Township of Southwold Water Distribution System
(Lynhurst Area)

DRINKING WATER QUALITY MANAGEMENT SYSTEM OPERATIONAL PLAN

REVISION 2.1

January 1, 2020

Prepared by:

Operating Authority

The City of St. Thomas
Environmental Services Department

Owner:

Township of Southwold

OPERATIONAL PLAN – SOUTHWOLD (LYNHURST AREA)	
EFFECTIVE DATE: JANUARY 1, 2020	**REVIEW FREQUENCY: ANNUALLY**
REVISION 2.1	
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

TABLE OF CONTENTS

LIST OF APPENDICES

1. Quality Management System

Preface

This Operational Plan describes the content of the Drinking Water Quality Management System (DWQMS) in place for the Township of Southwold Water Distribution System (Lynhurst Area). The contents of this Operational Plan are based upon the requirements of the Drinking Water Quality Management Standard:

a) To facilitate the Operating Authority's ability to consistently deliver drinking water that meets applicable legislative, regulatory and Owner requirements and
b) To enhance consumer protection through the effective application and continual improvement of the Quality Management System.

Abbreviation/Definitions

ADWQI or AWQI	Adverse Drinking Water Quality Incident
AMC	Asset Management Coordinator
CC	Compliance Coordinator
CCP	Critical Control Point
DWQMS	Drinking Water Quality Management System
EMPS	Elgin Middlesex Pumping Station
MCEWDS	Municipality of Central Elgin Water Distribution System - St. Thomas Suburban Area
MMC	Maintenance Management Coordinator
OA	Operating Authority, the current authority operating the System
OCWA	Ontario Clean Water Agency
QC	Quality Coordinator, also known as the Manager Water and Sewer or designate
QMS Representative	Quality Management System Representative
SOP	Standard Operating Procedure
STASWSS	St. Thomas Area Secondary Water Supply System
STWDS	St. Thomas Water Distribution System
TSWDS	Township of Southwold Water Distribution System - Lynhurst Area
WT	Water Tech.
Applicable Legislative and Regulatory Requirements	the Safe Drinking Water Act, 2002 (SDWA), the Ontario Water Resources Act, 1990 and all regulations and instruments issued under these Acts which are associated with drinking water.
Audit	a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a Quality Management System conforms to the requirements of the DWQMS.
Calendar Year	A period of one year beginning and ending with the dates conventionally accepted as marking the beginning and end of a year (January 1st to December 31st).
Consumer	the drinking water end user.
Corrective Action	Action to eliminate the cause of a detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.
Critical Control Limit	The point at which a Critical Control Point response procedure is initiated.
Critical Control Point	an essential step or point in the Subject System at which control can be applied by the Operating Authority to prevent or eliminate a Drinking Water Health Hazard or to reduce it to an acceptable level.
Director	Means the director appointed for the purposes of s.15 of the SDWA.

Distribution System	Has the same meaning as "distribution system" defined in s. 2(1) of the SDWA.
Document	Has the same meaning as "document" defined in s. 2(1) of the SDWA.
Drinking Water Health Hazard	Has the same meaning as "drinking water health hazard" defined in s. 2(1) of the SDWA.
Drinking Water Quality Management Standard (DWQMS)	Has the same meaning as Quality Management Standard for Drinking Water Systems approved under s. 21 of the SDWA.
Drinking Water System	Has the same meaning as "drinking water system" defined in s. 2(1) of the SDWA.
Environmental Bill of Rights Registry	Has the same meaning as "Registry" defined in s.2(1) of the SDWA.
Municipal Drinking Water System	Has the same meaning as "municipal drinking water system" defined in s. 2(1) of the SDWA.
Municipal Residential Drinking Water System	Has the same meaning as "large municipal residential system" or "small municipal residential system" defined in s. 1(1) of O. Reg. 170/03.
Operating Authority	Means, in respect of a Subject System, the person or entity that is given responsibility by the Owner for the operation, management, maintenance or alteration of the Subject System.
Operational Plan	Means, in respect of a Subject System, the Operational Plan required by the Director's Direction.
Operational Subsystem	Means a part of a Municipal Residential Drinking Water System operated by a single Operating Authority and designated by the Owner as being an Operational Subsystem.
Owner	Has the same meaning as "owner" defined in s. 2(1) of the SDWA.
Preventive Action	Action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.
Primary Disinfection	Has the same meaning as "primary disinfection" defined in s. 1(1) of O. Reg. 170/03.
Public	Subject System consumers and stakeholders.
Quality Management System (QMS)	A system to: o establish policy and objectives, and to achieve those objectives, and o direct and control an organization with regard to quality.
Quality Management System Policy	means the policy described in Element 2 developed for the Subject System or Subject Systems
Record	A document stating results achieved or providing proof of activities performed.
Secondary Disinfection	Has the same meaning as "secondary disinfection" defined in s. 1(1) of O. Reg. 170/03.
Subject System	Means: o a municipal residential drinking water system where the system is operated by one operating authority, or o an operational subsystem where two or more parts of a municipal residential drinking water system are operated by different operating authorities.
Supplier	An organization or person that provides a product or service that affects drinking water quality.

Top Management	A person, persons or a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner respecting the Subject System or Subject Systems.
Treatment System	Has the same meaning as "treatment system" defined in s. 2(1) of the SDWA.

Ownership and Operation
The Township of Southwold is the Owner and provides governance for the Township of Southwold Water Distribution System.

The Township of Southwold currently utilizes the services of the City of St. Thomas Environmental Services Department as the Operating Authority, which operates and maintains the Township of Southwold Water Distribution System in the Lynhurst Area. Other areas in the Township of Southwold are operated under the Township of Southwold Operational Plan. Under the provisions of the Safe Drinking Water Act, 2002, the Operating Authority is responsible for implementing and maintaining the DWQMS in partnership with the Township of Southwold.

2. Quality Management System Policy

The Quality Management System Policy is posted at the main entrance of the Environmental Services Department, City Hall (545 Talbot Street) and at the entrance to the Public Works Service Centre (100 Burwell Road) and is made available to the public via the Cities website.

A copy of the Quality Management System Policy can be found in **Appendix A**.

3. Commitment and Endorsement

This Operational Plan has been reviewed and approved by the Operating Authority and the Owner, who are committed to ensuring the Quality Management System is regularly assessed to confirm its ongoing applicability and relevance, as attested through the endorsement of the DWQMS Policy.

Top Management ensures the Operating Authority is aware of all applicable legislative and regulatory requirements.

Top Management ensures that the Drinking Water Quality Management System (DWQMS) is communicated according to procedure, by following the Communication Procedure attached in Appendix I. The Internal Audit Procedure and the Management Review Procedure describe how proper communication is monitored.

Top Management determines, obtains and provides the resources needed to maintain and improve the DWQMS, as demonstrated through records created under the DWQMS, and through the Management Review Process. The Review and Provision of Infrastructure Procedure (DW-ADMIN-850) describes how a need for resources may be identified, documented and followed through.

4. Quality Management System Representative

The Quality Management System (QMS) Representative is appointed and authorized by the Top Management of the Operating Authority. This appointment is made through the issuance of a letter to the QMS Representative and circulated to all pertinent staff.

5. Document and Records Control

Procedures are in place for Document Control and Record Control describing how documents and records are controlled.

The Document Control Procedure describes the activities required to ensure that all documents are identifiable, kept current, legible, retrievable, stored, protected, retained and disposed of. Documents that are required by the DWQMS are within the scope of this procedure.

The Record Control Procedure has been established and maintained to identify the controls needed for the identification, legible, retrievable, storage, protection, retention time and disposition of records. Records that are required by the DWQMS are within the scope of this procedure.

The Document Control Procedure (DW-ADMIN-100) can be found in **Appendix B.** The Record Control Procedure (DW-ADMIN-200) can be found in **Appendix C**.

6. Drinking- Water System

Description of the Township of Southwold Water Distribution System – Lynhurst Area

The Township of Southwold- Lynhurst Area drinking water subsystem receives its water from the City of St. Thomas Water Distribution System supplied through a control valve.
The drinking water distribution subsystem, consisting of approximately 0.883 km of piping, is arranged predominantly in a looped, grid based system with all efforts being made to minimize dead ends. The main is mainly comprised of 150mm cast iron piping where some areas of the main are comprised of asbestos cement.
The Township of Southwold Water Distribution System – Lynhurst Area map can be found in **Appendix D**.

Description of Water Source

Treated water for the Township of Southwold Water Distribution System - Lynhurst Area, is supplied from the Elgin Area Primary Water Supply System, which takes its source water from Lake Erie.

The Elgin Area Primary Water Supply System is responsible for ensuring that measures are in place to provide water to the EMPS that meets or exceeds Ministry of Environment, Conservation and Parks (MECP) requirements.

Under emergency circumstances, water can be supplied from the City of London Southeast Reservoir and Pumping Station, which receives water from the same source, the Elgin Area Primary Water Supply System, through the EMPS.

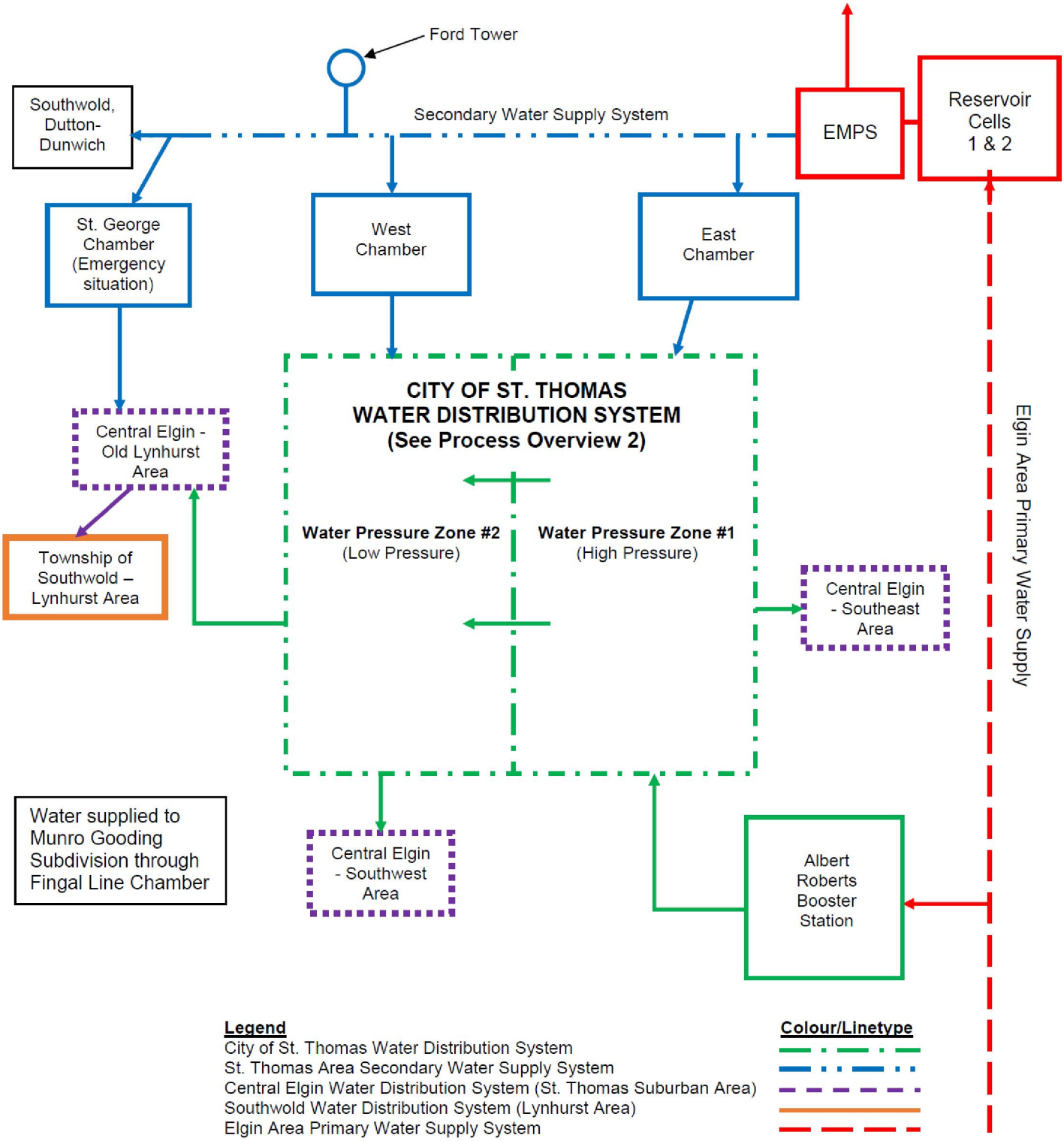
Lake Erie raw water can be treated effectively using conventional processes to produce water meeting Ontario Drinking-Water Quality Standards. Great Lakes water is considered to pose low risk for the formation of disinfection by-products (DBP's).

The Elgin Area Primary Water Supply System analyzes treated water for Dissolved Organic Carbon, an indicator for DBPs and distribution water for Trihalomethanes (THMs), the most common DBP.

General Characteristics of Lake Erie Treated Water Supply can be viewed on the Elgin Area Primary Water System website at **www.watersupply.london.ca**.

The Elgin Area Primary Water Supply System provides the City, as a member of the Elgin Area Primary Water System, quarterly reports on the operations of the Primary Water Supply System and water quality.

System Overview Schematic



Common Event-Driven Fluctuations:
During winter, late spring and late fall when changes in water and soil temperatures are occurring, there is typically a higher proportion than normal of water main breaks.

Threats to Ongoing Water Quality:
The main threats to ongoing water quality are: cross-contamination from industry back-flow, illegal connections or back siphonage from water main breaks. Building inspections, by-laws, back-flow preventers and proper construction minimize the potential for accidental back-flow or other contaminants, which may impact the water quality.

Challenges

Low Chlorine Residual: During the summer, higher water temperatures increase microbial activity increasing chlorine demand. In addition, long, low flow pipelines and dead end sections increases the likelihood of a low chlorine residual water sample, which may result in an adverse water quality incident.

Discolouration: Discolouration can occur due to the age of some of the distribution system piping and as a result of preventative maintenance driven flushing programs and occasional water main breaks. These events can cause rapid changes in flow velocity and/or cause the water in the pipeline to change direction, resulting in a disturbance in the natural flow of the pipe and stirring up any sediment residing in the pipes.

7. Risk Assessment
A risk assessment procedure has been developed and implemented. The procedure defines the process used to rank potential hazards to the TSWDS-Lynhurst Area and identify Critical Control Points, to which control measures may be applied to further reduce risks to the degradation of water quality within the system. Control measures, where they exist are defined. Procedures for critical control points (CCP's) include measures to: monitor, respond to document and to limit exceedances. The Risk Assessment Procedure also describes the process for staff to bring forward real or perceived risks to water quality for consideration.

The Risk Assessment Procedure (DW-ADMIN-300) and Hazard Analysis Spreadsheet (DWF-ADMIN-303) can be found in **Appendix E**.

8. Risk Assessment Outcomes
The results of the Risk Assessment are documented in the Hazard Analysis spreadsheet. The spreadsheet identifies:

- General Areas or major features of the water distribution system
- Process steps or major operational activities
- Types of hazards
- Description of potential hazards
- Ranking calculations and risks
- Control Measures to address hazards
- Designated CCPs
- References to CCP Procedures (which describe procedures to monitor, respond, report and record deviations)

The Hazard Analysis Spreadsheet, and the CCP procedures, designated by a 'CD-CCP' in their title can be found in **Appendix E**.

9. Roles, Responsibilities and Authorities

The organizational structure, roles, responsibilities and authorities for the systems Owner and Operating Authority personnel is described in the Roles, Responsibilities and Authorities Procedure (DW-ADMIN-402) and can be found in **Appendix F.**

10. Competency and Training

The Competency and Training Procedure (DW-ADMIN-500) describes the required and desired competencies established for each role within the Owners and Operating Authorities structure whose duties may have the ability to directly affect drinking water quality. The procedure also describes the process for requesting/scheduling and tracking training, as well as methods used to ensure staff members establish and/or maintain a satisfactory level of competence in their duties.

The Competency and Training Procedure (DW-ADMIN-500) can be found in **Appendix G**.

11. Personnel Coverage

The Personnel Coverage Procedure describes how sufficient personnel meeting identified competencies are available for duties that may directly affect drinking water quality.

The Personnel Coverage Procedure (DW-ADMIN-600) can be found in **Appendix H**.

12. Communications

The Communication Procedure describes how the DWQMS is communicated between Top Management and the Owner, Operating Authority personnel, Suppliers, and the public.

The Communications Procedure (DW-ADMIN-700) can be found in **Appendix I**.

13. Essential Supplies and Services

A list of all supplies and services deemed essential to the delivery of safe drinking water is provided in the Essential Supplies and Services Procedure (DW-ADMIN-800). The list includes the means to ensure the procurement of critical supplies and services and methods used by the Operating Authority to ensure the quality of essential services and supplies.
The Essential Supplies and Services Procedure (DW-ADMIN-800) can be found in **Appendix J.**

14. Review and Provision of Infrastructure

A process for the annual review of the adequacy of the infrastructure is described in Review and Provision of Infrastructure Procedure (DW-ADMIN-850). The procedure describes the programs in place to help assess the adequacy of infrastructure and how funds are secured for infrastructure related projects.

The Review and Provision of Infrastructure Procedure (DW-ADMIN-850) can be found in **Appendix K**.

15. Infrastructure Maintenance, Rehabilitation and Renewal

A procedure has been developed and implemented for the Maintenance, Rehabilitation and Renewal of Infrastructure. This procedure describes the various programs in place to maintain/rehabilitate and replace aging infrastructure.

The Infrastructure Maintenance, Rehabilitation and Renewal Procedure (DW-ADMIN-900) can be found in **Appendix K**.

16. Sampling, Testing and Monitoring

The Sampling, Testing and Monitoring Procedure describes the sampling, testing and monitoring in place for drinking water process control based on the most challenging conditions and how results are recorded and shared between the Operating Authority and the Owner.

The Sampling, Testing and Monitoring Procedure (DW-ADMIN-1000) can found in **Appendix L**.

17. Equipment Calibration
The calibration and maintenance of measurement and recording equipment is described in the Equipment Calibration Procedure.

The Equipment Calibration Procedure (DW-ADMIN-1100) can be found in **Appendix M**.

18. Emergency Management
Emergency preparedness is achieved by following requirements described in the Emergency Management Plan. In the Emergency Management Plan, the table of contents lists response procedures for the potential emergency situations or service interruptions. The response procedures describe planned responses for the identified potential emergencies, including Owner and Operating Authority responsibilities. A protocol for notification of customers and adjacent municipalities supplied by the system, initiates the necessary municipal emergency planning measure described in the Emergency Management Plan. A protocol for all emergency notification is also included, along with an up to date contact list.

The Emergency Management Plan 'Distribution Contingency Plans' (DCP-A to DCP-H) can be found in **Appendix N**.

19. Internal Audit
The Internal Audit Procedure describes how conformity of the DWQMS is evaluated on an annual basis. The procedure describes how audit criteria, frequency, scope, methodology and records are identified, referencing previous internal and external audits. It also describes how corrective actions are initiated as a result of an internal audit, and provides references to the Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400).

The Internal Audit Procedure, (DW-ADMIN-1200) can be found in **Appendix O**.

20. Management Review
The Management Review Procedure describes the procedure for management reviews, which are to occur at least once per calendar year, including instructions related to all of the required inputs to the meeting. The procedure also describes how Top Management considers results, identifies deficiencies, and record and forwards results to the Owner and to other key personnel.

The Management Review Procedure (DW-ADMIN-1300) can be found in **Appendix P**.

21. Continual Improvement
The Operating Authority and Owner of the TSWDS-Lynhurst Area are committed to continually improving the Quality Management System by following the Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400). This procedure describes how the Operating Authority responds to identified non-conformances/non-compliances, Opportunities for Improvement. The procedure also requires that the OA take into consideration industry best practices, as published by the MECP, or discovered through interaction with industry contacts.

The Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400) can be found in **Appendix Q**.

Table of Revisions

Revision	Date	Description of Revision
11	January 2, 2014	Change in the Treasurer position for the Township of Southwold
12	June 12, 2014	Formatting of procedure, added new procedure to Appendix B, Intranet Filing of Documents and Records Procedure and changed the number of kms for the Township of Southwold
13	June 29, 2015	Change in Top Management, Water/Wastewater Supervisor has temporally assumed the role of Quality Management System Representative
14	January 4, 2016	Change in QMS Representative and title Supervisor to Manager and removed reference to water/wastewater section
15	March 16, 2016	Added designate to QC definition
16	June 29, 2016	Change in Owner Representative for Southwold
17	June 29, 2017	Removed terminology Senior Management and using Top Management to be consistent with terminology in Standard
2.0	January 1, 2019	Inserted definitions, reworded several sections to improve clarity. Significant change in policy statement during transition to DWQMS 2.0. Removed extraneous commitments, inserted statement allowing for OP commitment and Endorsement on policy. Inserted system overview schematic.
2.1	January 1, 2020	Updated references to Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400)

Appendix A

~ St. Thomas Secondary Area Water Supply System - **DWQMS Policy** ~

~ St. Thomas Water Distribution System - **DWQMS Policy** ~

~ Township of Southwold Water Distribution System (Lynhurst Area) - **DWQMS Policy** ~

~ Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area) - **DWQMS Policy** ~

Drinking Water Quality Management System Policy

Township of Southwold Water Distribution System (Lynhurst Area)

EFFECTIVE DATE: JANUARY 1, 2020

REVISION: 2.1

TO BE REVIEWED: FOLLOWING SIGNIFICANT CHANGE TO BOARD

The Township of Southwold is the owner and provides governance for the Township of Southwold Water Distribution System (WDS).

The City of St. Thomas Environmental Services Department is the contracted operating authority for the Lynhurst Area of the Township of Southwold WDS and also provides the necessary resource support for the successful implementation and ongoing viability of the Drinking Water Quality Management System (DWQMS).

Under the provisions of the Safe Drinking Water Act, 2002, the Environmental Services Department is responsible for implementing and maintaining the DWQMS in partnership with the Township of Southwold.

Together, The Township of Southwold and City of St. Thomas Environmental Services Department are committed to providing our customers with clean, safe drinking water through the operation and maintenance of Township of Southold WDS – Lynhurst Area in a manner that adheres to all applicable legislation and regulations. We are committed to the adoption of the Drinking Water Quality Management Standard and as such, make a commitment to the maintenance and continual improvement of the Quality Management System (QMS).

Furthermore, we have reviewed the Operational Plan, endorse its application, and are committed to ensuring the QMS is regularly assessed to confirm its ongoing applicability and relevance.

Signed: Katherine Thompson

Owner Representative
Katherine Thompson
CAO/Clerk
Township of Southwold

Date: Dec. 10, 2019

Signed: [redacted]

Operating Authority
Nathan Bokma, P. Eng.
Quality Management System Representative
City of St. Thomas

Date: December 11, 2019

Appendix B

~ Document Control Procedure (DW-ADMIN-100) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: DOCUMENT CONTROL	**PROCEDURE NO.: DW-ADMIN-100**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 5**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure defines the actions and responsibilities to ensure the most recent documents required to demonstrate conformance to the Drinking Water Quality Management System (DWQMS) are suitably controlled and available to the user.

Procedure:

Document List and Storage
Table 100-1 below lists the documents that have been identified as required to demonstrate conformance to the Drinking Water Quality Management Standard:

- Table 100-1 lists for each document required, the Document Owner, the location of the Controlled Version, and an indication as to whether or not the document is posted to the City of St. Thomas intranet.
- The Document Owner as identified in table 100-1 is responsible for ensuring that the document is reviewed and updated as required and that current and obsolete documentation is maintained as per City of St. Thomas Retention of Records By-law Number 65-2018 (as amended from time to time).

Table 100-1: Document Listing

	Document	Document Owner	Location of Controlled Version	Posted to Intranet?
Internal Documents	DWQMS Operational Plan(s)	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	DWQMS Procedures	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	DWQMS Policies	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES – and front lobby of PW building and City Hall ES dept. and city website
	Standard Operating Procedures	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	DWQMS Form Templates	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES

	DWQMS Hazard Analyses	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	Critical Control Point Procedures	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	O&M Manuals	CC	**Paper:** CC Office **Electronic:** T:\Development and Compliance\Compliance	YES
	Water System Drawings	Manager of Capital Works	**Electronic:** C-MAP system	link provided to C-MAP
External Documents	Equipment Manuals	QC	**Paper:** PW Document Room	
	Applicable Industry Standards (AWWA and Ten State Standards)	QC	**Electronic:** Intranet	YES
	Relevant Federal and Provincial Legislation	N/A	Refer to e-laws website	(links may be provided)
	Relevant City By-laws	Manager of Development and Compliance	**Electronic:** Intranet	YES

Protection of Documents - Paper

- All printed versions of DWQMS documents, other than the signed hard copy retained by the Compliance Coordinator are considered 'uncontrolled' and are marked as such in the footer section of each document.
- All paper documents are to be maintained in such a way as to remain clean, legible, readily identifiable and retrievable.
- Hard copies of documents stored at the Public Works Service Centre are located in allocated file storage areas as identified in Table 100-1, above.
- Hard copies of documents stored at City Hall are located in allocated file storage areas as identified in Table 100-1, above.

Protection of Documents – Electronic

- All internal DWQMS documents are electronically controlled, with only the Asset Management, Maintenance Management System and Compliance Coordinator(s) having electronic access to modify them.
- The City of St. Thomas network, including the Intranet files are maintained and backed-up by the City of St. Thomas IT Services Team.
- Network data backups are completed on a Daily (incremental), Weekly (full), Monthly (Full-6 months at a time), and Year-End/Annual basis.

DWQMS Documentation Format

Internal DWQMS documentation shall include the following elements/sections, at a minimum:

- A DWQMS header, including document name, document number, effective date, a reference to the DWQMS element most suitable to the document, an indication of the documents review frequency, and a signature block to demonstrate document approval;
- Scope;
- Purpose;
- Procedure;
- Table of Revisions; and
- A DWQMS footer, including page number and total pages, as well as, a statement that the document is "Uncontrolled – when printed (refer to electronic documentation to ensure most recent version is in use).

The table of revisions in each document shall contain at least 5 years of entries. (ie. following 5 years, the revision box entry may be removed.)

DWQMS Forms are numbered, reviewed and revised in unison with the DWQMS procedure that describes its function. Forms are required to have the following elements:

- A DWQMS header, including document name, document number, effective date, a reference to the DWQMS element most suitable to the document, an indication of the documents review frequency, and a signature block to demonstrate document approval;
- A DWQMS footer, including page number and total pages, as well as, a statement that the document is "Uncontrolled – when printed (refer to electronic documentation to ensure most recent version is in use).

Revisions to forms are documented in the revision box of the associated procedure.

Document numbers follow the format DW-ADMIN-XXX are allocated as follows:

- DW – "Drinking Water" - denotes that the procedure is related to Water Operations
- F – is added to the first segment (eg. DWF-) to designate the document as a "FORM"
- ADMIN, CCP or SOP – to define if the main function of the document is administrative, operational or a critical control, in nature
- A three or four digit number is assigned in a non-repetitive nature.

DWQMS Documentation Review and Approval

- At least once per calendar year, or as noted on the document header, the CC initiates the review of documentation by sending out a copy of the procedure to be reviewed to the QC and Manager of Development and Compliance.
- The QC, CC and Manager of Development and Compliance mark up the documents with any required updates or modifications and return the document to the CC.
- The CC then revises the documentation as noted. Edits to the documents are summarized in the revision block located within the body of the document or associated procedure.
- The CC then forwards the edited documents to the Manager of Development and Compliance, for final review and approval.
- The Manager of Development and Compliance approves all newly created and edited DWQMS documents prior to their release by signing the title block of the document.
- Upon approval, the Manager of Development and Compliance returns the document to the Compliance Coordinator for filing and release.

Releasing Updated DWQMS documentation

- Updates to the operational plans are distributed to management and staff by the QC. This communication is typically completed during crew meetings, however, depending on the nature of the changes, a training session may be held to transfer knowledge.
- Upon receipt of updated documentation, the identified Document Owner is responsible for ensuring Obsolete versions of documents are addressed as required by City of St. Thomas Retention of Records By-law Number 65-2018 (as amended from time to time).
- The CC arranges to have the Intranet files updated to reflect the most recent version by e-mailing a request to the Asset Management and Maintenance Management System Coordinators.

Intranet Postings

- The Asset Management and Maintenance Management System Coordinators maintain the Intranet files for the City of St. Thomas's Environmental Services Dept..
- The CC, QC and Manager of Development and Compliance may send the Asset Management and/or Maintenance Management System Coordinators any new or updated documents via e-mail for posting to the Intranet.
- The requestor should be the Document Owner and shall copy the other counterparts on the request, so that all parties are aware of the new and/or updated material being posted.

Associated Forms:

- N/A

Table of Revisions

Revision #	*Date*	*Description of Revision*
7	January 28, 2013	Required signature of new Manager of Operations and Compliance
8	June 29, 2015	Change in Top Management, removed reference to hard copy locations for operational plans
9	January 4, 2016	Changed QMS Representative
10	January 30, 2018	Change in City logo
2.0	January 1, 2019	Revised document format; combined intranet files and document control procedures, IMS tech, now Asset Management Coord. MMS tech now Maintenance Management Coord.; revised document revision protocol and expanded document listing to include location of controlled version and identify a document owner.
2.1	January 1, 2020	Annual Review – Reworded info. on Protection of Documents - electronic

Appendix C

~ Record Control Procedure (DW-ADMIN-200) ~

~ Record Retrieval Form (DWF-ADMIN-200) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: RECORD CONTROL	**PROCEDURE NO.: DW-ADMIN-200**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 5**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure defines the actions and responsibilities for maintaining records generated by or provided to the City of St. Thomas Environmental Services Department that are required to demonstrate conformance to the Drinking Water Quality Management System (DWQMS).

Procedure:

Record Listing
Table 200-1 below lists the records that have been identified as required to demonstrate conformance to the Drinking Water Quality Management Standard:

- Table 200-1 lists for each record required, the Record Keeper, the retention time (as listed in the City of St. Thomas Retention of Records By-law 65-2018), its storage location and archive location.
- The identified Record Keeper is responsible for ensuring that records are filed, stored, archived, and disposed of as per the City of St. Thomas Retention of Records By-law 65-2018 (as amended from time to time).

Table 200-1: Record Listing

	Record	Record Keeper	Retention Time	Record Storage Location	Archive Location
Internal Records	Completed Logbooks	MMS	15 years	Paper: PW – Document Room	PW – Document Room
	Chain of Custodies	WT	2	**Paper:** PW – Binders in WT Office **Electronic:** T:\Water and Sewer\Water\Samples	**Paper:** PW – Document Room **Electronic:** T:\Water and Sewer\Water\Samples
	SCADA Data	QC	2	SCADA	SCADA Historian
	Completed Work Orders	MMS	5	**Paper:** PW – Administration Filing Cabinets (2 years) **Electronic:** Work Manager System	**Paper:** PW – Document Room **Electronic:** Work Manager System
	AWQI Reports	QC	15	**Paper:** PW – Filing Cabinet in WT Office	**Paper:** PW – Filing Cabinet in WT Office

				Electronic: T:\Water and Sewer\Water\Water Files\Adverse	**Electronic:** T:\Water and Sewer\Water\Water Files\Adverse
	Training Records	QC	5	**Paper:** PW – Filing Cabinet in QC's Office	**Paper:** PW – Filing Cabinet in QC's Office
	Internal Audit Reports	CC	5	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator
	Management Review Meeting Minutes	CC	5	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator
	Calibration Records	WT	5	**Electronic:** T:\Water and Sewer\Water\Calibration Records	**Electronic:** T:\Water and Sewer\Water\Calibration Records
	Complaints	MMS	5	Service Request Manager System	Service Request Manager System
	Annual Reports	CC	6	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator
	Summary Reports	CC	6	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator
	Water Supply Agreements	CC	P	**Electronic:** T:\Water and Sewer\Sewer and Water Agreements\Water	**Electronic:** T:\Water and Sewer\Sewer and Water Agreements\Water
	Operating Contracts	CC	P	**Electronic:** T:\Water and Sewer\Sewer and Water Agreements\Water	**Electronic:** T:\Water and Sewer\Sewer and Water Agreements\Water
	Backflow Prevention Correspondence, certification and results	EC	5	**Electronic:** T:\Water and Sewer\Water\Backflow Prevention	**Electronic:** T:\Water and Sewer\Water\Backflow Prevention
External Records	External Lab Reports	WT	15	**Paper:** PW – Binders in WT Office **Electronic:** T:\Water and Sewer\Water\Samples	**Paper:** PW – Binders in WT Office **Electronic:** T:\Water and Sewer\Water\Samples
	External Audit Reports	CC	5	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator	**Electronic:** T:\Development and Compliance\Compliance\!Compliance Coordinator
	MECP Inspection Reports	CC	6	**Electronic:** T:\Development and Compliance\Compliance	**Electronic:** T:\Development and Compliance\Compliance
	System Classification Certificates	CC	P	**Electronic:** T:\Development and Compliance\Compliance\Licences and Permits	**Electronic:** T:\Development and Compliance\Compliance\Licences and Permits

	DWWP and MDWL (form 1,2 and 3's)	CC	P	**Electronic:** T:\Development and Compliance\Compliance\Licences and Permits	**Electronic:** T:\Development and Compliance\Compliance\Licences and Permits
	Operator Licences/Certificates	QC	Superseded	Posted at PW Building	N/A

Retention Of Records

- All records are retained and disposed of as per the City of St. Thomas Retention of Records By-law Number 65-2018 or applicable legislation

Protection of Electronic Records

- Network data backups are managed by the IT Services team
- Network data backups are completed on a Daily (incremental), Weekly (full), Monthly (Full-6 months at a time), and Year-End/Annual basis.

Protection of Hard Copy or Paper Records

- All paper copies are properly stored (clean, legible, dry, organized) in a designated area as outlined in the "Record Listing Table" of this procedure

Intranet Postings

- The Asset Management and Maintenance Management System Coordinators maintain the Intranet files for the City of St. Thomas's Environmental Services Department.
- The CC, Quality Coordinator (QC) and Manager of Development and Compliance may send the Asset Management and/or Maintenance Management System Coordinators any new records via e-mail for posting to the Intranet.
- The requestor should be the Record Keeper and shall copy the other counterparts on the request, so that all parties are aware of the new and/or updated material being posted.

Retrieval of Original Records

- Anyone can make requests to the QC or the MMS Coordinator for the retrieval of records through a Record Retrieval Form (DWF-ADMIN-200)
- QC and/or MMS Coordinator properly re-file all paper records retrieved

Associated Forms:

- Record Retrieval Form (DWF-ADMIN-200)

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	June 29, 2015	Change in Top Management,
7	January 4, 2016	Changed QMS Representative
8	July 7, 2016	Removed Foreman as position eliminated.
9	January 30, 2018	Change in City logo and changed that information filed electronically
2.0	January 1, 2019	Revised document format; combined record control procedures, IMS tech, now Asset Management Coord. MMS tech now Maintenance Management Coord.; and expanded record listing and included locations, retention times, and identify a record keeper.
2.1	April 12, 2019	Updated to reflect RR Bylaw 65-2018, replacing references to 60-2010.
2.2	January 1, 2020	Annual Review – Reworded section on Protection of Electronic Records.

Drinking Water Quality Management System

PROCEDURE TITLE: RECORD RETRIEVAL FORM	PROCEDURE NO.: DWF-ADMIN-200
EFFECTIVE DATE: JANUARY 1, 2020	DWQMS REFERENCE: 5
REVISION #: 2.2	REVIEW FREQUENCY: ANNUALLY
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X	SOUTHWOLD DISTRIBUTION	X	CENTRAL ELGIN DISTRIBUTION	X

REQUESTOR INFORMATION:

NAME (print clearly): _____

DATE: _____

Record Being Requested:

_____

_____

_____

_____

Retrieval Record:

	Date (Month dd/yyyy)	Initials
Date Form Received		
Date Record Removed		
Date Requestor Received Record		
Date Requestor Returned Record		
Date Record returned to file		

~ LEAVE FORM IN PLACE OF RETRIEVED RECORD ~
ONCE COMPLETE, QC IS TO FILE THIS FORM.

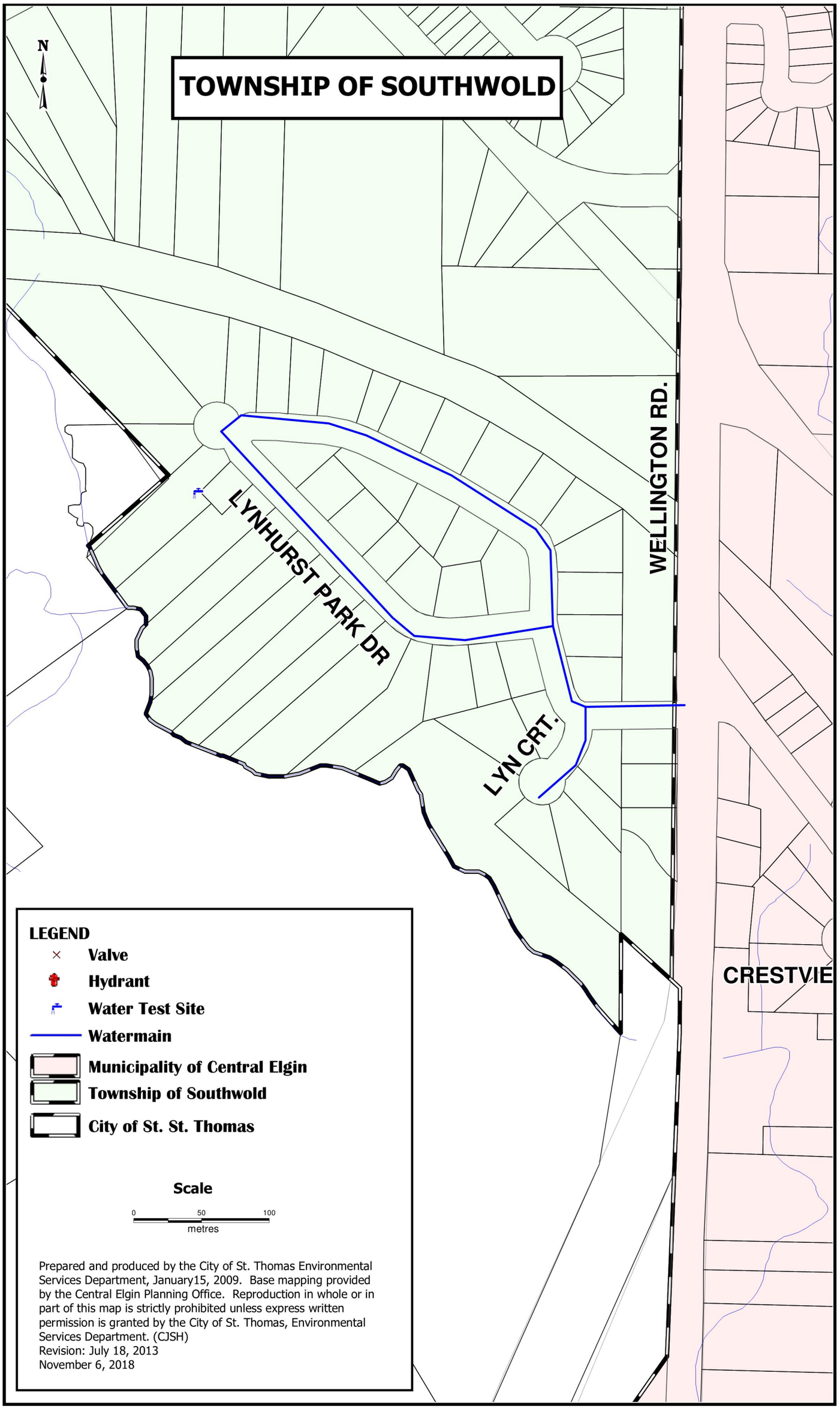
Appendix D

~ St. Thomas Secondary Area Water Supply System - **Mapping** ~

~ St. Thomas Water Distribution System - **Mapping** ~

~ Township of Southwold Water Distribution System (Lynhurst Area) - **Mapping** ~

~ Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area) - **Mapping** ~



Prepared and produced by the City of St. Thomas Environmental Services Department, January15, 2009. Base mapping provided by the Central Elgin Planning Office. Reproduction in whole or in part of this map is strictly prohibited unless express written permission is granted by the City of St. Thomas, Environmental Services Department. (CJSH)
Revision: July 18, 2013
November 6, 2018

Appendix E

~ Risk Assessment Procedure (DW-ADMIN-300) ~

~ Hazard Identification Form (DWF-ADMIN-300) ~

~ St. Thomas Secondary Area WSS - **Hazard Analysis Spreadsheet (DWF-ADMIN-301)** ~

~ St. Thomas WDS - **Hazard Analysis Spreadsheet (DWF-ADMIN-302)** ~

~ Twp. of Southwold WDS (Lynhurst Area) - **Hazard Analysis Spreadsheet (DWF-ADMIN-303)** ~

~ Munc. of Central Elgin WDS (St. Thomas Suburban Area) - **Hazard Analysis Spreadsheet (DWF-ADMIN-304)** ~

~ Low Pressure Control Procedure (DW-CCP-1000) ~

~ Discolouration Prevention Procedure (DW-CCP-2000) ~

~ Disinfection Control Procedure (DW-CCP-3000) ~

~ Backflow Prevention Control Procedure (DW-CCP-4000) ~

ST. THOMAS
THE RAILWAY CITY

1850 Township of Southwold

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: RISK ASSESSMENT	**PROCEDURE NO.: DW-ADMIN-300**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 7**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes the processes to be undertaken to identify hazards, conduct risk assessment, and determine critical control points.

Procedure:

Hazard Analysis Team
In order to adequately assess the hazards to drinking water quality within the drinking water system an Assessment Team shall be formed.
The Hazard Analysis Team consists of the following:

- Compliance Coordinator,
- Manager of Development and Compliance,
- Quality Coordinator, and
- 1 Operations staff members

Meetings of the Hazard Analysis Team may proceed with the absence of one of the above parties.

The Hazard Analysis Team may convene for any of the following reasons:

- Conducting annual hazard analysis verification exercises,
- Conducting hazard Re-assessment exercises (at least once every 36 months),
- Following an emergency event or drill
- Following training that impacts the knowledge of the plan users.
- When new equipment or processes are being introduced that may introduce hazards that have not yet been considered, or
- At the request of the any member of the Hazard Analysis Team.

Minutes shall be generated by the CC for any meetings of the Hazard Analysis Team.

Review Frequency

- On an annual basis, the QC and CC shall review the Hazard Analysis Spreadsheets for each water system and verify the currency of the information and the validity of the assumptions used in the assessment of risk.
- The review shall be documented in the Revision Index of the Spreadsheet.
- If either the QC or CC identifies that updates are required to the Hazard Analysis Spreadsheets, the QC shall arrange for a meeting of the Hazard Analysis Team to complete the required updates.

Reassessment Frequency

- At least once every 36 months a complete reassessment of the Hazard Analysis shall be conducted
- The reassessment shall be documented in the Revision Index of the HA Spreadsheets.

Hazard Reporting

- Hazard identification is formally conducted by the Hazard Analysis Team through brain storming exercises during hazard analysis verification and re-assessment meetings.
- Anyone can identify risks to water quality and/or sustained operations that have not already been analyzed. Hazards identified outside of verification and re-assessment meetings can be documented on the Hazard Identification Form (DWF-ADMIN-300) and submitted for consideration to the QC.
- The QC, who has the necessary knowledge and familiarity of the system's operations to understand its potential process and activity hazards shall conduct a risk assessment on the identified hazard immediately.
- Through completion of the Hazard Identification Form (DWF-ADMIN-300), if the QC determines that the identified hazard presents a moderate to high risk to operations, the QC shall call a meeting of the Hazard Analysis Team, in order to have the hazard considered and documented appropriately.
- If the QC determines that the identified hazard presents a low risk to operations, the QC shall retain the completed form and bring it forward at the next verification or re-assessment meeting of the Hazard Analysis Team.

Conducting Risk Assessments

Risk Assessments are recorded on the Hazard Analysis Spreadsheets (DWF-ADMIN-301 to DWF-ADMIN-304).

- Hazard Analysis Spreadsheets have been prepared to document the known and perceived risks to the 4 distribution-only systems the City of St. Thomas Environmental Services Dept. operate.
- The Hazard Analysis Spreadsheets consist of the following columns:
    - Activity or Process Step – list the activity or process that introduces the hazard
    - Hazard Category – identify the category of the hazard (biological/chemical/physical/radiological)
    - Specific Hazardous Event – identify the specifics of the real or perceived threat
    - Controls – list any programs in place that help control the risk posed by the hazard
    - Likelihood – assign a rating, as described in the Risk Ranking Each Hazard section below
    - Consequence - assign a rating, as described in the Risk Ranking Each Hazard section below
    - Detectability - assign a rating, as described in the Risk Ranking Each Hazard section below
    - Risk Ranking – sum the likehood, consequence and detectability ratings
    - CCP – demark yes or no, if the Risk Ranking or regulation identifies the hazard as a critical control point
    - CC Limits – list the critical level(s) that will trigger a response procedure. If CCP column identifies hazard as CCP, limits must be established.
    - Monitoring Process – list process for monitoring, or make reference to a procedure.
    - Response Procedures – List any procedures in place that

Identifying Hazardous Events and Associated Hazards

- Obtain and list the potential hazardous events and associated hazards, as identified in the MECP's document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems", dated December 2016, as it may be amended.
- With respect to process specific threats, start by using the basic process flow diagrams that follow the distribution of clean drinking water from supplier to delivery to residential, commercial and industrial customers
- For each step in the process flow diagram, identify and list on the appropriate Hazard Analysis Spreadsheet, each chemical, physical, biological and radiological hazards that may exist

Risk Rating Each Hazard

- For each Hazardous Event or associated hazard, assign a risk rating (through open discussion, the hazard analysis team should come to a consensus on each rating assigned) for each criterion (likelihood, consequence, and detectability).
- Reliability and redundancy of equipment should be considered when assessing the risk rating. Depending on the specific hazard, redundancy could lead to decreased scoring in the Likelihood or Severity Criterion. As such, the redundancy and reliability of equipment should be documented in the "Controls" column of the Hazard Analysis Spreadsheets.
- Tables are provided below to provide some context to each of the rating levels.

Criterion 1 – Likelihood

Description	*Likelihood of Hazard or Hazardous Event Occurring*	*Rating*
Rare	Has occurred or may occur less frequently than once every 10 years, given the existing control measures.	1
Unlikely	Has occurred or may occur approximately once every 5- to 10-year period, given the existing control measures.	2
Possible	Has occurred or may occur approximately once per 5-year period, given the existing control measures.	3
Likely	Has occurred or may occur approximately once per year, given the existing control measures.	4
Very Likely	Has occurred or may occur approximately once per month, given the existing control measures.	5

Criterion 2 – Severity (consequences)

Description	*Consequence of Hazard or Hazardous Event Occurring*	*Rating*
Insignificant	Insignificant or no: service interruption to customers or loss of available water supply (temporary, and low volume impact of up to <2,500 m^3/day), or insignificant or no public notification.	1
Minor	Localized minor: service interruption to customers or loss of available water supply (2,501-7,500 m^3/day), or localized public notification.	2
Moderate	Localized major / widespread minor: service interruption to customers, loss of available water supply (7,501-15,000 m^3/day) and/or illness, or city-wide media coverage.	3
Major	Widespread major: service interruption to customers, loss of available water supply (15,001-25,000 m^3/day) and/or illness, or province-wide media coverage.	4
Catastrophic	Catastrophic: service interruption to customers, loss of available water supply (>25,000 m^3/day) and/or illness, or national and/or international media coverage.	5

Criterion 3 – Detectability

Description	*Capability of Responding to Hazard or Hazardous Event Occurring*	*Rating*
Excellent	Excellent ability to respond in comparison to best practices, considering resources available[i].	1
Very Good	Very Good ability to respond, considering resources available.	2
Good	Good ability to respond, considering resources available[i].	3

Fair	Fair ability to respond, considering resources available[i].	4
Poor	Poor ability to respond, considering resources available[i].	5

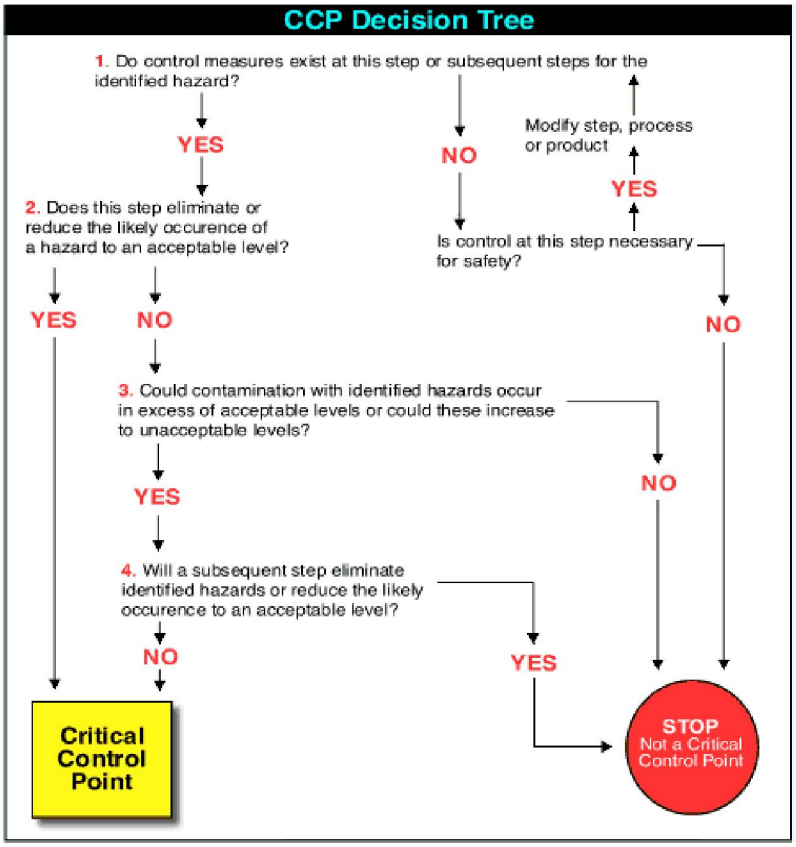
Determining the Risk Ranking

Risk Ranking = Likelihood Rating + Consequence Rating + Detectability Rating

Identifying Critical Control Points

The MECP has mandated disinfection CCP's related to primary and secondary disinfection.

The following "CCP Decision Tree" graphic is helpful in determining a critical control point:



Critical Limits

- Critical Limits are established for parameters that are identified as Critical Control Points.
- The limits provide operators with a range of acceptable values within which no preventative or corrective actions are required.
- Critical limits define the point at which an operator must take action to prevent escalation of the critical event or to correct the critical event.
- Critical limits are determined based on regulatory requirements, process monitoring capabilities, off-hours response time, and historical system performance.
- Process alarms (if available) are normally set at, or near critical limits.
- Responses to breached critical limits are detailed in the hazard specific Critical Control Point Procedures.

Natural / Man Made Disasters

- Regardless of how high of a ranking they may have, St. Thomas Environmental Services has no

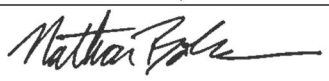
control over certain Natural and Man Made disasters.
- Responses to these types of hazards are outlined in the Emergency/Contingency Plan.

Communication
- If a new CCP is identified, critical control limits are adjusted, or alterations have been made to a procedure related to the monitoring or response of a critical control point, a training session shall be held to transfer the knowledge.

Associated Form(s):
- Hazard Analysis spreadsheets (DWF-ADMIN-301 to DWF-ADMIN-304)
- Hazard Identification Form (DWF-ADMIN-300)

Table of Revisions

Revision #	*Date*	*Description of Revision*
5	January 28, 2013	Required signature of new Manager of Development and Compliance
6	April 12, 2013	Added the DWQMS requires a risk assessment to be carried out every 36 months, that edits are carried out as group, the Compliance Coordinator records the edits, changed that the Foreman post a copy of the current CCPs instead of the QC
7	June 29, 2015	Change in Top Management
8	January 4, 2016	Change in QMS Representative, removed requirement to post CCPs on bulletin board, available electronically
9	July 7, 2016	Removed Foreman as position eliminated
10	March 24, 2017	Added that list of control measures included in the Hazardous Analysis Spreadsheet
	January 30, 2018	Change in City logo
2.0	January 1, 2019	Revised document format; combined Risk Assessment procedures, reworded many paragraphs. Removed statement that “Hazards are assessed without the influence of controls. That is, downstream or backup controls may affect the risk of the hazard, but hazards are first assessed without those controls in place”. Introduced Hazard Identification Form and process around its use. Inserted requirement to assess MECP list of possible hazards. Inserted manmade disaster section, as well as review and reassessment sections. Introduced concept of HA Team. Inserted CCP decision tree and new descriptions for each rating criterion.
2.1	January 1, 2020	Annual Review- Updated references to MOECC to MECP.

PROCEDURE TITLE: HAZARD IDENTIFICATION FORM	**PROCEDURE NO.: DWF-ADMIN-300**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 7**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

Name:	**Date:**
Location:	
Equipment:	
Description of the hazard:	
Recommended Control Measure(s):	
Signature:	

Preliminary Evaluation: Risk Ranking = Likelihood Rating + Consequence Rating + Detectability Rating

	Score	**Comment(s)**
Likelihood		
Severity		
Detectability		
Total Risk Rating:		

Risk Rating = Moderate to High Risk → Call meeting of Hazard Analysis Team
Risk Rating = Low Risk → Maintain copy for next Hazard Analysis Team meeting

Date:	
Signature: Manager of Water and Sewer	

Drinking Water Quality Management System

PROCEDURE TITLE: Hazard Analysis Spreadsheet (Southwold - Lynhurst Area)	**PROCEDURE NO.: DWF-ADMIN-303**
EFFECTIVE DATE: March 18, 2019	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: Annually**
APPROVED BY: Manager of Development and Compliance	

Activity or Process Step	Specific Hazardous Event	Hazard Category	Available Controls	Likelihood	Consequence	Detectability	Risk Ranking	CCP	CC Limits	Monitoring Process	Response Procedure for CC Limits
Water Supply Source	Chemical Spill / Algae Event at Source	chemical, biological, physical	EAPWSS monitors raw water for conductivity and dissolved oxygen	2	3	2	**7**	**NO**	N/A	OCWA monitors - if event occurs, could limit volumes available	OCWA procedure:
Water Supply Source	Loss of Source Water Supply	physical	None	2	2	1	**5**	**NO**	N/A	OCWA would advise	OCWA procedure:
Distribution	backflow/cross connection	biological chemical	OBC requires install; By-law # 44-2000 requires annual testing of BFP devices for severe risk facilities	3	4	4	**11**	**YES**	all severe risk commercial/industrial facilities have testable BFP devices	Complaints; Annual Inspection Reports	DW-CCP-4000; Bylaw#44-2000
Distribution	dead ends/low circulation	biological	flushing	5	1	2	**8**	**YES**	>0.05 mg/L regulation	auto-flushing on known areas of concern, visual grab chlorine sample	DW-ERP-300 - AWQI Reporting DW-ERP-200 - Low Chlorine Response
Distribution - Construction	Overland - dead ends/low circulation	biological	ES-SOP-3100 Coloured Water Flushing	3	2	2	**7**	**YES**	0.2 mg/L	flushing, visual grab chlorine sample	DW-ERP-300 - AWQI Reporting DW-ERP-200 - Low Chlorine Response
Distribution	Pressure Loss (sustained and widespread)	physical	SCADA monitoring	2	3	1	**6**	**YES**	>42.5	SCADA monitoring and alarms	Low Pressure Control DW-CCP-1000; DW-ERP-500 - Low Pressure Response
Distribution	Valves - inability to isolate	physical	Valve exercising program Redundancy - valves along line	3	2	1	**6**	**NO**	N/A	ES-SOP-4200; Watermain Valves	Move to next set of valves - isolating larger section
Distribution	Watermain Break	physical biological	SCADA monitoring of main pressure	2	1	1	**4**	**YES**	>42.5	SCADA monitoring and alarms; complaints	DW-CCP-4000: Disinfection Control; ES-SOP-4100: Watermain repair; ES-SOP-4200: Watermain Disinfection
Distribution	Water Quality- Discoloured water	physical chemical	ES-SOP-3100 Coloured Water Flushing	1	1	4	**6**	**YES**	No visible colour against white background	Complaints	DW-CCP-2000 - Discolouration Prevention Procedure; ES-SOP-3100 - Coloured Water Flushing
Distribution	Low pressure complaint	physical	Complaints	2	3	1	**6**	**YES**	complaints	SCADA monitoring	Low Pressure Control DW-CCP-1000; DW-ERP-500 - Low Pressure Response
Chlorination	Low FCR in Distribution	biological	FCR Checks throughout distribution	4	1	3	**8**	**YES**	>0.05 - <4.0 mg/L	FCR checks throughout distribution when bacti samples taken	DW-ERP-200 - Low Chlorine Response
System-wide	Extreme Weather (ie. tornado, ice storm)	physical, biological	SCADA, weather notices	1	2	1	**4**	**NO**	N/A	SCADA; complaints; observations	Community Emergency Management Plan Pre-emptive communications during cold snaps and heat waves.
System-wide	Long Term Climate Change	physical	None	2	2	1	**5**	**NO**	N/A	tracking weather trends and water demands	Community Emergency Management Plan Pre-emptive communications during cold snaps and heat waves.
System-wide	loss of SCADA communication	physical	maintenance	4	1	1	**6**	**NO**	N/A	Visual display of process data on SCADA	Procedure ES-SOP-101000: SCADA Service interuption
System-wide	Sustained Extreme temperatures	physical, biological	flushing, increased usage (heat), running water taps (cold temperatures)	2	2	2	**6**	**NO**	N/A	tracking weather trends and water demands	ES-SOP-3100: Watermain - Frozen; Pre-emptive communications during cold snaps and heat waves.
System-wide	Terrorist Threat	physical, chemical, biological	SCADA intrusion alarms, chambers locked, law enforcement notification	1	3	3	**7**	**NO**	N/A	SCADA intrusion alarms, visual inspection	DW-ERP-600: Unauthorized Entry and Vandalism; Law enforcement notification
System-wide	Vandalism	biological, chemical, physical	SCADA alarms	1	2	2	**5**	**NO**	N/A	SCADA intrusion alarms, visual inspection	DW-ERP-600: Unauthorized Entry and Vandalism; Law enforcement notification

ST. THOMAS
THE RAILWAY CITY

Drinking Water Quality Management System

PROCEDURE TITLE: Hazard Analysis Spreadsheet (Southwold - Lynhurst Area)	**PROCEDURE NO.: DWF-ADMIN-303**
EFFECTIVE DATE: March 18, 2019	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: Annually**
APPROVED BY: Manager of Development and Compliance	

REVISION #	DATE	REVISIONS	ATTENDEES
4	2013-04-12	Changed revised to reviewed	
5	2014-04-11	Completed 36 month reassessment and review, reduced	
6	2015-04-07	Yearly review, no changes	Mke Campbell, Cyril McCready, Chris Andrew, Bryan Rose, Clayton Morgan and Lynn Stafford
7	2016-04-01	Yearly review, no changes	Nathan Bokma, Chris Andrew, Charlie Johnston, Les Knot and
8	2017-03-30	Reassessed water supply source and likelihood is minimal so removed as hazard event, does not meet criteria.	Nathan Bokma, Chris Andrew, Lynn Stafford, Joe Resendes and Matt House
9	2018-03-27	Added MOECC mandated items to hazard list.	Chris Andrew, Bryan Rose, Jim Mars, Nathan Bokma, Terry Koning
2.0	2019-01-01	Updated Template	N/A
2.1	2019-03-18	annual review - inserted several new threats based on IA results from last year.	Karel Kamerman, Chris Andrew, Nathan Bokma, Joe Resendes

Drinking Water Quality Management System

PROCEDURE TITLE: LOW PRESSURE CONTROL	**PROCEDURE NO.: DW-CCP-1000**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
Low pressure was identified as a Critical Control Point (CCP) on the Hazard Analysis spreadsheet and therefore needs to be controlled. The risk is mainly due to the potential introduction of bacteria if adequate pressure is not achieved. This procedure describes the control of low pressure in the water systems operated by the City of St. Thomas Environmental Services Department.

Procedure:

Monitoring and Testing
SCADA System
- The pressure in the water main is continuously monitored through the SCADA system at a number of locations
- Critical alarms include:
    - ARBS low pressure alarm

Customer Complaints
- Low-pressure situations are also brought to the attention of staff from customer complaints.
- These are investigated by staff on a case-by-case basis for verification of the validity of the complaint
- If the complaint is deemed valid, an investigation as to the cause is initiated and repair work is undertaken to remedy the low-pressure situation

Critical Limits
SCADA alarmed low pressure events
- Low pressure is an indicator of a water main leak/break, pump failure, high water use and hydrant operation
- Distribution system pressures are monitored continuously by the SCADA system and communicated to staff via a paging system. A sudden and possibly large drop in normal pressure that does not correspond to any pump shutdown may indicate a large break.
- Pressure is indicated by the SCADA system from pressure gauges installed in the distribution system
- Low pressure is also communicated to staff through customer complaints at individual residences
- A low-pressure alarm will occur at 250 kPa (36.3 psi) at the ARBS
- Normal operating pressure within the city varies between 275 – 793 kPa (40 – 115 psi)

Operator Control
- The Operators, and the QC continuously monitor flow and pressure in the distribution system through the SCADA system
- If the Operator notices a significant drop in pressure (drops below 40 psi) they will investigate the cause, take appropriate action and notify appropriate personnel. E.g. isolate the ruptured section of watermain and divert water resources accordingly

Emergency Conditions and Response Requirements

Response

- In the case of a customer low-pressure compliant, Operations staff should refer to and respond as per the Responding to Complaints-Low Pressure Procedure (DW-SOP-520).
- In the case of an alarmed low-pressure event, Operations staff should refer to and respond as per the Low Pressure Response Procedure (DW-ERP-500).

Recovery

- Depending on the cause and nature of the low-pressure event, steps to recovery are outlined in the response procedure followed.

Reporting and Review

- Depending on the cause and nature of the low-pressure event, record-keeping mechanisms to be used are described in response procedure followed.

Table of Revisions

Revision No.	*Date*	*Description of Revision*
4	January 4, 2016	Changed Supervisor title to Manager/QC
5	July 12, 2016	Removed Foreman as position has been eliminated
6	January 30, 2018	Change in City logo
2.0	January 1, 2019	Operations Event Report Form replaced watermain break sheet, amalgamated 4 identical CCP procedures for low pressure control. Initiated new procedure format.
2.1	January 1, 2020	Moved sections around for better procedure flow. Updated references to response procedures.

Drinking Water Quality Management System

PROCEDURE TITLE: DISCOLOURATION PREVENTION AND CONTROL	**PROCEDURE NO.: DW-CCP-2000**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
Discolouration was identified as a Critical Control Point (CCP) on the Hazard Analysis spreadsheet and therefore needs to be controlled. The risk is mainly due to the potential for customers to perceive a lower standard of water quality due to aesthetic changes. The changes may occur due to flushing of existing or recently relined mains to name a few. This procedure describes the control of discolouration issues within the water systems operated by the City of St. Thomas Environmental Services Department.

Procedure:

General Description
Flushing of mains is a regular part of the operation and maintenance of the water distribution system. As a result, sediment in a main or loose tubercles, are picked up in the water column of the main and become suspended. Generally, these are flushed through a nearby hydrant until the water runs clear, refer to Preventive Maintenance_Watermain Flushing (DW-SOP-410). If possible, local customers are notified in advance. If a customer is unaware of the flushing and uses water during the flushing period, it will often be discoloured and may result in a customer complaint. All complaints become service requests and are investigated.

Critical Limits
- Visual inspection using water in a clear glass container against a white background in a natural light condition
- If any colour is observed, a coloured water situation is now in effect

Emergency Conditions and Response Requirements
- Discoloured water generally is not a drinking water hazard, however, is considered aesthetically displeasing. Customers may perceive this as a lower standard of water quality and submit a complaint.
- Operations staff shall refer and respond as per the Responding to Complaints-Coloured Water Procedure (DW-SOP-550).

Reporting and review
- Record-keeping mechanisms to be used are described in Responding to Complaints-Coloured Water Procedure (DW-SOP-550)
- Reviewed during capital budget deliberations for relining possibilities

Maintenance
- Annual Flushing Program

Table of Revisions

Revision No.	Date	Description of Revision
1	April 1, 2009	Initial Issue of Document
2	July 31, 2009	Added reference to SOP, ES-SOP-3100
3	June 1, 2010	Corrected complaint procedure number
4	January 30, 2018	Change in City logo
2.0	January 1, 2019	Amalgamated 4 identical CCP procedures. Initiated new procedure format.
2.1	January 1, 2020	Moved sections around for better procedure flow. Updated references to response procedures.

Drinking Water Quality Management System

PROCEDURE TITLE: DISINFECTION CONTROL	**PROCEDURE NO.: DW-CCP-3000**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
Disinfection during repairs or new construction is identified as a Critical Control Point (CCP) on the Hazard Analysis spreadsheet and therefore needs to be controlled. The risk is mainly due to the potential contamination of drinking water during repair and/or construction. The potential contamination of water could be severe and have a major impact to a large population if improper disinfection practices are used. This procedure describes the control of disinfection for repairs or new construction for the water systems operated by the City of St. Thomas Environmental Services Department.

Procedure:

General Description
Repairs generally refer to repair any water main or appurtenance within a drinking water system. New construction can include construction of new mains, tapping into existing mains, addition of new processes or equipment. The construction may be done on the water distribution systems or the secondary water supply system.

Critical Limits
Legislated Limit
As per condition 2.3 of the Drinking Water Works Permits for the water systems operated by the City of St. Thomas Environmental Services Department:
"All parts of the drinking water system in contact with drinking water which are:

2.3.1 Added, modified, replaced, extended; or

2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination, shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:

a) The Ministry's Watermain Disinfection Procedure, effective January 15, 2017;
b) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
c) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and
d) AWWA C654 – Standard for Disinfection of Wells."

Minimum Internal Limit After Repair
- 0.20 mg/L Free Chlorine

Minimum Internal Limit After New Construction Testing Complete
- Greater than 0.20 mg/L and less than 2 mg/L before final connection to distribution system

Operating Authority Control

- The Operating Authority has different levels of control depending on the following:
    - Whether it is a scheduled or unscheduled repair/construction
- If emergency repairs are required on the main beyond the capability of the Operating Authority, the Operating Authority may be responsible for obtaining a contractor to complete some of the work
- All new construction is inspected by the Environmental Services Department.
- Contractors are screened as per the Contractor and Supplier Requirements & Critical Supplies and Services (CD-ADMIN-800)

Operator Response Requirements During New Construction or Repairs

New Construction/Watermain Relining

- Refer to DW-SOP-220 Inspection – Watermain Commissioning Procedure or DW-SOP-230 Inspection – Disinfection of Relined Watermains, as appropriate.

Repairs

- Refer to the following procedures, as appropriate.

DW-SOP-300	Infrastructure Replacement - Services
DW-SOP-310	Infrastructure Replacement - Hydrants
DW-SOP-320	Infrastructure Replacement - Valves
DW-SOP-330	Infrastructure Replacement - Residential Water Meter
DW-SOP-340	Infrastructure Replacement - Watermain Repair

Emergency Conditions and Response Requirements

Response

- Refer to Emergency Response Plan Procedure DW-ERP-200 Low Chorine Response.

Reporting and Review

- Record-keeping mechanisms to be used are described within the applicable response procedure.

Maintenance

- Regular maintenance is performed on equipment as scheduled per the Infrastructure Maintenance, Rehabilitation and Renewal Procedure

Monitoring and Testing

- Ongoing monitoring of the chlorine residual and microbiological sampling is outlined in Sampling, Testing and Monitoring Procedure

Table of Revisions

Revision No.	*Date*	*Description of Revision*
1	April 1, 2009	Initial Issue of Document
2	June 1, 2010	Corrected Critical Supplies and Services procedure number
3	July 15, 2012	Removed procedure # for AWWA standard and added that CAF is to be completed for each adverse and construction may be done on the distribution or the secondary system
4	January 4, 2016	Replaced Supervisor with QC and Manager of Operations and Compliance with Manager of Development and Compliance
5	July 12, 2016	Removed Foreman as position has been eliminated
6	January 30, 2018	Change in City logo

2.0	January 1, 2019	Amalgamated 4 identical CCP procedures. Initiated new procedure format. Updated reference to O.Reg. 170, DWWP now requires all parts of system in contact with water be disinfected.
2.1	January 1, 2020	Updated references to procedures.

Drinking Water Quality Management System

PROCEDURE TITLE: BACKFLOW PREVENTION CONTROL	**PROCEDURE NO.: DW-CCP-4000**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 8**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
Backflow was identified as a Critical Control Point (CCP) on the Hazard Analysis spreadsheet and therefore needs to be controlled. The risk is mainly due to the potential introduction of bacteria or foreign substances if adequate backflow prevention is not achieved. This procedure describes the control of backflow within the water systems operated by the City of St. Thomas Environmental Services Department.

Procedure:

General Description
As treated water flows through the water distribution systems, it comes into contact with various customer connections and system appurtenances. Customers can be large users or small, and risks associated can be of a severe nature, such as a carwash, or minimal such as a typical single-family dwelling.

Critical Limits
- Zero commercial/industrial customers without backflow prevention installed
- Backflow prevention is installed on customer services for Severe Risk Facilities

Operator Control
- Yearly verification of customers' devices reported to Operating Authority by qualified testers

Emergency Conditions and Response Requirements
Initiation
- Backflow events are generally not detectable by the Operating Authority. Any indications that a backflow event may have occurred will be as a result of a customer complaint.

Response
- Backflow events shall be reported as an Adverse Water Quality Incident. Refer to DW-ERP-300 Adverse Water Quality Incident Reporting.

Recovery
- Depending on the nature of the backflow event, recovery plan will be developed in consultation with local MECP and MOH.

Reporting and Review
- Recording-keeping shall be completed as per the applicable response procedure, or per the Backflow Prevention Program.

Maintenance

- The operating authority conducts a monthly review of the backflow database and letters are sent out to customers notifying them of their annual recertification requirement by qualified testers. Refer to list maintained by the Environmental Coordinator.

Monitoring and Testing

- New installations are identified through building permits

Table of Revisions

Revision No.	*Date*	*Description of Revision*
4	January 4, 2016	Replaced Supervisor with QC and Manager of Operations and Compliance with Manager of Development and Compliance
5	January 30, 2018	Change in City logo
2.0	January 1, 2019	Amalgamated 4 identical CCP procedures. Initiated new procedure format. Updated reference to Wastewater Inspector to Environmental Coordinator
2.1	January 1, 2020	Updated references to response procedures.

Appendix F

~ St. Thomas Secondary Area WSS –

Roles, Responsibilities and Authorities Procedure (DW-ADMIN-400) ~

~ St. Thomas WDS –

Roles, Responsibilities and Authorities Procedure (DW-ADMIN-401) ~

~ Township of Southwold WDS (Lynhurst Area) –

Roles, Responsibilities and Authorities Procedure (DW-ADMIN-402) ~

~ Municipality of Central Elgin WDS (St. Thomas Suburban Area) –

Roles, Responsibilities and Authorities Procedure (DW-ADMIN-403) ~

ST. THOMAS
THE RAILWAY CITY

1850 Township of Southwold

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: ROLES, RESPONSIBILITIES AND AUTHORITIES – SOUTHWOLD	**PROCEDURE NO.: DW-ADMIN-402**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 11**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY		**ST. THOMAS DISTRIBUTION**		**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure clearly shows how information and responsibility is structured in the DWQMS. It defines the key personnel, who they primarily communicate with and their respective locations. This procedure is critical in defining paths for communicating DWQMS information and assigning responsibilities.

Procedure:

The table depicts the City of St. Thomas quality management system structure for the Township of Southwold Water Distribution System-Lynhurst Area.

Title: Owner - Mayor and Council of The Township of Southwold; Owner Representative, CAO	Location: Southwold	
Role	**Responsibility**	**Authority**
• Supply clean drinking water to the public • Ensure the distribution system is properly operated • Oversee status and progress of the DWQMS • Address the need for changes identified by the Operating Authority, Environmental Services	• Attends Management Review meetings • Prescribe requirements and monitor the operation of distribution system. • Represent the Township of Southwold to the public • Provide resources or infrastructure as necessary • Communicate with the Operating Authority • Respond to recommendations from the Operating Authority concerning: ○ The DWQMS to ensure its continuing suitability and effectiveness ○ Possible policy, objective and other ○ element changes ○ Objectives, Targets and Policy ○ Other DWQMS and contractual issues	• To perform all of its duties • To approve and assign funding for projects • To approve operative changes • To provide resources to ensure the proper implementation and continuance of the DWQMS, including access to personnel, access to equipment, and financial resources as per all regulations
Title: Operating Authority - Environmental Services Department	Location: St. Thomas City Hall / Public Works Service Centre	
Role	**Responsibility**	**Authority**

• Operate and monitor the distribution system	• Perform the operations as required • Obtain resources or infrastructure as necessary	• To perform its required operative duties • To recommend improvements or changes • To implement improvements or changes • To provide resources
Title: Top Management -:Director of Environmental Services & City Engineer		Location: St. Thomas City Hall
Role	**Responsibility**	**Authority**
• Oversee status and progress of the DWQMS, and liaise between the Operating Authority and the Township of Southwold	• Communicate regularly between the DWQMS Management Representative and also the Township of Southwold • Facilitate the acquiring of resources for making changes in the DWQMS by communicating with the Township • Appoint a management representative for the DWQMS • Review the DWQMS to ensure it's continuing suitability and effectiveness • Address any possible policy, objective and other element changes • Make reports and recommendations to the Corporation, based on reviews of DWQMS items, reports, and government reports from the OA	• To perform all required duties • To recommend funding for projects • To recommend operational changes • To recommend required resources to ensure the proper implementation and continuance of the DWQMS, including access to personnel, access to equipment, and financial resources
Title: Top Management – Operating Authority: Manager Development and Compliance (Quality Management System Representative):		Location: St. Thomas City Hall
Role	**Responsibility**	**Authority**
• Maintain the DWQMS in accordance with the Drinking Water Quality Management Standard • Communicate the status, progress and need for improvement of the DWQMS to Top Management	• Arrange, chair and provide necessary information to Top Management for the Management Review • Report the performance of the DWQMS to Top Management • Maintain an open door policy with Top Management and City staff to ensure there is no restriction of communication • Respond to Owner's requests as required • Represent the OA to internal or external parties with regards to the DWQMS including any external communications, maintaining the DWQMS files, handling and preserving the legislative files and legislative updates • Review/approve relevant DWQMS documents, applications, etc. and ensure that the most current versions of documents required by the DWQMS are being used at all times	• To perform all defined responsibilities under the DWQMS • May assign a designate to perform any of the above duties • To recommend funding for projects • To recommend operational changes • To recommend required resources to ensure the proper implementation and continuance of the DWQMS, including access to personnel, access to equipment, and financial resources

	• Ensure that personnel are aware of all current regulatory requirements that pertain to their duties with the operation of the drinking water system • Schedule and facilitates external audits • Promote awareness and effectiveness of the DWQMS throughout the operating authority • Identify the need for resources or infrastructure	
Title: Hazard Analysis Team (Compliance Coordinator, Manager of Development and Compliance, Quality Coordinator, Operations Team member)	Location: Varies	
Role	**Responsibility**	**Authority**
• Ascertain and analyze critical control points and hazards associated with the system	• Ascertain and analyze critical control points and hazards associated with the system Review documents, procedures, forms	• To perform all required duties • To prescribe requirements
Title: Quality Coordinator / Operating Authority (QC/OAS): Manager of Sewer and Water (commonly referred to as QC)	Location: Public Works Service Centre	
Role	**Responsibility**	**Authority**
• Key manager of the DWQMS • Implement and maintain the DWQMS in accordance with the Drinking Water Quality Management Standard • Communicate the status, progress and need for improvement of the DWQMS to Top Management/OA Personnel Management • Plan, manage and schedule operations & maintenance tasks for the Operating Authority	• Regular review of process data, upsets, operator reports • Ensure proper communication of DWQMS issues to proper personnel • Regular review/editing of relevant DWQMS documents, applications, etc. • Schedule and facilitate audits • Assist in maintaining Corporation legal compliance • Maintains an open door policy with Top Management and Corporation staff to ensure there is no restriction of communication • Report the performance of the DWQMS to Top Management • Respond to Owner's requests as required • Represent the OA to internal or external parties with regards to the DWQMS including any external communications, maintaining the DWQMS files, handling and preserving the legislative files and legislative updates • Review/approve relevant DWQMS documents, applications, etc. and ensure that the most current versions of	• To perform all defined responsibilities under the DWQMS • May assign a designate to perform any of the above duties • To recommend operational changes • To recommend required resources to ensure the proper implementation and continuance of the DWQMS, including access to personnel, access to equipment, and financial resources

	documents required by the DWQMS are being used at all times • Ensure that personnel are aware of all current regulatory requirements that pertain to their duties with the operation of the drinking water system • Promote awareness and effectiveness of the DWQMS throughout the operating authority • Identify the need for resources or infrastructure • Edits, manages and reviews for DWQMS compliance • Maintains version controlled documents • Report and act upon non-conformances • File records • Arranges training • Receive external complaints and communicate them to the Manager of Development and Compliance • Manage maintenance activities within the distribution system • Manage laboratory and sampling programs within the Corporation • Manage administration of permits, applications and other external quality information • File, modify and maintain appropriate quality documents	
Title: Operating Authority Personnel – Leadhand and Operator(s)	Location: Public Works Service Centre	
Role	**Responsibility**	**Authority**
• Carry out applicable DWQMS tasks	• Report and act upon non-conformances • Follow procedures, complete forms • File records • Attend training • Receive external complaints and communicate them to their Supervisor • Regularly communicate to their Supervisor • Carry out required operations and maintenance activities • Operators must maintain license • Identify the need for resources or infrastructure	• To perform the required DWQMS duties
Title: Compliance Coordinator	Location: St. Thomas City Hall	
Role	**Responsibility**	**Authority**

• Regularly monitor the Corporation DWQMS for conformance • Manage the DWQMS for the City of St. Thomas Distribution System	• Periodically audit the Corporation DWQMS for conformance • Schedule and facilitate internal audits • Report findings to the DWQMS Management System Representative • Follow up to assess closure of non-conformances and corrective actions • Regularly communicate with the Director, QMS Representative and/or QC • Develop documents, procedures, forms • Review documents, procedures, forms	• To investigate conformance to the Drinking Water Quality Management Standard, within the DWQMS scope • Communicate with key DWQMS parties • To change the DWQMS and operational changes
Title: MMS Coordinator	Location: Public Works Service Centre	
Role	**Responsibility**	**Authority**
• Administer Computerized Maintenance Management System (CMMS) • Carry out applicable DWQMS tasks	• File and maintain appropriate quality documents • Administer the CMMS • Retrieve records	• To perform the required DWQMS duties • To modify electronic documents, as designated • To file and archive electronic documents
Title: DWQMS Internal Auditors	Location: Public Works Service Centre	
Role	**Responsibility**	**Authority**
• Monitor the Corporation DWQMS for conformance	• Periodically audit the Corporation DWQMS for conformance • Report findings to the DWQMS Management System Representative • Follow up to assess closure of non-conformances and corrective actions • Regularly communicate with the Director, QMS Representative and/or QC • Review documents, procedures, forms	• To investigate conformance to the Drinking Water Quality Management Standard, within the DWQMS scope • Can be internal or external personnel • Communicate with key DWQMS parties
Title: Water Operations Technician	Location: Public Works Service Centre	
Role	**Responsibility**	**Authority**
• Maintains accurate water operations records	• Utilizes CMMS to track work accomplishments and ensure compliance • Updates and maintains operational databases • Summarizes and analyzes data related to water operations for use in the development of annual reports • Coordinates annual lead testing program • File records • Attend training • Receive external complaints and communicate them to the QC • Regularly communicate to the QC • Technician must maintain license •	• To perform the required DWQMS duties

Associated Form(s):

- **Not Applicable**

Table of Revisions

Revision #	*Date*	*Description of Revision*
8	June 29, 2015	Change in Top Management, removed that the Director of St. Thomas attends the Management Review meetings and to prepare financial plans as CE is the Owner Representative, Water/Wastewater Supervisor has temporally assumed role as Acting Quality Management System Representative
9	January 4, 2016	Change in QMS Representative and title Supervisor to Manager, removed Acting QMS Representative and removed reference to water/wastewater section
10	March 16, 2016	Change in Sewer and Water staff, Foreman as Acting QC
11	July 7, 2016	Change in Owner Representative for Southwold and removed Foreman as position eliminated
12	June 29, 2017	Removed terminology Senior Management and using Top Management to be consistent with terminology in Standard
13	January 30, 2018	Change in City logo
2.0	January 1, 2019	Implemented new procedure template. MMS tech now MMS coordinator.
2.1	July 16, 2019	Eliminated steering committee; inserted info. On R,R and A for Hazard Analysis Team, inserted Compliance Coordinator as separate Role. Removed CC responsibilities from Internal Auditor/Compliance Coordinator listing.
2.2	January 1, 2020	Annual Review – updated Owner Representative is now CAO, rather than Public Works Superintendent

Appendix G

~ Competency and Training Procedure (DW-ADMIN-500) ~

~ On-site Training Form (DWF-ADMIN-500) ~

~ Operator Competence Form (DWF-ADMIN-501) ~

~ Training Needs Matrix (DWF-ADMIN-502) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: COMPETENCY AND TRAINING	**PROCEDURE NO.: DW-ADMIN-500**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 10**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure clearly shows the required competencies of the Owner and the Operating Staff, whose duties may have the possibility of directly affecting drinking water quality.

Procedure:

Competencies:
The following table illustrates the competencies required by the Owner and/or Operating Authority Staff whose duties may have the ability to directly affect drinking water quality. The identified competencies consist of those required by regulation and by the City of St. Thomas. The listing also includes desired competencies, these are skill sets that may not be currently held by the position, but the position is encouraged to pursue.

DWQMS Role	Position	Required Competencies	Desired Competencies
Owner	○ St. Thomas Secondary Water Supply System - Joint Board of Management Members ○ City of St. Thomas Council ○ Southwold Council ○ Municipality of Central Elgin Council	• Understanding of the Safe Drinking Water Act and Financial Management • Experience in capital and operating budgets • DWQMS understanding • Understanding of Standard of Care requirements	• Not Applicable
Top Management – Owner Representative	○ St. Thomas Director of Environmental Services &City Engineer ○ St. Thomas Director of Environmental Services &City Engineer ○ Southwold CAO ○ Municipality of Central Elgin Director of Infrastructure & Community Services	• Minimum 10 years utility management experience • 10 years financial management experience • Experience and Development of Capital and Operating Plans and the DWQMS financial plans • Post Secondary Education • Computer Skills • DWQMS understanding	• Degree in Civil Engineering • 10 years Management Experience • Accounting
Top Management – OA Representative / QMS Representative	City of St. Thomas - Manager of Development and Compliance	• Minimum 5 years utility management experience • 5 years financial management experience • Experience and Development of Capital and Operating Plans • Post Secondary Education • Computer Skills • DWQMS understanding	• Water Distribution Certification • Accounting • Degree in Civil Engineering
QC / ORO	Manager Water & Sewer	• Water Distribution Class III Certification • Minimum 5 years of operations experience • Minimum of 5 years of operations supervision experience • Leadership training • SCADA Competency • Confined Space Certification • Computer Skills	• Internal Auditor Training • Experience and Development of Operating Plans • 5 years Management Experience • CMMS Training

		• DWQMS understanding	
OIC / Operator	Water/Sewer Operator	• Water Distribution Class I Certification • SCADA Competency • WHMIS • Confined Space Certification • Mechanical Aptitude • First Aid / CPR • Computer Skills • Water Meter Installer Course • Class DZ Drivers Licence • DWQMS understanding	• Water Distribution Class III Certification
OIC / Operator	Water/Sewer/Backhoe Operator	• List for Water/Sewer Operator above, plus, • Backhoe Competency	• Water Distribution Class III Certification
Operations Tech.	Water Operations Technician	• SCADA Competency • WHMIS • Confined Space Certification • Mechanical Aptitude • First Aid / CPR • Computer Skills • Class DZ Drivers Licence • DWQMS understanding	• Operational Awareness - Entry Level Course for Drinking Water Operators
DWQMS Internal Auditor	Various	• DWQMS Fundamentals Course • Internal Auditing for the DWQMS Course	• ISO Standard Internal Auditing Course

Developing Competencies

- New Operators train with an experienced Operator until a satisfactory level of competence is reached, as determined by the Manager Water and Sewer. During this time, the new operator receives on-the-job training.
- Following the required training period, the Manager Water and Sewer interviews the new Operator to determine if they have achieved a satisfactory level of competence.
- The Manager Water and Sewer goes through the Operator Competence Form (DWF-ADMIN-501), signs and dates the form when all practical training has been achieved to an acceptable level.
- This will become a record of competency and will be filed in the employee's personnel file.

Maintaining Competencies

- All City of St. Thomas Water Operations Staff must provide evidence of MECP certification and other competency requirements, as outlined in the table above.
- Certification must be maintained as a condition of employment.
- All City of St. Thomas Water Operations Staff undergo "DWQMS Orientation Training", including a review of the Operational Plan and Policy
- All City of St. Thomas Water Operations Staff must review the applicable related procedures and on the job instructions.

- All City of St. Thomas Water Operations Staff are provided DWQMS "Re-Orientation Training" *every* two years. Bi-annual training ensures that employees are aware of the relevance of their duties and how they affect drinking water quality.
- Training events are documented as per this procedure.

Training Needs

- The QMS Training Needs Matrix (DWF-ADMIN-502) lists the training requirements for each QMS role.
- A record of all training activities are maintained in the Training Tracker spreadsheet.
- The QC compares the Training Tracker spreadsheet records with the Training Needs Matrix (DWF-ADMIN- 502) at the end of each year to determine training requirements for the upcoming year.
- The QC develops an annual training plan to manage the QMS training requirements.

Maintaining Drinking Water Certification

- It is the responsibility of each employee to investigate, request, attend (if approved), and track training required to maintain Drinking Water certifications, initiate personal growth and increase water operations knowledge.
- The City of St. Thomas will endeavor to maintain complete training record files for each Operator in order to:
    - Demonstrate due diligence, with respect to workplace hazards and water quality.
    - Aid Operations staff in the orderly tracking of training required to maintain certifications.
- In accordance with the Collective Bargaining Agreement, The City of St. Thomas will pay for training required to maintain Operator Certifications.

Documenting Training

- Any person that conducts an informal training session for Water operations staff will be issued an On- Site Training Form (DWF-ADMIN-500).
- The form identifies the name, date, location and duration of the training session as well as the name of the instructor, the topics covered and the training materials used for the session.
- Anyone can complete the first portion of the form but; the trainee, the trainee's supervisor and the trainer must all provide a signature on the form to verify that the information is correct.
- The On-site Training Form (DWF-ADMIN-500) should be used to capture on-the-job training. For example, the trainer could be an operator that is training another operator. The Manager of Water and Sewer would need to sign-off on the form to verify that training took place.
- When staff receive an original training certificate from an external training provider, they shall provide a copy to the QC for filing and record-keeping.
- When management receives an original training certificate from an external trainer, management shall make a copy of the original certificate for filing and then forward the original copy to the employee.

Associated Form(s):

- On-site Training Form (DWF-ADMIN-500)
- Operator Competence Form (DWF-ADMIN-501)
- Training Needs Matrix (DWF-ADMIN-502)

Table of Revisions

Revision #	*Date*	*Description of Revision*
9	June 12, 2014	Removed 5 years management experience from Manager of Operations and Compliance from desired competency as it is already a required skill. Changed water operator class lll certification from required to desired skill and require

		the water operator to have a class I certification, removed water certification from Water Technician requirements as job is mainly a clerical job
10	June 29, 2015	Change in Top Management
1	January 4, 2016	Change in QMS Representative and title Supervisor to Manager
12	July 7, 2016	Removed Foreman and Water Service Worker as positions eliminated
13	January 30, 2018	Change in City logo
2.0	January 1, 2019	Changed procedure format. Amalgamated procedures from Southwold, MCE, Secondary and City distribution into one. Inserted Entry Level Course for Drinking Water Operators as desired for Water Tech. position. Inserted requirements for internal auditors. Pulled training form and competence form under system of control.
2.1	April 12, 2019	Updated DWF-ADMIN-502 to include D&C and Capital Engineers as having the ability to directly affect water quality and therefore have been identified as requiring DWQMS orientation upon hiring.
2.2	January 1, 2020	Updated reference to Southwold PW Superintendent to Southwold CAO. Updated reference to MCE Director of Physical Services to Municipality of Central Elgin Director of Infrastructure & Community Services.

Drinking Water Quality Management System

PROCEDURE TITLE: ON-SITE TRAINING FORM	**PROCEDURE NO.: DWF-ADMIN-500**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 10**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

Course Name:			**Date of Course:**		
Start Time:		**End Time:**		**Total Training Hours**	

Training Provider: ☐**Internal or** ☐**External (if external, company name)**
Name:

The training **provider** is considered to have expertise in the subject matter by virtue of having one of:

☐ Formal Education ☐ Specific Training ☐ 3 years direct experience

Topic of Training (Check Applicable)

☐ Technical/Professional ☐ Compliance/DWQMS ☐ Health and Safety ☐ Administrative

Training Method (Check Applicable)

☐ On-the Job Practical ☐ Classroom ☐ On-line ☐ Continuing Education

Description of Training:

Attendee(s)

	Print Name		**Signature**
1.		**1.**	
2.		**2.**	
3.		**3.**	
4.		**4.**	
5.		**5.**	
6.		**6.**	
7.		**7.**	
8.		**8.**	
9.		**9.**	
10.		**10.**	

I verify that the above information is accurate:

Training Provider Signature:_____ **Date:**_____

Supervisor Signature: _____ **Date:**_____

Recorded in Training Spreadsheet: YES NO Date:_____

Drinking Water Quality Management System

PROCEDURE TITLE: OPERATOR COMPETENCE FORM	**PROCEDURE NO.: DWF-ADMIN-501**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 10**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Employee Name: _____(print clearly) **Employee Start Date:** _____

Operator's Certificate(s):

- ☐ Water Distribution and Supply Subsystem Class _____
- ☐ Water Distribution Class _____

The Operator has completed practical training in the following:

- ☐ Monitoring the distribution system using the SCADA system
- ☐ Performing flushing operations
- ☐ Sample Taking – taking of water sample according to procedures
- ☐ Chemical handling – assisting in chemical delivery, handling various chemicals
- ☐ Responding to emergencies
- ☐ Valve operation – Using valve operator and other equipment as to test and/or replace distribution valves
- ☐ Hydrant operation
- ☐ Performing Chlorine residual testing
- ☐ Comparing laboratory results to legislated standards
- ☐ Performing disinfection activities after maintenance – watermain repairs
- ☐ Drinking Water Quality Management Standard Operational Plans
- ☐ Responding to Asbestos Pipe Watermain breaks
- ☐ Infrastructure Locating – (Completing and requesting locates)
- ☐ Other: _____

Comments:

_____

_____

_____

_____

Manager of Water & Sewer/ORO: _____ **Date:** _____

Employee Signature: _____ **Date:** _____

Date Reviewed	Manager	Description of Changes

Drinking Water Quality Management System

PROCEDURE TITLE: Training Needs Matrix	**PROCEDURE NO.: DWF-ADMIN-502**
EFFECTIVE DATE: January 1, 2020	**DWQMS REFERENCE: 10**
REVISION #: 2.2	**REVIEW FREQUENCY: Annually**
APPROVED BY: Manager of Development and Compliance	

St. Thomas Environmental Services
~ DWQMS Training Matrix~

Role	Statutory Standard of Care	Internal Auditing for the DWQMS	DWQMS Orientation	Confined Space Entry	Confined Space Rescue	First Aid/CPR	Working at Heights	Backhoe Operation	WHMIS	Water Meter Installation	Class DZ	Asbestos Awareness	Trenching and Shoring	Traffic Control
Renewal Period (yrs)	**Once/ Term**	**N/A**	**2**	**3**	**3**	**3**	**3**	**N/A**	**3**	**N/A**	**3**	**3**	**3**	**3**
Water Manager/QC	X	O	X	X	X	X	X	N/A	X	N/A		X	X	X
Operator	N/A	N/A	X	X	X	X	X	N/A	X	X	X	X	X	X
Backhoe Operator	N/A	N/A	X	X	X	X	X	X	X	X	X	X	X	X
Water Tech.	N/A	N/A	X	N/A	N/A	X	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A
Compliance Coordinator	N/A	X	X	N/A	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A
Internal Auditor	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A
Owner	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Owner Rep.	X	N/A	X	N/A	N/A	O	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OA Rep./QMS Rep.	X	O	X	N/A	N/A	O	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
D&C Engineers and Techs	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Capital Engineers and Techs	N/A	N/A	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

D&C - Development and Compliance
X - required
O - optional
N/A - not required for the role

Appendix H

~ Personnel Coverage Procedure (DW-ADMIN-600) ~

~ OIC Designation Table (DWF-ADMIN-600) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: PERSONNEL COVERAGE	**PROCEDURE NO.: DW-ADMIN-600**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 11**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

St. Thomas Secondary	X	**St. Thomas Distribution**	X	**Southwold Distribution**	X	**Central Elgin Distribution**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure demonstrates how the City ensures that sufficient personnel are available for duties that directly affect drinking water quality with the required competencies.

Procedure:

24/7 Operator Availability

- The Operating Authority is based out of the City of St. Thomas Public Works Service Centre and is staffed Monday to Friday 7:00 am until 3:30 pm, as per the collective agreement.
- Outside of regular business hours, an on-call operator is scheduled and available to respond 24/7 to events related to the operation of the water systems.

On-Call Coverage

- It is the responsibility of the On-call Operator to respond to after-hours water system related emergencies. This may include alarms paged and/or called to the Operator through SCADA.
- Upon review of the nature of the call for assistance, the operator on-call may contact another water operator, or if not available, a competent contractor, to assist with the assembly of additional crew assistance to remediate the reported problem.
- Competent contractors are listed in the Essential Supplies and Services Procedure (Appendix J for each system).
- Contact with the designated ORO is mandatory in the event that the maintenance problem creates an emergency situation involving severe pressure loss throughout a portion or all of the water distribution system.
- The QC establishes and maintains the on-call schedule.
- The schedule is posted in the Plan room and the lunch room at the Public Works Service Centre.
- The on-call schedule is based on a rolling schedule and is updated when changes occur.
- On-call duties are generally assigned in one-week intervals and transfer of the duties normally occurs on Friday's.
- The on-call operator is provided with the SCADA laptop and on-call cell phone.
- Only adequately certified operators may be assigned on-call duties. (ie. An Operator in Training may not be assigned on-call duties).
- New staff must have demonstrated an understanding of the systems operation through the successful completion of an Operator Competence Form, as described in the Competency and Training Procedure (CD-ADMIN-500) prior to being assigned on-call duties.

ORO Coverage

- The QC (Manager of Water and Sewer) is designated as the ORO for all systems operated by the City of St. Thomas Drinking Water Division.
- If the QC is absent of unavailable to act, the QC or Manager of Development and Compliance designates an alternate ORO to cover the responsibilities.
- When ORO designation is changed, the QC shall advise the following through e-mail and PW board posting:
  - St. Thomas Water and Sewer, and Pollution Control Staff
  - St. Thomas Environmental Services Management (Dir. Env. Services, Mgr. Capital Works, Mgr. Dev. And Compliance, Mgr. Roads and Transportation; Mgr. Pollution Control)
  - Southwold Owner and Operating Authority
  - Central Elgin Owner and Operating Authority
  - Dutton-Dunwich Operating Authority
- If there are no operators available that hold a certificate at the same Class or higher as the system to designate as ORO, an operator holding a certificate on Class lower than the Classification of said system may be designated as ORO.
- If it is necessary to designate an operator holding a lower Class of certificate than that of the highest Class of system operated, the designation is limited to a period of up to 150 days in any 12-month period, as prescribed by O.Reg. 128/04.
- The ORO has overall operational responsibility for the system
- The ORO directs operators on operating decisions beyond the knowledge, skill and experience of other operators
- The ORO is not required to be on site but must be available and able to provide direction in the event of an operational emergency.

Operator- In- Charge (OIC) Coverage

- Under normal circumstances, the Operator(s) in Charge (OIC) for the water distribution systems, shall be any or all operators (provided they are appropriately certified) currently conducting any work on the systems as defined by the OIC Designation Table (DWF-ADMIN-600) and recorded in the work manager system.
- The OIC Designation Table (DWF-ADMIN-600) describes activities and tasks from Work Manager and the percentage that qualifies for OIC time.
- Any undefined sub tasks that do not involve operation of the systems like snow removal, lawn maintenance, etc will not be included.
- **Note:** An operator in training cannot be designated as an OIC.

Labour Disruption Coverage

- In the event of a labour disruption, the QC (Manager of Water and Sewer) will retain operational control of the distribution system.

Associated Form(s):

- **OIC Designation Table** (DWF-ADMIN-600)

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	June 19, 2015	Change in Top Management, change in the on-call schedule, added duties for ORO and OIC from MOE Guideline 5.1
7	December 7, 2015	Change in QMS Representative and title Supervisor to Manager, to reflect that there is a winter and summer on call procedure, added supervisor on call during the winter months
8	July 7, 2016	Removed winter and summer on-call procedures and amalgamated into one on-call procedure, removed Foreman as position has been eliminated
9	January 30, 2018	Change in City logo

2.0	January 1, 2019	Format change. Amalgamated procedure from 4 OP's we were carrying. Inserted info. On OIC designation and introduced table from external document.
2.1	May 1, 2019	Updated to require Change in ORO Coverage Notification to go out to systems we supply water with.
2.2	January 1, 2020	Revised hours of operations from 7:30 am to 7:00 am

Drinking Water Quality Management System

PROCEDURE TITLE: OIC DESIGNATION TABLE	**PROCEDURE NO.: DWF-ADMIN-600**
EFFECTIVE DATE: January 1, 2020	**DWQMS REFERENCE: 11**
REVISION: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

St. Thomas Secondary	**X**	**St. Thomas Distribution**	**X**	**Southwold Distribution**	**X**	**Central Elgin Distribution**	**X**

Class	Phase	Activity	Task	Percentage applicable for OIC
Water Distribution	201	Main Break		100
	202	Main Maintenance	Alarm Response	100
			Exceptions:	
			Palm St. Monthly Inspection	0
			Record Maintenance	0
	203	Service Maintenance	Afterhours Service Call	100
	204	Valve Maintenance		100
			Exceptions:	
			Replace lid	0
	205	Hydrant Maintenance		100
			Exceptions:	
			Frost Check	0
			Paint	0
	206	Hydrant Flushing & Testing		100
			Annual Flushing Program – every operator receives 100%	100
	207	Meter Maintenance		0
	209	Inspection Testing		100
			Exceptions:	
			Record Maintenance	0
	210	Booster Station		100
	212	Leak Detection		100
	213	Valve Box Replacements		100
	214	Valve Replacements		100
	215	Locates		0
	216	Water Service Replacement		100
	222	Seminars & Training		0
	225	Tools		0
	229	Supervision		100
	230	Work for Others		0
2° System	211	Chambers		100
	812	Secondary System		100
			Exceptions:	
			Read Secondary Meters	0

Storm	**Various**	Various		0
Sanitary Sewer	**701**	Sanitary Sewer Cleaning		50
	704	Sanitary Manhole Maintenance		50
	705	Sanitary Sewer Maintenance		50
			Exceptions:	
			Thaw	0
	707	CCTV Inspections – Mainline		25
			Exceptions:	
			Review Video	0
	708	Roddings		25
	709	Training		0
	711	Locates		0
	790	Supervision		100
	805	WPCP	Water/Sewer Operators Assisting	0
	805A	Stations		0
Pollution Control Plant		Lab		100
		Centrifuge		100
		Stations		100
		Alarm Response for Plant and PS		100
		PCP Maintenance Shift		100
		Mechanical Activities		25
NOTES	If 2 staff are assigned		Each staff member gets 50% of available time	
	If 3 or more staff are assigned		Lead hand gets 100% of available time	
	On call operator		Depends on tasks assigned for call in only.	

Appendix I

~ Communications Procedure (DW-ADMIN-700) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: COMMUNICATIONS	**PROCEDURE NO.: DW-ADMIN-700**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 12**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
DWQMS communication must be performed consistently, to ensure all personnel are adequately informed on all DWQMS issues. External communication may be sensitive, and must also be carefully performed and recorded.

Procedure:

- The QC, and the Manager of Development and Compliance serve as the main contacts for DWQMS communication
- The relevant information that may be communicated between Top management and Owners, OA staff, Essential Suppliers and the Public are listed in the table below.
- The various methods that each type of information may be communicated is also identified within the table.

How Operating Authority Top Management Communicates with various stakeholders

Stakeholder	Relevant Information being Communicated	Method of Communication to:	Methods of Communication From:
Owner (St. Thomas Council; St. Thomas Area Secondary Water Supply System Board of Management; Central Elgin Owner Rep and/or Council; Southwold Owner Rep. and/or Council)	Performance of the DWQMS	Management Review meetings/meeting minutes	Meetings E-mail
	Financial Performance	Rate Studies, Financial Plans, Operational/ Capital Budget requests, Budget Monitoring Report	Meetings E-mail Council/Board Resolutions
	Performance of the Water System(s)	Annual Reports	Meetings E-mail Council/Board Resolutions
	Immediate need for resources	Board/Council Report	Meetings E-mail Council/Board Resolutions
	Need for resources	Annual Capital and/or Operational Budget Process	Meetings E-mail Council/Board Resolutions
	Standard of Care Information	Training Event	Meetings E-mail
	Procedural Changes	training event / crew meeting / PW posting	Hazard identification form

Operating Authority Staff	Legislative Changes	training event / crew meeting / PW posting	Corrective/Preventative Action Form
	Change in CCP	training event / crew meeting / PW posting	E-mail
	ORO designation Change	training event / crew meeting / PW posting	N/A
	QMS Representative Change	Letter distributed through e-mail and PW posting	N/A
Essential Suppliers	Performance Requirements	Contract Documents	Contract Documents
	Performance inadequate	Vendor Performance Form	Meetings, E-mail
	Disinfection Requirements	Procedure provided; Supplier Sign-off Form	Disinfection records
	Quality Policy	DWQMS Policy	Contractor Sign-off
	Quality Requirements	Supplier Sign-off Form	NSF documentation
	H&S concerns	Designated Substance Reports	Safety Data Sheets
Public	Annual Reports	Web posting, notice on bill?	Customer Service Call
	Significant announcements	Media Release	Customer Service Call
	Rate Changes	Bill insert – brochure at desk	Customer Service Call
	Water Supply Outage	Planned – Door hanger/letter Unplanned – if feasible, door to door.	Customer Service Call
	Emergency Situations -water quality/quantity	-if feasible, door to door. -media release -social media (City)	Customer Service Call
	DWQMS Accreditation	Bill insert – media	Customer Service Call
	Water Quality Concerns	Media release	Customer Service Call
	Complaints – W/M breaks	Media / signage	Customer Service Complaints
	Complaints		Customer Service - Leak report

Sensitivity Screening

- External communication on sensitive issues, such as release of sensitive quality, hazards and critical control points shall be screened through the QC and/or the Manager of Development and Compliance, as well as the Owner
- Both the QC and the Manager of Development and Compliance also maintain files concerning outstanding external quality issues. If information is opted by the QC or the Manager of Development and Compliance not to be released, this is recorded in the relative file
- External DWQMS communication involving the requirements of the Owner of the water systems may be handled by Owner and copied to the Manager of Development and Compliance
- Significant operational and financial changes to any of the water systems operated must be communicated to and approved by the respective Council or Board, recorded and filed by the Manager of Development and Compliance

Associated Form(s):

- **N/A**

Table of Revisions

Revision #	*Date*	*Description of Revision*
5	June 29, 2015	Change in Top Management
6	January 4, 2016	Change in QMS Representative, removed alerts, changed Lunch Room to Plan Room and added designate to complete service requests
7	July 7, 2016	Removed Foreman as position eliminated
8	June 29, 2017	Removed terminology Senior Management and using Top Management to be consistent with terminology in Standard
9	January 30, 2018	Change in City logo
10	May 17, 2018	Inserted additional methods of communication (i.e. specifications, contract documents, design guidelines, etc.) to ways Top Management communicates with contractors and suppliers.
2.0	January 1, 2019	Placed listing of methods of communication into tabular format. Expanded listing in some areas. Amalgamated procedures from the 4 OP's we were carrying and adopted new procedure format.
2.1	January 1, 2020	Annual Review – No Changes

Appendix J

~ Essential Supplies and Services Procedure (DW-ADMIN-800) ~

~ New Construction Sign-off Form (DWF-ADMIN-800) ~

~ Supplier and Contractor Sign-off Form (DWF-ADMIN-801) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: ESSENTIAL SUPPLIES AND SERVICES	**PROCEDURE NO.: DW-ADMIN-800**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 13**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	[redacted]

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
It is important that contractors/suppliers realize the impact they can have on water quality and be aware of controls in place and how to trigger those responses while working on the water systems operated by the City of St. Thomas Environmental Services Department.

Procedure:

Contractor Training and DWQMS Review

- All essential and/or new construction contractor personnel providing supplies or services to the water systems operated by the City of St. Thomas Environmental Services Department shall undergo a review of the following documentation:
  - Quality Policy,
  - Health and Safety Policy,
  - Pertinent sign-off form
  - Any prepared procedures that relate to the work or supplies being provided.
- Any contractor completing work on the drinking water systems operated by the City of St. Thomas Environmental Services Department is required to abide by the Quality Management System Policy, and report any quality, environmental or health and safety concerns to their specified site contact of the OA, or the QC.

Communication with Contractors/Suppliers Engaged through Procurement Process

- The Supplier and Contractor Sign-off Form (DWF-ADMIN-801) or New Construction Sign-off Form (DWF- ADMIN-800) and other pertinent information required for the review will be included in the tender.
- Once a contractor has been awarded the contract, the contractor must sign off on the applicable form (New Construction Sign-off or Supplier and Contractor Sign-off (DWF-ADMIN-800 or 801) prior to the pre- construction meeting and ensure that he/she and all employees have been made aware and will comply with the DWQMS requirements, including the QMS Policy and any procedures relevant to their work.
- The contractor is required to bring the signed form to the pre-construction meeting, failure to do so may result in a delay of the project.
- If the contractor does not have a signed form on file, the Operator shall arrange that the contractor complete a review **before** commencing work.
- Signed forms expire in three (3) years. The QC reviews the forms to verify they are current. If the signed form is expired, the QC shall arrange for a new review session and sign-off, as described above.

Communication with Suppliers Engaged through an Informal Process

Essential Suppliers or service providers that have been identified, however, are not engaged through a formal procurement process will be sent a package with the following information:

- Quality Management System Policy
- Health & Safety Policy
- Sign-off form for Contractors and Suppliers (DWF-ADMIN-802)
- For Chemical Suppliers only, applicable chemical delivery procedures
- For Equipment Suppliers/Contractors only, relevant maintenance procedures

- The packages are to be sent out by the end of October and completed forms are to be returned by December 31st of the same year for the 3-year term.
- Suppliers must read all material, sign-off on the Sign-off Form and return the original form to the QC.
- The supplier is responsible for ensuring that he/she and all employees from the supplier that may work on the water systems have been made aware and comply with the DWQMS requirements, including the QMS Policy and any applicable operational procedures.

Distribution of Completed Essential/New Construction Contractor and Supplier Forms

- Once the forms are signed by the QC, the QC will forward to the CC for filing the original forms and send a copy of the forms to the project manager (if applicable).

Ordering Supplies and Services

- The QC, Operators, and the PWSC Clerks have the authority to order critical supplies and services.

Critical Suppliers and Service Providers

- The following supplies and services have been identified as critical for the delivery or monitoring of safe clean drinking water.
- The supplies or services identified in the following table may be listed because they are associated with a critical control point, there would be difficulty associated with finding an alternate, or there is an immediate health risk without this supply/service.

Supply / Service	Primary Supplier	Alternate Supplier	Quality Requirements
Chlorination (12 % sodium hypochlorite)	**Anchem Sales** 120 Stronach Cres. London, ON N5V 3A1 Tel. (519)-451-1614 1-800-387-9799 www.anchemsales.com	**Jutzi Water** 525 Wright Blvd. Stratford, ON N4Z 1H3 Phone: (519) 814-9283 Toll Free: 1-833-299-9283	• Product must be NSF 60 certified • Require: SDS sheet and evidence of NSF 60 certification; batch certificate, if available
Lab Services (microbiological)	**SGS Environmental Services** 657 Consortium Court London, ON N6E 2S8 Tel. (519)-672-4500 angela.stott@sgs.com	**SGS Canada Inc.** 185 Concession St., P.O. Box 4300 Lakefield, ON K0L 2H0 Tel: (705)-652-2000 carrie.greenlaw@sgs.com	• MECP licenced. • CALA and/or SCC accredited • Require: evidence of licencing and accreditation and sample collection and shipping instructions.

Supply / Service	Primary Supplier	Alternate Supplier	Quality Requirements
	After hours emergency call: 519-870-7345 cell	After hours emergency call: 705-760-3494 (micro)	• **NOTE:** lab must be identified on MECP Notice of Lab Services Form
Lab Services (chemical)	**SGS Canada Inc.** 185 Concession St., P.O. Box 4300 Lakefield, ON K0L 2H0 Tel: 705-652-2000 carrie.greenlaw@sgs.com After hours emergency call: 705-760-3494 (micro)	**Maxxam Analytics** 4023 Meadowbrook Dr., Unit 109 & 110, London, Ontario N6L 1E7 Tel: (519) 652-9444, Fax: 519-652-8189 Toll-Free: 1 800 268-7396	• MECP licenced. • CALA and/or SCC accredited • Require: evidence of licencing and accreditation and sample collection and shipping instructions. • **NOTE:** lab must be identified on MECP Notice of Lab Services Form
Dechlorination (sodium thiosulphate)	**Anchem Sales** 120 Stronach Cres. London, ON N5V 3A1 Tel. (519)-451-1614 1-800-387-9799 www.anchemsales.com	**Jutzi Water** 525 Wright Blvd. Stratford, ON N4Z 1H3 Phone: (519) 814-9283 Toll Free: 1-833-299-9283	• Product must be NSF 60 certified • Require: SDS sheet and evidence of NSF 60 certification; batch certificate, if available
Electricians	**Talbot Electrical Contracting Ltd.** St. Thomas, ON Tel.: 519-434-4174 Cell: 519-671-9473	**Dielco** 1032 Hubrey London ON N6N 1B5 Jason Dieleman 519-685-2224	• WSIB Clearance Certificate
Mechanical	**Dielco** 1032 Hubrey London ON N6N 1B5 Jason Dieleman 519-685-2224	**Barrett Mechanical Inc.** 4058 Eastgate Crescent London Ontario N6L 1B2 519-652-7207	• WSIB Clearance Certificate
Piping for breaks and repairs	**Emco Waterworks** 94 Leathorne St London N5Z 3M5 519-686-1141	**Corix Water Products** 4080 Dowell Drive London, ON N6L 1P9 Office: 519-668-4607 Contact: Stephen Ferguson	• Product must be NSF 61 certified • Require: Evidence of NSF certification.

Supply / Service	Primary Supplier	Alternate Supplier	Quality Requirements
		Wolseley Waterworks Group 760 Little Simcoe Street London, ON N5Z 1P4 519-963-1004	
Equipment Calibration	**BIDS Technical Services Inc.** 21 Kevlin Road Markham Ontario L3R 8P1 Tel: 416-432-1565 bidsinc@outlook.com	**Metcon** 15 Connie Cres Unit 3 Concord Ont L4K 1L3 1-905-738-2355, Ext. 239 **Corix Water Products** 4080 Dowell Drive London, ON N6L 1P9 Office: 519-668-4607 Contact: Stephen Ferguson	• Require: Calibration reports and sticker on equipment. • WSIB Clearance Certificate
Contracted Workers for Main Breaks	**Elgin Construction** 140 Burwell Road St. Thomas, ON N5P 3R8 519-631-5041 Fax # 519-631-2591 Ken Kennedy 519-872-9605 Paul 519-851-1506 Tom 519-851-0712	**Omega Construction** 4104 Breck Avenue London, ON N6L 1B5 Jim Rea 519-652-6188 Work 519-473-2742 Home 519-430-1540 Pager Fax # 519-652-5568 **Blue Con** 1915 Crumlin Side Road London, ON N5B 3B8 519-659-2400 Fax # 519-659-6289	• Work must be completed in accordance with applicable industry standards • WSIB Clearance Certificate
SCADA Communication Support	**Execulink Technical Department** 1-877-393-2854, ext:800 Call Centre 519-456-7222 Joel Freund, Manager 519-456-7262 Cell 519-532-4117 Jonathan Scott, OPS 519-456-3000 Cell 519-873-0183 **On Call pager first** 519-430-3466 Cell 519-670-1281	Sole Supplier	• *Programmer must be proficient with Allen Bradley* • WSIB Clearance Certificate

Supply / Service	Primary Supplier	Alternate Supplier	Quality Requirements
SCADA Support and Maintenance	**Eramosa Engineering London Office** Tel.: 519-266-6994	**Summa Engineering Ltd.** Fernando Chua 3230A American Drive Mississauga ON L4V 1B3 905-678-3388	• *Programmer must be proficient with Allen Bradley* • WSIB Clearance Certificate

Ontario Water / Wastewater Agency Response Network (OnWARN)

- The City of St. Thomas is a member of OnWarn, an Ontario Water / Wastewater Agency Response Network (OnWARN), which is a network of utilities helping each other to respond to and recover from emergency situations.
- In the case of an emergency whereby the City does not have the essential supplies within its own inventory, or is unable to procure the essential supply of materials or services through its own contractors, the City may utilize the OnWarn system to obtain these services from other local municipalities, such as the City of London.
- In the event that an OnWARN response is deemed necessary to effectively respond to a situation or supply shortfall, the QC and/or Director of Environmental Services shall be notified immediately in order to trigger an OnWARN request for aid.

Associated Form(s):

- New Construction Sign-off Form (DWF-ADMIN-800)
- Supplier and Contractor Sign-off Form (DWF-ADMIN-801)

Table of Revisions

Revision #	*Date*	*Description of Revision*
10	February 17, 2015	Added OCWA to list of Mechanical Contractors and wording for performance evaluation of contractor/suppliers. Attached example of evaluation form
11	June 29, 2015	Change in Top Management
12	January 4, 2016	Change in QMS Representative
13	July 11, 2016	Updated contractor/supplier list and removed Foreman as position eliminated
14	January 30, 2018	Change in City logo
15	May 17, 2018	Added additional items in Contractor DWQMS review; changed timeline for renewal of Essential Services and Supplies form from 1 year to 3 year frequency; edited some contact info for various suppliers/contractors.
16	June 13, 2018	Added Bids Technical Services to list of Equipment Calibrations.
2.0	January 1, 2019	Format update. Expanded listing to identify specific primary and alternate suppliers/contractors – listed their quality requirements within the table.
2.1	January 1, 2020	Updated alternate chlorine and dechlor contacts. Inserted WSIB clearance requirement for applicable contractors.

Drinking Water Quality Management System

PROCEDURE TITLE: ***NEW CONSTRUCTION SIGN-OFF FORM***	**PROCEDURE NO.: DWF-ADMIN-800**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 11**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

Contractors, their employees, subcontractors, agents and suppliers involved in construction projects on the drinking water systems operated by the City of St. Thomas Environmental Services must work in accordance with the Safe Drinking Water Act and Drinking Water Quality Management System (DWQMS) requirements while on site.

1. **Water Quality**
   - All equipment coming into contact with drinking water must be ANSI/NSF 61 certified.
   - All chemicals coming into contact with drinking water must be ANSI/NSF 60 certified.
   - Any situation that may be an indicator of diminished or diminishing water quality is observed shall be reported immediately to the Quality Coordinator (QC).
2. **Chemical Handling and Storage**
   - All chemicals stored, consumed or used on the project site during the construction project must be accompanied by up-to-date SDS sheets.
   - All chemicals must be properly handled, used, stored, cleaned-up and disposed of according to applicable legislation and/or industry best practices.
   - All spills must be reported to the Quality Coordinator (QC).
2. **Fuel Handling and Storage**
   - Fuel storage and spill containment must meet applicable regulations.
   - Mitigation measures for spills (broken hydraulic hoses, dispensing fuel, etc.) must be in place prior to initiation of the project.
   - Spills must be reported to the QC.
3. **Waste**
   - All waste materials generated shall be collected in compatible containers, suitably labeled, properly stored, and disposed of as required by legislation or best practices.
   - The QC shall be informed of any hazardous materials and/or wastes on-site.
   - General garbage/waste must not litter the site and shall be disposed of in designated containers.
   - No waste materials shall be disposed of or buried on-site.
   - Septage haulage and disposal by appropriate means.
4. **Work around Watercourses**
   - The contractor is responsible for contacting Conservation Authorities regarding permits for work around watercourses.
   - Proper erosion and sedimentation control measures must be in place at all times.
   - Construction that may affect navigable waters must be given prior approval according to applicable legislation.
   - Releases of water must follow MECP and/or applicable industry standards.
5. **Other**
   - The contractor must abide by noise abatement by-laws and any other applicable municipal by-laws
   - This form must be completed prior to, and handed in at the pre-construction meeting. Failure to do so may result in a delay in starting the project at the contractor's sole expense.

Project Name:_____

Project Number:_____

Consultant Project Manager:_____

City Project Manager:_____

Contractor

In signing this form, you acknowledge that you have the authority on behalf of your company and are accepting corporate responsibility for ensuring that you and all employees from your company, including subcontractors, agents, and suppliers that may have reason to work on construction projects on the water systems operated by the City of St. Thomas Environmental Services Department.

I have reviewed the City of St. Thomas DWQMS Policy, Municipal Drinking Water Licence(s), Drinking Water Works Permit, and the Safe Drinking Water Act of Ontario. I have received all relevant procedures to the work being conducted and agree to ensure that all work is conducted in compliance with all applicable legislation and in accordance with best practice. Where there is uncertainty with any requirement, or a situation presents itself that needs to be reported to the City, I understand I am to contact the QC.

_____ _____

Contractor Signature Print Name

_____ _____

Company Name Date

Quality Coordinator

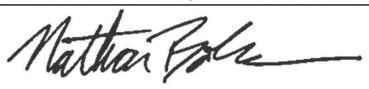
_____ _____

Signature Print Name

_____

Date

CC: Compliance Coordinator and Project Manager (if applicable)

PROCEDURE TITLE: ***SUPPLIER AND CONTRACTOR SIGN-OFF FORM***	**PROCEDURE NO.: DWF-ADMIN-801**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 11**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	**X**	**ST. THOMAS DISTRIBUTION**	**X**	**SOUTHWOLD DISTRIBUTION**	**X**	**CENTRAL ELGIN DISTRIBUTION**	**X**

General Sign-Off

All Contractors and Suppliers that undertake work on, or supply materials for the drinking water systems operated by the City of St. Thomas Environmental Services shall work in accordance with the DWQMS requirements while on site and shall hold all necessary licenses, permits and/or Certificates of Approval, as required to complete the work.

1. **Water Quality**
   - All equipment coming into contact with drinking water must be ANSI/NSF 61 certified.
   - All chemicals coming into contact with drinking water must be ANSI/NSF 60 certified.
   - Any situation that may be an indicator of diminished or diminishing water quality is observed MUST be reported immediately to the Quality Coordinator (QC).

2. **Disinfection of Equipment**
   - When required, all equipment coming into contact with drinking water shall be disinfected according the Ontario Watermain Disinfection Procedure and through reference, the applicable AWWA Standard for drinking water system disinfection.

3. **Operation of Waterworks Equipment**
   - No contractor shall perform the duties of an "operator" as defined by O. Reg.128/04 which states: *"Operator" means a person who conducts operational checks of or who adjusts, tests or evaluates a process that controls the effectiveness or efficiency of a subsystem and includes a person who adjusts or directs the flow, pressure or quality of the water within the subsystem, if the person works in a distribution subsystem or a distribution and supply subsystem;*
   - Unless that person holds a valid operator's certificate and has sought and received written permission from the QC.

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

5. **Wastes**
   - All waste materials generated shall be collected in compatible containers, suitably labeled, properly stored, and disposed of as required by legislation or best practices.
   - The QC shall be informed of any hazardous materials and/or wastes on-site.
   - General garbage/waste must not litter the site and shall be disposed of in designated containers.
   - No waste materials shall be disposed of or buried on-site.
   - Septage haulage and disposal by appropriate means.
   - All contractors involved directly in the handling of hazardous waste shall be trained in the Transportation of Dangerous Goods (TDG).

- Appropriate Certificates of Approval for Haulage or Treatment shall be on file with the QC.

6. Chemical Handling and Storage

- All chemicals stored, consumed or used on-site must be accompanied by up-to-date SDS sheets.
- All chemicals must be properly handled, used, stored, cleaned-up and disposed of according to applicable legislation and/or industry best practices.
- All spills must be reported to the QC.

7. Fuel Handling and Storage

- Fuel storage and spill containment must meet applicable regulations.
- Mitigation measures for spills (broken hydraulic hoses, dispensing fuel, etc.) must be in place prior to initiation of the work.
- All spills must be reported to the QC.

8. Compressed Air Equipment Maintenance

- Waste oil generated from compressor or airline maintenance shall be collected in a compatible container, stored on-site, with disposal handled by the Operating Authority (OA).
- Any filters or airline equipment to be disposed of in the regular landfill garbage shall be drained of all free oil before disposal.

9. HVAC Maintenance

- Air conditioning/chiller systems containing ozone-depleting refrigerants (such as R-22) shall only be maintained by personnel licensed to handle refrigerants.
- The contractor shall provide a letter to the QC, confirming that only licensed individuals will perform work on refrigerant equipment.
- Air conditioning/chiller systems containing ozone-depleting refrigerants shall be tagged and documented, as required.

10. Lawn Maintenance/Snow Removal

- Pesticides are not to be applied.
- All spills shall be reported to the QC immediately.
- Salt or other de-icing agents shall be applied sparingly, to reduce unnecessary environmental impact.

11. SCADA System Maintenance

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

12. Janitorial Services

- All chemicals stored, consumed or used on the project site during the construction project must be accompanied by up-to-date SDS sheets.
- All chemicals must be properly handled, used, stored, cleaned-up and disposed of according to applicable legislation and/or industry best practices.
- All spills must be reported to the Quality Coordinator (QC).

Type of Supply or Service:_____

In signing this form, you acknowledge that you have the authority on behalf of your company and are accepting corporate responsibility for ensuring that you and all employees from your company, including contractors, agents, and suppliers that may have reason to work on the water systems operated by the City of St. Thomas Environmental Services.

I have reviewed the City of St. Thomas DWQMS Policy, Municipal Drinking Water Licence(s), Drinking Water Works Permit, and the Safe Drinking Water Act of Ontario. I have received all relevant procedures to the work being conducted and agree to ensure that all work is conducted in compliance with all applicable legislation and in accordance with best practice. Where there is uncertainty with any requirement, or a situation presents itself that needs to be reported to the City, I understand I am to contact the QC.

Contractor

_____ _____
Signature Print Name

_____ _____
Company Name Date

_____ _____
Daytime Contact After Hours Contact

Quality Coordinator

_____ _____
Signature Print Name

_____
Date

NOTE: THIS SIGN_OFF FORM EXPIRES THREE (3) YEARS FROM DATE OF ISSUE

CC: Compliance Coordinator and Project Manager (if applicable)

Appendix K

~ Review and Provision of Infrastructure Procedure (DW-ADMIN-850) ~

~ Maintenance, Rehabilitation and Renewal Procedure (DW-ADMIN-900) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: REVIEW AND PROVISION OF INFRASTRUCTURE	**PROCEDURE NO.: DW-ADMIN-850**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 14**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes the actions and responsibilities that are in place to ensure infrastructure needs are reviewed on an annual basis and describes the manner in which the identified infrastructure needs are provided.

Procedure:

Each water systems' owner, is responsible for the provision of all municipal infrastructure required to deliver clean safe drinking water to their residents and businesses.

Minor Equipment Repair/Replacement

- With respect to existing infrastructure, operations staff are a large part of assessing field equipment for need of replacement or repair.
- The review of existing infrastructure is constantly being conducted through Operator inspections and maintenance activities.
- In the event an operator deems it necessary to have a minor piece of equipment replaced or repaired, he/ she shall initiate a work order through the CMMS.
- If the Manager of Water and Sewer is unable to approve the replacement due to operational budget constraints, he/she will bring the replacement need to the attention of the Manager of Development and Compliance.
- If replacement of the piece of equipment is an immediate need, the Manager of Development and Compliance will initiate discussions with the Owner or Owner Rep. immediately, in order to get the funding necessary to make the replacement.
- If replacement of the piece of equipment is of lower priority, the Manager of Development and Compliance will add the need to the listing of projects used to inform the 10-year capital plan during the next review period.

Capital Planning

- A 10-year capital plan has been prepared for each of the systems operated and maintained by the City of St. Thomas Environmental Services Department.
- The 10-year capital plan is established, maintained and updated on an annual basis, by each systems respective owner.
- City of St. Thomas Environmental Services Department staff will identify and confirm indicators of renewal needs through a review of main breaks, pressure changes, risk assessment outcomes, and water quality complaints.

- Any identified deficiencies/needs are brought to the attention of the QC and Manager of Development and Compliance.
- The Manager of Development and Compliance initiates discussion with the Owner representative to request renewal/capital funds
- In addition to the OA's identified deficiencies/needs, the Owner will also identify areas of concern within their respective system and add them to the listing.
- These projects are then prioritized and included in the 10-year Capital Plan, which informs annual Capital Budget requests, to be approved by the respective systems owner.
- The engineering, design, obtaining regulatory approvals and construction of approved projects are managed by the respective systems Owner.
- It is the Owner's responsibility to approve, through budget approval, and initiate capital projects
- The Owner provides a briefing to the OA on the status of capital projects during Management Review.

Associated Form(s):

- **Not applicable**

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	January 28, 2013	Required signature of new Manager of Operations and Compliance
7	June 29, 2015	Change of Top Management
8	January 4, 2016	Change in QMS Representative
9	July 7, 2016	Removed Foreman as position eliminated
10	January 30, 2018	Change in City logo
2.0	January 1, 2019	Separated review and provision and maintenance, renewal and rehab from a combined procedure. Updated format, significant changes to both procedures during transition to 2.0 to strengthen and more effectively meet the standards intent.
2.1	January 1, 2020	Annual Review – No Changes

Drinking Water Quality Management System

PROCEDURE TITLE: MAINTENANCE, REHABILITATION AND RENEWAL	**PROCEDURE NO.: DW-ADMIN-900**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 15**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes the actions and responsibilities that ensure control of all operations through maintenance activities. This includes planned preventive maintenance, unscheduled or upset maintenance, rehabilitation and renewal.

Procedure:

Maintenance Programs:

Scheduled Maintenance – All Systems

- The QC has the overall responsibility for managing maintenance activities
- Regularly scheduled maintenance activities and required frequencies, as recommended by the supplier, distributor, or industry contacts, are programmed into the Computerized Maintenance Management System.
- On a monthly basis, the MMS Coordinator prints out the work orders that are due to be completed for the upcoming month and places them in the folders in the PW office, for completion.
- On a regular basis, maintenance personnel retrieve the work orders to be completed, plan the maintenance activities and distribute the work accordingly
- When the scheduled activities are complete, the Work Orders are filled out by the Operator and submitted to the MMS Coordinator so that they may update the CMMS.

Below is a brief description of scheduled Maintenance Programs in place:

Life Cycle Maintenance Program – **All Systems**- The Supervisory Control and Data Acquisition (SCADA) system equipment and station pumps undergo maintenance based on manufacturers' specifications or as required by regulation.

Watermain Flushing Program – All Systems - The Watermain Flushing Program, undertaken city-wide on an annual basis, helps to maintain drinking water quality. Flushing is completed by forcing water through watermains at a high speed and discharging it through hydrants. This fast-moving water flow scours and cleans out mineral deposits and sediment that have built up over time and settled at the bottom of the pipes. Residents are notified during watermain flushing and may experience a temporary discolouration of water while the watermain is being flushed.

Hydrant Exercising Program – All Systems - Fire Fighters depend on properly working hydrants with adequate pressure and water flow. The Hydrant Exercising Program, run in connection with the Watermain Flushing

Program, provides an opportunity to check the volume of water as well as pressure that is available at each hydrant. This data is utilized to calibrate the computerized water system model. The hydrant's mechanical operation is also checked to ensure it will be in working order when needed.

Valve Exercising Program – All Systems- The purpose of the Valve Exercising Program is to exercise main line valves throughout the distribution system to assure reliable operation in emergency situations and maintain water quality. Each valve is operated through a full cycle and returned to its normal position. Valves are exercised on a regular cycle that is designed to prevent a buildup of rust in the pipes as a result of corrosion or other mineral deposits that could render the valve inoperable or prevent a tight shutoff.

Leak Detection Program – All Systems- Water lost after treatment and pressurization, but before delivery for the intended use, is water, money and energy wasted. The Leak Detection Program is an on-going program aimed at identifying and repairing any sources of leaks within the distribution system. Every 2nd year a contractor is procured to evaluate the entire drinking water system for leaks and provide a prioritized listing of identified leak locations and recommended repair method, which are used to inform the repair schedule.

Backflow Prevention Program – All Systems- Industrial and commercial customers considered severe or moderate risk facilities (as described in CAN/CSA-B64.10-01) connected to the municipal drinking water system introduce a risk of back-flowing or back-siphoning contaminants into the drinking water system. The Building Code requires that these types of facilities install testable backflow prevention devices. The City of St. Thomas Water Use By-law requires customers with testable backflow prevention devices have them tested on an annual basis by a qualified contractor and submit a satisfactory test report to the Environmental Coordinator, who oversees the Program.

Unscheduled Maintenance -

- The QC or designate has the overall responsibility for managing unscheduled maintenance as per operational requirements
- Unscheduled maintenance is recorded in the CMMS.
- Should unscheduled maintenance be required, the QC re-organizes the Operator's planned activities to include the unscheduled activities
- Priority of unscheduled activities is determined by the QC or designate
- For maintenance duties of a critical or urgent nature that are found in the field, the Operator contacts the QC directly for immediate assistance
- When an unscheduled activity is complete, the Work Order is completed by the Operator to whom the Work Order is assigned and submitted to the MMS
- If unscheduled maintenance is of a critical or urgent nature, the CMMS Work Order will be generated after the work is completed

Rehabilitation & Renewal:

Watermain Lining Program – An annual program for the cleaning and relining of existing watermains on streets throughout the City to maintain flow capacity and provide safe, cost effective water. Relining water main allows us to rehabilitate aging pipes while minimizing service interruption and nuisance to residents. Instead of digging up the road along the entire length of the water main, watermain lining can be completed with the use of excavated 'pits' to access the main at strategic locations.

Service Replacement Program – Homeowners who wish to have their substandard service line (lead or galvanized piping) replaced may participate in the on-going Service Replacement Program. This program requires the homeowner to replace the portion of the substandard service that is on their property (from the water meter in the basement, out to the property line). Once this has been completed, the City will replace the portion on public property at no cost to the homeowner.

Monitoring the Effectiveness of Infrastructure, Maintenance, Rehabilitation and Renewal Programs

- The Manager of Development and Compliance completes a minimum yearly periodical review of a summary of scheduled and unscheduled maintenance activities, open, closed and overdue work orders, which are provided by the QC.
- The Manager of Development and Compliance interviews the QC to determine if the frequency of maintenance or the maintenance program on infrastructure can be improved or adjusted.
- The Manager of Development and Compliance reports this information to the owner during Management Review and provides recommendations

Associated Form(s):

- **Not applicable**

Table of Revisions

Revision #	*Date*	*Description of Revision*
7	June 29, 2015	Change of Top Management
8	January 4, 2016	Change in QMS Representative
9	July 7, 2016	Removed Foreman as position eliminated
10	January 30, 2018	Change in City logo
2.0	January 1, 2019	Separated review and provision and maintenance, renewal and rehab from a combined procedure. Updated format, significant changes to both procedures during transition to 2.0 to strengthen and more effectively meet the standards intent.
2.1	January 1, 2020	Annual Review – No Changes

Appendix L

~ Sampling, Testing and Monitoring Procedure (DW-ADMIN-1000) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: SAMPLING, TESTING AND MONITORING	**PROCEDURE NO.: DW-ADMIN-1000**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 16**
REVISION # 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes the sampling, testing and monitoring programs for the water systems operated by the City of St. Thomas Environmental Services.

Procedure:

Upstream Testing and Monitoring

- Drinking Water delivered through infrastructure operated and maintained by the City of St. Thomas Environmental Services is sourced from Lake Erie, treated at the Elgin Area Primary Water Supply System (EAPWSS) Water Treatment Plant, and transmitted to St. Thomas through EAPWSS transmission mains to the Elgin Middlesex Pumping Station (EMPS).
- The infrastructure noted above is currently operated by the Ontario Clean Water Agency (OCWA). As such, the City of St. Thomas relies on OCWA's monitoring and control of primary and secondary disinfection.
- Primary Disinfection occurs at the EAPWSS WTP. Summary results of primary disinfection monitoring is shared with the City of St. Thomas through the annual reporting process.
- Free Chlorine is monitored at the East Chamber through a chlorine analyzer operated by the OCWA. City of St. Thomas staff can view this data in real time on SCADA.

Continuous Monitoring

- The water systems operated and maintained by the City of St. Thomas Environmental Services are monitored 24 hours a day, 7 days a week by a computerized Supervisory Control And Data Acquisition (SCADA) system displayed at the PW building
- SCADA is equipped to monitor flow, chlorine residual, pressure and pH at various locations and has been programmed to respond automatically to certain instances (ie. System pressure decrease → increase pump output) and annunciate an alarm for Operator response to other instances (ie. Low chlorine residual).

Alarm Response

- When the SCADA system detects a reading outside of pre-set alarm setpoints, an alarm will sound at the SCADA system and annunciate the alarm through a call to the on-call cell.
- If alarm is not acknowledged, SCADA moves through the pre-programmed sequence below
    - On-call operator call
    - On-call operator text
    - If the above go unresolved for 1 hour - Manager cell call
    - Manager cell text
- If the system proceeds through the entire sequence and the alarm remains unacknowledged, the sequence begins again.

- The Operator can verify the alarm by performing a manual lab test
- The manual lab tests have priority over the SCADA analyzers

Trend Reviews

- Each day, Monday to Friday, the QC retrieves the reports, reviews, digitally signs the previous days trends.
- A trend report is generated each day for the following monitoring locations and data:

Monitoring Station	Trends Reported	Purpose
East Chamber	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume into Secondary from Primary
West Chamber	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume into STDWS from Secondary
Albert Roberts Booster Stn.	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume into STDWS from Primary
Southdale Panel	Free Chlorine Residual, Pressure	Monitor WQ within STDWS
Southwold Panel	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume into Southwold from STDWS
Wellington Road Panel	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume within CE
Ford Meter Pit	Free Chlorine Residual, Flow, Pressure	Monitor WQ and volume into Southwold from Secondary

- In the event that the report indicates a value that is not within regulatory or operational limits, the QC will investigate the event by reviewing the logbook to ensure the event was adequately addressed
- The QC makes comments on the reports, providing a reasoning for any irregular reading, signs and dates the report digitally.
- The trend reports are filed electronically within the SCADA computer system.

Station Checks

- An Operator shall complete a visit to each of the various monitoring stations at a minimum, once per week.
- All visits to a station shall be documented within the station logbook.
- The conditions displayed on the analyzers within the station shall be recorded at the time of the first visit to the station on any given day.

Operational Checks:

- Operational Checks are conducted in accordance with Ontario Regulation 170/03.
- Distribution Free Chlorine checks are combined with microbiological testing requirements and are recorded on the chain of custody for the samples taken.
- In order to comply with 170/03 checks, the samples must be collected on two days of the week, at least 48 hours apart.
- Samples are normally collected on Mondays and Wednesdays or before Friday should a holiday occur on the Monday.

Water Quality Testing

- Samples are collected and shipped in accordance with sampling instructions supplied by the receiving laboratory.
- All regulatory required analysis shall be conducted by an independent, MECP licenced, CALA/SCC accredited laboratory.
- All sampling requirements are tracked through the use of the CMMS.
- Operators are prompted to collect the samples through a work order generated by the CMMS.
- The QC is responsible for ensuring all chemical sampling requirements are accurately programmed into the CMMS.

- If samples are required to be tested outside of the lab's regular hours, then arrangements must be made in advance by calling the 24 hour after hour number provided by the lab, listed in the Essential Supplies and Services Procedure (DW-ADMIN-800).
- During the holiday season, staff may deliver emergency samples to the accredited laboratory, providing that the lab is notified using the 24 hour after hour number.

- **Sample Submission - Chain of Custodies (C of C):**
  - Operators collect microbiological or chemical samples in the appropriate bottles and send the samples to the accredited laboratory, as listed in the Essential Supplies and Services Procedure (DW-ADMIN-800).
  - The Operator collecting the sample is responsible for accurately completing the C of C form required by the laboratory for sample submission.
  - All information required as per the legislation must be included on the C of C forms, any samples not submitted must be crossed off the C of C with a single line.
  - A copy of each C of C shall be made prior to delivery to the lab, the copy of the C of C is provided to the WT.

- **Microbiological Testing:**
  - On a weekly basis, the following number of bacteriological samples, at a minimum, are to be taken from the respective water systems.
  - Free chlorine residual checks shall be taken at the same time and from the same location as each microbiological sample collected and recorded on the C of C.

Water System	Serviced Population	Minimum # of Distribution Samples
St. Thomas Secondary	<8000	2 (8 monthly)
St. Thomas Distribution	38,909*	12 (46 monthly)
Southwold – Lynhurst	N/A	1 sample monthly
Central Elgin – S.T. Suburban Area	N/A	1 sample weekly

* based on Statistics Canada most recent census data for St. Thomas (Census Subdivision)

  - All submitted samples are tested for E. coli, total coliform and heterotrophic plate count (HPC) bacteria.

- **Chemical Testing**
  - Chemical Testing is conducted as required in Schedule 13 of Ontario Regulation 170/03.
  - **Trihalomethane (THM) and HAA (Haloacetic Acid) Sampling and Reporting:**
    - THM samples are to be taken from the furthest point(s) in the respective distribution system, as this is the condition most challenging to the systems.
    - Samples are to be collected from the following locations for each respective system:

Water System	THM Sample Location	HAA Sample Location
St. Thomas Secondary	Ford Meter Pit	East Chamber
St. Thomas Distribution	Parkside Collegiate	Albert Roberts
Southwold – Lynhurst	No sampling requirement	No sampling requirement
Central Elgin – S.T. Suburban Area	No sampling requirement	No sampling requirement

    - The standard for THM's and HAA's are expressed as a Running Annual Average (RAA), where RAA is defined as the quarterly average of THM results for a drinking water system.
    - The City of St. Thomas Environmental Services is responsible for calculating the RAA and reporting an adverse test result within 7 days of the completion of the calendar quarter that produced the adverse test result.
    - Upon receipt of the THM and HAA laboratory reports, the WT calculates the RAA, per the calculations outlined in O. Reg. 170/03 and makes adverse notification, as necessary, based on the RAA.

- **Community Lead Testing:**
  - Community Lead Testing requirements for the systems operated by the City of St. Thomas Environmental Services are listed below:

Water System	Schedule 15.1 requirement
St. Thomas Secondary	Exempt from Schedule 15.1
St. Thomas Distribution	**Exempt from Plumbing Sampling**
Southwold – Lynhurst	No sampling requirement
Central Elgin – S.T. Suburban Area	No sampling requirement

  - Despite the exemptions to the plumbing sampling requirements for St. Thomas Distribution, the Schedule still requires that pH and alkalinity sampling takes place in each of the sampling periods, annually; and,
  - Every third year, lead sampling from distribution must take place in each of the sampling periods, this is tracked through the CMMS.
  - **NOTE: pH testing must be conducted on-site at the time of alkalinity sampling and recorded on the chain of custody**.

- **Laboratory Results**
  - The QC, WT, CC, and owner receive a copy of all lab reports issued, directly from the lab.
  - The WT is responsible for reviewing the results, filing the records as per the Records Control Procedure (DW-ADMIN-200), calculating the RAA's, where necessary, comparing the results to the MAC's listed in O. Reg. 169/03 and making any adverse water quality reports as per the Reporting of an Adverse Sample Result Procedure (DCP-A2)
  - With the exception of THM's and HAA's, if the laboratory analyzes a sample and determines that the result for a certain parameter exceeds the MAC, as outlined in O.Reg. 169/03, the lab will provide immediate oral notification to the City of St. Thomas Environmental Services.
  - Upon receiving notification of an adverse result, City of St. Thomas Environmental Services staff shall refer to and follow Reporting of an Adverse Sample Result Procedure (DCP-A2) to complete the adverse report and apply any necessary corrective actions.

Associated Form(s):

- **Not Applicable**

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	January 28, 2013	Required signature of new Manager of Operations and Compliance
7	June 14, 2013	Samples are no longer delivered by courier, but by operational city staff, replaced analyze with performed
8	June 29, 2015	Change in Top Management
9	January 4, 2016	Change in QMS Representative
10	July 7, 2016	Removed reference to filing of hard copies and removed Foreman as position eliminated
11	January 30, 2018	Removed reference to Watertrax as program no longer used and changed City logo
2.0	January 1, 2019	Updated format, amalgamated 4 procedures we were carrying. Significant changes throughout to improve clarity and function of the procedure.
2.1	April 12, 2019	Inserted information on upstream testing and monitoring.
2.2	January 1, 2020	Annual Review – inserted statement on source of serviced population. Removed statement that background is analyzed for all microbiological samples.

Appendix M

~ Equipment Calibration Procedure (DW-ADMIN-1100) ~

~ Equipment Listing (DWF-ADMIN-1100) ~

ST. THOMAS
THE RAILWAY CITY

1850
Township of Southwold

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

PROCEDURE TITLE: EQUIPMENT CALIBRATION	**PROCEDURE NO.: DW-ADMIN-1100**
EFFECTIVE DATE: NOVEMBER 20, 2019	**DWQMS REFERENCE: 17**
REVISION: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes when, how and by what method monitoring equipment is verified/calibrated for the drinking water systems operated by The City of St. Thomas Environmental Services Dept.

Procedure:

Equipment Requiring Calibration

- All equipment requiring calibration on all systems operated by the City of St. Thomas Environmental Services are listed in the Equipment Listing. (DWF-ADMIN-1100).
- The Equipment Listing (DWF-ADMIN-1100) lists the equipment make, model, serial number, frequency of calibration and an indication of which operating authority is responsible for the equipment's calibration.
- The CMMS is utilized to track calibration requirements.

Verifications

- Online Chlorine residual analyzers are verified by Operating Authority staff on a regular basis, by comparing a grab sample analyzed with a pocket colorimeter with the on-line analyzers reading.
- If the analyzer is found to have drifted out of calibration, the operator adjusts the analyzer to meet the results displayed on the pocket colorimeter and records the "as found" and "as left" conditions in the station log book.

Calibration

- Calibration Service providers (listed in the Essential Supplies and Services Procedure (DW-ADMIN-800)). Are utilized to complete all formal equipment calibrations.
- The QC is responsible for ensuring the contractor calibrates all equipment at the required frequency, and within the calibration period
- Equipment User Manuals, maintained by the QC, or legislated requirements are used to determine the required calibration frequency.
- Calibrations are performed as described in the equipment's User Manual. If calibration instructions are not present, the contractor shall research and document the most appropriate calibration method for the piece of equipment.
- Calibrations must be documented on a calibration report. The QC is responsible for ensuring the calibration reports provided by the contractor contain all necessary information.

- Contractors provide the calibration reports to the QC for review.
- The QC is responsible for ensuring any deficiencies identified are suitably addressed.

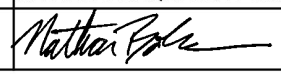
Associated Form(s):

- Equipment Listing (DWF-ADMIN-1100)

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	June 29, 2015	Change in Top Management
7	January 4, 2016	Change in QMS Representative
8	July 7, 2016	Combined schedule and calibration work to be generated by the Foreman and changed calibration sheet to calibration record and removed Foreman as position has been eliminated
9	January 30, 2018	Change in City logo
2.0	January 1, 2019	Format change. Amalgamated procedure from 4 OP's we were carrying. Introduced Equipment Listing (DWF-ADMIN-1100)
2.1	April 12, 2019	Updated DWF-ADMIN-1100 pocket colorimeter listing. Revised chlorine analyzer (in-line) calibration schedule to minimum of annual.
2.2	November 22, 2019	Updated DWF-ADMIN-1100 with new Hanna Hi-Range Calorimeters.

Drinking Water Quality Management System

PROCEDURE TITLE: EQUIPMENT LISTING	**PROCEDURE NO.: DWF-ADMIN-1100**
EFFECTIVE DATE: NOVEMBER 20, 2019	**DWQMS REFERENCE: 17**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

Analyzer Type	Location	Model #	Serial #	Range	Responsibility	Frequency
Chlorine	Albert Roberts	PROMINENT DICAW1C11001G00E	2009074425	0 - 2.0 mg/L	St. ES	Min. Annual
Chlorine	East Chamber	PROMINENT DICAW1C11001G00E	Not Available	N/A	OCWA	N/A
Chlorine	Ford Chamber	PROMINENT DICAW1C11001G00E	2010105264	0 - 2.0 mg/L	St. ES	Min. Annual
Chlorine	Southdale Chamber	PROMINENT DICAW1C11001G00E	2008001271	0 - 2.0 mg/L	St. ES	Min. Annual
Chlorine	Southwold Chamber	PROMINENT DICAW1C11001G00E	2008011256	0 - 2.0 mg/L	St. ES	Min. Annual
Chlorine	Wellington Rd PRV	PROMINENT DICAW1C11001G00E	2008001254	0 - 2.0 mg/L	St. ES	Min. Annual
Chlorine	West Chamber	PROMINENT DICAW1C11001G00E	2007124339	0 - 2.0 mg/L	St. ES	Min. Annual
Flow	Albert Roberts	Fischer Porter Mag XM 300mm	9209B2068/1/131	N/A	OCWA	N/A
Flow	East Chamber	PROMAG 50 W DN300	D601C616000	N/A	St. ES	Annual
Flow	Fingal Line	PROMAG 50 W DN150	EB069E16000	N/A	St. ES	Annual
Flow	Ford Chamber	aBB MagMaster	N/A	N/A	St. ES	Annual
Flow	Southwold Chamber	PROMAG 50 W DN150	DB09AF16000	N/A	St. ES	Annual
Flow	Wellington Rd	Sensus 4" W-1000	14149392	N/A	St. ES	Annual
Flow	West Chamber	PROMAG 53 W DN300	8702E516000	N/A	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	12110E211470	0 - 2.0 mg/L	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	13110E234658	0 - 2.0 mg/L	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	13110E234666	0 - 2.0 mg/L	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	15060E273625	0 - 2.0 mg/L	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	17080E337692	0 - 2.0 mg/L	St. ES	Annual
Pocket Cl2	Pocket Colorimeter II	HACH 593300	17080E337987	0 - 2.0 mg/L	St. ES	Annual
Hi Range Cl2	Portable Kit	HI96771	4420005101	0-500 mg/L	St. ES	Annual
Hi Range Cl2	Portable Kit	HI96771	4420001101	0-500 mg/L	St. ES	Annual
Pressure	Albert Roberts - Inlet	Rosemount C1151GP6E12B1C6	000149120	0 - 100 psi	St. ES	Annual
Pressure	Albert Roberts - Outlet	SMAR LD291	2094	0 - 100 psi	St. ES	Annual
Pressure	East Chamber - Outlet	SMAR LD291	H151897	0-100	St. ES	Annual
Pressure	Ford Chamber - Outlet	Honeywell ST900	N/A	0-516 kPa	St. ES	Annual
Pressure	Ford Tower	Honeywell ST94L	9442	N/A	St. ES	Annual
Pressure	Southdale Chamber	Rosemount 2088G2S22A1M5B4C6Q4	03971740	0-1000 kPa	St. ES	Annual
Pressure	Southwold Chamber	Rosemount 2088G2S22A1M5B4C6Q4D	0375741	0-1000 kPa	St. ES	Annual
Pressure	Wellington Rd PRV	Rosemount 2088G2S22A1M5B4C6Q4D	0375742	0-1000 kPa	St. ES	Annual
Pressure	West Chamber - Outlet	GREYSTONE RGS	4344168	0-150 psi	St. ES	Annual

Appendix N

~ Emergency Management – See Emergency Plan Binder ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Appendix O

~ Internal Auditing Procedure (DW-ADMIN-1200) ~

~ Internal Audit Plan Template (DWF-ADMIN-1200) ~

~ Internal Audit Opening/Closing Meeting Form (DWF-ADMIN-1201) ~

~ Internal Audit Checklist (DWF-ADMIN-1202) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: INTERNAL AUDITS	PROCEDURE NO.: DW-ADMIN-1200
EFFECTIVE DATE: JANUARY 1, 2020	DWQMS REFERENCE: 19
REVISION #: 2.1	REVIEW FREQUENCY: ANNUALLY
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X	SOUTHWOLD DISTRIBUTION	X	CENTRAL ELGIN DISTRIBUTION	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure defines the mechanism for the planning and implementation of internal Drinking Water Quality Management System (DWQMS) audits

Procedure:

Auditor Qualifications:
- Internal audits shall be conducted by persons approved by the QMS Representative and having the qualifications outlined in the Training Needs Matrix (DWF-ADMIN-502).

Frequency and Scope:
- Internal audits, covering all elements of the DWQMS, shall be conducted at least once per calendar year.
- At the discretion of the QMS Representative, Internal audits may be broken down into a series of audits, covering a number of elements on each date.
- Elements or processes that required a corrective action to correct a non-conformance in one year's internal and/or external audits shall be scheduled to be audited twice in the following year.
- The internal auditing schedule is prepared early each year and is maintained by the CC.
- Revisions to the audit schedule may be made based on the results of prior audits.

Audit Preparation:
- Internal auditors shall review the DWQMS and previous internal and third-party audit reports in preparation for the audit.
- At least 2 weeks prior to the scheduled audit date, the Internal Auditor shall distribute an audit plan to the QMS Representative, CC and QC, as applicable.
- An *Audit Plan Template* (DWF-ADMIN-1200) is maintained as part of the QMS.

Conducting the Audit:
- The internal auditors shall conduct an opening meeting of the internal audit.
- The opening meeting allows for the introduction of the audit team and establishment the importance of the audit process.
- The opening meeting is open to all staff and management, however, only the QMS Representative, QC and the auditor(s) are required to be present.
- Attendees of the opening and closing meetings shall sign the *Internal Audit Opening/Closing*

Meeting Form (DWF-ADMIN-1201)

- The *Internal Audit Opening/Closing Meeting Form* (DWF-ADMIN-1201) is retained by the Lead Auditor
- The criteria for the audit shall be the Drinking Water Quality Management Standard, as amended from time to time.
- The *Internal Audit Checklist* (DWF-ADMIN-1202) shall be used by the internal auditor as a guideline and for record keeping purposes for conducting the interviews and document review during the audit.
- Auditors shall record audit information, including
    - Areas visited
    - Items checked
    - Individuals interviewed
    - Documents or records reviewed
    - Concerns identified
- Auditors shall promptly notify the QC, CC or QMS Representative of any possible regulatory non-compliance identified.
- Upon completion of an internal audit, the auditors shall review their findings together, and the Lead Auditor shall decide on non-conformances and opportunities for improvement
- A closing meeting may be held, where the Lead Auditor presents their findings.

Audit Reporting/Follow-up:

- Completed *Internal Audit Checklists* (DWF-ADMIN-1202) are retained by the auditor(s).
- The Lead Auditor shall prepare a report of the findings, or forward a completed copy of the *Internal Audit Checklist* (DWF-ADMIN-1202) with all areas completed.
- The Lead Auditor shall submit the final report to the QMS Representative and the QC within 30 days of the audit.
- The QC and/or QMS Representative shall handle the identified non-conformances or opportunities for improvement by following the Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400).

Reporting Audit Findings:

- The QMS Representative shall present the audit findings and any remedial actions taken to the owner of the respective drinking water system during the annual management review meeting.

Associated Form(s):

- Audit Plan Template (DWF-ADMIN-1200)
- Internal Audit Opening/Closing Meeting Form (DWF-ADMIN-1201)
- Internal Audit Checklist (DWF-ADMIN-1202)

Table of Revisions

Revision #	*Date*	*Description of Revision*
7	June 12, 2014	Removed providing report to Council
8	June 29, 2015	Change in Top Management
9	January 4, 2016	Change in QMS Representative
10	January 30, 2018	Change in City Logo
11	April 18, 2018	Change in Auditors training requirements
2.0	January 1, 2019	Several changes in procedure and its format during transition to DWQMS 2.0. Audit checklist updated to reflect DWQMS 2.0 and brought under control of the system. Introduced Audit Plan and Opening/Closing Meeting forms. Introduced concept of doubling up audits on NC's in previous audits.
2.1	January 1, 2020	Updated reference to Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400).

Drinking Water Quality Management System

PROCEDURE TITLE: INTERNAL AUDIT PLAN	PROCEDURE NO.: DWF-ADMIN-1200
EFFECTIVE DATE: JANUARY 1, 2020	DWQMS REFERENCE: 19
REVISION #: 2.1	REVIEW FREQUENCY: ANNUALLY
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X	SOUTHWOLD DISTRIBUTION	X	CENTRAL ELGIN DISTRIBUTION	X

Objective: To verify the City of St. Thomas Environmental Services conformance with the Drinking Water Quality Management Standard.

Criteria: Drinking Water Quality Management Standard 2.0 – Final version as posted on Ontario's Environmental Registry

Scope: All municipal drinking water systems operated and maintained by the City of St. Thomas Environmental Services Department.

Audit Type: Internal

Auditor(s): First Last Name (Lead); First Last Name

Audit Date(s): Any days, Month, DD, 201X

	Day 1 AM	Day 1 PM	Day 2 AM	Day 2 PM
Opening Meeting				
Document Review: Policy & Manual; procedures and Records				
Interviews				
Review				
Closing Meeting				

Documentation:

- Quality Policy
- Quality Management System Manual and Procedures
- Emergency Response Plan
- Hazard Analysis
- Supporting Records (Training, External Communications, Calibrations, Maintenance, others as required)
- Reports from previous QMS audits
- Management Review Minutes
- Corrective Action Forms

Note: The audit will be conducted through a review of a sampling of documents, limited interviews and observations by the auditor to demonstrate conformance with the Drinking Water Quality Management Standard (DWQMS). The review and audit should not be construed as a complete and comprehensive review of all elements and all documentation.

Drinking Water Quality Management System

PROCEDURE TITLE: INTERNAL AUDIT OPENING/CLOSING MEETING FORM	PROCEDURE NO.: DWF-ADMIN-1200
EFFECTIVE DATE: JANUARY 1, 2020	DWQMS REFERENCE: 19
REVISION #: 2.1	REVIEW FREQUENCY: ANNUALLY
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X	SOUTHWOLD DISTRIBUTION	X	CENTRAL ELGIN DISTRIBUTION	X

OPENING MEETING:

Date:_____

Time:_____

ATTENDEE(s)

Name	Title/Department

CLOSING MEETING:

Date:_____

Time:_____

ATTENDEE(s)

Name	Title/Department

Drinking Water Quality Management System

PROCEDURE TITLE: INTERNAL AUDIT CHECKLIST	PROCEDURE NO.: DWF-ADMIN-1202
EFFECTIVE DATE: JANUARY 1, 2020	DWQMS REFERENCE: 19
REVISION #: 2.0	REVIEW FREQUENCY: ANNUALLY
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X	SOUTHWOLD DISTRIBUTION	X	CENTRAL ELGIN DISTRIBUTION	X

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

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

Authority is aware of all applicable legislative and regulatory requirements, c) communicating the Quality Management System according to the procedure for communications, and d) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.		c) d)
4. Quality Management System Representative **PLAN -** The Operational Plan shall identify a Quality Management System representative.		
DO - Top Management shall appoint, and authorize a Quality Management System representative who, irrespective of other responsibilities, shall: a) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained, b) report to Top Management on the performance of the Quality Management System and any need for improvement, c) ensure that current versions of documents required by the Quality Management System are being used at all times, d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and e) promote awareness of the Quality Management System throughout the Operating Authority.		 a) b) c) d) e)
5. Document and Records Control **PLAN -** The Operational Plan shall document a procedure for document and records control that describes how: a) documents required by the Quality Management System are: i. kept current, legible and readily identifiable ii. retrievable iii. stored, protected, retained and		 a)i. a)ii. a)iii.

disposed of, and b) records required by the Quality Management System are: i. kept legible, and readily identifiable ii. retrievable iii. stored, protected, retained and disposed of.		b)i. b)ii. b)iii.
DO - The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes: a) the Operational Plan and its associated policies and procedures, b) documents and records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and c) the results of internal and external audits and management reviews.		 a) b) c)
6. Drinking-Water System PLAN – The Operational Plan shall document, as applicable: a) for the Subject System: i. the name of the Owner and Operating Authority, ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection: A. a description of the system including all 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		a) i. a) ii. A. B. C. I. C. II. C. III.

B. a description of any procedures that are in place to maintain disinfection residuals. b) if the Subject System is an Operational Subsystem, a summary description of the Municipal Residential Drinking Water System it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems. c) if the Subject System is connected to one or more other Drinking Water Systems owned by different Owners, a summary description of those systems which: i. indicates whether the Subject System obtains water from or supplies water to those systems, ii. names the Owner and Operating Authority(ies) of those systems, and 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.		a) iii. A. a) iii. B. b) c) i. c) ii. c) iii.
DO - The Operating Authority shall ensure that the description of the drinking-water system is kept current.		
7. Risk Assessment **PLAN –** The Operational Plan shall document a risk assessment process that: a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at www.ontario.ca/drinkingwater. b) identifies additional potential hazardous events and associated hazards, c) assesses the risks associated with the occurrence of hazardous events, d) ranks the hazardous events according to the associated risk, e) identifies control measures to address the potential hazards and		a) b) c) d) e) f)

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.		g) h) i)
DO - The Operating Authority shall perform a risk assessment consistent with the documented process.		
8. Risk Assessment Outcomes **PLAN -** The Operational Plan shall document: a) the identified potential hazardous events and associated hazards, b) the assessed risks associated with the occurrence of hazardous events, c) the ranked hazardous events, d) the identified control measures to address the potential hazards and hazardous events, e) the identified critical control points and their respective critical control limits, f) procedures and/or processes to monitor the critical control limits, g) procedures to respond to deviations from the critical control limits, and h) procedures for reporting and recording deviations from the critical control limits.		a) b) c) d) e) f) g) h)
DO - The Operating Authority shall implement and conform to the procedures.		
9. Organizational Structure, Roles, Responsibilities and Authorities **PLAN** - The Operational Plan shall: a) describe the organizational structure of the Operating Authority including respective roles,		a)

responsibilities and authorities, b) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple subject systems, c) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review, d) identify the person, persons or group of people, having Top Management responsibilities required by this Standard, along with their responsibilities, and e) Identify the Owner of the subject system.		b) c) d) e)
DO - The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.		
10. Competencies **PLAN -** The Operational Plan shall document: a) competencies required for personnel performing duties directly affecting drinking water quality, b) activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality, and c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.		a) b) c)
DO - The Operating Authority shall undertake activities to: a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.		a) b)

11. Personnel Coverage **PLAN** - The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.		
DO - The Operating Authority shall implement and conform to the procedure.		
12. Communications **PLAN -** The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and: a) the Owner, b) Operating Authority personnel, c) Suppliers that have been identified as essential under Plan (a) of Element 13 of this Standard, and, d) the public.		 a) b) c) d)
DO - The Operating Authority shall implement and conform to the procedure.		
13. Essential Supplies and Services **PLAN -** The Operational Plan shall: a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and b) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.		 a) b)
DO - The Operating Authority shall implement the procedure.		
14. Review and Provision of Infrastructure **PLAN –** The Operational Plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the Subject System that: a) Considers the outcomes of the risk assessment documented under		a)

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.		b)
DO - The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.		
15. Infrastructure Maintenance, Rehabilitation and Renewal **PLAN –** The Operational Plan shall document: a) a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the Subject System, and b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities.		a) b)
DO – The Operating Authority shall: a) keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current, b) ensure that the long term forecast is reviewed at least once every Calendar Year, c) communicate the programs to the Owner, and d) monitor the effectiveness of the maintenance program.		 a) b) c) d)
16. Sampling, Testing and Monitoring **PLAN -** The Operational Plan shall document: a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system, b) a description of relevant sampling, testing or monitoring activities that take place upstream of the subject system, and c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.		a) b) c)

DO - The Operating Authority shall implement and conform to the procedures.		
17. Measurement and Recording Equipment Calibration and Maintenance **PLAN** - The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.		
DO - The Operating Authority shall implement and conform to the procedure.		
18. Emergency Management **PLAN** - The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes: a) a list of potential emergency situations or service interruptions, b) processes for emergency response and recovery, c) emergency response training and testing requirements, d) Owner and Operating Authority responsibilities during emergency situations, e) references to municipal emergency planning measures as appropriate, and f) an emergency communication protocol and an up-to-date list of emergency contacts.		a) b) c) d) e) f)
DO - The Operating Authority shall implement and conform to the procedure.		
19. Internal Audits **PLAN** - The Operational Plan shall document a procedure for internal audits that: a) evaluates conformity of the QMS with the requirements of this Standard, b) identifies internal audit criteria, frequency, scope, methodology and record- keeping requirements, c) considers previous internal and external audit results, and d) describes how Quality Management System corrective actions are identified and initiated.		a) b) c) d)

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

management review and identify deficiencies and actions items to address the deficiencies, c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.		b) c) d)
21. Continual Improvement PLAN – The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by: a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment and Climate Change and available on www.ontario.ca/drinkingwater, at least once every thirty-six months; b) documenting a process for identification and management of Quality Management System Corrective Actions that includes: i. investigating the cause(s) of an identified non-conformity, ii. documenting the action(s) that will be taken to correct the non-conformity and prevent the non-conformity from re-occurring, and iii. reviewing the action(s) taken to correct the non-conformity, verifying that they are implemented and are effective in correcting and preventing the re-occurrence of the non-conformity. c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes: i. reviewing potential non-conformities that are identified to determine if preventive actions may		a) b) i. b) ii. b) iii. c) i.

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.		c) ii. c) iii.
DO- The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System through the use of corrective actions.		

Appendix P

~ Management Review Procedure (DW-ADMIN-1300) ~

ST. THOMAS
THE RAILWAY CITY

TOWNSHIP OF
Southwold

MUNICIPALITY OF CENTRAL ELGIN

Drinking Water Quality Management System

PROCEDURE TITLE: MANAGEMENT REVIEW	**PROCEDURE NO.: DW-ADMIN-1300**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 11**
REVISION #: 2.1	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure describes the process of conducting a Drinking Water Quality Management System (DWQMS) management review.

Procedure:

The DWQMS is reviewed by Top Management, to stay informed and to ensure that:

- The system is suitable to the operations,
- Adequately managing quality issues,
- Performing this management effectively, and that
- Adequate resources are provided

If Top Management determines the DWQMS is not meeting any of these four criteria, corrective or preventive actions are identified to make the changes that are recommended and resources necessary for their implementation are allocated.

Participants
The attendees of management review meeting for each of the systems operated by the City of St. Thomas Environmental Services are as follows:

St. Thomas Secondary	St. Thomas Distribution	Southwold Distribution	Central Elgin Distribution
St. Thomas Director of Environmental Services – Owner Rep.	St. Thomas Director of Environmental Services – Owner Rep.	Southwold CAO – Owner Rep.	Central Elgin Director of Infrastructure and Community Services – Owner Rep.
St. Thomas Manager of Development and Compliance – QMS Rep.	St. Thomas Manager of Development and Compliance – QMS Rep.	St. Thomas Manager of Development and Compliance – QMS Rep.	St. Thomas Manager of Development and Compliance – QMS Rep.

Other participants may be added at the discretion of the QMS Representative.
The meeting is chaired by the QMS Representative.

Frequency Of Management Reviews

- Management Review shall be conducted at least once per calendar year.
- Management Review can be conducted on a more frequent basis, at the discretion of the QMS Rep., however, all topics of discussion must be covered at least once per calendar year.

Discussion Topics

- The QMS representative is the chair of the management review meeting and is responsible for scheduling and arranging for a meeting location, as well as collecting, summarizing and providing the date for discussion and preparing meeting minutes.
- Prior to the management review meeting, the QMS Rep shall provide a meeting agenda and summary of the pertinent information to the respective participants.
- Discussion items that are permanently on the agenda shall include:
    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 Quality Management System
    l) Consumer feedback
    m) The resources needed to maintain the Quality Management System
    n) The results of the infrastructure review
    o) Operational Plan currency, content and updates
    p) Staff suggestions
- Other relevant and valuable discussion items may be added to the listing, at the discretion of the QMS Representative.
- If further information is required on specific discussion topics, a follow-up meeting shall be held as soon as practicable to provide the information.

Deficiencies, Decisions and Action Items

- Deficiencies, decisions and action items stemming from management review shall be documented in the meeting minutes. The personnel responsible for action items and the proposed timelines for their completion shall be recorded within the management review minutes.
- The QMS Rep is responsible for taking and distributing meeting minutes.
- Deficiencies, identified through management review shall be addressed through the assignment of corrective or preventative action items.
- Action items, identified during management review shall be regarded as corrective or preventative actions, as appropriate, and shall be tracked as per the Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400).

Record Keeping and Communication of Results to Owner

- Management Review meeting minutes are filed and maintained as per the Records Control Procedure (DW-ADMIN-200).
- Distribution of Minutes of Management Review meetings for each of the systems are as follows:
    - **St. Thomas Secondary:** QMS Rep. forwards to CC and Owner Rep. who forwards to Board of Management.
    - **St. Thomas Distribution:** QMS Rep. forwards to CC and Owner Rep. who forward to St. Thomas Mayor and Council.
    - **Southwold Distribution:** QMS Rep. forwards to CC and Owner Rep. who forwards to Southwold Mayor and Council.
    - **Central Elgin:** QMS Rep. forwards to CC and Owner Rep. who forwards to Central Elgin Mayor and Council.

Associated Form(s):

- **Not Applicable**

Table of Revisions

Revision #	*Date*	*Description of Revision*
6	January 7, 2015	Replace management review meeting requirements with direct wording from the DWQMS
7	June 29, 2015	Change in Top Management
8	January 4, 2016	Change in QMS Representative
9	June 29, 2016	Removed additional item reviewed that were previously mentioned in the required items to be reviewed
10	June 29, 2017	Removed terminology Senior Management and using Top Management to be consistent with terminology in Standard
11	January 30, 2018	Change in City logo
2.0	January 1, 2019	Procedure format change. Significant changes to entire procedure for clarity, following review for DWQMS 2.0 implementation.
2.1	January 1, 2020	Annual Review – updated Southwold Owner Representative is now CAO, rather than Public Works Superintendent and CE owner rep now Director of Infrastructure and Community Services – Owner Rep, rather than Director of Physical Services. Updated reference to Continual Improvement and Corrective Action Procedure.

Appendix Q

~ Continual Improvement and Corrective Action Procedure (DW-ADMIN-1400) ~

~ Corrective and Preventative Action Form (DWF-ADMIN-1400) ~

~ Root Cause Codes (DWF-ADMIN-1401) ~

Drinking Water Quality Management System

PROCEDURE TITLE: CONTINUAL IMPROVEMENT AND CORRECTIVE ACTION	**PROCEDURE NO.: DW-ADMIN-1400**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 21**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Scope:
This procedure applies to the City of St. Thomas Environmental Services Department. More specifically, the procedure is to be followed by management and staff having the ability to directly affect drinking water quality through the course of their work related to the drinking water system(s) demarked in the header section above.

Purpose:
This procedure defines the responsibilities and process for identifying and investigating non-conformances, for taking action to mitigate any negative impacts caused, and for applying corrective and preventative actions. This procedure also deals with preventative actions initiated independently – not originating from a non-conformance or corrective action.

Procedure:

Continual Improvement

- As stated in the DWQMS policy, The City of St. Thomas Environmental Services, in its role as an Operating Authority is committed to the continual improvement of the DWQMS.
- Opportunities for continual improvement of the DWQMS can be identified through numerous avenues.
- This procedure can be followed in order to implement continual improvement initiatives stemming from any source, however, the procedure must be applied to findings/action items stemming from following:
    - Staff Observations/Recommendations – reported using a Corrective Action Form (DWF-ADMIN-1400) or Hazard Identification Form (DWF-ADMIN-300)
    - Internal and/or External Audits
    - Ministry of Environment, Conservation and Parks (MECP) Inspections
    - Management Review Meetings
    - Review of Emergency Responses and other incidents of concern
    - Review of applicable industry Best Management Practices
- Action items may not be assigned as a result of the identification of improvement opportunities, however, their consideration and reasons for not moving forward with implementation should be documented in the Corrective Action Tracking Spreadsheet.

Best Management Practices
Awareness of industry best practices may occur through various avenues, including but not limited to:

- attending the annual DWQMS workshop facilitated by the Walkerton Clean Water Centre, when feasible;
- communicating with peers through reviewing and contributing to discussions on the Municipal Water Wastewater Regulatory Committee (MWWRC) online forum, http://municipaldrinkingwater.ning.com/, as appropriate;
- attending the quarterly MWWRC meeting, when feasible;
- discussing best management practices with neighboring municipalities and water Boards;
- any other means (e.g. staff suggestions).

- BMPs cited in MECP Inspection Reports, or published by the MECP and available at www.ontario.ca/drinkingwater ;

Review and consideration of industry Best Management Practices (BMPs) should occur as the BMP's are identified through the above avenues. At a minimum, at least once every thirty-six months, the QC/CC and QMS Rep. shall review the BMP's published by the MECP, available at www.ontario.ca/drinkingwater, record the consideration of each BMP in the Corrective Action Tracking Spreadsheet, implementing items where value is deemed.

Reporting Observations

- DWQMS non-conformances, non-compliances, and preventative actions shall be reported to the QC, CC or QMS Representative.
- If the initial observer is employed by the City of St. Thomas, the observer shall initiate a Corrective/Preventative Action Report through the completion of a Corrective/Preventative Action Form (DWF-ADMIN-1400).
- Alternatively, the QC, CC or QMS Representative may initiate the report upon notification from the observer. Such is the case with all findings cited in Internal and External Audit Reports, MECP inspection Reports and other operational related reports that require action associated with Water Quality, system operation and/or regulatory compliance.
- Paper copies of the Corrective/Preventative Action Form (DWF-ADMIN-1400) are available to staff, and are strictly for the capturing of water quality concerns while operations staff are in the field.
- Corrective/Preventative Action Forms (DWF-ADMIN-1400) initiated on paper shall be transferred into the Corrective Action Tracking Spreadsheet by the CC.

Initiating a Corrective/Preventative Action Report

- A Corrective/Preventative Action is initiated in the field by completing the first half of the Corrective/Preventative Action Forms (DWF-ADMIN-1400),
- Indicate a "Proposed Root Cause". (Try to ask yourself "Why did this happen?" and repeat until a root cause is identified).
- A listing of common Root Causes is available in the Root Cause Codes Form (DWF-ADMIN-1401).
- Upon completion of the initiation of the Corrective/Preventative Action Forms (DWF-ADMIN-1400), the report initiator shall submit the form to the QC, CC or QMS Representative.
- The QC or QMS Representative shall forward the form to the CC.

Verification of Proposed Corrective Action

- Upon receipt of a Corrective Action Form, the CC, in consultation with the QC and QMS Representative will review the proposed action and root cause.
- If the QC and QMS Representative agree with the proposed action and root cause, they approve the proposed action and assign a person responsible and an action due date.
- If the QC and QMS Representative do not agree with the proposed action and/or root cause, they provide an approved root cause and action, and assign a person responsible and an action due date.
- The QMS Representative and QC determine and record if the action required is a Correction, Corrective or Preventative Action.
- The CC shall update the Corrective Action Tracking Spreadsheet with the approved action, if it differs from proposed, and identify the person responsible and action due date.

Responding to Opportunities For Improvement (OFI's)

- Identified OFI's do not necessarily have to be acted upon. The QC and QMS Representative have the authority to deny further action on these items.
- If the QC and QMS Representative do not agree that action should be taken to address an OFI, the CC shall review and close the declined Action Request, making note of the decision.
- If the QMS Representative is not able to approve the correction and/or corrective action due to financial limitations, the Director of Environmental Services and City Engineer shall arrange for budgetary

approval.

Responding to Non-conformances

- Identified "Non-conformances" may require Correction, Corrective or Preventative Actions to be applied in order to eliminate the non-conformity and its root causes.
- A correction is assigned to immediately correct a non-conforming situation, if this is all that is required to eliminate the cause, the root cause is not required to be recorded, nor is a 90-day effectiveness check required.
- A corrective or Preventative action is applied in order to eliminate the root cause of a non-conforming situation. If corrective or preventative action is required, root cause analysis shall be completed in order to apply an effective corrective action, and a 90-day effectiveness check shall be conducted.
- It should be noted that the accrediting body requires that root cause analysis be performed for all non-conformances identified by their auditors.

Responding to Corrections

- Some findings do not identify a systemic concern and simply require a Correction to be made in order to eliminate the detected non-conformity.
- In such cases, the CC marks the Report "complete" upon verification that the identified action has been completed.
- While Root Cause may have been investigated in order to identify that a Correction is required, no root cause needs to be recorded for findings, nor is a 90-day effectiveness check required to be recorded.
- If the QMS Representative is not able to approve the correction and/or corrective action due to financial limitations, the Director of Environmental Services and City Engineer shall arrange for budgetary approval.

Completing Corrections/Corrective/Preventative Actions

- The person identified as responsible for the required action will be notified by e-mail, work order, or verbal communication, depending on the nature of the action required and the associated deadline.
- Upon completion of the assigned action item, the action owner shall notify the CC or QC of the date the required action was completed, as well as, a detailed description of what actions were taken, including document references for any DWQMS procedures that may have been revised as a result.
- Upon notification of a completed action item, the QC shall forward the information to the CC so that they may update the Corrective Action Tracking Spreadsheet, review the CAR to ensure all required actions were taken and close the CAR, if appropriate.

90-day Effectiveness Check

- 90-day effectiveness checks of corrective/ preventative actions completed are conducted to verify that the action taken has addressed the cause of the non-conforming situation and that the action taken has resulted in an improvement to the DWQMS.
- On, or about, the 90 day anniversary of the action complete date, the CC shall review the corrective action taken, investigate as required, and provide evidence that the corrective action is working after 90 days.
- If the corrective action is found to be effective it is considered complete and the report can be closed.
- If the corrective action is found to be ineffective, the CC advises the QC and QMS Rep and together, they will propose another approach to control the concern and issue a new CAR.

Associated Form(s):

- Corrective and Preventative Action Form (DWF-ADMIN-1400)
- Root Cause Codes (DWF-ADMIN-1401)
- Corrective Action Tracking Spreadsheet

Table of Revisions

Revision #	*Date*	*Description of Revision*
5	June 29, 2015	Change in Top Management
6	January 4, 2016	Change in QMS Representative and removed Service Request reference as program is changing
7	July 7, 2016	Removed Foreman as position eliminated
8	January 30, 2018	Change in City logo
2.0	January 1, 2019	Format change. Amalgamated procedure from 4 OP's we were carrying. Significant changes to procedure. Tracking of CAPA;s now done on spreadsheet. Introduced root cause code form to help categorize systemic issues.
2.1	April 12, 2019	Title change.
2.2	January 1, 2020	Inserted Hazard Identification Form (DWF-ADMIN-300) as possible source of continual improvement initiatives.

Drinking Water Quality Management System

PROCEDURE TITLE: CORRECTIVE AND PREVENTATIVE ACTION FORM	**PROCEDURE NO.: DWF-ADMIN-1400**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 21**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

☐ **Corrective Action** ☐ **Preventative Action (Opportunity for Improvement)**

Date Submitted:		**Prepared By:**	
System Location /Process Stream:			
Date of Occurrence:			
Origin of Finding: (audit, new equipment, etc.)			
Nature of Concern:	☐ **Environmental** ☐ **Quality**	☐ **Operational** ☐ **Other: _____**	
Regulatory Notifications Required?: Yes / No (If yes, specify agencies contacted):			
Description: ***(what happened, how was it observed, area of occurrence, activities, equipment involved, containment, etc.)***			
Proposed Root Cause: ***(what was the core reason behind the non-conformance?)***			
Corrective Action Proposed: ***(include change benefit/ implications of not making the change, where applicable)***			
Proposed Action Reviewed by:			
Approved Root Cause: ***(what was the core reason behind the non-conformance?)***			
Approved Corrective Action:			
Responsible Party:		**Action Due Date:**	
Date Transferred to Spreadsheet:			
CC Action Taken:			

Drinking Water Quality Management System

PROCEDURE TITLE: ROOT CAUSE CODES	**PROCEDURE NO.: DWF-ADMIN-1401**
EFFECTIVE DATE: JANUARY 1, 2020	**DWQMS REFERENCE: 21**
REVISION #: 2.2	**REVIEW FREQUENCY: ANNUALLY**
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE	

ST. THOMAS SECONDARY	X	**ST. THOMAS DISTRIBUTION**	X	**SOUTHWOLD DISTRIBUTION**	X	**CENTRAL ELGIN DISTRIBUTION**	X

Root Cause	Sub-Cause	Code
Material / Equipment Problem	Defective or failed part	MEP1
	Defective or failed material	MEP2
	Electrical or instrument failure	MEP3
	Combination	MEP4
Design Problem	Inadequate man-machine interface	DP1
	Inadequate or defective design	DP2
	Error in equipment or material selection	DP3
	Drawing, specification or data errors	DP4
Training Deficiency	No training provided	TD1
	Insufficient practice or hands-on experience	TD2
	Inadequate content	TD3
	insufficient refresher training	TD4
	Inadequate presentation or materials	TD5
Management Problem	Inadequate administrative control	MP1
	Work organization/planning deficiency	MP2
	Inadequate supervision	MP3
	Improper resource allocation	MP4
	Policy not adequately defined, disseminated, or enforced	MP5
	Other management problem	MP6
Personnel Error	Inadequate work environment	PE1
	Inattention to detail	PE2
	Violation of requirement or procedure	PE3
	Verbal communication problem	PE4
	Other human error	PE5
Procedure Problem	Defective or inadequate procedure	PP1
	Lack of procedure	PP2
	Procedure not user friendly	PP3
External Phenomenon	Weather or ambient condition	EP1
	Power failure or transient	EP2
	External fire or explosion	EP3
	Theft, tampering, sabotage or vandalism	EP4
Other	Not a current requirement	OTH1
	Legislative Restraints	OTH2
	Lack of follow-up	OTH3
	Recent change in the system	OTH4