM
		9.0 Evidence of Continual Improvement? (s. 21) Incidents – e.g. abnormal observations or alarms – communications have improved between colleagues (up-and-down the chain). Emergency review with director and SMT – adopted the communication chain for those (emergencies or abnormal conditions). Tailgate discussions re: out-of-ordinary conditions followed by training related to topics that are timely and being experienced. Monthly generator tests on load – mock power outage to fully test generators will start-up as expected, along with UV's are performing as well – so all staff are familiar with and understand what to expect – regular checks help develop understanding and comfort levels.

Appendix "D" – Auditor CV and Training Certificates

Curriculum Vitae: Brigitte Roth, BES, EP(EMSLA)

SUMMARY:

A management systems, compliance and risk management professional with over 25 years' experience in:
- achieving legislative compliance,
- optimizing and integrating management systems,
- conducting risk assessments and analysis,
- preparing and improving emergency response plans,
- planning and executing annual emergency test exercises and debrief sessions,
- leading and carrying out compliance and management system audits, and
- developing and delivering training related to the above areas of expertise.

A certified environmental professional with ECO Canada, as EP(CEA) from 2005-2015 and currently as EP(EMSLA) since 2015; she has conducted environmental compliance, pollution prevention and management system audits at over 95 unique organizations of various industries in Ontario and at 66 golf courses under the Integrated Pest Management Accreditation Program. She has overseen the implementation and integration of management systems in conformity with ISO 14001, ISO 9001, ISO 17025, OHSAS 18001 and Ontario's Drinking Water Quality Management Standard.

Also experienced as an alternate Community Emergency Management Coordinator (CEMC) for the City of Guelph from 2015 to 2017 and a Planning Section Chief in the City's Emergency Operations Centre from 2014 to 2017.

PROFESSIONAL DESIGNATIONS:

2015, Environmental Professional – Environmental Management Systems Lead Auditor, ECO Canada
2005-2015, Environmental Professional – Compliance Auditor, ECO Canada

EDUCATION & KEY TRAINING:

2018, ISO/IEC 17025:2017, Waher Consulting Services
2016, Community Emergency Management Coordinator, Emergency Management Ontario
2014-2017, Emergency Management Certificate program courses, Justice Institute of British Columbia
2013, Project Management Certificate (with High Honours), Sheridan College
1998, Environmental Management System Lead Auditor, KPMG (Certificate No. E0034)
1997, Quality Management System Lead Auditor, KPMG (Certificate No. K193)
1996, Certificate of Environmental Assessment, University of Waterloo
1996, Bachelor of Environmental Studies (Honours Geography), University of Waterloo

EMPLOYMENT HISTORY:

Principal Consultant at Acclaims Environmental Inc.
January 2018 - present

Helping optimize the effectiveness of customers' integrated management systems through audits and facilitated sessions to improve:
- legislative compliance (e.g. emissions reporting, approvals and environmental protection plans)
- conformance to management system standards (e.g. DWQMS, ISO 14001, ISO 9001, ISO 45001)
- risk assessment and management
- emergency preparedness and business continuity

Trainer at Walkerton Clean Water Centre
October 2016 - present

Contract trainer for the following courses:
- Drinking Water Quality Management Standard (DWQMS)
- Internal Auditing for DWQMS
- Responsibilities under the Statutory Standard of Care
- Risk Assessment & Emergency Preparedness

Program Coordinator – Project and Program Management at City of Guelph
March 2017 – January 2018

For the City's Corporate Project Management Office (CPMO):
- Developed and promoted methodologies and standards,
- Reported to the Executive Team and city Council on the CPMO's performance,
- Promoted and trained on project management processes,
- Implemented project document and records control, and
- Researched and implemented best practices.

Quality Assurance Coordinator at City of Guelph
October 2008 – March 2017

Managed the processes related to:
- Municipal Drinking Water Licensing,
- Drinking Water Quality Management Standard (DWQMS) accreditation,
- Leading the audit team in internal audits and coordinating external audits,
- Risk assessment, analysis and emergency response plans, and
- Regular compliance reports to Top Management and city Council.

Pollution Prevention Coordinator / Senior Environmental Auditor at CASF
2001 – 2008

- Conducted over fifty pollution prevention and/or compliance audits at metal finishing sites.
- Designed and delivered Advanced Environmental Management Series of courses (Auditing 101; Pollution Prevention Planning & Materials Accounting; Regulatory Compliance; Spills Prevention, Emergency Preparedness and Response).
- Chaired annual Metal Finishing Conference committee from 2000-2008.

Environmental Management System Specialist at WESA Group Inc. (BluMetric Environmental Inc.)
2004 – 2006

- Conducted compliance and management system audits at industrial and municipal drinking water sites.
- Assisted with management system implementations (ISO 9001, ISO 14001, OHSAS 18001, DWQMS).
- Assisted industrial clients with Canada's National Pollutant Release Inventory annual reporting.
- Assisted in the application process for industrial facilities' Certificates of Approval (Air & Noise).

Quality and Environmental Coordinator at Kuntz Electroplating Inc.
1996 – 2001

- Project manager for ISO 9001, ISO 14001 and ISO 17025 implementation and maintenance.
- Facilitated annual reviews of quality policies, risk assessments and emergency response plans.
- Kept up-to-date on all changes in regulatory / customer requirements and reported to management.
- Developed and delivered various quality and environmental management system training programs.
- Managed external and internal audit plans for all management systems and functioned as lead auditor.

ENVIRONMENTAL CAREERS ORGANIZATION OF CANADA

hereby certifies that

Brigitte Roth

has been awarded the title of

Environmental Professional - Environmental Management Systems Lead Auditor EP(EMSLA)

in the following specialization(s)

Environmental Management Systems

Ratified by the Canadian Environmental Certification Approvals Board (CECAB), and in accordance with the EP Code of Conduct and the current Occupational Standards, for a certification term of five (5) years, from:

11/10/2020 to 11/09/2025

Brigitte Roth has been a certified member since
07/12/2005

Chair, CECAB

Registrar

20855

WCWC Walkerton Clean Water Centre
An agency of the Government of Ontario

CWAE Centre de Walkerton pour l'assainissement de l'eau
Un organisme du gouvernement de l'Ontario

CERTIFICATE OF ACHIEVEMENT

BRIGITTE ROTH

has successfully completed the

Internal Auditing for the Drinking Water Quality Management Standard course

WWOCS Course ID # 8194

September 24, 2020 to September 25, 2020

Director Approved Continuing Education Units: 1.4

Carl Kuhnke
CEO

September 25, 2020
Date

www.wcwc.ca