DRINKING WATER QUALITY MANAGEMENT SYSTEM WATER DIVISION OPERATIONAL PLAN

Version 11

Quality Management Systems

A QMS is a system to establish policy and objectives and achieve those objectives, and direct and control an organization with regard to quality.
Quality management for Ontario's municipal drinking water systems will occur through the development and implementation of a QMS for each system based upon the DWQMS.

The Corporation of the Town of Tecumseh, Public Works & Environmental Services

Contents

1. Quality Management System

This Operational Plan documents the Drinking Water Quality Management System for The Corporation of Town of Tecumseh Water Distribution System. The Corporation of the Town of Tecumseh Water Distribution System is owned and operated by The Corporation of the Town of Tecumseh. The Drinking Water Quality Management System (DWQMS) for The Corporation of the Town of Tecumseh covers the transmission and distribution of potable drinking water to consumers within the Town of Tecumseh.

Under the terms and conditions of the 2004 Water Agreement executed among the Windsor Utilities Commission (WUC), City of Windsor and The Corporation of the Town of Tecumseh, the Tecumseh water distribution system (formerly north and south Tecumseh water distribution systems) is currently supplied by the Windsor Water System.

Treated potable drinking water is purchased from the Windsor Utilities Treatment Plant, which is owned by the Windsor Utilities Commission (WUC) and is a separately held entity managed by ENWIN Utilities, which operates and manages the production and distribution of potable water.

The potable water enters The Corporation of the Town of Tecumseh Water Distribution System through 12 locations bordering the City of Windsor, Town of LaSalle and the Town of Tecumseh. Each location is metered and monitored using a Supervisory Control and Data Acquisition system (SCADA). Storage for equalization and peak hour flow of water for Tecumseh is the responsibility of the Windsor Utilities Commission (WUC).

The Corporation of the Town of Tecumseh, in turn, supplies potable drinking water to the Town of Lakeshore at 4 locations all bordering Manning Road: Scott Side Rd; County Rd. 42; Little Baseline; and Amy Croft.

The Corporation of the Town of Lakeshore owns and operates the production and distribution facilities of potable water within their boundary. The Corporation of the Town of Lakeshore is a fully owned local government and is represented by elected officials of the Town of Lakeshore.

The Corporation of the Town of Tecumseh is connected with the Town of LaSalle at one location bordering Howard Avenue. The Corporation of the Town of LaSalle owns and operates the distribution facilities of potable water within their boundary. Town of LaSalle`s treated potable drinking water is purchased from the Windsor Utilities Treatment Plant, which is owned by the Windsor Utilities Commission (WUC) and is a separately held entity managed by ENWIN

Utilities, which operates and manages the production and distribution of potable water. The Corporation of the Town of LaSalle is a fully owned local government and is represented by elected officials of the Town of LaSalle.

Additional details about the Town of Tecumseh Water Distribution System are included in section 6.

2. Quality Management System Policy

The Corporation of the Town of Tecumseh is committed to supplying a safe, consistent, drinking water supply while maintaining strict adherence to all applicable legislative and regulatory requirements. The Corporation of the Town of Tecumseh will strive to achieve these goals through the implementation of a management system and staff competency to our consumers.

The municipal owners, management and the employees of The Corporation of the Town of Tecumseh who are directly involved in the supply of drinking water, share in the responsibilities of implementing, maintaining, and contributing to the continual improvement of the Drinking Water Quality Management System (DWQMS).

The Quality Management System Policy is available on the Town's website at https://www.tecumseh.ca/en/living-here/water-quality.aspx.

3. Commitments and Endorsement

This Operational Plan has been reviewed and approved by The Corporation of the Town of Tecumseh. The purpose of this document is for the planning, operation, and maintenance of The Corporation of the Town of Tecumseh Water Distribution System.

This document will be reviewed and approved by:

- **Municipal Owner/Operating Authority**: Mayor and Council
- **Top Management**: Chief Administrative Officer, Director of Public Works and Environmental Services and the Manager, Water & Wastewater/ORO *(Overall Responsible Operator)*

Top Management and Owner endorsement includes the following commitments:

a) ensuring that a Quality Management System is in place that meets the requirements of the Drinking Water Quality Management Standard,
b) ensuring that the Operating 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.

The DWQMS Representative will keep the DWQMS document up-to-date and promote continual improvement. All recommended changes are to be approved by Municipal Owner/Operating Authority resolution **(See Appendix 1- Commitments and Endorsement).**

4. Drinking Water Quality Management System (DWQMS) Representative

The Corporation of the Town of Tecumseh has designated a DWQMS Representative and an alternate DWQMS Representative:

DWQMS Representative:
Name: Nicole Bradley
Position: DWQMS Representative / Water Operator

Alternate DWQMS Representative:
Name: Brad Dupuis
Position: Manager, Water & Wastewater/O.R.O.

The DWQMS Representative is responsible for the following:

- Ensures that processes and procedures needed for the DWQMS are established and maintained,
- Reports to Top Management on the performance of the DWQMS and any need for improvement, as needed, or during the Management Review meetings,
- Ensures that current versions of documents required by the QMS are being used at all times, and reviews DWQMS documentation and record control,
- With members of top management, ensures that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the drinking water system, and
- Promotes awareness of the DWQMS throughout the Water Division and The Corporation of the Town of Tecumseh.

5. Document and Records Control

This procedure is applicable to the following DWQMS documents:

- Operational Plan and associated procedures
- DWQMS Forms
- Equipment Manuals
- As Built Drawings
- Applicable drinking water regulations (e.g. O. Reg. 170/03 and O. Reg. 128/04)

Creating New or Updating Existing Documents

The need for document changes or for new documents may be identified through audits, Management Reviews, DWQMS Committee or staff. The DWQMS Representative will delegate the task of creating the new documents to be approved (if necessary) by the Manager Water and Wastewater/ORO Top Management and/or Municipal Owner/Operating Authority if necessary.

Any employee of the Water Division may request a change to an existing DWQMS document. The request must be made in writing, dated and submitted to the DWQMS Representative.

The request must include the following information:

- Reason for the new or changed document (one of the following needs to apply):
  - Is it required by the DWQMS?
  - Will it enhance process control?
  - Can it reduce risk?
  - Will it support regulatory requirements?
  - Will it improve operational efficiency?
- A proposed document change or new document content when applicable to the Water Division or the Operational Plan.

Proposed Document Change or New Document Content

The requester shall develop the new/changed document and submit it to the DWQMS Representative for review.

The DWQMS Committee shall review the document, make any changes as required, and approve changes if applicable.

Approving Documents

- DWQMS-related documents may be approved by Municipal Owner; Operating Authority's Top Management: CAO, Director of Public Works & Environmental Services, Manager of Water & Wastewater / ORO; or the DWQMS Representative.
- DWQMS documentation shall be stored at the Water Division office or electronically on The Corporation of the Town of Tecumseh network servers.
- Water Division staff has read-only access to the electronic version of the documentation. The Manager, Water & Wastewater/ORO, DWQMS Representative and Clerical Staff have access rights to manage and/or edit the electronic version of DWQMS-related documents
- The DWQMS Representative is responsible to ensure that new or changed documents are communicated and /or distributed to the appropriate staff members
- Documents shall be collected, archived, stored, and disposed of as per legislation under the Safe Drinking Water Act 2002 and The Corporation of the Town of Tecumseh municipal by-law.

Reviewing Documents

The Operational Plan and procedures shall be reviewed by the DWQMS Committee for applicability and relevance.

Document Availability

- The current copy of the Operational Plan, procedures and associated documents are retained electronically on The Corporation of the Town of Tecumseh network servers and at the Water Division office.
- Original sets of equipment manuals / specifications and drinking water regulations are kept at the Water Division office.
- Copies of As-Builts are stored at the Water Division office and electronically on The Corporation of the Town of Tecumseh network servers.

DWQMS Records Control

This procedure is applicable to all records and documents that demonstrate conformance to the DWQMS and compliance to legislative requirements:

DWQMS records and documents include (and are not limited to) Council Resolutions (for Operational Plan endorsement); risk assessment outcomes, training information, evidence of communications, procurement-related (e.g. specifications for essential supplies and services),

evidence of infrastructure reviews, evidence of equipment maintenance and calibration, emergency preparedness, results of internal and external audits, and management review meetings.

Compliance records and documents demonstrate compliance with legislative requirements and include (and are not limited to) the records required by the Safe Drinking Water Act and related regulations (e.g. O. Reg. 170/03, O. Reg. 128/04, O. Reg. 169/03, etc.), the Municipal Drinking Water Licence (and its parts, including: Drinking Water Works Permit, approved Financial Plan, Accreditation) and all related records (e.g. annual reports, Operator certification, sampling and testing, forms documenting changes to the distribution system, etc.).

Records are stored in such a manner as to prevent their deterioration. All records are filed and/or archived (as per retention table) at the Water Division office and The Corporation of the Town of Tecumseh network servers.

Records Management

Records are stored and protected to ensure that they are kept legible, readily identifiable, and are retrievable when they are required by personnel of the Town of Tecumseh Drinking Water System.

Paper records are maintained on-site in file folders, filing cabinets, binders, or by other means deemed acceptable by individual responsible for the records. Electronic records are stored on the organization's network, and within the Town of Tecumseh's Management System Software. Regularly scheduled back-ups help protect electronic information from damage or loss.

All employees have access to the files appropriate to their roles and responsibilities. The Management System Software is also used to facilitate access to and retrieval of the required information.

Minimum record retention periods are determined according to appropriate legislative and regulatory requirements. Retention periods for records not governed by standards or legislation are established through the by-laws of the Town of Tecumseh. Records specific to the Town of Tecumseh Water Distribution System have been documented on a Record Retention Table. The records will be disposed of by either recycling, shredding, or in the case of electronic documentation archival and deletion.

6. Drinking Water System

System Overview

Section 1 of this Operational Plan provides a general overview of the Town of Tecumseh's Water Distribution System and its connections to other area municipalities' water systems with different Owners and Operating Authorities (**See Appendix 2- The overall service area is identified on Map 1**).

The Town is responsible for its own distribution system within the boundaries of Tecumseh and is responsible for any new storage works that may be required to supply its fire flow of water. The Town of Tecumseh also has a 4,546m3 water tower, located in the North end of Tecumseh. This water tower is monitored by Windsor Utilities Commission (WUC) and the Town of Tecumseh through SCADA (Supervisory Control and Data Acquisition system).

The north Tecumseh water service area (north of Highway 401) includes the urban settlement areas of Tecumseh, St. Clair Beach and Tecumseh Hamlet, and rural areas north of Highway 401; and is supplied from the Windsor Water System through metering facilities at the Town boundary on Dillon Drive, McNorton Street, Tecumseh Road, County Road 22, County Road 42, Baseline Road and, in the future, on Intersection Road.

The south Tecumseh water service area (south of Highway 401) includes urban settlement areas of Oldcastle Hamlet, and Maidstone Hamlet, and rural areas south of Highway 401; and is supplied from the Windsor Water System through existing supply connections at the Town boundary on, and at the Town boundary in Oldcastle Hamlet on the 8th Concession Road, County Road 46, Walker Road, North Talbot Road and Howard Avenue.

Service Areas and Water Distribution System Components

North Tecumseh Water Service Area

The distribution system in the north Tecumseh water service area is operated by The Corporation of the Town of Tecumseh and consisting of watermains ranging in size from 100 mm (4") to 600 mm (24") in diameter (**See Appendix 2- The north service area boundary is identified on Map 2**).

The feedermains on Dillon Drive, McNorton Street and Tecumseh Road extend from the Town boundary through the centre of Tecumseh (Planning Area) to the elevated water tank on Tecumseh Road, and are interconnected through a new 300 mm feedermain on Lesperance Road and the existing 400 mm trunk watermain on Lacasse Boulevard. The 600 mm diameter

feedermain on County Road 22 extends from the Town boundary to Manning Road (County Road 19) and is connected to the 400 mm diameter feedermain on Tecumseh Road. The 600 mm diameter feedermain on County Road 42 extends from the Town Boundary to Lesperance Road and is connected to the 300 mm diameter distribution mains on St. Alphonse Avenue and on Lesperance Road.

South Tecumseh Water Service Area

The distribution system in the south Tecumseh water service area is operated by The Corporation of the Town of Tecumseh consisting of watermains ranging in size from 100 mm (4") to 600 mm (24") in diameter (**See Appendix 2 -The south service area boundary is identified on Map 3**).

The feedermains on 8th Concession Road and County Road 46 supply the north east end of Oldcastle Hamlet. The 300 mm diameter feedermain on Walker Road and North Talbot Street connect to the 300 mm diameter trunk watermain on Talbot Road (Highway 3) which supplies Oldcastle Hamlet, the rural areas south of Highway 401, and Maidstone Hamlet.

Consolidated Water Distribution System

The existing water distribution system will be operated as a single distribution system with connections through the Windsor Supply System. In the future, the Town intends to extend trunk watermains from County Road 42 to connect to the south service area to improve system performance. A copy of the approved Water and Wastewater Master Plan can be viewed at the Water Division office (**See Appendix 2 – Table 1 Watermain Material Type and Length in Tecumseh Water Distribution System**).

Procedures in place to maintain disinfectant residuals within the distribution system

Tecumseh Water Distribution System staff sample and monitor disinfectant residuals on a regular basis through regulatory sampling programs and during response activities related to consumer water quality calls.

Staff also carry-out work to improve disinfectant residuals within the distribution system through:

- regular maintenance programs (e.g. flushing);
- the practice of cycling water in the water tower (reducing water age);
- optimizing distribution system flows (e.g. close-looping and eliminating system dead ends); and

- by responding in a timely manner to watermain breaks (and carrying out proper disinfection in accordance with the province's Watermain Disinfection Procedure).

7. Risk Assessment

Risk Assessment Team

The Risk Assessment Team shall be no less than a three-member forum and will be made up of the Manager, Water & Wastewater/ORO in conjunction with the Lead Water Operator and one other Water Operator.

The Risk Assessment Team shall meet once a calendar year to review the validity of the assumptions and the currency of the information used in the risk assessment. A comprehensive risk assessment will be redone every thirty-six months unless changing conditions indicate that it should be done more frequently. In each of the risk assessment update activities, the risk assessment outcomes are presented to Top Management at Management Review for their official review and approval.

The Risk Assessment Team considers the Ministry's "Potential Hazardous Events for Municipal Drinking Water Systems" (dated February 2017) in the risk assessment process and is to identify and assess:

- Potential hazardous events and associated hazards as listed in the Ministry's document, and any additional potential hazardous events,
- The risks with the occurrence of potential hazardous events which could affect the water system,
- The ranking of hazardous events according to the associated risk,
- The control measures to address the potential hazards and hazardous events,
- The Critical Control Points and their respective Critical Control Limits,
- The associated procedures and/or processes to monitor Critical Control Limits,
- The procedures to respond to deviations from the Critical Control Limits,
- The procedures for reporting and recording deviations from the Critical Control Limits, and
- Consideration of the reliability and redundancy of equipment.

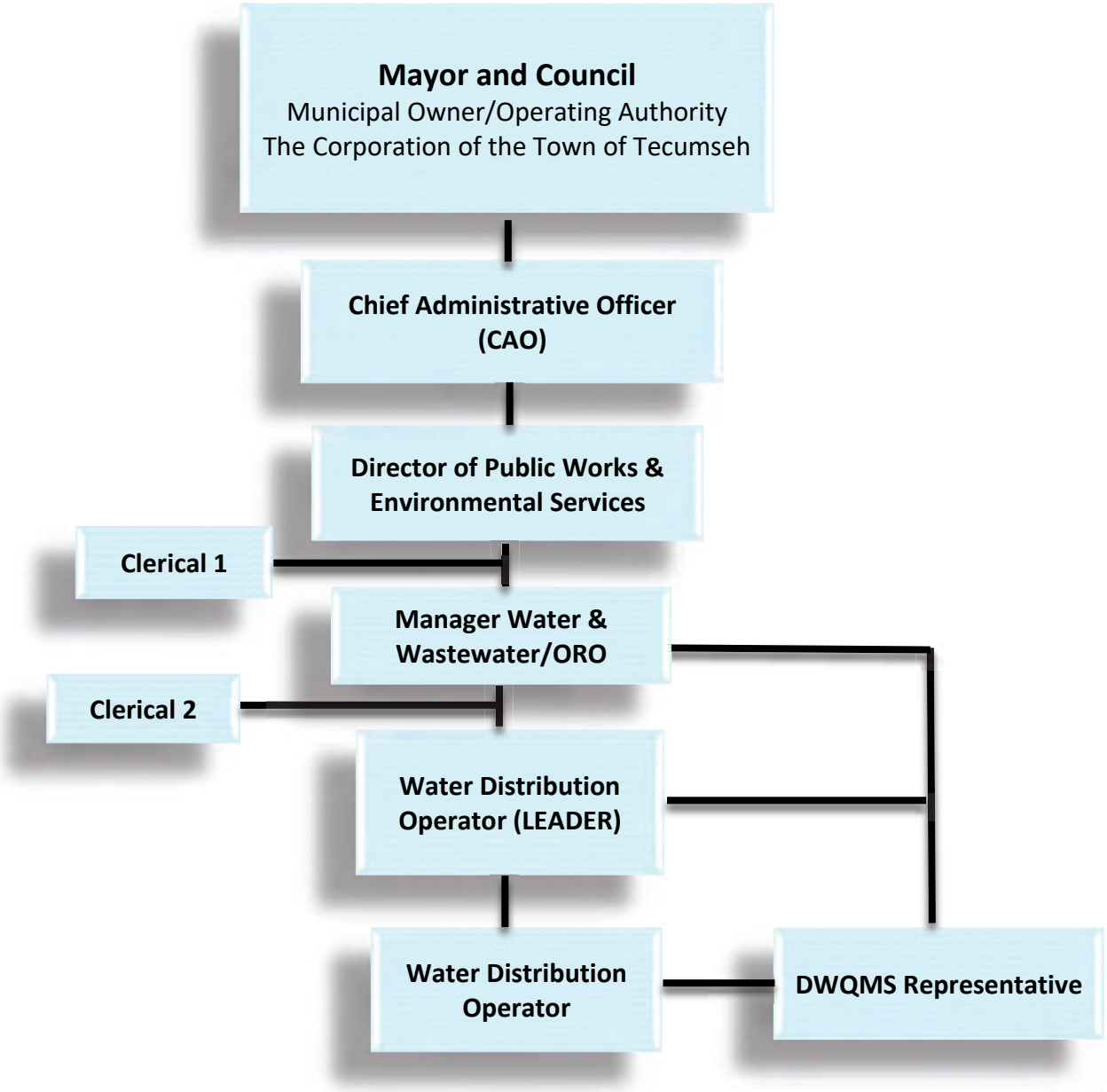
8. Risk Assessment Outcomes

The risk assessment will be facilitated by developing and completing Risk Assessment Tables. As the Risk Assessment Team conducts this assessment, it will document the results of each step of the risk assessment procedure. The risk assessment process is an ongoing activity.

The DWQMS Representative shall ensure that relevant information is circulated to all members of the Risk Assessment Team; and update the outcomes of each risk assessment activity (whether it is for the calendar year or thirty-six-month update).

- **(See Appendix 3 – Risk Assessment)**
- **(See Appendix 4 - Risk Assessment Outcomes)**

9. Organizational Structure, Roles, Responsibilities and Authorities



The Corporation of the Town of Tecumseh

Water Division - Organizational Chart

Operational Roles, Responsibilities and Authorities

Municipal Owner/Operating Authority (Mayor and Council)

Responsibilities

In addition to ensuring the provision of safe and reliable municipal water supply to the serviced areas of The Corporation of the Town of Tecumseh Council is also responsible for:

- Complete legal oversight of The Corporation of The Town of Tecumseh Water Distribution System and the DWQMS,
- Ultimate responsibility for the provision of safe potable drinking water under the Safe Drinking Water Act 2002,
- Ensures compliance with applicable legislation and regulations,
- Participating in Council meetings and Council committee meetings and meetings of other bodies to which they are appointed by the Council,
- Obtaining and giving due consideration to information about the operation or administration of the municipality from the Chief Administrative Officer, (CAO) and from other appropriate Town staff,
- Evaluating the policies and programs of the municipality such as bylaw enforcement, taxation, property permits and inspections, planning, public works (roads, water, and sewer), parks and recreation, fire services, police services, and
- Endorsing the DWQMS and providing a representative to participate on the DWQMS Management Review Committee.

Authorities

On behalf of the electorate of The Corporation of the Town of Tecumseh, and in accordance with the Municipal Act, Council is authorized to:

- Implement Drinking water system and DWQMS improvements or changes,
- Authorize resources to improve or change the drinking water system and DWQMS,
- Approve and review policies for the management and operation of Town assets,
- Review, revise, and approve proposed and existing bylaws, expenditures, user fees, taxation rates,
- Hire, evaluate, discipline, or terminate Town Management Staff and contracted service providers, and
- Provide financial, administrative authority related to the distribution of safe drinking water.

Top Management

Top Management is comprised of the following: Chief Administrative Officer; Director, Public Works & Environmental Services; and Manager, Water & Wastewater/Overall Responsible Operator (ORO).

Chief Administrative Officer (CAO)

Responsibilities

As the senior Town staff person reporting to Council, the Chief Administrative Officer (CAO) responsibilities include:

- Oversight of the operation and management of all Town departments,
- Ensuring that the policies and direction from Council are effectively communicated to senior department managers,
- Ensuring that policies and direction from Council is carried out by the appropriate Town departments,
- Direct supervision of senior department directors and managers, and
- Endorsing the ongoing development of the DWQMS and participating on the DWQMS Management Review Committee.

Authorities

Authorities of the Chief Administrative Officer (CAO) include:

- Communicate information from senior managers directly to Council,
- Request expenditure approval from Council and implement approved expenditures,
- To convey and mandate council policy and direction to the department senior managers,
- To hire, evaluate, discipline, or terminate utility management staff, and
- Staffing (within the guidelines of The Corporation of the Town of Tecumseh and any collective agreements).

Director, Public Works & Environmental Services

Responsibilities

Reporting to the Chief Administrative Officer (CAO), the responsibilities of the Director of Environmental Services and Public Works responsibilities include:

- Ensuring the safe, reliable, and compliant management and operation of all of the Towns physical infrastructure as well as Water Distribution System,
- Direct supervision of Environmental Services and Public Works department supervisors and administrative staff,
- Coordinating budget preparation,
- Preparation and presentation of Environmental Services Department Reports to Council,
- Administration of the Collective Bargaining Agreement for department personnel,
- Ensuring adequate and competent staffing,
- Ensuring appropriate staff training,
- Investigating and responding to public complaints and inquiries, and
- Participate and represent the Municipal Owner/Operating Authority (Mayor and Council) on the DWQMS Committee and Management Review Committee.

Authorities

The Director of Environmental Services and Public Works is authorized to:

- Evaluate and prioritize long-term department needs,
- Prepare, review, and approve design specifications,
- Select contractors, and equipment,
- Develop and implement departmental administrative and technical policy,
- Recruit, hire, evaluate, discipline, or terminate Environmental Services Department staff in accordance with Town policies,
- Within the scope of the Environmental Services Department and Public Works, communicate directly with regulatory agencies and the public on behalf of the Town Municipal Owner/Operating Authority,
- When necessary, will appoint a temporary Overall Responsible Operator (ORO) position, in absence of the designated ORO.

Manager, Water & Wastewater/Overall Responsible Operator (ORO)

Responsibilities

Reporting to the Director of Environmental Services and Public Works, the responsibilities include:

- Ensuring the efficient, safe and compliant operation of the Towns Water Distribution System,
- Providing supervision, technical direction and training to water distribution staff,
- Maintaining provincial operator certification,
- Assisting the Director of Environmental Services and Public Works with the water distribution budget preparation and long-term planning,
- Communicating with regulatory authorities to ensure compliance with applicable legislation,
- Preparing and presenting Municipal distribution information to Council, Town staff, managers and the public, and
- Serving as an alternate DWQMS Representative and participating on the DWQMS Committee and Management Review Committee.

Authorities

The Manager Water & Wastewater /ORO, Water System is authorized to:

- Act and is the Overall Responsible Operator (ORO) and therefore must be available to be contacted 24/7. The ORO will make arrangements with the Director of Environmental Services for a designated ORO in the event he/she is not available and cannot be contacted,
- Develop, approve and implement operations, maintenance and safety policies and procedures related to water distribution,
- Supervise and inspect the work of contractors,
- Evaluate and prioritize the long-term rehabilitation and upgrade to the Town's infrastructure(s),
- Participate in hiring, evaluation and discipline of unionized and non-unionized staff in accordance with Town Policies,
- Communicate with Regulatory Agencies,
- Order/purchase necessary supplies and services, and
- Apply various Town By-laws.

DWQMS Representative

Responsibilities

Reporting to the Town Municipal Owner/Operating Authority and Top Management, the responsibilities include:

- Promotes awareness of the DWQMS,
- Reports DWQMS results to staff,
- Ensures DWQMS documentation is prepared and maintained, as needed,
- Provides all staff with technical and administrative consultation related to DWQMS document preparation and implementation, as needed,
- Reviews and may approve DWQMS documentation,
- Implements and oversees document control procedure,
- Coordinates internal auditing acts as the external audit liaison,
- Communicates DWQMS information to staff and facilitates training when needed,
- May report DWQMS results to Municipal Owner/Operating Authority and Top Management, and any needs for improvement, and
- Assist Municipal Owner/Operating Authority and Top Management, that personnel who directly impact drinking water for The Corporation of the Town of Tecumseh are aware of all applicable legislative and regulatory requirements that pertain to their duties if reference to the DWQMS.

Authorities

The DWQMS Representative is authorized to:

- The overall managing role, responsible for overseeing the development and implementation of the DWQMS.

Designated DWQMS Representative Alternate

- Performs all roles of Designated DWQMS Representative.

Water Distribution Certified Operator (Leader)

Responsibilities

Reporting to the Water & Wastewater/Overall Responsible Operator (ORO), the responsibilities include:

- Oversees day-to-day activities relating to maintenance of the water distribution system,
- Communicates and liaises with the Manager, Water & Wastewater/ORO, Water Operators and Clerical Staff,
- Works with the Manager, Water & Wastewater/ORO in completing the Water Operators' performance assessments,
- Assists with developing procedures and processes for assuring water quality, and
- Has input into the development of procedures and processes for assuring water quality.

Authorities

The Water Distribution Certified Operator (Leader) is authorized to:

- Directs Operators in day-to-day operations of water distribution system,
- Orders day-to-day supplies as needed,
- Respond to public complaints as relayed from Manager, Water & Wastewater/ORO, Clerical Staff and/or after-hours answering service.

Water Distribution Certified Operator

Responsibilities

Reporting to the Water & Wastewater/Overall Responsible Operator/ORO and the Water Distribution Certified Operator (Leader), the responsibilities include:

- Performs weekly testing of drinking water,
- Performs regular maintenance of the water distribution system,
- Reports any incidents of non-compliance, and
- Responds to repairs.

Authorities

The Water Distribution Certified Operator is authorized to:

- Monitors process and equipment of day-to-day operations of the water distribution system,
- Respond to public complaints as relayed from Manager, Water & Wastewater/ORO, Clerical Staff, Water Operator Leader and/or after-hours answering service.

Clerical Staff

Responsibilities
Reporting to the Director of Environmental Services and Public Works Water & Wastewater/Overall Responsible Operator/ORO, the responsibilities include:

- Communicates/liaises with the following: Director, Public Works & Environmental Services; Manager, Water & Wastewater/ORO; Water Operator (Leader); and Water Operators,
- Responds to and documents public complaints. Example- drinking water quality complaints, broken watermain, hydrant hit by car etc.,
- Inputs lab results,
- Prepares reports as required by regulations and circulates to management,
- Assists with DWQMS documentation and record control, and
- Assists with communication during emergency situations.

Authorities
The Clerical Staff is authorized to:

- Updates and implements document changes as directed by applicable administration identified in the Water Division Organizational Chart.

10. Competencies

The MECP classified The Corporation of the Town of Tecumseh a "Water Distribution Subsystem Class II". The following identifies the competencies required of staff whose performance may have a direct impact on drinking water quality.

Municipal Owners / Operating Authorities

Municipal Owners/Operating Authorities who have complete legal oversight of The Corporation of The Town of Tecumseh Water Distribution System and the DWQMS are briefed on operating conditions and are provided updates by senior management to 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. They may also attend relevant drinking water training courses, conferences, and seminars to assist in their overall knowledge pertaining to regulatory and legislative requirements.

Director of Public Works & Environmental Services

The Director shall possess advanced theoretical and working knowledge of administrative skills expected of a senior level manager. In addition, the Director shall possess an intermediate theoretical and working knowledge of the Safe Drinking Water Act and applicable regulations and legislations, and The Corporation of the Town of Tecumseh drinking water distribution system. When necessary, will appoint a temporary Over All Responsible Operator (ORO) position, in absence of the designated ORO.

Manager, Water & Wastewater and Overall Responsible Operator (ORO)

Shall possess advanced theoretical and working knowledge of administrative skills. The Manager, Water and Wastewater and ORO shall also possess advanced theoretical and working knowledge of the Safe Drinking Water Act and applicable regulations and legislation. The Manager, Water and Wastewater and ORO should also have a good working knowledge of The Corporation of the Town of Tecumseh drinking water distribution system and it components. Is the Overall Responsible Operator (ORO) and therefore must be available to be contacted 24/7. The ORO will make arrangements with the Director of Environmental Services for a designated ORO in the event he/she is not available and cannot be contacted.

New Operators (OIT's)

Must complete the OIT Water Distribution Prep Course and OIT exam as per MECP (MECP) O.Reg.128/04 requirements.

Class I Water Distribution Operators

The operator must successfully complete the Class I Water Distribution Exam to become a Class I Water Distribution Operator as per MECP O.Reg.128/04 requirements.

Class II Water Distribution Operators

Class I level, the operator can advance to a Class II Water Distribution operator by successfully completing the Class II Water Distribution Exam as per MECP O.Reg.128/04 requirements.

Class III Water Distribution Operators

Class II level, the operator can advance to a Class III Water Distribution operator by successfully completing the Class III Water Distribution Exam as per MECP O.Reg.128/04 requirements.

Water Operator Competencies

- Water Operators Shall posse an OIT or Class 1 Operating Certificate as per Ontario Regulation 128/04 requirements
- The ORO shall have a minimum Class II Water Distribution Certificate as per Ontario Regulation 128/04 requirements

Water Operator Skills and Knowledge

- The Water Operator performs a variety of skilled and semi-skilled tasks including: operates equipment used in the construction, repair and maintenance of the water distribution system and various public buildings and facilities; utilizes private contractors as authorized; oversees the contractors' work; and performs other related duties as required.
- The Water Operator will work with Town's Water Operators, other Town employees and / or contractors and provide direction to contractors as needed.
- The Water Operator will work with minimum supervision and shall comply with all safety rules and regulations and will work unsupervised if required.

Methods to Develop, Assess and Maintain Competencies

The following methods develop, assess and maintain the required competencies for personnel performing duties directly affecting drinking water quality:

Identify Training Requirements

The Manager, Water & Wastewater/ORO and Water Operators must meet the training requirements as per MECP O.Reg.128/04 requirements.

The required competencies include, but are not limited to the following:

- Class 1 Water Distribution Operator Certificate
- Understanding the Quality Management System
- Familiarity with the Town's water distribution system
- Knowledge of regulations and identifying, reporting and responding to adverse drinking water conditions as required by regulations.

Assess Competencies

The Corporation of the Town of Tecumseh may administer certain tests, conduct interviews, verify references and/or request specific documentation as part of the hiring process in order to verify skills, experience and knowledge.

In order to meet the ongoing changes to technology, software, the requirements of O. Reg. 128/04 and the Water Division processes, Water Operators shall receive training as required by O. Reg. 128/04, at a minimum. The training may be provided on or off site by qualified employees or contracted subject matter experts. Training effectiveness is evaluated when appropriate through testing, or a demonstration of knowledge gained.

Training records are maintained by the Manager, Water & Wastewater/ORO and/or the DWQMS Representative, stored in document control software and filed in hard copy in the Water Division office as proof that the required training has been successfully completed. The Manager, Water & Wastewater/ORO is responsible for ensuring that all identified training is completed.

Maintain Competencies

The Manager, Water & Wastewater/ORO will ensure that the Standard Operating Procedures and Quality Management System are reviewed every calendar year. These duties are included in the Annual Schedule of Duties maintained and tracked by the ORO. Furthermore, the Water Operators will meet or exceed the training hours required by MECP O.Reg.128/04 to maintain Water Distribution Water Distribution Operator Certificates. Training hours and courses completed by the Water Distribution Operators are logged and tracked by the Manager, Water & Wastewater/ORO and/or the DWQMS Representative and are documented in document control software.

11. Personnel Coverage

Water Division is staffed as per the Collective Agreement between the Corporation of the Town of Tecumseh and the Outside Bargaining workers represented by CUPE Local 702.1. The Manager, Water & Wastewater is the designated ORO. After hours calls are managed by the Water Operator (Leader) using an emergency call-out service with the staff seniority list for overtime as set out by the Collective Agreement.

Regular Hours Coverage

- All work orders are generated through the Water Division office during regular working hours
- Created work orders will have date and time of the call, location of the problem, details of the problem, name and contact information of person initiating service call.

- Work orders are distributed through the Manager, Water & Wastewater/ORO and the Water Operator (Leader)

After Hours Coverage

- The Water Operator (Leader) receives a call from the answering service, assesses information and provides direction
- If the Lead Water Operator cannot be contacted, the call will bump to the next Water Operator according to seniority
- When necessary, staff is called in to do repairs, and or deal with public complaints
- All reports and forms are authorized by the Manager, Water & Wastewater/ORO
- Reports, forms and or work orders, will have date and time of the call, location of the problem, details of the problem, name and contact information of person initiating service call.
- If required, sub-contractors are approved by the Manager, Water & Wastewater/ORO and are used in digression of the Water Operator

Pandemic, Strikes and/or Lockouts

- The provisions for personnel coverage during situations where staff may not be available to work include the following:

Pandemic

- Should a pandemic occur the Town will request from surrounding municipalities with qualified licensed operators as well as private contractors for assistance.
- If needed the Town will also contact the MECP to request advice or assistance should an emergency of this nature arise.

Strikes and/or Lockouts

- The Manager, Water & Wastewater is designated as the Overall Responsible Operator (ORO) for the distribution system and has the appropriate Water Distribution Operators License. In the event of a union strike and/or lockout, the ORO is qualified to maintain the water distribution system.
- In the event the ORO is not available or if additional staff is required to maintain the distribution system, Town will request from surrounding municipalities with qualified licensed operators as well as private contractors for assistance.
- If needed the Town will also contact the MECP to request advice or assistance should an emergency of this nature arise.

12. Communications

The DWQMS Representative shall ensure the Municipal Owner/Operating Authority and Top Management is provided with a current copy of the Operational Plan. The DWQMS Representative shall keep the Municipal Owner/Operating Authority and Top Management informed of any changes to the DWQMS as a result of Management Review and other DWQMS issues when necessary.

A current version of the Operational Plan is available to staff at the Water Division office. A hard copy of the DWQMS Operational Plan will be kept at the Water Division office and an electronic copy can be obtained using the document control software. Personnel will be informed of DWQMS changes or updates through regular staff meetings with the DWQMS Representative or the Manager, Water & Wastewater/ORO.

Any suggested revisions or recommendations to the DWQMS Operational Plan submitted by staff will be documented and provided to the DWQMS Representative.

The DWQMS Committee will meet to review and update the Operational Plan and review any staff recommendations.

Town of Tecumseh Water Division will utilize a web-based survey/questionnaire to allow the public and essential suppliers to have input and communication with all levels of the Town's Water Division and Management. The Manager, Water and Wastewater/ORO will collect and analyze all data communicated to the town. The Manager, Water and Wastewater/ORO will then make changes if necessary/ or may make recommendations to the Municipal Owners/ Operating Authority any changes or improvements identified.

Essential suppliers and service providers receive relevant DWQMS information regarding product or service requirements from the purchaser in the form of quality / quantity specifications and timeframes, as required by regulations, the Municipal Drinking Water Licence and Drinking Water Works Permit.

Notification is provided to The Corporation of the Town of Tecumseh suppliers and service providers that a copy of the current Water Distribution System Standards and Material Specifications is available on the Town's website or in hardcopy from the Water Division.

The DWQMS Policy is available to the consumers of The Corporation of the Town of Tecumseh water distribution system at the Water Division office, Town Hall and can be viewed on the Town's website https://www.tecumseh.ca/en/living-here/water-quality.aspx.

13. Essential Supplies and Services

Where applicable, supplies must meet AWWA and NSF/ANSI standards. Supplies are verified against the order requisition when received (**See Appendix 5 - Essential Supplies and Service List**).

14. Review and Provision of Infrastructure

Infrastructure for The Corporation of the Town of Tecumseh consists of a water distribution system, water tower and monitoring equipment at the boundary meters. The Corporation of the Town of Tecumseh has in place a Water & Wastewater Master Plan, which has been accepted and adopted by the Municipal Owners/Operating Authority.

Rehabilitation and renewal of the water distribution system is performed on a needs schedule in association with the Water & Wastewater Master Plan. Capital and operational money is allocated each calendar year for improvements to the system.

The Director, Public Works & Environmental Services, under the advisement of the Manager, Water & Wastewater/ORO and Manager, Engineering Services, will identify areas needed for rehabilitation and renewal in accordance with risk assessment.

A report detailing the maintenance programs, any requirements for infrastructure, rehabilitation and renewal is prepared annually by the Director, Public Works & Environmental Services and Director, Financial Services/Treasurer. The capital requirements are then submitted to Top Management and Municipal Owner/Operating Authority for budgetary approval.

15. Infrastructure Maintenance, Rehabilitation and Renewal

The Manager, Water and Wastewater/ORO will annually review the planned and unplanned maintenance reports and programs. A summary will be prepared and communicated to the Director, Public Works & Environmental Services under advisement of the Manager, Engineering Services and will identify areas that may need rehabilitation and renewal planning (**See Appendix 6: Public Works & Environmental Services Capital Works Plan**).

Planned Maintenance

All planned maintenance is scheduled and communicated to staff by the Manager, Water & Wastewater/ORO. All records are retained at the Water Division office.

- Annual valve exercising programs
- Annual flushing programs
- Annual hydrant inspection, maintenance and painting

Planned maintenance is scheduled on an electronic spreadsheet stored on the central office computer server. Server files are backed up daily. The long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities is kept current by reviewing planned rehabilitation and renewal programs on an annual basis as capital works are planned for each calendar year by the Manager, Water & Wastewater/ORO with the following: Director, Public Works & Environmental Services; Director, Financial Services/Treasurer; Manager, Engineering Services; and Manager, Roads & Fleet.

Scheduled tasks are typically defined by manufacturer's literature when available and revised as needed according to operator experience/observations. Planned maintenance tasks are communicated to the person responsible by issuance of work orders from the Manager, Water & Wastewater/ORO or the Water Operator (Leader). Completed work orders are reviewed and signed by the Manager, Water & Wastewater/ORO or DWQMS Representative.

If feasible, rehabilitation or replacement of water distribution piping is coordinated with the Town's scheduled wastewater and road resurfacing projects.

Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Manager, Water& Wastewater/ORO.

- Service leaks
- Meter repairs
- Emergency hydrant repairs
- Water quality complaints
- General customers inquiries

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring of the treated water produced at the Windsor Utilities Commission (WUC) Water Treatment Plant is conducted by Windsor Utilities Commission Water Operators as required by Ontario Regulation 170/03.

A competent certified Water Operator for the Town performs all in house sampling. Results are recorded on a weekly log sheet and monitored by Water Operators. Detailed procedures for all tests performed on-site are provided in Standard Operating Procedures (SOP's).

The operators ensure that the water supplied to The Corporation of the Town of Tecumseh Water Distribution System meets the Safe Drinking Water Act, 2002. Sampling and testing for The Corporation of the Town of Tecumseh Water Distribution System is limited to the distribution system only as required by Ontario Regulation 170/03.

The results at all boundary meters and the water tower are displayed and recorded on the SCADA system and monitored by the Manager, Water & Wastewater/ORO and Water Operators.

Free chlorine will be done in-house. All other regulatory testing is contracted out and performed by an accredited lab chosen by The Corporation of the Town of Tecumseh. Records and logs are kept at the Water Division office.

Sampling and monitoring Standard Operating Procedures (SOP) are established for operating the water distribution system. Provisions have been made when sampling and monitoring under abnormal circumstances.

Adverse Water Quality Sample

- If the accredited laboratory discovers adverse water quality in a sample, they are obligated to notify Water Division within 24 hours. All adverse water results prescribed by Schedule 16 of O.Reg.170/03 must be immediately reported by Water Division to the Medical Officer of Health, Spill Action Centre and the MECP.
- During adverse water quality incidents, maps and drawings are provided to the local health authority whereby direction is given to the Town as to the locations of sampling and monitoring upstream and downstream of the location from which the adverse sample was found.

Power/Communication Loss

- Water Division staff is alerted via telephone in the event of a power/communication loss that affects the SCADA system (refer to Element 11 for call-out procedure during working hours and after working hours).
- The SCADA system is programmed to continue calling the emergency contact list until the alarm is acknowledged.

Inclement Weather

- Additional staff and/or equipment will be provided for as needed.

17. Measurement and Recording Equipment Calibration and Maintenance

The portable chlorine analyzers and flow meters are calibrated by contractors according to the manufacturers' specifications or as mandated by legislation. All calibrations are recorded and filed at the Water Division office.

Contractors that are used for performing calibrations are identified in the "Essential Supplies and Services List" (**See appendix 5 - Essential Supplies and Services List**).

18. Emergency Management

The Corporation of the Town of Tecumseh's Water Operators have emergency training and are aware of the location of written procedures to deal with emergencies in the water distribution system. Specific instructions for responding to emergencies, including emergency situations that have the potential to result in acute drinking water health risks, are included in hardcopy in the Water Division office and electronically in the document control software. Once a year, a training exercise will be conducted to test selected emergency procedures. If present methods should change, or if new employees are brought into the system, semi-annual training will occur on dealing with emergencies. Senior employees or direct supervisors would provide this training. All training is documented and placed in employee training files.

Water Operators are on twenty-four hour call to ensure that a qualified staff member will attend and assess any water emergency.

Emergencies

- Adverse Water Quality

- Water distribution cannot supply fire protection or safe drinking water
- Situations in the water distribution system that have the potential to result in acute drinking water health risks

In the event of an identified emergency the Manager, Water & Wastewater/ORO shall be contacted immediately. The Manager, Water & Wastewater/ORO is designated to be responsible for overall management, decision-making, and communications at the entail level of emergency.

In the event the Manager, Water & Wastewater/ORO is unavailable, the Director of Public Works and Environmental Services shall be contacted and will appoint a temporary ORO.

The Manager, Water & Wastewater/ORO will then report all incidents and corrective actions to the Director, Public Works and Environmental Services or designate.

The Director, Public Works and Environmental Services, in collaboration with the Manager, Water & Wastewater/ORO, will advise the Municipal Owners/Operating Authorities of the system.

The Mayor and CAO of The Corporation of the Town of Tecumseh shall only be notified in the event that water cannot be supplied to the Town in sufficient amounts for fire protection, or that water quality poses an acute health risk to consumers and a boil water advisory or drinking water advisory must be issued.

The Water Division Emergency Response Plan is an emergency plan consisting of a set of guidelines assembled to assist water staff in emergency response procedures and is intended to facilitate a systematic and coordinated response to a variety of water emergencies or major incidents. The Water Division Emergency Response Plan has been formulated to assign emergency response roles and responsibilities, and to guide immediate and long-term response to incidents adversely affecting the water operations.

In the event of a problem occurring greater than a water emergency the Corporation of the Town of Tecumseh Emergency Response Plan will be implemented. A hardcopy is stored in the Water Division office and electronically in the document control software.

An extensive emergency contact list is provided within the Water Division Emergency Response Plan. There is a procedure in place to review and update the Water Division Emergency Response Plan on an annual basis.

19. Internal Audits

Internal audits will be performed in entirety at least once every calendar year as legislated, to ensure the DWQMS conforms to the requirements of the DWQMS Operational Plan. These requirements include ensuring that the DWQMS has been effectively implemented and properly maintained.

The Corporation of the Town of Tecumseh will conduct internal audits by trained auditors internally or by a contracted trained auditor chosen by The Corporation of the Town of Tecumseh.

Internal Audits Conducted by Town of Tecumseh Auditors

- The assignment of auditor's and schedules will be the responsibility of the DWQMS Representative
- Internal audits will be conducted by a person who has successfully completed a recognized Internal Auditor workshop
- Internal audits will be scheduled based on the availability and schedules of the participants.
- DWQMS will be audited as per the legislative requirements
- The auditor shall review all related DWQMS documentation
- The auditor shall observe activities, review records, review previous internal and external audit results, and interview personnel as necessary to ensure that the status of the audited Elements of the DWQMS has been effectively covered
- The auditor shall submit completed reports to the DWQMS Representative and the Manager, Water & Wastewater/ORO
- The report shall include any corrective actions requests required to address discrepancies
- Responses to corrective action request shall be designated to the responsible individual by the DWQMS Management Review Committee

20. Management Review

Management Review (Also referred to as the DWQMS Committee) ensures and evaluates the continuing suitability, adequacy and effectiveness of the DWQMS. This process reviews the effectiveness of the DWQMS by the Management Review Committee

Review Participants

Management Reviews shall be conducted during a meeting of the Management Review Committee that is comprised of the following:

- Chief Administrative Officer (CAO)
- The Director of Public Works & Environmental Services
- The Manager, Water and Wastewater /ORO
- The meeting is chaired by DWQMS Representative

The DWQMS Rep will communicate the meeting minutes to all management Review Committee members.

Review Frequency

Management Reviews shall be conducted after the internal audit has been completed and submitted to the DWQMS Representative by the Internal Auditor. The Management Review shall be conducted at least once a calendar year unless additional meetings are required as per the DWQMS Committee.

Review Input

The DWQMS Representative and/or Manager, Water & Wastewater/ORO shall provide information and data concerning the following categories for the review if requested:

- Incidents of regulatory non-compliance
- Incidents of adverse drinking water tests
- Deviations from Critical Control Point limits and response actions
- The effectiveness of the risk assessment process
- Results of internal and 3rd party audits
- Results of relevant emergency response testing
- Operational performance and water quality trends
- Follow-up on action items from previous Management Reviews
- Status of management action items (if any) identified between reviews
- Changes in resource requirements, infrastructure, process, personnel, the DWQMS or regulations that could affect the DWQMS
- Consumer feedback
- The resources needed to maintain the DWQMS
- The results of the infrastructure review

- Operational Plan, content, updates and staff suggestions

Review Process

The Management Review Committee shall review and discuss all information presented.

The Committee shall make recommendations and initiate an action plan, including the person(s) responsible for delivering the action items and the proposed timelines, to improve the content and implementation of the Operational Plan and related procedures, and to ensure the provision of adequate resources.

The DWQMS Representative shall be responsible for communication and implementation of the Management Review findings.

21. Continual Improvement

The Corporation of the Town of Tecumseh strives to continually improve the effectiveness of its DWQMS. Issues of non-compliance, non-conformance and opportunities for improvement are presented through:

- The review of best management practices (BMP's) at least once every 36 months (including the review of MECP's BMP document, when published) will undergo the same schedule as the comprehensive risk assessment;
- MECP compliance inspections;
- Adverse water quality incidents;
- External DWQMS accreditation audits;
- Internal DWQMS audits;
- Management reviews;
- Staff suggestions;
- Consumer calls; and
- Other means (e.g. near-misses, other utilities' experiences, etc.)

Using the Request for New or changed DWQMS Document form included in Appendix 7, the DWQMS Representative tracks and measures continual improvement.

Corrective actions are taken to address issues (e.g. non-conformities, non-compliances and other drinking water system failures) where:

- Causes of the issues are investigated;

- Actions taken to correct the issues are documented;
- Actions are taken to prevent the issues from re-occurring;
- Reviews of actions taken to correct / prevent the issues are carried out to verify they are implemented and effective in correcting / preventing the re-occurrence of the issue.

Preventive actions may also be taken to eliminate potential issues – and these are documented and reviewed to ensure they are implemented an effective in preventing the potential issue from occurring.

Appendices

Appendix 1 - Commitment and Endorsement

The endorsement of the Water Division Operational Plan by Municipal Owner/Operating Authority (The Corporation of the Town of Tecumseh, Municipal Council) report, submitted by Manager, Water & Wastewater /ORO will be added to this Appendix 1 when formerly approved.

The Corporation of the Town of Tecumseh

Public Works & Environmental Services

To:	Mayor and Members of Council
From:	Phil Bartnik, Director Public Works & Environmental Services
Date to Council:	February 23, 2021
Report Number:	PWES-2021-10
Subject:	Drinking Water Quality Management System Operational Plan Version 11

Recommendations

It is recommended:

That Tecumseh Town Council **endorse and commit to** the Drinking Water Quality Management System, Operational Plan Version 11.

Background

As recommended by Justice Dennis O'Connor, in Part 2 of the Walkerton Inquiry, the government of Ontario has implemented a licensing program for municipal drinking water systems. The program requires owners and operators of drinking water systems to incorporate the concepts of quality management into system operation and maintenance. In response to this recommendation, the Ministry of the Environment, Conservation and Parks developed the Drinking Water Quality Management Standard, which sets out the framework for the development of a Quality Management System. Owners and Operating Authorities of a drinking water system are mandated to implement a Quality Management System by the provincial government through the *Safe Drinking Water Act, 2002*.

The Town's Drinking Water Quality Management System (DWQMS) Operational Plan was first endorsed and committed to by Council in 2008. The Operational Plan provides an understanding of the drinking water system, the roles and responsibilities of the owner and operational staff, procedures to operate and maintain the drinking water system, and a commitment and endorsement by the owner to provide safe drinking water to consumers.

As legislatively required by the province, the Town's Water Division reviews and updates its Operational Plan on an annual basis.

In order for the Owner to continue to show support of it's drinking water system and DWQMS, it is required that they provide their endorsement of and commitment to the updated Operational Plan.

Comments

Updates to the Operational Plan were submitted to and approved by the Management Review Committee at their meeting held on February 8, 2021. The minutes of this meeting are appended to this report as Attachment 1. The revisions to the Operational Plan include, but are not limited to, the following:

- The approved 2021 Public Works & Environmental Services Capital Works Plan.
- An up to date Essential Services contact list.
- The current watermain material and length in the Town's water distribution system.
- Staffing and operational changes.

Version 11 of the Operational Plan is appended to this report as Attachment 2.

The above-noted changes were incorporated into Version 11 due to:

- Legislative and regulatory changes;
- The Town's administrative and/or policy changes;
- Management Review Committee recommendations.

Updates to the Operational Plan are necessary for continuous improvement of the Town's Quality Management System.

Consultations

Chief Administrative Officer
Ministry of the Environment, Conservation and Parks

Financial Implications

There are no financial implications arising from this report.

Link to Strategic Priorities

Applicable	2019-22 Strategic Priorities
☐	Make the Town of Tecumseh an even better place to live, work and invest through a shared vision for our residents and newcomers.
☒	Ensure that Tecumseh's current and future growth is built upon the principles of sustainability and strategic decision-making.
☒	Integrate the principles of health and wellness into all of Tecumseh's plans and priorities.
☒	Steward the Town's "continuous improvement" approach to municipal service delivery to residents and businesses.
☐	Demonstrate the Town's leadership role in the community by promoting good governance and community engagement, by bringing together organizations serving the Town and the region to pursue common goals.

Communications

Not applicable ☐

Website ☒ Social Media ☐ News Release ☐ Local Newspaper ☐

This report has been reviewed by Senior Administration as indicated below and recommended for submission by the Chief Administrative Officer.

Prepared by:

Cheryl Curran, BES
Project Technician

Reviewed by:

Brad Dupuis, C. Tech.
Manager Water & Wastewater Services, O.R.O.

Reviewed by:

Phil Bartnik, P.Eng.
Director Public Works & Environmental Services

Recommended by:

Margaret Misek-Evans, MCIP, RPP
Chief Administrative Officer

Attachment Number	**Attachment Name**
1	Management Review Committee Meeting Minutes, February 8, 2021
2	Drinking Water Quality Management System Operational Plan Version 11

Appendix 2 – Drinking Water System

Table 1: Watermain Material Type and Length in Tecumseh Water Distribution System

Watermain Material, Size & Length in Meters	
Cast Iron Watermain: 19,407 Meters	
100mm Pipe = 109 Meters	250mm pipe = 784 Meters
150mm Pipe = 18,405 Meters	400mm pipe = 3 Meters
200mm Pipe = 106 Meters	
Concrete Watermain: 2,526 Meters	
400mm Pipe = 2,526 Meters	
Ductile Iron Watermain: 21,176 Meters	
150mm Pipe = 8,397 Meters	300mm Pipe = 1,660 Meters
200mm Pipe = 7,128 Meters	400mm Pipe = 2,429 Meters
250mm Pipe = 1,062 Meters	600mm Pipe = 500 Meters
Polyvinyl Chloride (PVC) Watermain: 177,211 Meters	
50mm Pipe = 639 Meters	250mm Pipe = 15,173
100mm Pipe = 1,825 Meters	300mm Pipe = 17,956
150mm Pipe = 60,465 Meters	400mm Pipe = 8,522
200mm Pipe = 68,897 Meters	600mm Pipe = 3,734
Polyethylene Watermain: 68 Meters	
50mm Pipe = 8 Meters	
150mm Pipe = 60 Meters	
Total Length of Watermain – 220,388 Meters	

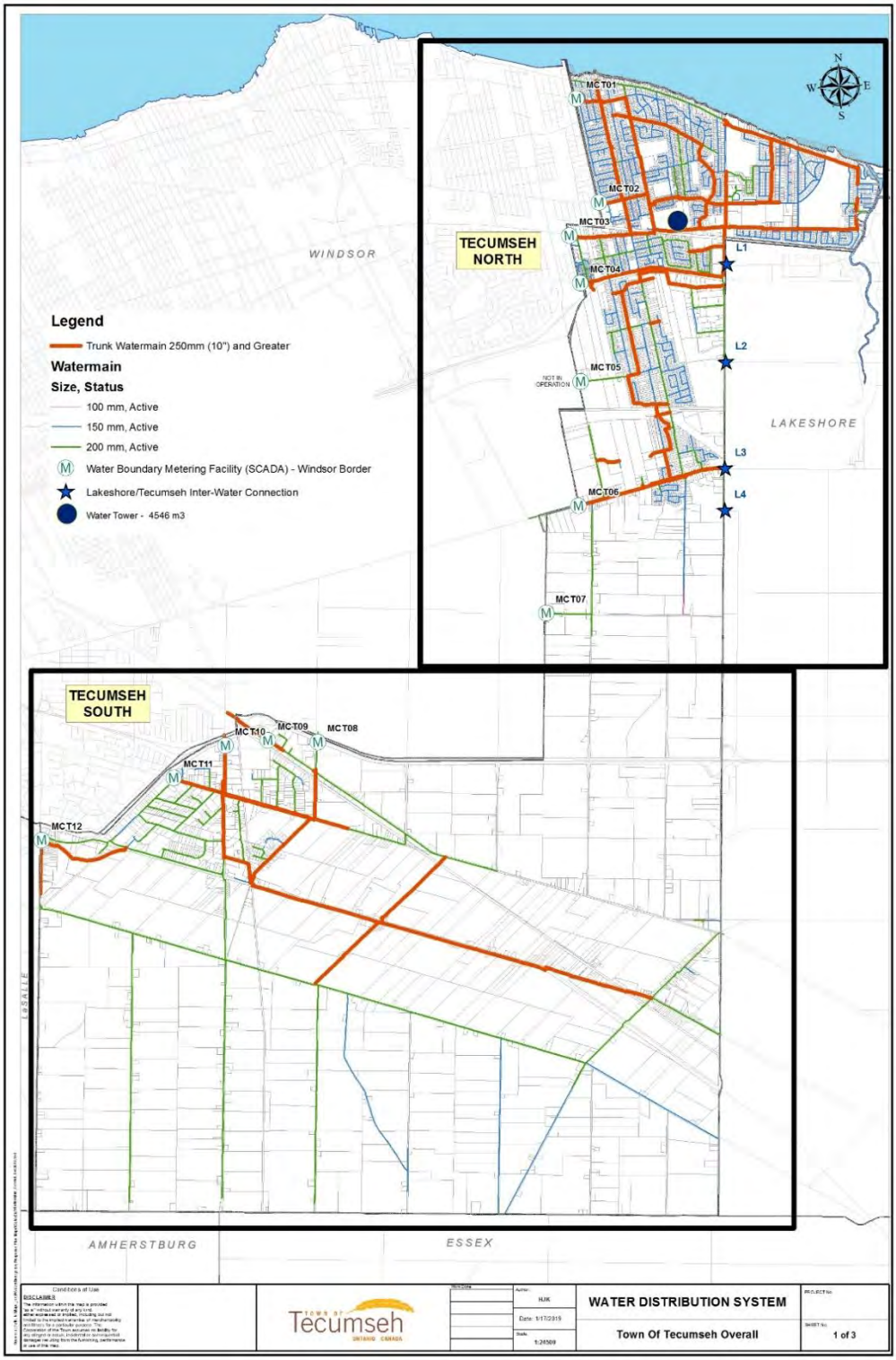
The north distribution system is currently supplied from the Windsor Water System through the following metering connection:

- 400 mm diameter feedermain on Dillon Drive
- 300 mm diameter feedermain on McNorton Street
- 400 mm diameter feedermain on Tecumseh Road
- 600 mm diameter feedermain on County Road 22
- 600 mm diameter feedermain on County Road 42
- (future) 600 mm diameter feedermain on Intersection Road

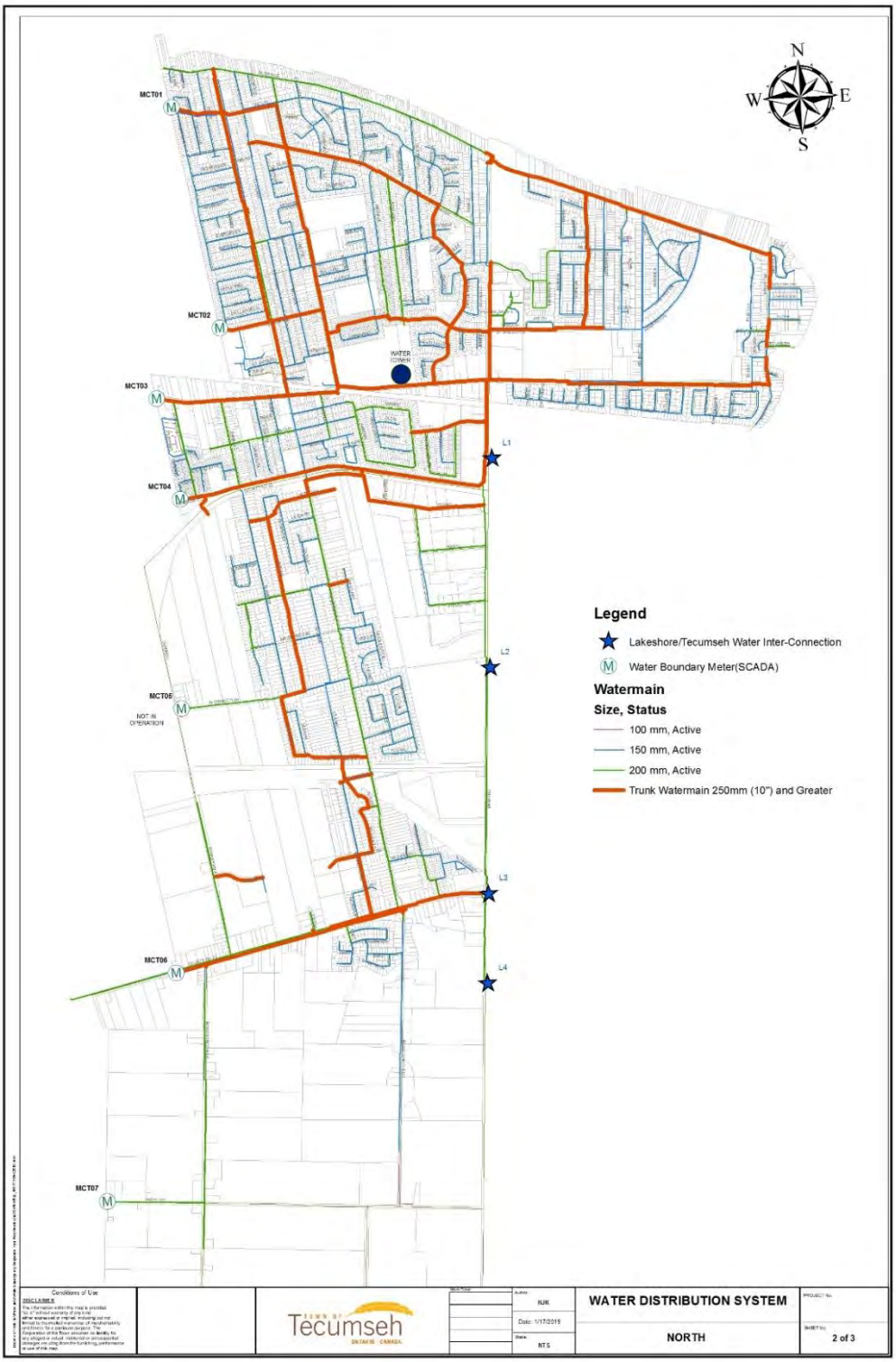
The south distribution system is currently supplied from the Windsor Water System through the following connections:

- 200 mm diameter feedermain on Baseline Road
- 200 mm diameter feedermain on 8th Concession Road
- 600 mm diameter feedermain on County Road 46
- 300 mm diameter feedermain on Walker Road
- 300 mm diameter feedermain on North Talbot Road
- 200 mm diameter feedermain on Talbot Road

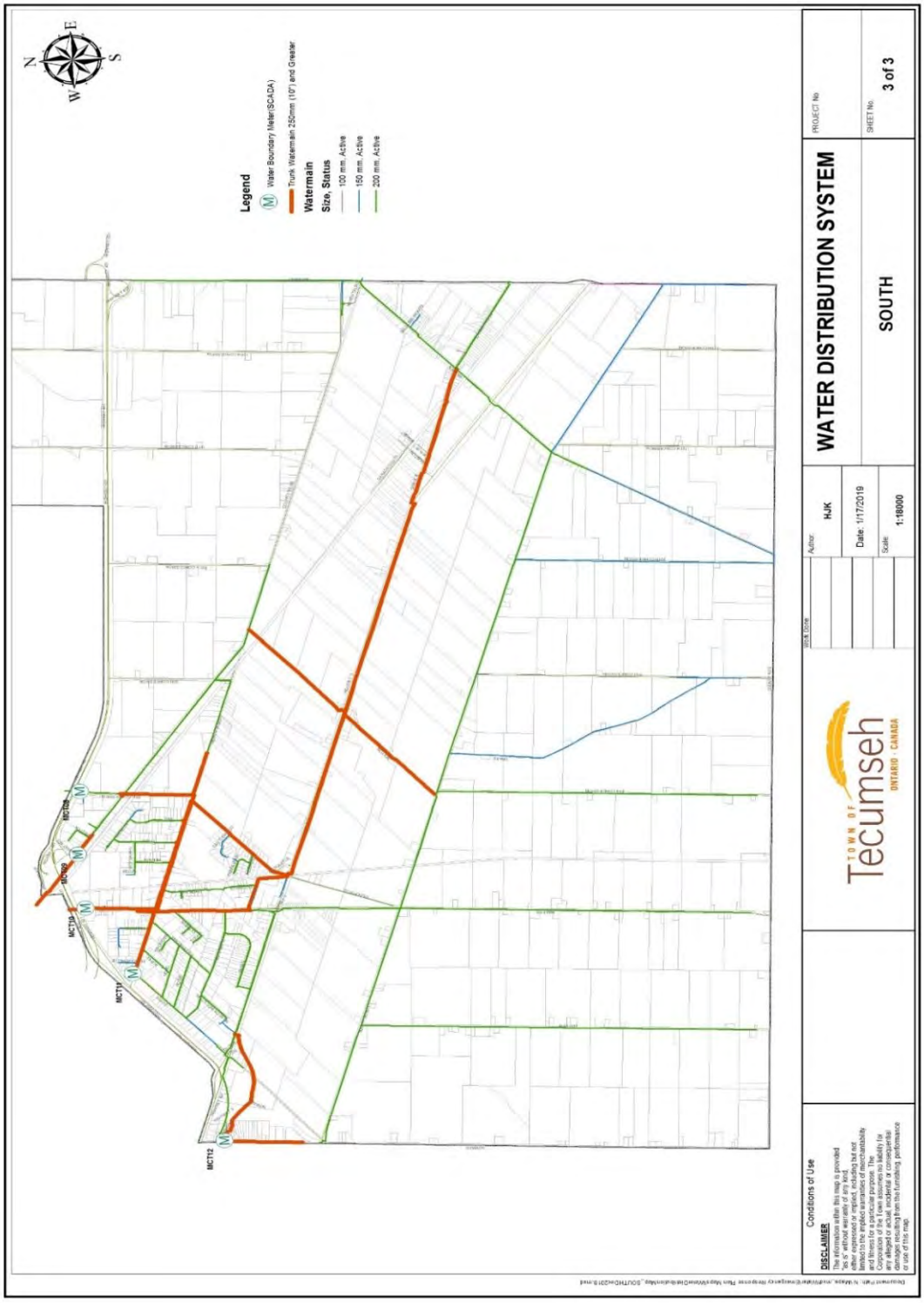
Map 1: Town of Tecumseh Water Distribution System – Overall Service Area



Map 2: Town of Tecumseh Water Distribution System – North Service Area



Map 3: Town of Tecumseh Water Distribution System – South Service Area



Appendix 3 – Risk Assessment (Comprehensive Risk Assessment done January 24, 2019)

Completing the Hazard Analysis and Critical Control Point Worksheet Procedure

The Risk Assessment Team is to complete the tasks outlined in section 7 Risk Assessment and section 8 Risk Assessment Outcomes (included as part of this Operational Plan) along with the instructions included as part of Appendix 3 – Risk Assessment (this section) and Appendix 4 – Risk Assessment Outcomes.

The Hazard Analysis & Critical Control Point (CCP) Worksheets included in Appendix 4 are reviewed and used to record the results of the risk assessment.

A. **Getting Started:** Follow the flow and process of receiving and delivering of clean drinking water to the consumer.

B. **Activity or Process Step:** This column refers to specific areas within a particular process step (pumps, tower, distribution system, etc.).

C. **Description of Hazard:** This column refers to an incident or situation that can lead to the presence of a hazard. Hazards and Hazardous events can result from natural or technological causes, or from human activities. At a minimum, the Ministry's "Potential Hazardous Events for Municipal Drinking Water Systems" (dated February 2017) is considered as part of this assessment. Any additional potential hazardous events and associated hazards also need to be included.

D. **Potential Result of Hazard:** This column refers to the source of danger or a property that may cause drinking water to be unsafe for human consumption. Biological, Chemical, Physical and Radiological. A description of each hazard is outline in (Table 1).

E. **Comments:** This column refers to any additional information that will help in the description of the hazard or identification.

F. **Available Monitoring & Control Measures:** This column refers to any monitoring and control measures in place or need to be identified as a need to be put in place. Control measures must be addressed for all potential hazards and hazardous events, regardless of whether they are CCP's or not. This may include monitoring, preventive measures, regular inspection, back-up equipment, written standard operating procedures etc.

G. **Emergency Procedures or Contingency Plan:** This column identifies any emergency procedure or contingency plan in place to deal with the hazards identified.

H. **Likelihood, Consequence, Detectability and Total:** These columns refer to the ranking criteria identified in (Tables 2, 3, 4, 5.).

I. **Critical Control Point (CCP):** Identifies if the total value of the columns, and determines if the value are above or below the set threshold.

J. **Control Procedure:** This column is where you apply some sort of control, to prevent or eliminate a drinking water health hazard or to reduce the health hazard to an acceptable level.

- Hazards identified as CCP's or Recommended Minimum CCP's require control measures, which are documented in procedures or work instructions.

Control Measures include:

- Work Instructions
- Monitoring, reporting and recording requirements
- Support information
- Response for a deviation from critical control point
- Recovery procedures if necessary
- Equipment reliability and redundancies

Determining the Level of Risk for each Hazard

A. Using the Ranking criteria set out at the bottom of each work sheet estimate the level of risk for each hazard.

B. Using the criteria set out at the bottom of the work sheet assign a value to each **Likelihood, Consequence and Detectability**.

C. Once the value for each is assigned, add the three values together **A+B+C=Total**.

D. The **Total** will be ranked as per the criteria in the "Total Analysis" table found at the bottom of the work sheet.

E. If the Total is in the High or Very High range as a hazard, it will require either a Critical Control Point procedure, or a response procedure.

Table 1- Hazards

Type of Hazard	Description of Hazard
Biological Hazards	Biological pathogens are usually considered the most significant drinking water health risk because the effects are acute; Waterborne biological hazards include bacterial, viral and parasitic organisms. These organisms are commonly associated with faecal wastes from humans and other animals, and some can occur naturally in the environment.
Chemical Hazards	Chemical hazards in drinking water may come from a source or occur in the treatment and distribution system. They include but are not limited to: toxic spills, naturally occurring minerals, heavy metals, dissolved gases (e.g. radon), pesticides, fertilizers, endocrine disruptors, personal care products and pharmaceutical residuals, cyanotoxins, flocculants, coagulants, lubricants, copper, iron, zinc, and lead from pipes and fittings.
Physical Hazards	Sediments are the most common physical hazard associated with drinking water and are of concern as they may carry with them microbiological hazards and interfere with disinfection system efficiency. Other physical hazards include biofilms, pipe materials etc.
Radiological Hazards	Radiological hazards may arise from man-made or natural sources, with naturally occurring chemicals (uranium, radon, etc.) most frequently found in groundwater.

Table 2 – Likelihood

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	**1**
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	**2**
Possible	Has occurred or may occur once or more per year.	**3**
Likely	Has occurred or may occur on a monthly to quarterly basis.	**4**
Very Likely	One or more occurrences on a monthly or more frequent basis.	**5**

Table 3- Consequence

Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	**1**
Minor	Limited public exposure, minor health risk.	**2**
Moderate	Minor public exposure, health impact on small part of the population.	**3**
Major	Large part of population at risk.	**4**
Catastrophic	Major impact for large part of the population, complete failure of systems.	**5**

Table 4 – Detectability

Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	**1**
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	**2**
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	**3**
Unlikely Detectable	Unlikely detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	**4**
Undetectable	Cannot be detected.	**5**

Table 5- Risk Analysis (Total)

Likelihood + Consequence+ Detectability	(Total) Risk Category
3 to 5	Low
6 to 7	Moderate
8 to 11	High
12 to 15	Very High

Provincial Government Bulletin: Potential Hazardous Events for Municipal Residential Drinking Water Systems to Consider in the DWQMS Risk Assessment

Ministry of the Environment and Climate Change

Potential Hazardous Events for Municipal Residential Drinking Water Systems
to Consider in the DWQMS Risk Assessment

1.0 Background

A risk assessment must be conducted for all municipal residential drinking water systems, as part of the operational plans for those systems. These operational plans form the basis upon which third party auditors assess conformance to the Drinking Water Quality Management Standard.

This document lists the potential hazardous events and associated hazards that are, at a minimum, required to be assessed as part of these risk assessments.

2.0 Definitions

All Systems - all municipal residential drinking water systems, including distribution-only systems.

Treatment Systems - all municipal residential drinking water systems that include equipment used to provide primary and/or secondary disinfection of the drinking water, including those with groundwater and/or surface water sources unless otherwise noted.

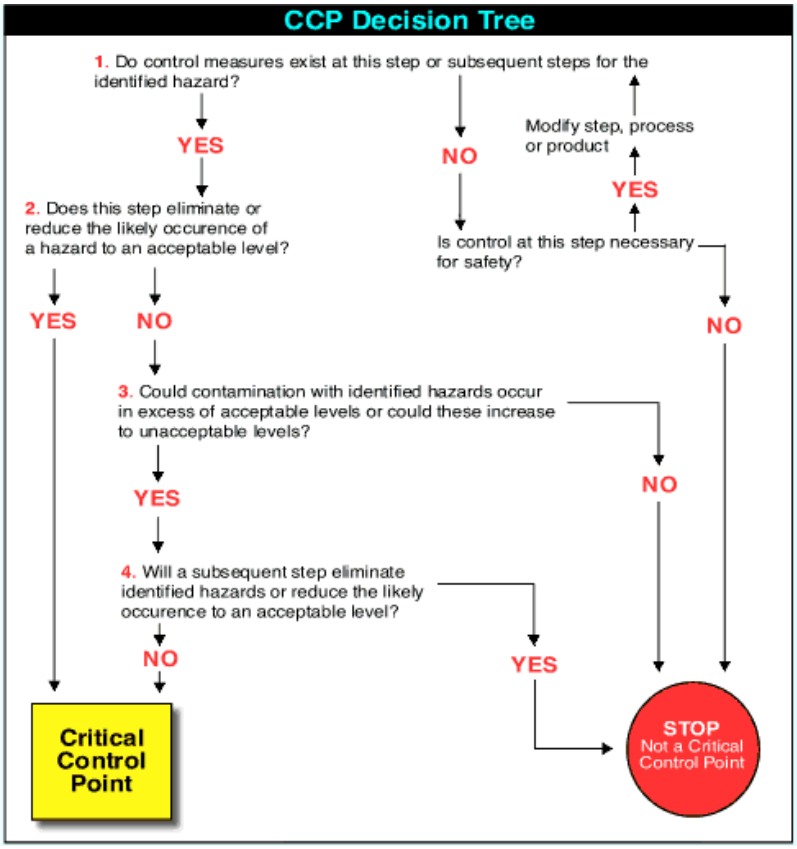
3.0 Potential Hazardous Events

System Type	Description of Hazardous Event / Hazard
All systems	Long Term Impacts of Climate Change
All systems	Source water supply shortfall
All systems	Extreme weather events (e.g., tornado, ice storm)
All systems	Sustained extreme temperatures (e.g., heat wave, deep freeze)
All systems	Chemical spill impacting source water
All systems	Sustained pressure loss
All systems	Backflow
All systems	Terrorist threat

Ontario

Appendix 4 –Risk Assessment Outcomes

Once the values for likelihood, consequence, and detectability are assessed, the determination of whether an identified risk is also a critical control point (CCP) is made using the following decision tree:



The control points generally meet the characteristics of an ideal critical control point as they typically are:

- Able to prevent, eliminate or reduce hazards,
- Monitored, preferably in real time,
- Able to have determined control limits, and,
- Essential to ensure the safety of the drinking water

These control points also provide important barriers in the multiple barrier process to ensure that pathogens that could be present in the water are effectively inactivated and/or removed, and that secondary disinfection is maintained in the distribution system. CCP's often have corresponding Critical Control Limits, which are identified in the table included below:

Critical Control Point (CCP)	Hazard Description	Critical Control Limit (CCL)	Monitoring Process and/or Procedures	Response Procedures
Secondary Disinfection To ensure the maintenance of a disinfectant residual throughout the distribution system.	**Deterioration of Chlorine Residual** • Reduced water flows based on demand, pipe size, etc. • Occurrence of dead ends and Metered Areas • Increased water temperature (temporary mains) • Reaction with organic matter in watermains • Water age in the distribution system • Water age in storage facilities	**Free Chlorine** Target Residual in the Distribution System: • >0.20 mg/L (operational minimum) Reportable under the SDWA: • 0.05 mg/L **Turbidity** • <5 ntu in the distribution system **Customer Complaints** • Re: water quality characteristics (taste, odour, colour, other)	• Certified and competent operators • Sampling, testing and monitoring of control limits, as applicable • Watermain flushing programs • Installation of blow-offs in dead ends • Regular samples taken and analyzed for chlorine residual	Emergency Response procedures: • 2.1 Boil Water Advisory; • 2.2 Adverse Laboratory Water Quality Results; • 2.3 Loss of Primary Disinfectant (Chlorine); • 2.14 Water Shortage; • 2.16 Establishing Potable Water Filling Stations • Response to customer calls • Service Request tracking and monitoring

Critical Control Point (CCP)	Hazard Description	Critical Control Limit (CCL)	Monitoring Process and/or Procedures	Response Procedures
				• Repair and system rehabilitation • Use of appropriately certified and competent contractors and suppliers

Critical Control Point (CCP)	Hazard Description	Critical Control Limit (CCL)	Monitoring Process and/or Procedures	Response Procedures
Backflow Prevention To prevent cross-contamination that can result from the flowing back of or reversal of the normal direction of flow of water.	**System contamination from negative or reduced pressure** • Lack of backflow prevention device • Main breaks or blow-outs • Large services • Temporary connections • Firefighting drawdown • Depressurization from residential usage • Pipe failure (deterioration)	**System pressure** Alarm setpoint ranges for pressure: • 210 to 900 kPa **Consumer complaints** • Related to system pressure or water characteristics (taste, odour, colour, other).	• Backflow Prevention program • Where possible, implementation of backflow prevention devices and small mains • Proactive Watermain replacement program • Pressure monitoring though pressure	Emergency Response procedures: • 2.2 Adverse Laboratory Water Quality Results; • 2.4 Contamination of Water Transmission System • 2.14 Water Shortage • 2.16 Establishing Potable Water Filling Stations • Response to customer calls • Service Request tracking and monitoring • Water Division Emergency Plan procedures

Critical Control Point (CCP)	Hazard Description	Critical Control Limit (CCL)	Monitoring Process and/or Procedures	Response Procedures
Contamination within Distribution System	Contamination of treated water through watermain breaks, new watermain commissioning or other means.	**Drinking Water Quality Standards (O. Reg. 169/03)** • Water that meets ODWQS	• Certified and competent operators • Regulatory sampling, monitoring and test programs.	Emergency Response procedures: • 2.1 Boil Water Advisory (if bacteriological) • 2.2 Adverse Laboratory Water Quality Results; • 2.4 Contamination of Water Transmission System • 2.11 Watermain Break • 2.14 Water Shortage • 2.16 Establishing Potable Water Filling Stations • Contact MOH, MECP & SAC • Communicate water advisory issued by MOH

Critical Control Point (CCP)	Hazard Description	Critical Control Limit (CCL)	Monitoring Process and/or Procedures	Response Procedures
				• Follow corrective actions required by O.Reg. 170/03.

Risk Assessment - Hazard Analysis & Critical Control Points

Work Sheet No. & Description

Definitions of the abbreviations found in the Hazard Analysis & Critical Control Point Work Sheet:

- **SOP** - Standard Operating Procedures
- **CCP** – Critical Control Point
- **MECP** - Ministry of the Environment, Conservation and Parks
- **MOH** - Medical Officer of Health
- **SAC** - Spills Action Centre (a division of MECP Emergency Management)
- **WUCTP** - Windsor Utilities Commission Water Treatment Plant
- **Cl2** – Chlorine
- **SCADA** - Supervisory Control and Data Acquisition

Hazard Analysis & Critical Control Points

Work Sheet No. 1: Contamination of Source Water

Contamination of Source Water			
Activity or Process Step: • Source Water (Windsor Utilities Commission)			
Description of Hazard: • Contamination of Source Water (water supply shortfall)			
Potential Results of Hazard: • Physical • Biological • Chemical			
Comments: • No Control			
Available Monitoring & Control Measures: • Weekly sampling throughout distribution system as per mandatory under O.Reg.170/03 • On-line monitoring at (WUCTP)			
Emergency Procedure or Contingency Plan: • Follow SOP *Bad Sample or Adverse Water Quality* • Contacting MECP, MOH & SAC • Communication with the (WUCTP) • Conducting all sampling and testing as necessary or directed at points in the distribution system under the direction of the MOH			
Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	4
		Detectability	2
		(High Risk Threshold = 8)	***Total* = 7** **(CCP = No)**
Control Procedure • There is no control for source water spills. However, there are ongoing sampling and monitoring programs; along with contingency plans, as noted above. • Emergency Response Procedures: ✓ 2.1 Boil Water Advisory ✓ 2.4 Contamination of Water Transmission System ✓ 2.14 Water Shortage ✓ 2.16 Establishing Potable Water Filling Stations ✓ 2.20 Pandemic			

Work Sheet No. 2: Vandalism/Tampering of Water Tower/Storage

Vandalism/Tampering of Water Tower/Storage

Activity or Process Step:

- Water Tower/ Storage

Description of Hazard:

- Vandalism/ Tampering

Potential Results of Hazard:

- Biological
- Chemical
- Damage to equipment

Comments:

- None

Available Monitoring & Control Measures:

- Security fence locked and gated
- Alarm system with SCADA
- Security Cameras

Emergency Procedure or Contingency Plan:

- SCADA Alarm Procedures SOP
- Contact Emergency Services, MOH, MECP & SAC
- Communicate drinking water advisory issued by MOH
- Sample water quality and take tower offline until two consecutive sample are negative within 48hrs
- Conduct sampling microbiological & Cl_2 residual
- Contact WUCTP about closure of water valve for tower

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	4
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 6** **(CCP = No)**

Control Procedure

- There are redundant security measures, including: secure fencing, intrusion alarms, SCADA monitoring related to Cl_2 residual, and other measures as noted above. Also, contingency plans exist, as noted above.
- Emergency Response Procedures:
  - ✓ 2.1 Boil Water Advisory
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.5 Emergency Evacuation
  - ✓ 2.6 Illegal Entry / Vandalism
  - ✓ 2.9 Bomb Threat at any Water Facility
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations
  - ✓ 2.20 Pandemic

Work Sheet No. 3: Biofilm and Sediment Build-up in Water Tower/Storage

Biofilm and Sediment Build-up in Water Tower/Storage

Activity or Process Step:

- Water Tower/ Storage

Description of Hazard:

- Biofilm and sediment buildup

Potential Results of Hazard:

- Biological
- Contamination

Comments:

- None

Available Monitoring & Control Measures:

- Inspection of tower 5 years as prescribed AWWA standards or per legislation
- Monitoring water levels
- Sampling testing of chlorine residuals weekly

Emergency Procedure or Contingency Plan:

- Cleaning tower using a qualified contractor

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	3
		Detectability	3
		(High Risk Threshold = 8)	***Total*= 7** **(CCP = No)**

Control Procedure

- There is an assessment of tower reliability: 5-year inspection program; and tower cleaning in response to issues once every 5 years. Ongoing sampling and monitoring programs as noted above.

Work Sheet No. 4: Terrorism

Terrorism

Activity or Process Step:

- Water Tower/ Storage

Description of Hazard:

- Terrorism

Potential Results of Hazard:

- Biological
- Chemical
- Damage to equipment

Comments:

- None

Available Monitoring & Control Measures:

- Security fence locked and gated
- Alarm system with SCADA
- Security Cameras

Emergency Procedure or Contingency Plan:

- Contact Emergency Services, MOH, MECP & SAC
- Communicate drinking water advisory issued by MOH
- Sample water quality and take tower offline until two consecutive sample are negative within 48hrs)
- Conduct sampling microbiological & Cl_2 residual
- Contact WUCTP about closure of water valve for tower

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	5
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 7** **(CCP = No)**

Control Procedure

- There are redundant security measures, including: secure fencing, intrusion alarms, SCADA monitoring related to Cl_2 residual, and other measures as noted above.
- Emergency Response Procedures:
  - ✓ 2.5 Emergency Evacuation
  - ✓ 2.6 Illegal Entry / Vandalism
  - ✓ 2.9 Bomb Threat at any Water Facility
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations
  - ✓ 2.20 Pandemic

Work Sheet No. 5: Spills from Freight Trains on Railway Tracks

Spills from Freight Trains on Railway Tracks

Activity or Process Step:

- Water Tower/ Storage

Description of Hazard:

- Spills from CN freight trains on VIA tracks.

Potential Results of Hazard:

- Physical
- Chemical
- Biological
- Contamination

Comments:

- No Control

Available Monitoring & Control Measures:

- Alarm system with SCADA
- On-line monitoring at (WUCTP)
- Security Cameras
- Passenger & Freight trains limited to max speed of 50mph zone

Emergency Procedure or Contingency Plan:

- Contact Emergency Services, MOH, MECP & SAC
- Communicate drinking water advisory issued by MOH
- Sample water quality and take tower offline until two consecutive sample are negative within 48hrs
- Conduct sampling microbiological & Cl_2 residual
- Contact WUCTP about closer of water tower

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	3
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 5** **(CCP = No)**

Control Procedure

- There is no control for spills from freight trains. However, there are ongoing monitoring programs and contingencies, as noted above.
- Emergency Response Procedures:
  - ✓ 2.1 Boil Water Advisory
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.5 Emergency Evacuation
  - ✓ 2.8 Loss of Access to Facilities
  - ✓ 2.12 On-Site Injury
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 6: Power Failure (Affecting Control Systems)

Power Failure (Affecting Control Systems)

Activity or Process Step:

- Control Systems

Description of Hazard:

- Power failure
  (power loss in general and also from extreme weather conditions (tornadoes / ice storms))

Potential Results of Hazard:

- Loss of SCADA network

Comments:

- None

Available Monitoring & Control Measures:

- UPS battery backup at monitoring stations
- UPS battery backup on server
- System alarmed
- Backup generator for server – natural gas generator, tested at least once per month
- Regular daily scheduled working days SCADA system checks

Emergency Procedure or Contingency Plan:

- Data is backed up daily onto main server

Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	2
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 4** **(CCP = No)**

Control Procedure

- Controls, reliability and redundancy measures exist as described above.
- Emergency Response Procedures:
  - ✓ 2.7 Interruption of SCADA Components;
  - ✓ 2.15 Failure of Control Systems;
  - ✓ 2.18 Equipment Failure

Work Sheet No. 7: Loss of Communication/Control

Loss of Communication/Control

Activity or Process Step:

- Control of System

Description of Hazard:

- Loss of Communications/Control
  (loss in general and also from extreme weather conditions (tornadoes / ice storm))

Potential Results of Hazard:

- Failure of business telephone lines
- Failure of local telephone provider's circuit connections, radio signals, and Ethernet connections
- Failure of cellular telephones

Comments:

- Refer to the Failure of Control Systems section of The Corporation of the Town of Tecumseh Water Division Emergency Response Plan

Available Monitoring & Control Measures:

- The response procedure for long-term failure of control systems and communication networks is detailed in the Failure of Control Systems section of The Corporation of the Town of Tecumseh Water Division Emergency Response Plan

Emergency Procedure or Contingency Plan:

- Follow the response procedure for long-term failure of control systems and communication networks in The Corporation of the Town of Tecumseh Water Division Emergency Response Plan

Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	5
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 7** **(CCP = No)**

Control Procedure

- There are redundant communications systems in place for SCADA controls: fiber optic is main supply with cellular back-up.
- Emergency Response Procedures:
  - ✓ 2.7 Interruption of SCADA Components
  - ✓ 2.15 Failure of Control Systems
  - ✓ 2.18 Equipment Failure

Work Sheet No. 8: Watermain Breaks within the Distribution System

Watermain Breaks within the Distribution System

Activity or Process Step:

- Distribution

Description of Hazard:

- Watermain breaks within the distribution system

Potential Results of Hazard:

- Physical
- Biological
- Chemical
- Quantity
- Quality

Comments:

- No elevated distribution system; Tecumseh tower and continuously pumping from WUCTP needed

Available Monitoring & Control Measures:

- Customer complaints; low pressure or visual inspection
- General inspection of distribution system
- Controlling valves, looping and replacing watermain
- SCADA alarm system

Emergency Procedure or Contingency Plan:

- Customer complaints; low pressure or visual inspection
- General inspection of distribution system
- Controlling valves, looping and replacing watermain

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	4
		Consequence	2
		Detectability	3
		(High Risk Threshold = 8)	***Total*= 9** **(CCP = No)**

Control Procedure

- System reliability evaluations are regularly carried out as noted above.
- There is a need for response procedures because the Risk Analysis Ranking value is greater than the high-risk threshold.
- Follow SOP *Watermain Repair Category 1-2*
- Emergency Response Procedures:
  - ✓ 2.1 Boil Water Advisory;
  - ✓ 2.3 Loss of Primary Disinfection;
  - ✓ 2.4 Contamination of Water Transmission System;
  - ✓ 2.11 Watermain Break
  - ✓ 2.13 Street Flooding Due to Watermain Break
  - ✓ 2.17 Damage to Main Supply Transmission Line

Work Sheet No. 9: Loss of Chlorine Residual (Secondary Disinfection)

Loss of Chlorine Residual (Secondary Disinfection)

Activity or Process Step:

- Distribution

Description of Hazard:

- Loss of chlorine residual (secondary disinfection)

Potential Results of Hazard:

- Biological

Comments:

- Legislated under O.Reg. 170/03

Available Monitoring & Control Measures:

- Weekly monitoring chlorine residuals throughout the distribution system

Emergency Procedure or Contingency Plan:

- Flush affected area to increase Cl_2 residual
- Follow corrective actions required by O.Reg. 170/03.
- Resample and follow corrective action as per SOP

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	2
		Consequence	3
		Detectability	3
		(High Risk Threshold = 8)	***Total*= 8** **(CCP = Yes)**

Control Procedure

- There is a need for control procedures because the Risk Analysis Ranking value is greater than the High-Risk Threshold, and through the CCP Decision Tree, maintenance of chlorine residual / secondary disinfection is determined to be a critical control point.
- Requirements for corrective action under O.Reg.170/03
- Follow SOP for *Low Chlorine Result Procedure*
- Emergency Response Procedures:
  - ✓ 2.1 Boil Water Advisory;
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.3 Loss of Primary Disinfectant (Chlorine);
  - ✓ 2.14 Water Shortage;
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 10: Commissioning New Watermains Causing Contamination

Commissioning New Watermains Causing Contamination

Activity or Process Step:

- Distribution

Description of Hazard:

- Commissioning new watermains causing contamination

Potential Results of Hazard:

- Biological
- Chemical

Comments:

- None

Available Monitoring & Control Measures:

- Follow SOP's as per C*ommissioning New Watermain*
- Check Cl_2 residuals
- Take microbiological testing

Emergency Procedure or Contingency Plan:

- Follow corrective action as per O.Reg.170/03
- If necessary, communicate issuance of boil water after consultation with MOH

Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	3
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 5** **(CCP = Yes)**

Control Procedure

- While the high-risk threshold was not reached for this hazardous event, "Commissioning New Watermains causing contamination" is determined a critical control point (following the CCP Decision Tree) because it can directly introduce contamination to the distribution system and can be controlled with proper disinfection.
- Follow control procedures as noted above.
- Emergency Response procedures:
  - ✓ 2.1 Boil Water Advisory (if bacteriological)
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.11 Watermain Break
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 11: Loss of Pressure Resulting from a Watermain Break

Loss of Pressure Resulting from a Watermain Break

Activity or Process Step:

- Distribution

Description of Hazard:

- Loss of pressure due to watermain break

Potential Results of Hazard:

- Biological
- Chemical
- Physical
- Low pressure back-siphoning

Comments:

- None

Available Monitoring & Control Measures:

- Consumer complaints
- Pressure gauges on boundary meters and tower monitored and alarmed by SCADA
- Backflow prevention by-law and program

Emergency Procedure or Contingency Plan:

- Check pressures in affected area. If necessary, discuss with MOH and MECP/SAC
- If necessary, issue water advisory in consultation with MOH as per SOP
- Restore pressure and chlorine residuals and conduct testing and sampling in effected area
- Notify (WUCTP) of low-pressure alarms

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	2
		Consequence	4
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 7** **(CCP = Yes)**

Control Procedure

- System reliability / redundancy measures are in place, as noted in monitoring and control measures above.
- While the high-risk threshold was not reached for this hazardous event, backflow prevention is considered CCP's (following CCP Decision Tree) – as contaminants can be directly introduced to distribution system and with pressure and backflow prevention program monitoring and response, could be prevented.
- Follow SOP *Watermain Repair Category 2*
- Emergency Response procedures:
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 12: Bacteriological Test Failure

Bacteriological Test Failure

Activity or Process Step:

- Distribution

Description of Hazard:

- Bacteriological test failure

Potential Results of Hazard:

- Biological

Comments:

- Legislated under O.Reg. 170/03

Available Monitoring & Control Measures:

- Weekly monitoring: bacteriological testing throughout the distribution system

Emergency Procedure or Contingency Plan:

- Contact MOH, MECP & SAC
- Communicate water advisory issued by MOH
- Sample water quality and take tower offline until two consecutive sample are negative within 48hrs
- Flush affected area to increase Cl_2 residual
- Follow corrective actions required by O.Reg. 170/03.
- Follow SOP *Bad Sample or Adverse Water Quality*

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	3
		Consequence	3
		Detectability	2
		(High Risk Threshold = 8)	***Total*= 8** **(CCP = Yes)**

Control Procedure

- There is a need for control procedures because the Risk Analysis Ranking value is greater than the high-risk threshold and is determined a CCP (through CCP Decision Tree) because contamination is direct to distribution system and response and contingency actions can be taken to address the issue.
- Requirements for corrective action under O.Reg.170/03
- Emergency Response Procedures:
  - ✓ 2.1 Boil Water Advisory;
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.3 Loss of Primary Disinfection (Chlorine)
  - ✓ 2.14 Water Shortage;
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 13: Failure of Backflow Prevention Device

Failure of Backflow Prevention Device

Activity or Process Step:

- Distribution

Description of Hazard:

- Failure of Backflow Prevention Device

Potential Results of Hazard:

- Biological
- Chemical

Comments:

- Backflow preventers on all connections of concern

Available Monitoring & Control Measures:

- Visual on- site inspection
- Backflow prevention by-law and program

Emergency Procedure or Contingency Plan:

- If backflow is suspected, report to MOH and MECP, SAC
- Isolate area. Flush the system and sample as needed. Re-pressurize system

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	4
		Detectability	4
		(High Risk Threshold = 8)	***Total*= 9** **(CCP = Yes)**

Control Procedure

Backflow prevention is considered a CCP (following CCP Decision Tree) – as contaminants can be directly introduced to distribution system and with pressure and backflow prevention program monitoring and response, could be prevented.

- Emergency Response procedures:
  - ✓ 2.1 Boil Water Advisory (if bacteriological contamination);
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.14 Water Shortage
  - ✓ 2.15 Failure of Control Systems
  - ✓ 2.16 Establishing Potable Water Filling Stations
  - ✓ 2.18 Equipment Failure

Work Sheet No. 14: Adverse Drinking Water Lead Results

Adverse Drinking Water Lead Results

Activity or Process Step:

- Distribution

Description of Hazard:

- Adverse drinking water lead results

Potential Results of Hazard:

- Biological
- Chemical
- Positive lead sample from testing

Comments:

- Will follow legislations and Regulations as mandated by the MECP

Available Monitoring & Control Measures:

- Follow SOP *Community Lead Testing Program*

Emergency Procedure or Contingency Plan:

- O.Reg. 170/03 mandating every water system in Ontario to test for lead in the drinking water

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	2
		Detectability	2
		(High Risk Threshold = 8)	***Total*= 5** **(CCP = No)**

Control Procedure

- There is no need for control procedures because the Risk Analysis Ranking value is less than the high-risk threshold.
- Emergency Response procedures:
  - ✓ 2.2 Adverse Laboratory Water Quality Results

Work Sheet No. 15: Extreme Cold/Heat/Long-term Impacts of Climate Change

Extreme Cold/Heat/Long-term Impacts of Climate Change

Activity or Process Step:

- Distribution

Description of Hazard:

- Extreme cold / heat / long-term impacts of climate change (including frozen pipes, potential for wildfires)

Potential Results of Hazard:

- Maintain fire protection
- No access to water from the distribution system if pipes are frozen
- Maintain reliable and safe drinking water to customers

Comments:

- None

Available Monitoring & Control Measures:

- SCADA (re: major fire); freezing conditions (re: alarms for water tower boundary meters)

Emergency Procedure or Contingency Plan:

- Emergency Response Plan

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	1
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 3** **(CCP = No)**

Control Procedure

- There is no need for control procedures because the Risk Analysis Ranking value is less than the high-risk threshold.
- Emergency Response procedures:
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations
  - ✓ 2.19 Serve Storm (tornado, Wind, Hurricane, Winter Storm etc.)

Work Sheet No. 16: Loss of Pressure Resulting from Major Fire

Loss of Pressure Resulting from Major Fire

Activity or Process Step:

- Distribution

Description of Hazard:

- Loss of pressure due to major fire

Potential Results of Hazard:

- Physical
- Chemical
- Low pressure back-siphoning
- Biological

Comments:

- None

Available Monitoring & Control Measures:

- Notification from the fire department
- Consumer complaints
- Pressure gauges on boundary meters and tower monitored and alarmed by SCADA
- Backflow prevention

Emergency Procedure or Contingency Plan:

- Check pressures in effected area. If necessary, discuss with MOH and MECP/SAC
- If necessary, issue water advisory with consultation of MOH as per SOP *Bad Sample or Adverse Water Quality*
- Restore pressure and chlorine residuals and conduct testing and sampling in effected area
- Notify (WUCTP) of low-pressure alarms

Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	3
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 5** **(CCP = Yes)**

Control Procedure

Backflow prevention is considered a CCP (following CCP Decision Tree) – as contaminants can be directly introduced to distribution system and with pressure and backflow prevention program monitoring and response, could be prevented.

- Emergency Response procedures:
  - ✓ 2.1 Boil Water Advisory (if bacteriological contamination);
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.10 Major Fire at any Facility
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 17: Loss of System Pressure

Loss of System Pressure

Activity or Process Step:

- Distribution

Description of Hazard:

- Loss of system pressure

Potential Results of Hazard:

- Physical
- Chemical
- Low pressure back-siphoning
- Biological

Comments:

- None

Available Monitoring & Control Measures:

- Consumer complaints
- Pressure gauges on boundary meters and tower monitored and alarmed by SCADA
- Backflow prevention

Emergency Procedure or Contingency Plan:

- Check pressures in effected area If necessary discuss with MOH and MECP/SAC
- If necessary, issue water advisory with consultation of MOH as per SOP *Bad Sample or Adverse Water Quality*
- Restore pressure and chlorine residuals and conduct testing and sampling in effected area
- Notify (WUCTP) of low pressure alarms

Risk Analysis Ranking		*RISK ANALYSIS*	*RANKING*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	3
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 5** **(CCP = Yes)**

Control Procedure

Backflow prevention is considered a CCP (following CCP Decision Tree) – as contaminants can be directly introduced to distribution system and with pressure and backflow prevention program monitoring and response, could be prevented.

- Emergency Response procedures:
  - ✓ 2.1 Boil Water Advisory (if bacteriological contamination);
  - ✓ 2.2 Adverse Laboratory Water Quality Results;
  - ✓ 2.4 Contamination of Water Transmission System
  - ✓ 2.14 Water Shortage
  - ✓ 2.16 Establishing Potable Water Filling Stations

Work Sheet No. 18: Staff Shortage

Staff Shortage

Activity or Process Step:

- Distribution

Description of Hazard:

- Staff shortage
  (due to lottery, retirements, Illness /Pandemic, Strike/Lock-out)

Potential Results of Hazard:

- Physical
- Chemical
- Biological

Comments:

- No Control

Available Monitoring & Control Measures:

- Collective Agreements for both outside and inside workers
- Attendance/medical records
- MOH health advisory's
- Town's Wellness Committee

Emergency Procedure or Contingency Plan:

- Having the proper amount of Water Operators
- The ORO has a Class III Water Distribution Operators License
- The ORO has the required competencies to maintain the water distribution system.
- Town of Tecumseh Water Division Emergency Response Plan
- Will contract outside license water operators to assist the ORO if necessary

Risk Analysis Ranking		*Risk Analysis*	*Ranking*
[A] LIKELIHOOD 1 to 5 [B] CONSEQUENCE 1 to 5 [C] DETECTABILITY 1 to 5 *[A] + [B] +[C] = Total*	3 to 5 = LOW 6 to 7 = MODERATE 8 to 11= HIGH 12 to 15 = VERY HIGH	**Likelihood**	1
		Consequence	4
		Detectability	1
		(High Risk Threshold = 8)	***Total*= 6** **(CCP = No)**

Control Procedure

- Adequate staffing levels assured through personnel coverage, competency requirements achieved, and other monitoring, control and contingency measures identified above.

Appendix 5 – Essential Supplies and Services

A list of supplies and services has been developed and is provided below. The list includes suppliers / service providers for each essential supply and service. A secondary source is also listed for each supply and service to ensure supplies and services are available as needed. This list is reviewed by the Manager, Water and Wastewater to ensure that it is current and up-to-date.

All supplies and services shall meet AWWA and NSF/ANSI standards; these purchases must be in accordance with the Town of Tecumseh By-Law 2017-63, a by-law to govern procurement and procedures.

Essential Supplies and Service List		
Product/Service	**Primary Source**	**Secondary Source**
Treated Drinking Water Supply	Windsor Utilities Commission P.O. Box 1625, Station A 4545 Rhodes Drive Windsor, ON N8W 5T1 Tel: 519-251-7300 Fax: 519-255-7423 www.enwin.com	Refer to the Water Division Emergency Response Plan Section 2, Sub-Section 2.16 "Establishing Potable Water Filling Stations"
Accredited Laboratory Services	Caduceon Environmental Laboratories 3201 Marentette Ave. Windsor, ON N8X 4G3 Tel: 519-966-9541 Fax: 519-966-9567 contactwindsor@caduceonlabs.com	SGS Environmental Services 657 Consortium Crt. London, ON N6E 2S8 Tel: 519-672-4500 Fax: 519-672-0361 emily.crowey@sgs.com
Instrumentation Calibration	SCG Flowmetrix 2088 Jetstream Rd London, ON N5V 3P6 Tel: 519-870-3569 Fax: 519-268-3459 service@flowmetrix.ca	ACI Instrumentation Limited 14 Gormley Idustrial Ave, Unit 5 Gormley, ON L0H 1G0 Tel: 905-888-0063 Fax: 905-888-6381 bhadresa@aciltd.ca
Meter Supply & Service	Evans Utility and Municipal Products Supply Limited 338 Neptune Crescent London, ON N6M 1A1 Tel: 519-453-6515 Fax: 519-453-7756 www.evansupply.com	Emco Waterworks 5255 County Rd 42 Windsor, ON N8N 2M1 Tel: 519-944-3626 Fax: 519-948-4210 www.emcoltd.com

Essential Supplies and Service List		
Product/Service	**Primary Source**	**Secondary Source**
AMR/ERT Supply & Service	Emco Waterworks 5255 County Rd 42 Windsor, ON N8N 2M1 Tel: 519-944-3626 Fax: 519-948-4210 www.emcoltd.com	Itron Headquarters 2111 N Molter Rd Liberty Lake, WA 99019 Tech Support 1-877-487-6602 Chris.Jay@wolseleyinc.ca
Health & Safety Supplies	Great Lakes Safety Supply 3303 Walker Rd. Windsor, ON N8W 3R9 Tel: 519-972-6605 Fax: 519-972-6620 sales@glspi.com	HD Supply 3350 North Talbot Rd. Tecumseh, ON Tel: 519-737-7023 Fax: 519-737-9157 Meredith.stpierre@hdsupply.com
SCADA & Instrumentation	Summa Engineering Limited 3230 American Drive Mississauga, ON L4V 1B3 Tel: 905-678-3388 Fax: 905-678-0444 www.summaeng.com	Onyx Engineering Ltd. 2960 Jefferson Blvd. Windsor, ON N8T 3J2 Tel: 519-948-4324 sales@onyxengineering.com
Construction Contracting Services	Coco Paving Inc. 6725 South Service Road East Windsor, ON N8N 2M1 Tel: 519-948-7133 Fax: 519-948-7469 www.cocogroup.com	Amico Contracting and Engineering 2199 Blackacre Drive Oldcastle, ON N0R 1L0 Tel: 519-737-1577 Fax: 519-737-1929 sdraper@triamico.com
Distribution Parts	Emco Waterworks 5255 County Rd 42 Windsor, ON N8N 2M1 Tel: 519-944-3626 Fax: 519-948-4210 www.emcoltd.com	Underground Specialties Wolseley 5340 Walker Road Oldcastle, ON N0R 1L0 Tel: 519737-1263 Fax: 519-737-1712 bob.bezaire@wolseleyinc.ca
Disinfectant (Sodium Hypochlorite)	Emco Waterworks 5255 County Rd 42 Windsor, ON N8N 2M1 Tel: 519-944-3626 Fax: 519-948-4210 www.emcoltd.com	Underground Specialties Wolseley 5340 Walker Road Oldcastle, ON N0R 1L0 Tel: 519737-1263 Fax: 519-737-1712 bob.bezaire@wolseleyinc.ca

Essential Supplies and Service List		
Product/Service	**Primary Source**	**Secondary Source**
Water Testing Supplies	SCG Flowmetrix 2088 Jetstream Rd London, ON N5V 3P6 Tel: 519-870-3569 Fax: 519-268-3459 service@flowmetrix.ca	Hach Canada 3020 Gore Rd London, ON N5V 4T7 Tel: 800-665-7635 Fax: 866-259-0984 www.ca.hach.com
Locators	Ontario One Call 104 Cooper Dr, Suite 1 Guelph, ON N1C 1C3 Tel: 800-400-2255 solutions@accu-link.ca	G-Tel Engineering 1150 Frances Street London, ON N5W 5N5 Tel: 866-692-0208 Fax: 866-692-0809 bgowan@gtel.ca
Communications Supplies	Information Services Corporation of the Town of Tecumseh 917 Lesperance Road Tecumseh, ON N8N 1W9 Tel: 519-735-2184 sfuerth@tecumseh.ca	Kelcom 363 Eugenie St. E. Windsor, ON N8X 2Y2 Tel: 519-250-5070 www.kelcom.com
Computer Systems Supplies	Information Services Corporation of the Town of Tecumseh 917 Lesperance Road Tecumseh, ON N8N 1W9 Tel: 519-735-2184 sfuerth@tecumseh.ca	Summa Engineering Limited 3230 American Drive Mississauga, ON L4V 1B3 Tel: 905-678-3388 Fax: 905-678-0444 www.summaeng.com ONYX Engineering 2960 Jefferson Blvd. Windsor, ON N8T 3J2 Tel: 519-948-4324 Ext 210 Fax: 519-948-4840
Answering Service	Environmental Services Corporation of the Town of Tecumseh 917 Lesperance Road Tecumseh, ON N8N 1W9 Tel: 519-735-2184	After hour call Kelcom answering service Tel: 519-971-2866

Appendix 6 Public Works & Environmental Services Capital Works Plan

The Corporation of the Town of Tecumseh

Public Works & Environmental Services

To:	Mayor and Members of Council
From:	Phil Bartnik, Director Public Works & Environmental Services
Date to Council:	December 8, 2020
Report Number:	PWES-2020-33
Subject:	Pre-Approval of 2021 Public Works & Environmental Services Capital Works Projects

Recommendations

It is recommended:

That the following Public Works & Environmental Services projects for the 2021 year, **be approved**:

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Pre-Approval of 2021 Public Works & Environmental Services Capital Works Projects Page 2 of 55

	Previously Approved	Requested for 2021	Future Costs	Total Costs
Sidewalk Projects				
1. Sidewalk Repair Program - Various Locations	$ -	$ 69,000	$ -	$ 69,000
Sub-Total	$ -	$ 69,000	$ -	$ 69,000
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ -	$ -
Sidewalk Lifecycle Reserve:	$ -	$ 69,000	$ -	$ 69,000
New Infrastructure				
1. Riverside Drive Trail	$ 850,000	$ 351,800	$ -	$ 1,201,800
2. CR42: CR19 to CR43 (Sidewalks and Bike Lanes)	$ 90,000	$ -	$ 618,500	$ 708,500
3. Lesperance Road Trail (CR22 to CR42)	$ -	$ 137,500	$ 1,066,500	$ 1,204,000
4. Malden Road Pathway Extension	$ -	$ 25,000	$ -	$ 25,000
5. CWATS Study - Pike Creek/Tecumseh Road	$ 6,000	$ -	$ -	$ 6,000
Sub-Total:	$ 946,000	$ 514,300	$ 1,685,000	$ 3,145,300
Grants:	$ -	$ -	$ 466,707	$ 466,707
Recoveries:	$ -	$ -	$ -	$ -
Infrastructure Reserve:	$ 946,000	$ 514,300	$ 1,218,293	$ 2,678,593

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Pre-Approval of 2021 Public Works & Environmental Services Capital Works Projects Page 3 of 55

	Previously Approved	Requested for 2021	Future Costs	Total Costs
Road Projects				
1. Road Paving - Tar & Chip	$ -	$ 100,000	$ -	$ 100,000
2. Road Paving - Asphalting	$ -	$ 1,100,000	$ -	$ 1,100,000
3. Road Paving - Crack Sealing	$ -	$ 100,000	$ -	$ 100,000
4. TTMP Bicycle Sharrows	$ -	$ 15,000	$ -	$ 15,000
5. CR42/43 Construction	$ 22,450	$ -	$ 24,850	$ 47,300
6. Tecumseh Hamlet SPA EA FSR	$ 30,250	$ 67,750	$ -	$ 98,000
7. Tecumseh Sigange Project	$ 16,000	$ -	$ -	$ 16,000
8. Lesperance/VIA Rail Improvements	$ 155,000	$ 1,279,300	$ -	$ 1,434,300
9. Tecumseh Road CIP - Streetscape Plan & Final Design	$ 1,422,640	$ -	$ 27,908,927	$ 29,331,567
10. Manning Road/ETLD Drain Relocation - Phase 2	$ 54,500	$ 787,900	$ -	$ 842,400
11. Manning Road Reconstruction - Phase 3	$ 225,500	$ 100,000	$ 6,578,400	$ 6,903,900
12. Sylvestre Drive Sanitary Sewer Extension	$ 94,000	$ -	$ 1,020,000	$ 1,114,000
13. Brighton Road Traffic Improvements	$ -	$ 30,000	$ -	$ 30,000
14. Various Watermain Replacement Projects 2021	$ -	$ 23,100	$ -	$ 23,100
15. Scully & St. Mark'sStorm PS/Riverside Drive	$ 43,600	$ 84,000	$ 1,400,400	$ 1,528,000
16. Cty Rd 46/Webster/Laval Sanitary Sewer Extension	$ 120,750	$ -	$ 1,982,050	$ 2,102,800
17. Del Duca Drive Sanitary Sewer	$ 92,450	$ 20,000	$ 1,336,050	$ 1,448,500
18. Lanoue Street Improvements	$ 363,300	$ 125,000	$ 503,200	$ 991,500
19. Tecumseh Road Sanitary Sewer	$ 404,500	$ -	$ -	$ 404,500
20. Tecumseh Road Path - Arlington to DM Eagle	$ 100,000	$ -	$ -	$ 100,000
21. Traffic Signal Controller Update	$ 150,000	$ -	$ -	$ 150,000
22. Expansion/Improvements PW Yard (North)	$ 30,000	$ 30,000	$ -	$ 60,000
23. CP/Lesperance Crossing Improvements	$ -	$ 30,000	$ -	$ 30,000
24. Traffic Calming Guideline Study	$ 20,000	$ -	$ -	$ 20,000
25. Annual Project Contingency	$ -	$ 250,000	$ -	$ 250,000
26. PJ Cecile Storm Pump Station	$ -	$ 14,000	$ 260,000	$ 274,000
Sub-Total:	$ 3,344,940	$ 4,156,050	$ 41,013,877	$ 48,514,867
Grants:	$ -	$ -	$ 525,000	$ 525,000
Recoveries:	$ -	$ -	$ 1,295,000	$ 1,295,000
Road Lifecycle Reserve:	$ 3,344,940	$ 4,156,050	$ 39,193,877	$ 46,694,867
Bridge Projects				
1. Bridge #1005 - Pike Creek Drain at Baseline Road	$ -	$ 250,000	$ -	$ 250,000
2. Culvert #42 - Snake Lane Road	$ -	$ 62,300	$ 487,500	$ 549,800
3. Culvert #53 - Snake Lane Road	$ -	$ 65,100	$ 572,500	$ 637,600
4. Culvert #54 - Snake Lane Road	$ -	$ 65,100	$ 572,500	$ 637,600
Sub-Total:	$ -	$ 442,500	$ 1,632,500	$ 2,075,000
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ -	$ -
Bridges Lifecycle Reserve:	$ -	$ 442,500	$ 1,632,500	$ 2,075,000

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	Previously Approved	Requested for 2021	Future Costs	Total Costs
Water Projects				
1. Tecumseh Road CIP - Streetscape Plan & Final Design	$ 50,250	$ -	$ 1,292,686	$ 1,342,936
2. Manning Road/ETLD Drain Relocation - Phase 2	$ 31,000	$ 1,038,300	$ -	$ 1,069,300
3. Fire Hydrant Reflectors	$ -	$ 15,000	$ -	$ 15,000
4. Banwell Watermain - Intersection to South of CPR	$ -	$ 130,900	$ 607,100	$ 738,000
5. Various Watermain Replacement Projects 2021	$ -	$ 1,085,000	$ -	$ 1,085,000
6. Hwy3-CR34 Water Valve Replacement	$ -	$ 456,300	$ -	$ 456,300
7. Hwy#3/County Road 11 Watermain Replacement	$ 1,826,300	$ -	$ -	$ 1,826,300
8. Watermain Anode Program - Inspection/Replacement	$ -	$ 200,000	$ -	$ 200,000
9. Tecumseh Hamlet SPA EA FSR	$ 30,250	$ 67,750	$ -	$ 98,000
10. Cty Rd 46/Webster Laval Sanitary Sewer Exten.	$ 80,400	$ -	$ 1,240,400	$ 1,320,800
11. Del Duca Drive Sanitary Sewer	$ 5,550	$ -	$ 25,250	$ 30,800
12. CR42/43 Construction	$ 758,600	$ -	$ 410,400	$ 1,169,000
13. 2020 Water and Wastewater Rates Study	$ 10,000	$ -	$ -	$ 10,000
Sub-Total:	$ 2,792,350	$ 2,993,250	$ 3,575,836	$ 9,361,436
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ -	$ -
Watermain Reserve Fund:	$ 2,792,350	$ 2,993,250	$ 3,575,836	$ 9,361,436
Wastewater Projects				
1. Tecumseh Road CIP - Streetscape Plan & Final Design	$ 63,500	$ -	$ 1,246,436	$ 1,309,936
2. Sylvestre Drive Sanitary Sewer Extension	$ 186,800	$ -	$ 542,500	$ 729,300
3. Manhole Restoration Program	$ 75,000	$ 50,000	$ -	$ 125,000
4. Tecumseh Hamlet SPA EA FSR	$ 30,250	$ 82,750	$ -	$ 113,000
5. Cty Rd 46/Webster/Laval Sanitary Sewer Exten.	$ 166,700	$ -	$ 1,290,100	$ 1,456,800
6. Scully & St. Mark's Storm PS/Riverside Drive	$ 20,550	$ 78,000	$ 316,450	$ 415,000
7. Del Duca Drive Sanitary Sewer	$ 148,500	$ 40,000	$ 1,047,200	$ 1,235,700
8. CR42/43 Construction	$ 44,900	$ 30,000	$ 747,100	$ 822,000
9. Tecumseh Road Sanitary Sewer	$ 1,839,000	$ -	$ -	$ 1,839,000
10. Sanitary Sewer Model Update	$ 295,000	$ 20,000	$ -	$ 315,000
11. 2020 Water and Wastewater Rates Study	$ 10,000	$ -	$ -	$ 10,000
Sub-Total:	$ 2,880,200	$ 300,750	$ 5,189,786	$ 8,370,736
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ 3,546,300	$ 3,546,300
Wastewater Sewers Reserve Fund:	$ 2,880,200	$ 300,750	$ 1,643,486	$ 4,824,436
Wastewater Facility Projects				
1. Sylvestre Drive Sanitary PS Improvements	$ 15,000	$ 15,000	$ 113,000	$ 143,000
2. Lakewood Sanitary PS Improvements	$ 7,500	$ 25,000	$ 56,000	$ 88,500
3. St. Alphonse Sanitary PS Improvements	$ -	$ 31,500	$ -	$ 31,500
Sub-Total:	$ 22,500	$ 71,500	$ 169,000	$ 263,000
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ -	$ -
Wastewater Facilities Reserve Fund:	$ 22,500	$ 71,500	$ 169,000	$ 263,000

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	Previously Approved	Requested for 2021	Future Costs	Total Costs
Stormwater Projects				
1. Tecumseh Road CIP - Streetscape Plan & Final Design	$ 68,310	$ -	$ 701,690	$ 770,000
2. Manning Road/ETLD Drain Relocation - Phase 2	$ 71,000	$ 1,769,600	$ -	$ 1,840,600
3. Manning Road Reconstruction - Phase 3	$ 2,500	$ -	$ 319,600	$ 322,100
4. Riverside Drive Trail (Lesperance-Manning)	$ -	$ 37,500	$ -	$ 37,500
5. Lesperance/VIA Rail Improvements	$ 31,000	$ 131,500	$ -	$ 162,500
6. Sylvestre Drive Sanitary Sewer Extension	$ 4,200	$ -	$ 49,900	$ 54,100
7. Brighton Road Storm PS Repairs	$ -	$ 75,000	$ -	$ 75,000
8. Manhole Restoration Program	$ 75,000	$ 50,000	$ -	$ 125,000
9. Oldcastle Storm Drainage Master Plan	$ 450,000	$ 40,000	$ -	$ 490,000
10. Tecumseh Hamlet SPA EA FSR	$ 219,250	$ 276,750	$ -	$ 496,000
11. Cty Rd 46/Webster/Laval Sanitary Sewer Exten.	$ 77,400	$ -	$ 455,700	$ 533,100
12. Scully & St. Marks Storm PS/Riverside Drive	$ 733,100	$ 338,000	$ 14,035,900	$ 15,107,000
13. MRSPA Pond Design and Construction	$ 2,780,000	$ -	$ 9,955,000	$ 12,735,000
14. Del Duca Drive Sanitary Sewer	$ 125,850	$ 40,000	$ 964,850	$ 1,130,700
15. Lanoue Street Improvements	$ -	$ -	$ 55,500	$ 55,500
16. Shoreline Management Plan	$ 350,000	$ -	$ -	$ 350,000
17. Stormwater Rate Study	$ 45,000	$ -	$ -	$ 45,000
18. Turkey Creek Watershed Assessment - Phase 1	$ -	$ 60,000	$ -	$ 60,000
19. PJ Cecile Pump Station	$ -	$ 486,000	$ 8,940,000	$ 9,426,000
Sub-Total:	$ 5,032,610	$ 3,304,350	$ 35,478,140	$ 43,815,100
Grants:	$ 180,000	$ -	$ 10,700,000	$ 10,880,000
Recoveries:	$ -	$ -	$ -	$ -
Storm Sewer Lifecycle Reserve:	$ 4,852,610	$ 3,304,350	$ 24,778,140	$ 32,935,100
Municipal Drains				
1. Manning Road/ETLD Drain Relocation - Phase 2	$ 126,500	$ 3,465,900	$ -	$ 3,592,400
Sub-Total:	$ 126,500	$ 3,465,900	$ -	$ 3,592,400
Grants:	$ -	$ -	$ -	$ -
Recoveries:	$ -	$ -	$ -	$ -
Drains Lifecycle Reserve:	$ 126,500	$ 3,465,900	$ -	$ 3,592,400

Executive Summary

The Public Works & Environmental Services (PWES) Department is recommending the Pre-Approval of the 2021 PWES Capital Works Projects in advance of the adoption of the 2021 Budget (scheduled for Council's consideration in early 2021). This is in part to continue with projects previously approved in prior years which are at various stages of completion. Currently, numerous projects and studies are being undertaken covering many areas of the Town for both existing and future needs. Administration recommends continuing with these on-going projects in 2021 and further that a strategic planning session be arranged with Council to confirm the desired focus of the Town for the next 5 year PWES Capital Works planning horizon. Administration plans to bring forward a separate report to Council in early 2021 regarding the 2021-2025 Public Works & Environmental Services Five Year Capital Works Plan following these future discussions with Council regarding project prioritization.

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The total number of 2021 projects for PWES is 46, totalling $15.3M in requests for new allocation for 2021. It is important to note that many of these projects are on-going projects that are at various stages of completion. Of the 46 projects, approximately 20 are new projects. The new projects generally relate to water, sanitary and bridge repairs/improvements required to maintain existing infrastructure, as well as projects that are required to move forward based on funding agreements.

The notable projects and studies consist of the following:

- Finalization of various studies such as the Shoreline Management Plan, the Stormwater Rates Study, the Oldcastle Stormwater Master Plan and the Sanitary Sewer Model Update;
- Construction to continue on the watermain replacement project at Highway No.3/Walker Road;
- Construction of the Manning Road Improvement Project (Phase 2) to commence;
- Projects and initiatives that look to progress development opportunities within the Tecumseh Hamlet Secondary Plan Area and the Manning Road Secondary Plan Area;
- The continuation of detailed design for sanitary sewer expansions in the Oldcastle Hamlet;
- Detailed design and preparation for multiple culvert replacements which had been identified in the Culvert Needs Study (Spans <3.0 metres);
- Continued works on active transportation initiatives such as multi-use trails and roadway cycling markings;
- Implementation of the annual asphalting program;
- Continuation of Municipal Drain improvement and maintenance projects.

Details regarding each of the 2021 projects are provided within the following sections of this report including updates on the status of all in-progress projects.

Background

The projects listed above are intended to upgrade existing infrastructure while also providing for future development. The objective of the Pre-Approval of 2021 Public Works & Environmental Services (PWES) Capital Works Projects is to maintain a consistently high level of service and strive to improve the Town's infrastructure components through these improvements.

In general, most of the projects listed in this report for 2021 are on-going projects that require works to continue into 2021 in order to advance the projects. In addition to on-going projects, a number of new projects are recommended to satisfy applicable legislation and/or updated municipal standards. Administration plans to bring forward a separate report in early 2021 regarding the 2021-2025 Public Works & Environmental Services Five Year Capital Works Plan following future discussions with Council regarding project prioritization.

While projects have continued to move forward in 2020, there have been delays due to staff demands related to the Covid-19 pandemic and Lake Flood Preparedness. As we move into 2021, many uncertainties remain regarding the impact that the Covid-19 pandemic, and related government regulations, may have on the planned projects for 2021. Based on the current

state of the pandemic, it is reasonable to anticipate that unavoidable project delays may occur in 2021.

Comments

This section provides detailed information for all 2021 projects (i.e. both those previously approved and those newly proposed for 2021). Comments are provided by **road**, **sidewalks** and **pathways**, **bridge**, **water**, **wastewater**, **storm sewer** and **municipal drain** categories. Generally, the description for each project includes cost estimates for each of the related infrastructure categories (i.e. roads, water, wastewater, storm, etc.). The tables presented above in the recommendations section of this report, separate the cost of each project into the related infrastructure categories and include previously approved budget, requested budget for 2021, future budget needs and total category cost related to the specific project. In addition, the project descriptions generally include discussions on the main drivers requiring the projects to be undertaken.

Certain projects have been proposed to be phased in over a two-year period or multiple years. Generally, this occurs because either the project scope is too large or costly to be completed in one construction season or would be too disruptive over too large of an area and too long a period of time to the adjacent properties. Projects being phased would be tendered as two separate tender calls.

In addition, all new projects, and infrastructure replacement projects, will be designed to be compliant with the current requirements of the *Accessibility for Ontarians with Disabilities Act* (AODA).

Road Projects

Public Works staff review roads for inclusion in the annual paving program. The Town's Road Needs Study has been used for reference in conjunction with Public Works input and suggestions from Council and residents to form the basis for the recommended annual paving projects. PWES investigates and categorizes the needs based on the condition of the roads in comparison with other similar traffic volumes.

The list of roads proposed for tar and chip are based on Public Works staff review of observed conditions of the roads and maintenance needs in conjunction with Pavement Condition Index (PCI) ratings from the Road Needs Study. Based on this information, Administration recommends the installation of new tar and chip surfaces on the Sylvestre Drive (CR19 to Jamsyl Drive), Ruston Road (full extent) and Oldcastle Road (from Hwy 3 to approximately 500 m south of Hwy 3). Public Works also suggest earmarking an amount for remedial tar and chip repairs on roads other than those planned for. Every spring Public Works finds areas that require some repair from winter plowing activities, and this would be used to address those concerns.

Administration recommends that as part of the annual paving program, an amount be set aside for crack sealing of Town roads to extend the lifespan of the pavement before more substantial repairs or replacement are required. It is recommended that $100,000 be set aside for crack sealing.

RD 1. Tar & Chip, Asphalting and Crack Sealing

Work	**Budget Allocation**	Location of Work	Extent
Tar & Chip	$100,000	Sylvestre Drive Ruston Road Oldcastle Road	CR19 to Jamsyl Drive Full extent Hwy 3 to 500 m south
Asphalting	$1,100,000	Baseline Road Estate Park 8th Concession Road Gauthier Drive Chene Court Gouin Street Shawnee Road Lesperance Road Green Valley Drive Harvest Lane St. Gregory's Road	11th Conc to City of Windsor Talthorpe to Talthorpe CR46 to City of Windsor Little River to Cedarwood Full extent Herbert to Shawnee Gouin to Maissoneuve CR22 to Arbour Tecumseh to Meadowland Full extent Manning to Green Valley
Crack Sealing	$100,000	Various locations	To be determined

Administration recommends that the above-noted road improvements be undertaken in 2021. Inspection and project administration will be carried out by Public Work & Environmental Services staff upon award of the Contract by Council. Quality control of the materials will be carried out by a Consulting Geotechnical Engineer.

Funding to be provide from Road Lifecycle Reserve in the amount of $1,300,000.

RD 2. Tecumseh Signage Project

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$16,000	**$0**	$0	$16,000

In response to various Councilor inquiries regarding Town of Tecumseh existing and new signage, Administration completed an inventory of existing signage within the Town. As a result of this inventory, it was confirmed that the existing signage varies greatly in design, branding, size, road classification, location and age. Based on these findings, Council approved Administration's recommendation that a study be undertaken as part of the 2020 Capital Works Plan to develop criteria for signage to create consistency in design, branding and location selection. It was further recommended that Generator Design of Canada Inc. be retained to undertake this study based on their previous development of the 2014 Town of Tecumseh Branding Standards.

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Based on the above, Generator Design of Canada Inc. commenced the study in 2020. The study is nearing completion and will carry over into 2021.

Funding for this project was previously approved from the Road Lifecycle Reserve in the amount of $16,000.

RD 3. Lesperance/VIA Rail Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$186,000	**$1,410,800**	$0	$1,596,800

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to proceed with the detailed design for required improvements to the Lesperance/VIA Rail crossing in 2020 with construction anticipated in 2021. The need for these improvements was based on regulations established by Transport Canada on November 28, 2014 for on grade crossings. The new regulation stated that a railway company must assure the conformity of grade crossings within seven years of the new regulations coming into force. VIA inspected all grade crossings over its entire network and identified two rail crossings in the Town of Tecumseh – Lesperance Road north of Tecumseh Road (Mile: 99.31) and Tecumseh Road just west of Lacasse Blvd (Mile: 99.13).

In accordance with Article 12 of the new regulation, the Town retained Dillon Consulting Ltd. to assist with providing the required documentation and design parameters as outlined by VIA. Based on these investigations, VIA identified that minor improvements were required, such as faded road paint and consideration for additional safety features, as well as one major item at the crossing at Mile 99.31. VIA determined that the gradient for the road approach at Mile 99.31 exceeds the maximum gradient of 2% within 8 m of the nearest rail and 5% for 10 m beyond. At that time, it was the Town's understanding that the Town was required to regrade the approach by late 2021 and that failure to do so may lead Transport Canada to impose measures to address the required improvements.

At the July 28, 2020 Regular Meeting of Council, Council approved the recommendations (Motion RCM-236/20) of Report PWES-2020-24 titled "Rail Safety Improvement Program – Infrastructure, Technology and Research Funding (RSIP-ITR) 2021/2022 Intake VIA Crossing at Lesperance Road (Chatham Mile 99.31)" that Authorized the Town to submit an application for funding to this program for the VIA/Lesperance Rail Improvements Project. Subsequent to this meeting an application for funding was submitted. Since costs incurred prior to receiving the grant would likely be deemed ineligible for funding under this program, the continuation of detailed design for this project was deferred pending the results of the funding application. To date the results of the funding application have not been received.

In addition, Administration has had recent discussions with Transport Canada regarding the requirements and timelines for improvements at this crossing. These discussions are on-going, however, it appears that the crossing may be "grandfathered in" unless we undertake works on the road or the crossing.

The estimated project cost of $1,596,800 includes $162,500 for storm sewers and $1,434,300 for road reconstruction.

Subject to funding approval, Administration recommends that the detailed design and construction of improvements to the Lesperance/VIA Rail crossing commence in 2021. It is further recommended that Dillon Consulting Ltd. continue with the detailed design including the preparation of tender documents, assistance with tendering, approvals and contract administration/construction observation based on their initial work related to the inspection of this crossing and their current involvement in the Tecumseh CIP/Streetscape project.

Funding for this project is to be provided from the following:

- Road Lifecycle Reserve in the amount of $1,279,300
- Storm Sewer Lifecycle Reserve in the amount of $131,500

RD 4. Lanoue Street Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$363,300	**$125,000**	$558,700	$1,047,000

The Town of Lakeshore is moving forward with the construction of Lanoue Street and Commercial Drive to provide a second connection from Manning Road to Amy Croft Drive. These works will include improvements to the Manning Road and Lanoue Street intersection. Lakeshore tendered their project in 2020 and has recently started construction. Improvements to the Manning/Lanoue intersection are expected to commence in 2021.

The Town of Tecumseh anticipates that Lanoue Street, from Manning Road to approximately 200 metres west of Manning Road, will require improvements when the vacant property at the southwest corner of the Manning Road and Lanoue Street intersection is developed. To accommodate the added traffic from this future development to Lanoue Street, it is anticipated that Lanoue Street will need to be widened to a three-lane cross-section to allow for a center left turning lane. It is also anticipated that the Lanoue Street improvements may require improvements to the Tecumseh side of the Manning/Lanoue intersection.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to proceed with the detailed design for the Lanoue Street Improvements in 2020 and also included an allowance for Tecumseh's share of the Manning/Lanoue intersection improvements. In accordance with this report, Stantec Consulting Ltd. was retained and the detailed design is nearing completion. Through the detailed design, it has been determined that utility relocations will be required as part of the road improvements project. In addition, new regulations from the Ontario Ministry of Environment, Conservation and Parks related to excess soil generated from construction projects are expected to be released in 2021. These new excess soil regulations will require additional geotechnical investigations to determine the type/quality of the excess soil including a plan for the intended re-use of same.

As noted above, improvements to Lanoue Street in both Tecumseh and Lakeshore will require improvements to the Manning/Lanoue intersection. Accordingly, a cost sharing agreement will be required between both municipalities and the County of Essex for the intersection improvements. Preliminary discussions regarding the required cost sharing agreement have occurred with Administration from Tecumseh, Lakeshore and the County of Essex. Administration will bring forward a future report to Council regarding cost sharing when these discussions are finalized.

Detailed design for the Lanoue Street Improvements project will continue into 2021. Administration recommends that the required utility relocations and the excess soil investigations commence in 2021 with construction tentatively planned for 2022 or 2023. Based on the recent cost sharing discussions, it is further recommended that an allowance of $250,000 be carried for potential costs associated with the Town's portion of the Manning/Lanoue intersection improvements.

The estimated project cost is $1,047,000, which includes $991,500 for road improvements and $55,500 for storm sewers.

Funding for this project is to be provided from the Road Lifecycle Reserve in the amount of $125,000.

RD 5. Tecumseh Road Community Improvement Plan (CIP) – Streetscape Plan & Design

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$1,604,700	**$0**	$31,149,740	$32,754,440

At the April 23, 2019 Public Meeting of Council, Council received (Motion PCM-25/19) PWES Report No. 2019-28 titled "Tecumseh Road Main Street CIP – Streetscape Plan and Design Project Update – April 2019" which provided a project update. General items discussed during the meeting included concerns related to potential traffic impacts, the need for additional public consultation and potential cost savings if existing above ground hydro/utilities are maintained in the Streetscape improvements beyond Phases I and II. Subsequent to this meeting, a detailed traffic model was developed for the CIP area to better understand the traffic impacts.

On February 19, 2020, a Public Information Centre (PIC) was held with Lanoue Street Residents to obtain feedback regarding the proposed improvements to Legion Alley and Lanoue Street. In addition, on February 20, 2020, a second PIC was held to provide the public with an update on the Phase 1 portion of the Tecumseh CIP/Detailed Streetscape Design and to obtain feedback. The second PIC included a traffic simulation video to show expected traffic movement within the improved streetscape corridor. Concerns/questions raised at the PICs generally related to the following:

- Potential increases in traffic and speed if Lanoue Street is changed to a 2-way street.
- Has traffic calming been considered?
- Configuration of Legion Alley - Could Legion Alley extend through the park to Beddel rather than to Lanoue?

- How will the decrease in lanes on Tecumseh Road impact traffic? Will alternative routes be used and cause negative impacts on other roads?
- Residents liked added pedestrian safety, connectivity between north and south sides of Tecumseh Road, reduced speed limits, etc.
- The addition of trees in the corridor is desired provided they are sustainability in the proposed urban streetscape environment.
- Questions were raised with how changes to street parking may impact businesses.
- Streetscape will add value to the area and draw people to the Tecumseh Community.
- Project timing, phasing and funding.

The project is expected to continue into 2021. A future report will be brought forward to Council with recommendations regarding a path forward for this project.

RD 6. Manning Road Improvements Project, Phase 3

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$228,000	**$100,000**	$6,898,000	$7,226,000

The Town completed a Class Environmental Assessment (EA) in April 2010 for improvements to the East Townline Drain (Manning Road) Storm Pump Station. The proposed upgrades to the pump station and drain enclosure along Manning Road provided an opportunity to improve this portion of Manning Road by constructing an urban cross-section that accommodates pedestrians, cyclists and urban design features to create an aesthetically pleasing gateway into Lakewood Park. The limits of the Class EA included Manning Road from Riverside Drive to St. Gregory's Road.

Construction of Phase 1 was completed in 2014 which included the construction of the storm pump station and associated facilities, and the reconstruction of a section of Riverside Drive (Manning Road to Christy Lane), including the roundabout at the Manning Road/Riverside Drive intersection.

At the December 13, 2016 Regular Meeting of Council, Council approved the recommendation (Motion RCM-442/16) of PWES Report No. 54/16 titled "2017-2021 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the engineering design for Phase 3 of this project. In accordance with that report, Dillon Consulting Ltd. was retained to compete the detailed design. Phase 3 generally relates to the road re-construction component of the project from Riverside Drive to St. Gregory's Road including improvements to an urban cross-section that accommodates pedestrians, cyclists and urban design features to create an aesthetically pleasing gateway into Lakewood Park.

The Town previously sought funding for this project under the following government funding programs:

- Disaster Mitigation and Adaptation Fund – 1st Intake
- Investing in Canada Infrastructure Program: Rural and Northern Communities Funding Stream – 2019 Intake

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Unfortunately, this project was not selected for funding under either funding program.

The design for this project has proceeded since 2017 with the most recent work related to pedestrian crosswalks at the proposed roundabouts. During this time, the original scope of the project expanded to include a new parking lot at Lakewood Park, flood control berming in Lakewood Park, road improvements on Little River Boulevard and the development of existing tree protection mitigation measures. In addition, significant effort has been expended on grant funding applications.

In addition to the above, new regulations from the Ontario Ministry of Environment, Conservation and Parks related to excess soil generated from construction projects are expected to be released in 2021. These new excess soil regulations will require additional geotechnical investigations to determine the type/quality of the excess soil including a plan for the intended re-use of same.

The Phase 3 project cost estimate is $7,226,000, which includes $6,903,900 for road works and $322,100 for storm sewers.

Expected recoveries from the County of Essex are anticipated to be $525,000 for a portion of the Bike Lanes (under the CWATS program), and $1,295,000 for a portion of the Manning Road reconstruction (under the Connecting Link Agreement). The estimated recoveries will be refined once the actual tender costs are known.

Administration recommends proceeding with the required excess soil investigations and updating/finalizing the design drawings/tender documents in 2021 with construction tentatively anticipated to proceed in 2022.

Funding for this project is to be provided from the Road Lifecycle Reserve in the amount of $100,000.

RD 7. Traffic Signal Controller Upgrades

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$150,000	**$0**	$0	$150,000

As part of the approved 2019-2023 Public Works & Environmental Services Five Year Capital Works Plan, Administration recommended that a yearly program be created to replace traffic signal controller equipment currently in use at the Town's signalized intersections. The Town utilizes electronic equipment that is compatible with the County of Essex highways infrastructure due to the many intersections on shared roads. The equipment currently in use is dated and replacement parts are no longer available. Both the Town and County road departments are transitioning towards the next generation of traffic controller equipment. This program will take multiple years to complete and coordination between both road departments will ensure seamless operation and the potential for integration in the future between the two systems. This project will continue in 2021.

Funding for this project was previously approved from the Road Lifecycle Reserve in the amount of $150,000.

RD 8. Expansion/Improvements to the Public Works Yard (North)

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$30,000	**$30,000**	$0	$60,000

Additional storage area is required for Public Works equipment and materials. As part of the approved 2019-2023 Public Works & Environmental Services Five Year Capital Works Plan, Administration recommended that the Lacasse Public Works yard be expanded westerly in 2019 to include a portion of the previous Town dog park which was closed approximately 10 years ago. It was recommended that the area be stripped of topsoil and that a treed earth berm be constructed around the perimeter of the site. Site modifications were to include construction of a gravel surface suitable for vehicle traffic and the construction of storage bins with concrete blocks.

To date, the following works have been completed:

- Removal of existing perimeter fence/shrubs and stripping of topsoil.
- New perimeter berm has been constructed with cedar/spruce tree screening and mulch.
- Drainage has been installed.
- Recycled aggregate has been placed and rough graded.
- A new waterline has been installed to the new wash bay.

The remaining works generally include the following:

- Construction of a concrete pad for material storage.
- Construction of an asphalt pad for dirt and gravel storage.
- Purchase and installation of mass concrete blocks for material storage separation walls.
- Construction of a concrete pad for the wash bay.
- Fine grading and compaction of recycled aggregate.

This project will carry over into 2021 with additional budget being required to complete the improvements.

Funding for this project is to be provided from the Road Lifecycle Reserve in the amount of $30,000.

RD 9. TTMP Bicycle Sharrows

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$15,000**	$0	$15,000

At the December 13, 2016 Regular Meeting of Council, Council received (Motion RCM-439/16) PWES Report No. 43/16 titled "Tecumseh Transportation Master Plan (TTMP) and approved the report being placed on the 30-day public review period.

The Tecumseh Transportation Master Plan (TTMP) provides a flexible and dynamic multi-modal transportation strategy that guides the provision of transportation service and networks by the Town of Tecumseh to the year 2034. The Tecumseh transportation system balances the needs of residents, businesses, and recreational users in a way that is fiscally responsible.

The TTMP was developed around four core themes:

- Improve the integration of the existing transportation networks
- Provide networks to encourage and facilitate transportation by Active Modes
- Provide infrastructure to serve demands at preferred Performance Targets
- Provide transportation systems that serve all citizens

The Town's Transportation Strategy identifies that the active transportation network will be improved over the life of the TTMP in order to address the principles and goals of the TTMP and to encourage sustainable transportation for all users. In addition, the TTMP notes that the Town of Tecumseh adopts a "complete streets" approach to the planning, design, operation, and maintenance of roads. The TTMP further notes that going forward, the Town will shift the focus of streets from a strong emphasis on auto mobility to a more balanced philosophy to better serve all modes to meet the needs of travellers of all ages and abilities.

One component of complete streets includes the assumption that cyclists will use the streets. This does not necessarily warrant a dedicated bicycle facility or that every street accommodate every type of cyclist, but a bikeway network must be considered to accommodate "interested cyclists", who have a desire to cycle, but may not currently feel safe doing so. One way to create this is shared lanes with markings. Vehicles and cyclists share the lanes with cyclists riding to the right of the vehicle. Markings such as Sharrows may be used where there is a desire to provide additional awareness to drivers that the lane is shared with cyclists.

As identified within the TTMP's Active Transportation Network, Administration recommends that Sharrows be painted on the following roads that are frequently used by cyclists:

- Little River Boulevard – Manning to Tecumseh/Windsor boundary
- Lacasse Boulevard – Full extent
- Arlington Boulevard – Full extent

Funding for this work is to be provided from the Road Lifecycle Reserve in the amount of $15,000.

RD 10. Brighton Road Traffic Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$30,000**	$0	$30,000

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to proceed with the 2019 capital works projects which included an engineering

assessment of the Brighton Road corridor (including intersection roads). In accordance with this report, Dillon Consulting Ltd. was retained and the study was completed in 2019.

At the November 12, 2019 Special Meeting of Council, Council received (Motion SCM-22/19) Report PWES-2019-48 titled" Brighton Road Corridor Review – Review of Intersection Traffic Control Operations, October 2019" which provided a number of recommendations for traffic improvements along this corridor including pavement markings, signage, enhanced pedestrian crossings, maintain the traffic circles with minor enhancements, traffic calming measures, etc.

Administration recommends moving forward with traffic circle enhancements (elevating the median splitters), pavement markings and signage improvements along portions of this corridor.

Funding for this project is to be provided from the Road Lifecycle Reserve in the amount of $30,000.

RD 11. CP/Lesperance Crossing Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$30,000**	$0	$30,000

Canadian Pacific Railway is planning to rehabilitate the existing CP Rail crossing on Lesperance Road. It is anticipated that the works will include removing the asphalt pavement and reinstating the granular base and bedding for the rail bed. Once the tracks are leveled, the crossing will be repaved. All works, including contract administration, will be under the control of CP Rail. The Town would assist with traffic control and detour setup. Once the crossing is rehabilitated, the cost of the works may be cost shared between the Town and CP Rail. It is recommended that an allowance of $30,000 be included in the 2021 Capital Works Plan in anticipation of a potential cost sharing with CP Rail.

Funding for this project is to be provided from the Road Lifecycle Reserve in the amount of $30,000.

RD 12. Traffic Calming Guideline Study

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$20,000	**$0**	$0	$20,000

Administration receives numerous complaints related to motor vehicles traveling above the post speed limit at many locations throughout the Town. As identified in the 2017 Tecumseh Transportation Master Plan (TTMP), one potential approach to improve this problem is the implementation of traffic calming principles (where appropriate). Traffic calming generally relates to physical devices aimed at slowing the speed of motorists to the desired speed, given the context of the street.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023

Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to proceed with a Traffic Calming Guideline Study in 2019. In accordance with this report, Dillon Consulting Ltd. was retained to complete the study.

The Traffic Calming Guideline Study was completed in 2020. Based on this study, a Speed Mitigation Guideline was developed which contains the following elements:

- A process for assessing the need for speed mitigation measures at locations identified by an area's stakeholders.
- A process for developing a Speed Mitigation Plan, in collaboration with project stakeholders.
- A process for assessing the feasibility of constructing traffic calming measures at these same locations.

Administration intends to bring forward a future report to Council in 2021 regarding this study.

Funding for this project was previously provided from the Road Lifecycle Reserve in the amount of $20,000.

RD 13. Annual Project Contingency

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$250,000**	$0	$250,000

Administration recommends carrying an Annual Project Contingency for Public Works and Environmental Services. This allocation would be used for issues that come up annually that cannot be projected during the preparation of the Five Year Capital Works Plan for Roads, Water, Wastewater, Storm Sewers, Bridges and Sidewalks. It is recommended that this allocation would be used to address issues in a timely and efficient manner in accordance with the Town Purchasing and Procurement Policies.

Funding for this Annual Project Contingency is to be provided from the Road Lifecycle Reserve in the amount of $250,000.

RD 14. CWATS Study for Facility Enhancements for Crossing at Pike Creek/Tecumseh Road

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$6,000	**$0**	$0	$6,000

At the September 2020 Regular Meeting of Council, Council approved the recommendations (Motion RCM-281/20) of Planning & Building Services Report No. PBS-2020-32 titled "County Wide Active Transportation System, Town of Tecumseh 2021 Proposed Projects – Study for Facility Enhancement for Crossing at Pike Creek/Tecumseh Road". The total estimated cost of the study is $20,000, of which the Town of Tecumseh and the Town of Lakeshore will provide

a contribution of $6,000 each, for a total of $12,000 (60%), with the County of Essex's share being $8,000 (40%), in accordance with the CWATS cost-sharing agreement.

Funding for this project was previously approved from the Infrastructure Reserve in the amount of $6,000.

Sidewalks and Pathway Projects

SW 1. 2021 Sidewalk Repair Projects

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$69,000**	$0	$69,000

The 2021 sidewalk program will be based on sidewalk conditions determined through the comprehensive sidewalk inspection conducted annually. Currently this inspection is completed by Public Works staff and, along with input from Council and residents, this information is used to develop the annual program for recommended sidewalk repair and replacements. Should this inspection generate large amounts of sidewalk replacement, a Request for Quotation (RFQ) will be issued.

Trip hazards identified throughout the Town will be addressed to keep the Town in compliance with minimum maintenance standards. Currently, a detailed list of sidewalks to be repaired/ replaced has not been generated. The funding requested is for an upset limit to carry out the work. A detailed list of recommended sidewalk replacements will be circulated to Council for their information prior to issuing the RFQ. Inspection and project administration will be carried out by PWES Staff upon award of the Contract.

Funding for this project is to be provided from the Sidewalk Lifecycle Reserve in the amount of $69,000.

SW 2. County Road 42 Sidewalks and Bike Lanes (2020 - CR19/CR42 Roundabout)

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$90,000	**$0**	$618,500	$708,500

As part of the County of Essex 25-year capacity program, County Road 42 and County Road 43 road improvements were identified and the County of Essex engaged Dillon Consulting Ltd. to undertake the detailed design for the following:

- Widening of County Road 42 from the City of Windsor border with the Town of Tecumseh to the Pike Creek located in the Town of Lakeshore.
- Diversion of County Road 43 from Shields Avenue to approximately 250 metres south of County Road 42.

The County of Essex is proposing to complete the County Road 42 improvements in a number of phases. The County's original schedule was to construct the County Road 19/42 roundabout

in 2020, however, this project has been delayed. It is now tentatively planned to construct the County Road 19/42 roundabout and related municipal services in 2022. The County has not finalized the scope of the phases, however, it is anticipated that the remaining watermain and sanitary works may proceed in 2023 with the County Road 42/43 roundabout proceeding in 2024 and the remaining roadwork proceeding in 2025. Sidewalk and bike lane construction will be included in related phases of this project. These future works are subject to change based on the County's ultimate phasing plan.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that included an allowance for the Town's portion of the sidewalks and bike lanes related to the County Road 19/42 roundabout in the Town's 2020 Capital Works Plan. It was also recommended that these works be included in the tender specifications and contract documents for the County's County Road 42 improvements project. The ultimate cost to the Town will be based on a future cost sharing agreement and a future report will be brought forward to Council regarding same.

Based on the above noted schedule revisions, the County's proposed construction work did not proceed in 2020 and is now tentatively planned to proceed in 2022.

The estimated project cost of $708,500 includes $439,000 for sidewalks and $269,500 for bike lanes. Through the CWATS program, the Town can apply for 40% funding for costs related to the design and construction of the bike lanes.

Funding for portions of the sidewalks and bike lanes related to the County Road 19/42 roundabout was previously provided from the Infrastructure Reserve in the amount of $90,000.

SW 3. Tecumseh Road Multi-Use Pathway Re-construction (Arlington to DM Eagle Public School)

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$100,000	**$0**	$0	$100,000

Public Works staff reviewed the condition of the existing asphalt path located on the north side of Tecumseh Road between Arlington Boulevard and D.M. Eagle Public School. The existing path is approximately 600 metres long and 2.4 metres wide. Based on the path inspection, it was determined that the existing condition of the path warrants full re-construction.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to proceed with the full re-construction of this path in 2020. The works were to include complete removal of the existing asphalt path/granular base and the construction of a new gravel base, 2.4 metre wide asphalt path and related restoration. Administration further advised that a tender process would be used to obtain prices to complete the work with a future report being brought forward to Council for tender award.

Administration currently plans to proceed with this project in 2021.

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Funding for this project was previously provided from the Road Lifecycle Reserve in the amount of $100,000.

SW 4. Riverside Drive Trail

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$850,000	**$389,300**	$0	$1,239,300

At the October 25, 2016 Regular Meeting of Council, Council approved the recommendations (Motion RCM-372/16) of Planning & Building Services Report No. 32/16 titled "County Wide Active Transportation Study Plan, Town of Tecumseh 2017 Project, Trail on Riverside Drive from Tecumseh/Windsor Municipal Boundary to Manning Road" that endorsed in principle the construction of a 2.4m wide trail having a length of approximately 2.4km as a 2017 CWATS Project, subject to the resolution of a suitable design and determination to which side of the road the trail should be located.

At the December 13, 2016 Regular Meeting of Council, Council approved the recommendations (Motion RCM-442/16) of PWES Report No. 54/16 titled "2017-2021 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the 2017 capital works projects including the design of the Riverside Drive Trail.

On Wednesday, September 13, 2017, a Public Information Centre was held to share details and gather public input on the Town's above noted initiative to construct a multi-use recreational trail along Riverside Drive. Options under consideration included constructing the trail in the public right-of-way on the south side of the road or on the north side of the road. Comments received were reviewed by Administration and the Consulting Team. Following consideration of the comments, it was recommended that the preferred location for the trail was within the public right-of-way on the south side of the road.

On Wednesday, June 6, 2018, a second Public Information Centre was held to discuss the detailed analysis that had been completed since the first Public Information Centre and to convey the resulting best design solution for the new multi-use trail. Concept plans showing the multi-use trail on the south side of the road were presented for discussion and to gather public input.

It was originally anticipated that the pathway design and utility relocations would be completed in 2020 upon a final determination of the preferred location of the trail by Council, with construction to follow in 2021. It is now anticipated that the detailed design and utility relocations will commence in 2021 upon a final determination of the preferred location of the trail by Council, with construction tentatively planned to follow in 2021 or 2022. Administration plans to bring a report forward to Council in 2021 with recommendations regarding the path forward for this project.

The estimated project cost is $1,239,000, which includes $1,201,800 for new infrastructure and $37,500 for storm sewers.

Funding for this project is to be provided from the following:

- Infrastructure Reserve in the amount of $351,800.
- Storm Sewer Lifecycle Reserve in the amount of $37,500.

SW 5. Lesperance Road Multi-Use Trail – CR22 to CR42

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$137,500**	$1,066,500	$1,204,000

As part of the Tecumseh Transportation Master Plan (TMP), a network of key Active Transportation facilities was developed to ensure connectivity in the larger network. This network has been coordinated with plans and recommendations from the County Wide Active Transportation Study (CWATS) and the City of Windsor Bicycle Use Master Plan (BUMP). The expansion of the Active Transportation Network is a municipal focus for several reasons, including: it promotes environmental sustainability, it promotes personal health, and it promotes equity in transportation service.

At the May 28, 2019 Regular Meeting of Council, Council approved the recommendation (Motion RCM-150/19) of Report No. PBS-2019-16 titled "Investing in Canada Infrastructure Program, 2019 Intake of the Public Transit Funding Stream, Lesperance Road Multi-Purpose Pathway - Cty Rd 22 to Cty Rd 42 Final Recommendation" that endorsed this Multi-Purpose Pathway as a candidate project for funding through this funding program. Following this meeting, an application for funding was submitted which was ultimately approved by the funding agency. The maximum amount of funding available for this project is $466,707. Based on the funding application, design is to be completed in 2021 with construction following in 2022.

Administration recommends proceeding with the design of this project in 2021. Administration further recommends that Dillon Consulting Ltd. be retained for detailed design, tender preparation, assistance with tendering, contract administration and construction inspection.

Funding for this project is to be provided from the Infrastructure Reserve in the amount of $137,500.

SW 6. Malden Road Pathway Extension

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$25,000**	$0	$25,000

An existing pedestrian pathway is located along Malden Road within the Hamlet of Maidstone. The pathway is approximately 1,150 metres long and extends north-easterly from County Road 34. Between County Road 34 and Pike Creek, the path is on the western side of Malden Road. Between Pike Creek and North Talbot Road, the pathway is on the eastern side of Malden Road.

With the exception of one location, the pathway is continuous throughout its length. Immediately northeast of the Pike Creek, however, there is a missing section of the pathway (approximately 50 metres in length) that needs to be established for connectivity for the users.

Administration recommends that a pathway be constructed along this 50 metre section of road.

Funding for this project is to be provided from the Infrastructure Reserve in the amount of $25,000.

Bridge Projects

BR 1. Snake Lane Road Culverts (with Spans < 3.0m) – Culverts No. 42, 53 & 54

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$192,500**	$1,632,500	$1,825,000

At the November 8, 2016 Regular Meeting of Council, Council approved the recommendations (Motion RCM-384/16) of PWES Report No. 39/16 titled "2016 Culvert Needs Study (Structures with Spans < 3.0m)" that authorized Administration to use the recommendations contained within the report to form the basis for prioritizing projects when completing future annual PWES Capital Works Plan. The 2016 Culvert Needs Study (Structures with Spans < 3.0m) identified the following Culverts for rehabilitation or replacement within a 1-5 year time frame.

- Culvert No. 42 - South Talbot Road Drain at Snake Lane Road (Est. Cost $549,800)
- Culvert No. 53 - 9th Line Drain at Snake Lane Road (Est. Cost $637,600)
- Culvert No. 54 - Webster Drain at Snake Lane Road (Est. Cost $637,600)

Administration recommends Dillon Consulting Ltd. be retained in 2021 to commence the design work for Culverts No. 42, 53 & 54 based on their experience with various bridge rehabilitation and replacement projects throughout the Town and their completion of the previous Culvert Needs Studies (Structures with Spans < 3.0m). Construction is tentatively anticipated for 2022 or 2023.

Funding for this project is to be provided from the Bridges Lifecycle Reserve in the amount of $192,500.

BR 2. Bridges (with Spans > 3.0m) – Baseline Road/Pike Creek Bridge No.1005 Bank Stabilization

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$250,000**	$0	$250,000

During recent road inspections, settlement was observed adjacent to Bridge No.1005 located on Baseline Road at the Pike Creek Drain. Subsequent investigations revealed that scour/erosion is occurring at the bottom of the adjacent Pike Creek Drain bank resulting in bank instability and settlement. Based on a preliminary assessment, bank stabilization works

are recommended to address the bank scour/erosion and to stop the settlement of the road shoulder.

Administration recommends that Dillon Consulting Ltd. be retained to undertake the following: detailed design for the bank stabilization works; assist with obtaining approvals; tender document preparation; assist with tendering; and to undertake contract administration/construction observation. Dillon Consulting Ltd. is recommended based on their previous involvement with the 2013/2014 Bridge No.1005 rehabilitation project and their current appointment for repair and improvement to the Pike Creek Drain under the provisions of the Drainage Act.

Funding for this project is to be provided from the Bridges Lifecycle Reserve in the amount of $250,000.

Water & Wastewater Projects

Water and wastewater projects are intended to upgrade existing infrastructure while also providing for future development.

The methodology used to provide Council with recommendations for yearly capital projects are:

- a review of the Town of Tecumseh Water & Wastewater Master Plan.
- a review of lifecycle dollars available and possible government funding.
- a review of the Ministry of Environment, Conservation and Parks regulations/guidelines.
- a review of other planned capital projects.
- a review of private land development opportunities.
- a review of possible opportunities to improve/upgrade the existing infrastructure.

Water Projects

WA 1. Highway No.3 / County Road 11 Watermain Replacement

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$1,826,300	**$0**	$0	$1,826,300

The Water Division previously recommended replacement of the existing 200mm diameter ductile iron watermain at the Highway No.3 / County Road 11 intersection. In recent years, the 200 mm diameter ductile iron watermain has been failing due to the age and material of the pipe.

The recommended works consist of the following:

- Replacement of approximately 410m of 200mm ductile iron watermain on Highway No.3 from County Road 11 westerly with a new 300mm diameter PVC;

- Replacement of approximately 345m of 200mm ductile iron watermain on County Road 11 from McCord Lane to just south of Highway No.3 with a new 300mm diameter PVC;
- The installation of approximately 430m of 300mm diameter PVC watermain on Highway No.3 from County Road 11 to Oldcastle Road.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to proceed with the construction of this project in 2020. Accordingly, the project was tendered in January 2020 with seven tenders being received.

At the February 25, 2020 Regular Meeting of Council, Council approved the recommendations (Motion RCM-64/20) of Report PWES-2020-10 titled "Highway 3/County Road 11 Watermain Replacement Project, Ontario Ministry of Transportation Agreement and Tender Award" that authorized the award of the project to Shearock Construction Group Inc.

Due to the Covid-19 pandemic and pipe material shortages, the start of construction was delayed until November 2020. Construction is now proceeding and will continue into 2021.

Funding for this project was previously provided from the Watermain Reserve Fund in the amount of $1,826,300.

WA 2. County Road 42 and County Road 43 Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$825,950	**$30,000**	$1,182,350	$2,038,300

As part of the County of Essex 25-year capacity program, County Road 42 and County Road 43 road improvements were identified and the County of Essex engaged Dillon Consulting Ltd. to undertake the detailed design for the following:

- Widening of County Road 42 from the City of Windsor border with the Town of Tecumseh to the Pike Creek located in the Town of Lakeshore.
- Diversion of County Road 43 from Shields Avenue to approximately 250 metres south of County Road 42.

Based on these proposed road improvements, Administration identified municipal services within the project limits that need to be designed and incorporated into the County's overall project. These municipal services included watermains, sanitary sewers and overland storm water flow routing from existing development located on the north side of County Road 42 to the Pike Creek located to the south of County Road 42.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that included undertaking advanced engineering design for the above noted municipal services to allow this work to be incorporated into the County of Essex contract drawings and specifications for their County

Road 42 improvements project. In accordance with this report, Dillon Consulting Ltd. was retained to complete the advance engineering.

Based on the advanced engineering completed in 2019, it was recommended that the following Town municipal services be included in the County of Essex County Road 42 improvements project:

- Construction of a new 400 mm diameter trunk watermain on County Road 19 in the vicinity of the proposed County Road 19/42 roundabout.
- Construction of a new 400 mm diameter trunk watermain from the proposed County Road 19/42 roundabout to the 12th Concession Road.
- Replacement of a section of existing 150 mm diameter watermain on the 12th Concession Road with new 150 mm diameter PVC watermain.
- Replacement of a section of the existing 200 mm diameter watermain on County Road 43 with new 200 mm diameter PVC watermain.
- Replacement of existing sanitary connections on County Road 42 with new PVC service connections.
- Installation of landscaping within the proposed roundabouts at County Road 19/42 and County Road 42/43 to enhance the aesthetic nature of the entry points into the Town of Tecumseh.
  (Note: The above noted 400 mm diameter trunk watermains are in accordance with the 2018 Water and Wastewater Master Plan Update and are components of project W-5A (Trunk watermain on Manning Road–CP Railway to CR42) and project W-5B (Trunk watermain on CR42–11th Concession Road to Manning Road).)

The County of Essex is proposing to complete the County Road 42 improvements in a number of phases. The County's original schedule was to construct the County Road 19/42 roundabout in 2020, however, this project has been delayed. It is now tentatively planned to construct the County Road 19/42 roundabout in 2022. This will include the 400 mm diameter trunk watermain on County Road 19, a portion of the 400 mm diameter trunk watermain on County Road 42, sanitary service connection improvements on a portion of County Road 42 and landscaping within the County Road 19/42 roundabout. The County has not finalized the scope of the phases, however, it is anticipated that the remaining watermain and sanitary works may proceed in 2023 with the County Road 42/43 roundabout proceeding in 2024 and the remaining roadwork proceeding in 2025. These future works are subject to change based on the County's ultimate phasing plan.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that allowed for the above noted municipal service improvements to be included in the County of Essex contract drawings and specifications for the County's County Road 42 improvements project. Also included in the PWES 2020 Capital Works Plan was an allowance for the estimated cost of the Town services associated with the construction of the County Road 19/42 roundabout. Once the County's ultimate phasing plan is determined, Administration will confirm the applicable costs for municipal infrastructure in future capital works plans.

Based on the above noted schedule revisions, the County's proposed construction work did not proceed in 2020 and is now tentatively planned to proceed in 2022.

During 2020, Dillon Consulting Ltd. continued with the design for the municipal watermains and sanitary sewers for future phases of this project. These works included an assessment of the sanitary needs for the future potential development lands (within the current settlement area) on the south side of County Road 42. The Town's updated sanitary sewer model was used to complete this assessment. The watermain and sanitary sewer designs will continue into 2021.

In addition, due to the delay in the County's construction schedule and the current condition of the above note watermains on the 12th Concession Road and County Road 43, Administration recommends that the replacement of these watermains be removed from the County project and be included in the proposed 2021 Various Watermain Replacement Project detailed in a subsequent section of this report.

The estimated project cost of $2,038,300 includes $47,300 for road works, $1,169,000 for watermains and $822,000 for sanitary sewers.

Funding for this project is to be provided from the Wastewater Sewers Reserve Fund in the amount of $30,000.

WA 3. 2020 Water and Wastewater Rates Study

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$20,000	**$0**	$0	$20,000

The last update to the Town's water and wastewater rates was completed in 2015. It is important to update these rates to ensure full cost recovery for the water and wastewater services provided by the Town. Full cost recovery is the generation of sufficient revenues to cover the cost of providing water and wastewater services which includes operations, capital works and the appropriate reserve contributions necessary for asset lifecycle replacement and growth.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to undertake a study in 2020 to update the Town's water and wastewater rates. It was identified that the results of the study will be used as a guide to set the water and wastewater rates for budget years 2021 to 2025. It was further noted that Administration planned to complete the majority of this study in-house, however, an allowance of $20,000 was approved for potential external consulting assistance and peer review.

This study did not commence in 2020 and is now proposed to proceed in 2021.

Funding for this project was previously provided from the following:

- Watermain Reserve Fund in the amount of $10,000
- Wastewater Sewers Reserve Fund in the amount of $10,000

WA 4. Fire Hydrant Reflectors

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$15,000**	$0	$15,000

Municipal fire hydrants are to be accessible, visible and the available fire flow is to be identified on the hydrant with standard colour coding. The National Fire Protection Association (NFPA) sets voluntary consensus standards (NFPA 291) that cover fire flow testing and marking of hydrants. With flow testing, hydrants are classified in accordance with their rated capacities. Once the capacities are determined, the tops and nozzle caps are painted in accordance with a capacity-indicating colour scheme to provide simplicity and consistency.

Recently an innovative product has been introduced to improve hydrant visibility and capacity rating identification. The new product is a reflective colour coded ring that is installed on the side nozzles of the hydrant. The reflective rings make the hydrants extremely visible at night with the reflective colour clearly identifying the available flow capacity. Many municipalities throughout the Province, including the Windsor/Essex region, have installed this product on their municipal hydrants.

Administration recommends that the above noted fire hydrant reflectors be purchased and installed on the all Town fire hydrants. It is anticipated that the reflector will be installed during the annual hydrant flushing program.

Funding for this project is to be provided from the Watermain Reserve Fund in the amount of $15,000.

WA 5. County Road 43/Banwell Watermain – Intersection Road to South of CPR

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$130,900**	$607,100	$738,000

The existing watermain on County Road 43 (Banwell Road) currently extends from County Road 42 to a dead end approximately 250 m south of the CP Railway property. Similarly, an existing watermain on Intersection Road extends westerly to Banwell Road where it reduces to a 50 mm watermain that extend northerly to a dead end. Between the end of the County Road 43 watermain and the intersection of Banwell Road and Intersection Road, there is approximately a 675 metres section of County Road 43/Banwell Road where no watermain exists.

To maintain adequate water quality in the existing watermains, auto flushers exist at the end of the County Road 43 watermain and at the location where the Banwell/Intersection watermain changes to 50 mm pipe. In addition, Tecumseh Vista School is serviced from the County Road 43 watermain. If an issue arises with the County Road 43 watermain that requires the watermain to be shut down for repairs, there is no alternative water feed to maintain a water supply to the school.

Planning for this watermain will require input and approvals from the City of Windsor, the County of Essex and the CP Railway.

Administration recommends that a new watermain be constructed to connect the existing County Road 43 watermain to the existing watermain at the intersection of Banwell Road and Intersection Road. Connection of these existing watermains will add resiliency to the water supply for the Tecumseh Vista School, improve water quality and reduce the required number of auto flushers.

Administration recommends that Dillon Consulting Ltd. be retained to undertake the engineering design and to assist with obtaining approvals from the City of Windsor, the County of Essex and the CP Railway. Dillon Consulting Ltd. is recommended based on their current design work for the County Road 43 watermain replacement between County Road 42 and Shields Road, their experience with other Town projects and their experience with other watermain projects in Essex County. It is proposed to commence the design in 2021 with construction to follow upon completion of the design. Based on the required coordination with the City of Windsor, the County of Essex and the CP Railway, it is anticipated that design could extend into 2022.

Funding for this project is to be provided from the Watermain Reserve Fund in the amount of $130,900.

WA 6. 2021 Various Watermain Replacement Project

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$1,108,100**	$0	$1,108,100

The Water Division recommends the replacement of old cast iron and ductile iron watermain infrastructure throughout the Town of Tecumseh. These aging systems are prone to water loss, breaks and increase the potential for poor water quality. Over time, buildup also occurs within these types of pipes reducing water flow and making it difficult to maintain chloride residuals as mandated by the Ministry of Environment, Conservation and Parks.

Administration recommends that the following watermains be included in this project:

12th Concession Road Watermain (Estimated Cost $575,700)

There are two sections of 150 mm cast iron watermain that require replacement on the 12th Concession Road. The first section of watermain is approximately 300 metres long and is located between County Road 42 and Dimu Drive. In accordance with the 2018 Water and Wastewater Master Plan Update, Administration recommends that this section of watermain be replaced with new 300 mm PVC watermain. This section of watermain was originally planned to be included with the County of Essex County Road 42 Improvements project, however, based on delays with the County project, it is recommended that this watermain be replaced as a Town project. The majority of the design has been completed for this section of watermain.

The second section of watermain is approximately 180 metres long and is located approximately 450 metres south of County Road 42. Administration recommends that this section of watermain be replaced with new 150 mm PVC watermain.

County Road 43 Watermain (Estimated Cost $247,900)

On County Road 43 there is approximately 275 metres of 200 mm ductile iron watermain. The section of watermain starts at County Road 42 and extends northerly towards Shields Road. This is the only water supply to Tecumseh Vista School. In 2019, a watermain break occurred on this watermain during the day. To avoid a school closure, the watermain was not shutdown during school hours and the watermain leak continued throughout the day. Following the end of the school day, the watermain was shut down and the break repaired. This break was small in nature and the option existed to maintain the water supply to the school. A major break would have required the watermain to be shut down and the school closed.

This section of watermain was originally planned to be included with the County of Essex County Road 42 Improvements project, however, based on delays with the County project, it is recommended that this watermain be replaced as a Town project. The majority of the design has been completed for this section of watermain.

Administration recommends that this section of watermain be replaced with new 200 mm PVC watermain.

Tecumseh Road Watermain – Brighton Road to Pike Creek (Estimated Cost $284,500)

On Tecumseh Road there is approximately 160 metres of 200 mm ductile iron watermain extending from Brighton Road easterly to the Pike Creek. This watermain is located in front of the Bay Harbour Condo site that is currently under construction. As part of the Bay Harbour Condo site development, significant landscaping improvements are proposed in the vicinity of the existing watermain. Administration recommends that this watermain be replaced with new 200 mm PVC watermain before the adjacent site improvements are undertaken.

Administration recommends that Dillon Consulting Ltd. be retained for the 2021 Various Watermain Replacement Project to undertake the following: detailed design; assist with obtaining approvals; tender document preparation; assist with tendering; and to undertake contract administration/construction observation. Dillon Consulting Ltd. is recommended based on their current design work for the 12th Concession Road and County Road 43 watermains (that were originally included in the County's County Road 42 Improvements Project) as well as their experience with other Town projects and their experience with other watermain projects in Essex County.

The estimated project cost of $1,108,100 includes $23,100 for road works and $1,085,000 for watermains.

Funding for this project is to be provided from the following:

- Road Lifecycle Reserve in the amount of $23,100

- Watermain Reserve Fund in the amount of $1,085,000

WA 7. Hwy 3/CR34 Water Valve Replacement

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$456,300**	$0	$456,300

In the late 1990's, a 300 mm PVC watermain was installed along Highway No. 3 from Oldcastle Road to County Road 34 and along County Road 34 from Highway No. 3 to Malden Road. The project generally included the watermain, service connections, fire hydrants/valves and mainline valves.

During recent fire hydrant work on this watermain, four fire hydrant valves were operated to undertake required maintenance and the valves did not seal. Further investigation revealed that the rubber valve seat on all four valves had deteriorated causing the valves to fail. Based on discussions with suppliers, the valves used on this project were only manufactured for a short period of time and they are no longer available. In addition, repair parts are not available. Failure of these valves limits the ability of the Water Division to isolated sections of the waterline during normal maintenance and for any unexpected watermain issue that may arise.

In total, there are approximately 50 water valves that need to be replaced including all fire hydrant valves and mainline valves. Administration recommends that the replacement of these water valves commence in 2021 and that the project proceed through a normal tender process to obtain prices to complete the work with a future report being brought forward to Council for tender award. It is further recommended that Blackrock Consulting Limited be retained to assist with tendering and contract administration.

Funding for this project is to be provided from the Watermain Reserve Fund in the amount of $456,300.

WA 8. Watermain Anode Program – Inspection/Replacement

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$200,000**	$0	$200,000

Ductile and cast iron pipe make up approximately 20% of the total amount of watermain in the Town's watermain distribution system. Due to the continual corrosion problems and high failure rates associated with ductile and cast iron pipe, the Town of Tecumseh Water Division commenced an anode protection program in 2015. Anodes (Cathodic Protection) are a scientifically proven method of corrosion control. Anodes minimize the effects of external corrosion on existing ductile and cast iron watermains, thus reducing watermain breaks and extending the useful life of watermain. If the watermains are left unprotected, and continue to corrode at the rates being experienced, total replacement of the watermains would be necessary sooner at a large capital cost.

Cathodic protection consists of installing sacrificial anodes (magnesium or zinc) underground, ideally at watermain depth and connecting them to the watermains with insulated copper wires. The basis of Cathodic Protection is such that the attached anode will corrode instead of the watermain. To achieve adequate protection on a watermain, installation of several anodes along the pipe is necessary. Each anode is effective over a short range of pipe length. The spacing of the anodes is dependent on the condition of the pipe, pipe size, soil resistivity and strength of stray electric ground currents. The anodes are also attached to above ground test stations so that their effectiveness over time can be measured.

It is approximately 5 years since the first anodes were installed and it is now time to inspect the condition of the anodes at the above noted test stations. The purpose of the inspections is to determine the remaining life expectancy of the previously installed anodes and to replace anodes where required.

Administration recommends that an anode inspection/replacement project commence in 2021 and that an allowance of $200,000 be provided for this project.

Funding for this project is to be provided from the Watermain Reserve Fund in the amount of $200,000.

Wastewater Projects

WW 1. Tecumseh Road Sanitary Sewer – Lesperance to Southfield

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$2,243,500	**$0**	$0	$2,243,500

The Tecumseh Road Sanitary Sewer – Lesperance Road and Southfield Drive is located within the Tecumseh Road Community Improvement Plan (CIP) area. The Tecumseh Road CIP area is currently serviced by a sanitary sewer collection system that includes a sub-trunk sewer on Tecumseh Road, which directs sewage flows to the Lesperance Road trunk sewer and ultimately to the Gauthier (Cedarwood) Pump Station. Over time, the Town has implemented several strategies to address sanitary servicing requirements within the Tecumseh Road CIP area as development has progressed.

In 2018, four development proposals within the Tecumseh CIP area west of St. Anne Street were presented to the Town that included approximately 216 apartment/condo units and 2,635 m^2 of commercial space. An assessment of the existing sanitary sewer, with the addition of these four potential development proposals, was completed and available capacity was confirmed for same. With these four developments, however, the capacity of the existing sewer was maximized and any further new development would require sewer improvements. In 2019, an additional development proposal was presented to Administration from a property owner on Southfield Drive that includes approximately 150 apartment units. In order for this development to proceed along with the four other developments, the Tecumseh Road sanitary sewer would need to be upgraded. Based on the timing of the development proposals, improved sanitary servicing will be required by 2021. Accordingly, the detailed design for sanitary sewer upgrades was initiated in 2019.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to proceed with the construction of this project in 2020. Accordingly, the project was tendered in January 2020 with eight tenders being received.

At the March 24, 2020 Regular Meeting of Council, Council approved the recommendations (Motion RCM-144/20) of Report PWES-2020-18 titled "Tecumseh Road Sanitary Sewer - Tender Award" that authorized the award of the project to D'Amore Construction (2000) Ltd. Due to the Covid-19 pandemic, the start of construction was delayed until August 2020. Construction is complete with a few minor deficiencies remaining. Minor deficiency repairs and the maintenance period will extend into 2021.

Funding for this project was previously provided from the following:

- Road Lifecycle Reserve in the amount of $404,500
- Wastewater Sewers Reserve Fund in the amount of $1,839,000

WW 2. Sylvestre Drive Sanitary Sewer Extension

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$285,000	**$0**	$1,612,400	$1,897,400

This project consists of the extension of a sanitary sewer on Sylvestre Drive from Sylvestre Drive to County Road 19 (approximately 410-metres), as well as adjacent to the County Road 19 right-of-way through a future easement (approximately 215-metres) or within an expanded County Road right of way as part of a future County Road 19 improvement project. It is also proposed to rehabilitate Sylvestre Drive from Jamsyl Drive to County Road 19 (approximately 760-metres). The installation of the sanitary sewers to service the properties identified within the study area is in keeping with Town's Water & Wastewater Master Plan, the Provincial Policy Statement, the County of Essex's Official Plan, and the Town's Official Plan to provide full municipal services to those properties within designated Settlement Areas.

As part of this project, a Schedule B Class Environmental Assessment was required to be undertaken due to the extension of a sanitary sewer through a future easement.

At the December 12, 2017 Regular Meeting of Council, Council approved the recommendations (Motion RCM-441/17) of PWES Report No. 57/17 titled "2018-2022 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the 2018 capital works projects, including the engineering design work and the Class Environmental Assessment for the Sylvestre Drive Sanitary Sewer Extension project. In accordance with this report, Dillon Consulting Ltd. was retained for this project.

At the July 23, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-232/19) of PWES Report No. 2019-31 titled" Sylvestre Drive Sanitary Sewer Extension Municipal Class Environmental Assessment, Schedule B Filing the Notice of Study Completion" that authorized administration to file the Notice of Study Completion and initiate the mandatory 30-day public and agency review period. Accordingly, the Notice of Study

Completion was issued and the 30-day public and agency review period occurred from August 2, 2019 to September 1, 2019. All comments received were satisfactorily addressed and on October 9, 2019 Dillon Consulting Ltd. issued correspondence advising that the Sylvestre Drive Sanitary Sewer Extension Class Environmental Assessment is considered approved under the Municipal Class EA process and may proceed to detailed design and implementation.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-403/19) of Report PWES-2019-51 titled "Sylvestre Drive Sanitary Sewer Extension, Municipal Class Environmental Assessment, Schedule B Study Completion and Final Adoption" which adopted this study.

It was originally planned to obtaining required approvals, prepare tender documents, obtain easements and undertake utility relocations in 2020 with construction tentatively planned to proceed in 2021. Detailed design is nearing completion, however, discussions are still on-going with Hydro One regarding the pump station design. The County of Essex also recently advised that future improvements to County Road 19 may commence in the next 5 to 10 years. The County Road 19 improvements will require the County to obtain a right of way widening over the area where the sanitary sewer easement is required. To obtain construction efficiencies and potentially avoid the need for the Town to obtain easements, it is beneficial to plan for this sanitary sewer construction when the County Road 19 improvements are completed. Accordingly, the potential construction of this project has tentatively been moved to beyond 2025. This schedule will be further updated in future Five Year Capital Works Plans as the County's schedule for the County Road 19 improvements is refined. Final design and the preparation of tender documents will continue in 2021.

Estimated recoveries from landowners for the sanitary sewers would be approximately $729,300, with assessments to be calculated by Administration and invoiced back to the landowners by means of a Part XII by-law (*Municipal Act*, s.391). Administration intends to bring forward a future report to Council in 2021 regarding the cost recovery by-law.

The project cost of $1,897,400 includes $1,114,000 for road works, $729,300 for sanitary sewers and $54,100 for storm sewers.

Funding for this project was previously provided from the following:

- Road Lifecycle Reserve in the amount of $94,000
- Wastewater Sewers Reserve Fund in the amount of $186,800
- Storm Sewer Lifecycle Reserves in the amount of $4,200

WW 3. County Road 46, Webster and Laval Sanitary Sewer Extension

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$445,250	**$0**	$4,968,250	$5,413,500

The County Road 46, Webster and Laval Sanitary Sewer Extension is a continuation of the sanitary sewer servicing within the 8th Concession Road sanitary service area. The project includes the extension of a sanitary sewer along County Road 46 from the 8th Concession

Road to Webster Drive, as well as on Webster Drive (entire length), and the extension of a sanitary sewer through an easement just south of Highway 401. This project will be coordinated with the County's planned road rehabilitation for County Road 46.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to complete the engineering design for the County Road 46, Webster and Laval Sanitary Sewer Extension in 2019 with construction tentatively planned for 2020. In accordance with this report, Dillon Consulting Ltd. was retained to complete the engineering design.

Through detailed design it was determined that additional storm sewer improvements are required on Webster Drive, that the existing local watermain on County Road 46 requires replacement and that certain utilities need to be relocated to facilitate this project. Based on this information, it was previously proposed that the project design, advanced utility relocations, easement acquisition and obtaining all required approvals would occur in 2020 with construction anticipated to proceed in 2021.

Detailed design, consultation with utility companies and negotiations with regard to easement acquisition continued in 2020. It is proposed that detailed design, preparation of tender documents and obtaining approvals will continue in 2021. With regard to easement acquisition, an agreement has been reached with the property owner and a related report will be brought forward to Council for approval in 2021.

In addition to the above, new regulations from the Ontario Ministry of Environment, Conservation and Parks related to excess soil generated from construction projects are expected to be released in 2021. These new excess soil regulations will require additional geotechnical investigations to determine the type/quality of the excess soil including a plan for the intended re-use of same. Administration recommends proceeding with the required excess soil investigations in 2021 so this information can be included in the tender documents. Construction is tentatively planned to proceed in 2022 or 2023.

Estimated recoveries from landowners for the sanitary sewers would be approximately $1,767,000 and will be refined once the By-Law for the 8th Concession Road sanitary service area is completed. The project cost of $5,413,500 includes $2,102,800 for road reconstruction, $533,100 for storm sewers, $1,456,800 sanitary sewers and $1,320,800 for watermains.

Funding for this project was previously provided from the following:

- Road Lifecycle Reserve in the amount of $120,750
- Wastewater Sewers Reserve Fund in the amount of $166,700
- Storm Sewer Lifecycle Reserves in the amount of $77,400
- Watermain Reserve Fund in the amount of $80,400

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WW 4. Del Duca Drive Sanitary Sewer Extension

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$372,350	**$100,000**	$3,373,350	$3,845,700

The Del Duca Drive Sanitary Sewer Extension is a continuation of the sanitary sewer servicing within the 8th Concession Road sanitary service area. The project includes the extension of a sanitary sewer along Del Duca Drive.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to complete the engineering design for the Del Duca Drive Sanitary Sewer Extension in 2019. In accordance with this report, Stantec Consulting Ltd. was retained to complete the detailed design.

The Oldcastle Stormwater Master Plan is being completed concurrently with the design for the Del Duca Sanitary Sewer Extension. Through the Oldcastle Stormwater Master Plan it was determined that a future major storm event flow route is required from the Del Duca Drive cul-de-sac southerly to the Hurley Relief Drain. Coordination has occurred between these two projects to ensure that the Del Duca design provides for the anticipated recommendations of the Oldcastle Stormwater Master Plan. Based on this coordination, it has been determined that a previously identified sanitary easement may need to be modified to accommodate a future storm sewer. These details are currently being finalized and, as a result, easement discussions with property owners have not commenced. Once the easement requirements are finalized through the Oldcastle Stormwater Master Plan EA process, the preliminary plans can be finalized and easement discussions can occur.

It is proposed that detailed design, easement acquisition, preparation of tender documents and obtaining required approvals will continue in 2021. A future report will be brought forward to Council with recommendations related to easement acquisition.

In addition to the above, new regulations from the Ontario Ministry of Environment, Conservation and Parks related to excess soil generated from construction projects are expected to be released in 2021. These new excess soil regulations will require additional geotechnical investigations to determine the type/quality of the excess soil including a plan for the intended re-use of same. Administration recommends proceeding with the required excess soil investigations in 2021 so this information can be included in the tender documents. Construction is tentatively planned to proceed in 2022 or 2023.

Estimated recoveries from landowners for the sanitary sewers would be approximately $1,050,000 and will be refined once the By-Law for the 8th Concession Road sanitary service area is completed. The project cost of $3,845,700 includes $1,448,500 for road reconstruction, $1,130,700 for storm sewers, $1,235,700 for sanitary sewers and $30,800 for watermains.

Funding for this project is to be provided from the following:

- Road Lifecycle Reserve in the amount of $20,000

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- Wastewater Sewers Reserve Fund in the amount of $40,000
- Storm Sewer Lifecycle Reserves in the amount of $40,000

WW 5. Sanitary Sewer Model Update and Flow Monitoring

Previously Approved	**Requested for 2020**	Future Costs	Total Project Costs
$295,000	**$20,000**	$0	$315,000

In 2011 Council received the report (Motion RCM-227/11) titled "Town of Tecumseh, Sanitary Sewer Assessment Report, dated May 2011". The report included a recommendation that the Town update their existing sanitary sewer model every three to four years, as well as carryout a flow monitoring program.

In 2011, Dillon Consulting Ltd. was retained to update the sanitary sewer model for the sanitary sewer infrastructure located north of County Road 22 in order to assess the impacts of a proposed development. The findings of the model update and related assessment led to the preparation of the "Sanitary Sewerage Collection System Improvements Class Environmental Assessment – April 2013 (Dillon) to address the recommended improvements. Following completion of the EA, Dillon Consulting Ltd. was retained to update the sanitary sewer model for the sanitary infrastructure located south of County Road 22 which was completed in late 2013. Both models were then integrated into one model.

At the June 26, 2018 Regular Meeting of Council, Council approved the recommendation (Motion RCM-194/18) of PWES Report No. 2018-17 "Flood Mitigation Strategy" that the report be received. Continued flow monitoring and sanitary sewer modeling were recommended flood mitigation strategies in the report. The report further identified that updating the sanitary sewer model would be incorporated within the 5-year PWES Capital Works Plan.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to complete a Sanitary Sewer Model Update and Flow Monitoring project. In accordance with this report, Dillon Consulting Ltd. was retained to undertake the modelling project.

Following commencement of the study, the original project scope was expanded to determine if the impacts of the Town's Inflow and Infiltration Removal project could be quantified based on the 2019 flow monitoring program to assist with sewer capacity assessments for new development proposals. In addition, to obtain design efficiencies and improve available information to assist with development inquiries, Administration recommended expanding the scope of work in 2020 to include modelling assessments related to the Tecumseh CIP area and the reconfiguration of the future sanitary trunk servicing within the Tecumseh Hamlet area (including integration of the Tecumseh Hamlet and Manning Road Secondary Planning areas and refinements to the existing County Road 42 service area for both dry and wet weather flow conditions).

A significant component of the model development is model calibration/verification. In order to calibrate/verify a model, flow monitoring data is used to confirm that the flows generated by the

model are representative of actual flows measured in the sewers during recorded events. In order to assess rain derived inflow and infiltration, a significant rainfall event is required. During the scheduled flow monitoring period, only minor rain events were received. Accordingly, the flow monitoring was extended into Fall 2020 which postponed the final model calibration/verification. The final report for this project is expected in 2021.

Funding for this project is to be provided from the Wastewater Sewers Reserve Fund in the amount of $20,000.

WW 6. Manhole Restoration Program

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$150,000	**$100,000**	$0	$250,000

Administration previously recommended a program whereby manholes that have been constructed in the travelled lanes of Town roadways will be reviewed and manholes that are found to have a significant difference in elevation between the rim and the surrounding roadway will be repaired. The method of repair is a technique that has been used by PWES for the last few years. It involves a machine to core drill around the manhole lid and the manhole is rebuilt and levelled to the surrounding pavement elevation. This method results in significantly less cracking of existing roadway pavement due to the circular excavation. It also allows the area around the manhole to be compacted prior to reinstatement of any pavement. PWES has experienced good success with this restoration method and it has been used by other municipalities to reconstruct manholes in travelled lanes.

At the December 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-361/18) of PWES Report No. 2018-08 titled "2019-2023 Public Works & Environmental Services 5 Year Capital Works Plan" that authorized Administration to proceed with a manhole restorations plan in 2019.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to continue with a manhole restorations plan in 2020.

Based on the success of this program, Administration recommends that the program be continued in 2021.

Funding for this project is to be provided from the following:

- Wastewater Sewers Reserve Fund in the amount of $50,000
- Storm Sewer Lifecycle Reserve in the amount of $50,000

WW 7. 2021 Sanitary Pump Station Improvements

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$22,500	**$71,500**	$169,000	$263,000

The Town owns and operates four (4) sanitary pump stations. The 2016 Pump & Metering Station Condition Assessment identified 'Immediate Repairs' and '10 Year Repairs' for the sanitary pump stations. In addition, The Town contracts the Ontario Clean Water Agency (OCWA) as the Overall Responsible Operator for the Town's pump station. Accordingly, the OCWA also provides recommendation to the Town for the on-going maintenance needs of our pump stations.

Administration recommends the following sanitary pump station works be undertaken in 2021, based on the recommendations contained in the 2016 Pump & Metering Station Condition Assessment and the recommendations provided by the OCWA.

Sylvestre Drive Sanitary Pump Station (Estimated Cost $15,000)

- Installation of surge suppression to protect the pump station from lightning strikes and other power surges.

Lakewood Sanitary Pump Station (Estimated Cost $25,000)

- Installation of surge suppression to protect the pump station from lightning strikes and other power surges.
- Installation of a differential pressure transmitter or hydrostatic probe to provide a back up system for the pump controls when the existing controls are submerged during a storm event.

St. Alphonse Sanitary Pump Station (Estimated Cost $31,500)

- Installation of surge suppression to protect the pump station from lightning strikes and other power surges.
- Purchase spare pump. Rental pumps are no longer available.

Funding for this project is to be provided from the Wastewater Facilities Reserve Fund in the amount of $71,500.

Storm Sewer Projects

ST 1. Shoreline Management Plan

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$350,000	**$0**	$0	$350,000

At the June 26, 2018 Regular Meeting of Council, Council approved the recommendation (Motion RCM-194/18) of PWES Report No. 2018-17 "Flood Mitigation Strategy" that the report be received. Completion of a Shoreline Management Plan was one of the recommended flood mitigation strategies in the report. The report further identified that completion of a Shoreline Management Plan would be incorporated within the 5-year PWES Capital Works Plan.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to undertake a Shoreline Management Plan in 2020. In accordance with this report, Zuzek Inc. was retained to complete the study.

The Shoreline Management Plan will generally include the following components:

- Re-assessment of the 1:100-year Lake St. Clair flood elevations.
- A detailed shoreline property inventory including topographic information for each shoreline property within the Town of Tecumseh.
- Determination of vulnerable flood locations along the shoreline.
- Determination of extent of inland flooding based on lake water conveyance through vulnerable areas.
- Assessment of potential impacts of climate change.
- Assessment of lake flooding plus rain generated runoff (Integration with Dillon 2D Storm Drainage Master Plan model).
- Damage value estimates for public and private properties.
- High level conceptual mitigation measures that could be considered in the next phases of the study.

Public consultation is an important part of this project. Due to the COVID-19 pandemic, traditional Public Information Centres (PIC) are not possible, however, a series of virtual PICs will be used to ensure residents have an opportunity to provide information, ask questions and participate in the process. The first virtual PIC was held on Thursday, October 29, 2020. Two sessions were coordinated; one in the afternoon and the second in the evening. For both sessions, an on-line 'live' presentation (via Zoom) was provided followed by a question and answer session. Participants were also invited to provide written comments. The presentation and question and answer sessions were recorded and are available for the public to view through links on the Town's website. The second virtual PIC is tentatively scheduled for January 2021.

Work on the Shoreline Management Plan commenced in July 2020 and the study will continue into 2021.

Funding for this project was previously provided from the Storm Sewer Lifecycle Reserve in the amount of $350,000.

ST 2. Stormwater Rate Study

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$45,000	**$0**	$0	$45,000

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-402/19) of Report PWES-2019-50 titled "Storm Drainage Master Plan Study Completion and Final Adoption" which adopted this study.

Based on the findings of the recently adopted Storm Drainage Master Plan, significant improvements are recommended to existing Town storm infrastructure to reduce surface flooding concerns resulting in 'level of service improvements'. The recommended solutions to improve the level of service for the storm infrastructure within the study area are estimated to cost $106.59M. In addition to the Storm Drainage Master Plan, the Town is also in the process of completing the Oldcastle Stormwater Master Plan. This study will also provide recommendations for stormwater infrastructure 'level of service improvements' as well as the related costs for same. As identified within the Town's 2018 Asset Management Plan (v2.0), these types of recommended improvements are to be incorporated into the annual Public Works & Environmental Services Capital Works Plan moving forward.

The current allocation to the Storm Sewer Reserves ($1,002,700) is intended for the replacement of the existing assets and is not meant for 'level of service improvements'. There was approximately an 11% increase in the Storm Sewer Reserves within the 2020 budget, however it was intended that the 'level of service improvements' may be funded from the New Infrastructure Reserve in the interim. This approach may find storm infrastructure projects competing for funding with other Council initiatives such as the Multi-Use Sportsplex and the Main Street CIP Streetscape project.

To address these challenges, the Town needs to have a long-term plan that defines, prioritizes and appropriately funds the storm system needs, while recognizing many competing interests. Similar to water and wastewater rates, many municipalities are considering the implementation of a user fee system for stormwater services.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to undertake a Stormwater Rate Study to assess the feasibility of implementing a user fee system to meet the significant funding requirements needed to implement the Town's recommended stormwater infrastructure improvements. In accordance with this report, Watson & Associates Economists Ltd. (Watson) was retained to undertake a Stormwater Rate Study in 2020. The study is nearing completion and will continue into 2021.

Funding for this project was previously provided from the Storm Sewer Lifecycle Reserve in the amount of $45,000.

ST 3. Manning Road Secondary Plan Area – Stormwater Facility

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$2,780,000	**$0**	$9,955,000	$12,735,000

The Town of Tecumseh completed the Manning Road Secondary Plan Area, Stormwater Management Class Environmental Assessment (EA) Environmental Study Report (ESR) in April 2010. The preferred stormwater management solution resulting from this EA included a single regional stormwater management facility at the southerly limits of the Study Area with a stormwater pump station that would discharge the runoff volume collected in this facility to the East Townline Drain at a controlled rate. In addition, the Baillargeon Drain would continue to discharge separately and directly to the East Townline Drain.

Between 2010-2013, the Town initiated the functional design of site servicing for the Manning Road Secondary Plan Area (MRSPA) during which time alternative servicing options for the MRSPA were investigated to assess potential cost saving opportunities. Based on these investigations, the Town of Tecumseh completed the Manning Road Secondary Plan Area, Stormwater Management Class Environmental Assessment (EA) Addendum in December 2014 (Updated March 2015). The Addendum incorporated the Baillargeon Drain as part of the MRSPA storm sewer system and stormwater management facility to better utilize the capacity of the existing and proposed storm drainage infrastructure in the area and to achieve cost savings compared to the original design, which had included the enclosure of the Baillargeon Drain generally along its existing alignment and discharging directly to the East Townline Drain.

Following the completion of the EA Addendum, the original 2013 Functional Servicing Report (FSR) was updated to address the recommendations included in the Addendum and a revised FSR was issued in 2015.

At the November 12, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-369/19) of PWES Report No. 2019-55 titled "Amendment to 2019-2023 PWES Five Year Capital Works Plan Manning Road Secondary Plan Area, Stormwater Management Facility" which included the following:

- Adding the MRSPA Stormwater Management Facility to the 2019-2023 PWES Five Year Capital Works Plan
- Authorization of an initial $40,000 expenditure in 2019 to be funded out of the Storm Sewer Lifecycle Reserve for costs associated with the acquisition of lands related to legal, surveyors and land appraisals
- Recommendation that additional funding be referred to budget deliberations in the 2020-2024 PWES Five Year Capital Works Plan specific to detailed design, property acquisition and construction costs

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to complete the detailed design for the MRPSA stormwater facility and to move forward with

the process to acquire the required property for the MRSPA stormwater management pond in 2020 with construction anticipated to proceed in 2021. In accordance with this report, Dillon Consulting Ltd. was retained based on their previous work on the MRSPA EA, MRSPA EA Addendum and related Functional Servicing Reports.

During 2020, the Town acquired the property required for the MRSPA stormwater management facility. In addition, prior to completing the detailed design for the MRSPA stormwater facility, it was necessary to update information contained in the previous 2015 ESR and FSR to reflect the current storm design criteria as provided in the Windsor/Essex Region Stormwater Management Standards Manual (December 2018). The update to the FSR is nearing completion and is expected by the end of 2020. Additional assessment of the sanitary servicing requirements for the MRSPA area in relation to the overall Town's sanitary system network was also undertaken. Detailed design will continue in 2021 with construction to be scheduled upon completion of the detailed design. Administration will bring forward a future report to Council to obtain approval to move forward with the pond construction.

Options for cost recovery are currently being considered by Administration, and a future report will be brought forward to Council regarding cost recovery recommendations for this project.

Funding for this project was previously provided from the Storm Sewer Lifecycle Reserve in the amount of $2,740,000.

ST 4. Tecumseh Hamlet EA and Functional Servicing Study

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$310,000	**$495,000**	$0	$805,000

In 2011, Council approved Administration to engage the services of DIALOG, an Urban Design Consultant, to assist in the development of the Tecumseh Hamlet Secondary Plan (THSP). DIALOG was to assist Administration with stakeholder engagement and capacity building, organizing and facilitating design charrettes and developing concept plans, policies and urban design guidelines to ensure orderly development of lands within the planning area.

In 2012, it was identified that a range of servicing issues needed to be addressed in the THSP area and that these servicing issues needed to be addressed concurrently with the land use planning issues. Accordingly, it was determined that a Functional Servicing Report (FSR) was required to address storm drainage, sanitary collection, water distribution infrastructure and road layout for the planned development of this area.

At that time, Dillon Consulting Ltd. (Dillon) was engaged to complete an FSR (water, wastewater, stormwater) to supplement the planning work. It was intended that the FSR would take into account the trunk infrastructure proposed by the Town's Water and Wastewater Master Plan and would provide more details as to how the lands would be serviced.

In conjunction with the FSR, it was also identified that a Municipal Class Environmental Assessment (Class EA) would be required to the fulfil infrastructure Class EA requirements for water distribution, wastewater, stormwater and transportation within the Hamlet area.

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At the same time as the above, the Upper Little River Watershed Master Drainage and Stormwater Management Municipal Class EA Study (ULR) was being undertaken jointly by the City of Windsor and the Town of Tecumseh, with project management being delivered by the Essex Region Conservation Authority. It was originally intended that the general location and size of the required Hamlet stormwater facilities would be determined through the recommendations of the ULR study. Due to numerous justifiable issues, the ULR study was delayed which ultimately resulted in the THSP and FSR/EA being delayed since the ULR stormwater requirements are needed to finalize the servicing requirements for the Hamlet area.

Based on the design and planning work completed to date, it is anticipated that the new development within the Tecumseh Hamlet area will include four (4) regional stormwater management facilities and approximately 155 hectares of residential development, 12 hectares of commercial development and 1 hectare of institutional development. The12 hectare Tecumseh Vista Academy site is also included in the Tecumseh Hamlet area.

At the December 10, 2019 Regular Meeting of Council, Council approved the recommendations (Motion RCM-401/19) of Report PWES-2019-49 titled "2020-2024 Public Works & Environmental Services Five Year Capital Works Plan" that authorized Administration to undertake the stormwater management analysis, to finalize the road network and to commence the Class EA in 2020 in conjunction with the related planning processes for the THSP. It was further recommended that the FSR and the finalization of the Class EA be completed in 2021. In accordance with this report, Dillon Consulting was retained to undertake the identified design and Class EA.

Dillon Consulting Ltd. has proceeded with the stormwater management analysis and has developed preliminary pond sizes for the Tecumseh Hamlet. During this same time, Dillon Consulting Ltd. has also been proceeding with the City of Windsor Sandwich South Master Servicing Report and Little River Watershed Floodplain Mapping Project (SSMSR). Ultimately, drainage from the Tecumseh Hamlet Area outlets to Little River. Currently, the preliminary pond sizing for the Tecumseh Hamlet is based on the allowable release rates identified in the draft ULR study (which has not been finalized). The allowable release rates in the draft ULR study are very restrictive resulting in the need for large ponds. Based on the preliminary results from the City's SSMSR study, it appears that larger release rates may be allowable from the Tecumseh Hamlet without adversely impacting the existing flow regime of the Little River. Since the SSMSR is generating new floodline mapping, an in depth review and approval by the Conservation Authority is required. Traditional modelling techniques were not adequately representing the watershed, therefore a more unique and complex 2-D modelling approach was undertaken. The initial model results and associated hydrologic and hydraulic reports have been reviewed by ERCA and the Peer Review team. The Project Team and Peer Review Team are currently collaborating and working towards resolving some of the issues that have been brought up as part of the review. It is anticipated that these issues may be resolved early in the new year.

The Town has submitted a design memo to ERCA regarding potential release rates for the Tecumseh Hamlet ponds based on the preliminary finding for the SSMSR. ERCA will not be in a position to comment on the proposed Tecumseh Hamlet release rates until the SSMSR issues are resolved. Once the allowable release rates are confirmed, the pond sizing for the Tecumseh Hamlet and the proposed road network can be finalized.

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The total estimated cost for Hamlet FSR/Class EA is $805,000 which includes design components of $98,000 for roads, $98,000 for water distribution, $113,000 for sanitary sewers and $496,000 for stormwater infrastructure.

It is recommended that Dillon Consulting Ltd. continue with the stormwater management analysis, the road network design, the FSR and the Class EA in 2021.

Funding for this project is to be provided from the following:

- Road Lifecycle Reserve in the amount of $67,750
- Watermain Reserve Fund in the amount of $67,750
- Wastewater Sewers Reserve Fund in the amount of $82,750
- Storm Sewer Lifecycle Reserve in the amount of $276,750

ST 5. Oldcastle Storm Drainage Master Plan

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$450,000	**$40,000**	$0	$490,000

At the December 12, 2017 Regular Meeting of Council, Council approved the recommendations (Motion RCM-441/17) of PWES Report No. 57/17 titled "2018-2022 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the 2018 capital works projects which included undertaking the Oldcastle Storm Drainage Master Plan. In accordance with this report, Stantec Consulting Ltd. was retained to complete the study.

The stormwater infrastructure network located within the Oldcastle Hamlet area is comprised of a combination of roadside ditches, Municipal Drains, storm sewers, swales/sub-drains, as well as County and Provincial storm infrastructure. There are three (3) distinct watershed areas within the Oldcastle Hamlet which include Little River (8 outlets), Turkey Creek (1 outlet), and River Canard (3 outlets).

The Oldcastle Storm Drainage Master Plan will focus on an analysis of the storm infrastructure within these watersheds and will set the framework for how stormwater is addressed for new and re-developments. This analysis will review how the storm infrastructure functions during minor rainfall events (what can be contained within the ditches, drains and sewers), and major rainfall events (which would follow overland flood routes). The Master Plan will follow the Municipal Class Environmental Assessment (EA) process and is equivalent to the same steps that a Schedule 'B' EA would follow.

At the September 11, 2018 Regular Meeting of Council, Council approved the recommendations (Motion RCM-272/18) of PWES Report No. 2018-21 titled "National Disaster Mitigation Program-Intake 5" that authorized Administration to submit an application to the federal government for funding under the National Disaster Mitigation Program (NDMP) for the Oldcastle Storm Drainage Master Plan. Subsequent to the September 11, 2018 Regular Meeting of Council, Administration submitted a funding application for this project to the NDMP. On March 28, 2019, Administration received confirmation that our funding application in the amount of $180,000 was approved.

In the Spring of 2019, the project manager for the Oldcastle Stormwater Master Plan left Stantec Consulting Ltd. to seek employment opportunities at another local engineering firm. Through discussions with Stantec Consulting Ltd., it was mutually agreed that the best path forward for this study was for the original project manager to complete the project. Accordingly, Landmark Engineers Inc. was retained to complete the study in accordance with the original project schedule and approved budget.

On October 17, 2019, a Public Information Center was held at the Ciociaro Club. Plans showing the existing drainage conditions within the Oldcastle area were available for review and discussion.

On January 29, 2020, a second Public Information Center was held at the Ciociaro Club. Information regarding existing drainage conditions, alternative mitigation measures and anticipated recommended solutions was available for review and discussion.

During 2020, the project scope expanded to include coordination efforts with a proposed residential development in the Oldcastle area and with the Town's Del Duca Drive sanitary sewer project. A draft report was received in October 2020 and is currently being reviewed by Administration. A report will be brought forward to Council in 2021 to obtain approval to advertise the Notice of Study Completion to initiate the mandatory 30-day public and agency review period.

Funding for this project is to be provided from the Storm Sewer Lifecycle Reserve in the amount of $40,000.

ST 6. Manning Road Improvement Project, Phase 2

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$303,000	**$7,061,700**	$0	$7,364,700

The Town completed a Class Environmental Assessment (EA) in April 2010 for improvements to the East Townline Drain (Manning Road) Storm Pump Station. The proposed upgrades to the pump station and drain enclosure along Manning Road provided an opportunity to improve this portion of Manning Road by constructing an urban cross-section that accommodates pedestrians, cyclists and urban design features to create an aesthetically pleasing gateway into Lakewood Park. The limits of the Class EA included Manning Road from Riverside Drive to St. Gregory's Road.

Construction of Phase 1 was completed in 2014 which included the construction of the storm pump station and associated facilities, and the reconstruction of a section of Riverside Drive (Manning Road to Christy Lane), including the roundabout at the Manning Road/Riverside Drive intersection.

At the December 13, 2016 Regular Meeting of Council, Council approved the recommendation (Motion RCM-442/16) of PWES Report No. 54/16 titled "2017-2021 Public Works & Environmental Services Capital Works Plan" that authorized Administration to proceed with the engineering design for Phase 2 of this project. In accordance with this report, Dillon Consulting Ltd. was retained to undertake the engineering design. Phase 2 generally relates to

underground servicing including the enclosure and redirection of the East Townline Drain into the recently constructed Lakewood Park channel, filling in the existing open drain on the west side of Manning Road, watermain replacement, construction of a new local storm sewer on the west side of Manning Road and the construction of an overflow storm sewer on St. Thomas Street. Both the enclosure/redirection of the East Townline Drain into the Lakewood Park channel and the construction of an overflow storm sewer on St. Thomas Street are recommended works from the Tecumseh Storm Drainage Master Plan (Projects ETL-3 and ESL-1) which was recently approved under the Municipal Class EA process.

The Town previously sought funding for this project under the following government funding programs:

- Disaster Mitigation and Adaptation Fund – 1st Intake
- Investing in Canada Infrastructure Program: Rural and Northern Communities Funding Stream – 2019 Intake

Unfortunately, this project was not selected for funding under either funding program.

The design for this project is now complete with tender documents currently being finalized. As previously noted in this report, new regulations from the Ontario Ministry of Environment, Conservation and Parks related to excess soil generated from construction projects are expected to be released in 2021. These new excess soil regulations will require additional geotechnical investigations to determine the type/quality of the excess soil including a plan for the intended re-use of same. Administration recommends proceeding with the required excess soil investigations immediately following the approval of this report so this information can be included in the tender documents.

The Phase 2 estimated project cost of $7,364,700 includes $842,400 for road works, $1,069,300 for watermains, $11,500 for sanitary sewers, $1,840,600 for storm sewers and $3,592,400 for municipal drains. There is the potential to apply funding allocations from both the Ontario Community Infrastructure Fund (OCIF) and Federal Gas Tax funds towards the costs of this project. The Town has been accumulating OCIF and Federal Gas Tax funds in reserves to use towards larger costing projects. Reserve balances are approximately $2,925,000 and $3,200,000 respectively. These funds have not yet been allocated to specific projects.

Administration recommends proceeding with construction for the Manning Road – Phase 2 Project in 2021. Administration further recommends continuing with Dillon Consulting Ltd. to assist with tendering, contract administration and construction observation.

Funding for this project is to be provided from the following:

- Road Lifecycle Reserve in the amount of $787,900
- Watermain Reserve Fund in the amount of $1,038,300
- Storm Sewer Lifecycle Reserve in the amount of $1,769,600
- Drains Lifecycle Reserve in the amount of $3,465,900

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ST 7. Scully & St. Mark's Storm Pump Station & Riverside Drive Storm Sewers

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$797,250	**$500,000**	$15,752,750	$17,050,000

In 2016 a review of the St. Mark's Storm Pump Station, the Scully (Edgewater) Storm Pump Station and the existing storm sewer infrastructure within the contributing drainage area was conducted. The results indicated that the storm pump stations would be unable to accommodate additional flows from local streets that were slated to be reconstructed with storm sewers having a 1:5-year level of service. In addition, the detailed analysis of the stormwater infrastructure that was conducted as part of the Storm Drainage Master Plan confirmed that improvements are required to the existing Scully & St. Mark's pump stations.

The proposed project consists of decommissioning the St. Mark's storm pump station and redirecting those flows into an upgraded and expanded Scully storm pump station to provide a greater level of service. The Scully pump station upgrade is to increase pump capacity to accommodate the additional flows from the current St. Mark's service area, as well as other adjacent areas where interconnections and overland flows have been identified as part of the Town's Storm Drainage Master Plan. This project also includes trunk storm sewer improvements along Riverside Drive to add resiliency to the system and improve the level of service to address area-wide issues of surface flooding.

The project cost of $17,050,000 includes $15,107,000 for storm sewers and pumping stations, $415,000 for sanitary sewers and $1,528,000 for road reconstruction.

In May 2020, after being unsuccessful in our first two funding applications to the Disaster Mitigation and Adaptation (DMAF) funding program, the Town was invited to attended a teleconference with administrators of DMAF from Infrastructure Canada (INFC), where we were advised that funding was still available through the DMAF program. INFC invited Tecumseh to partake in a resubmission for a 'Special Spring 2019 Flooding Intake' application for the program that closed on July 17, 2020. Subsequent to this conference call, the Town resubmitted an updated application for the following projects:

- Scully & St. Mark's Storm Pump Station & Riverside Drive Trunk Storm Sewers project (Estimated cost 17.05M).
- P.J. Cecile Storm Pump Station Improvements project (Estimated cost $9.70M).

On October 21, 2020, the Town was advised that our funding application had been approved for both of the above noted projects (Total funding $10.7M).

Under the DMAF, all works must be completed by March 31, 2028. The Scully & St. Mark's Storm Pump Station & Riverside Drive Trunk Storm Sewer project is a major infrastructure improvement project that will require significant time to undertake the engineering design, obtain the required approvals and complete construction. The DMAF Funding Agreement is expected to be received in early 2021. The ultimate design and construction schedule will need to be in accordance with the Funding Agreement. Administration recommends approval of sufficient budget allocation in 2021 to allow the design and potential advance works to continue. Once the Funding Agreement is received, a future report will be brought forward to

Council to seek authorization to execute the agreement and to request allocation of the full municipal component of the project cost, $10.23M, as required by the Federal Government.

Dillon Consulting Ltd. commenced the design for the Scully & St. Mark's Pump Station and Riverside Drive Trunk Storm Sewer in summer 2020. Administration recommends continuing with the design in 2021.

Funding for this project is to be provided from the following:

- Storm Sewer Lifecycle Reserve in the amount of $338,000
- Wastewater Sewers Reserve Fund in the amount of $78,000
- Road Lifecycle Reserve in the amount of $84,000

ST 8. P.J. Cecile (Kensington) Storm Pump Station

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$500,000**	$9,200,000	$9,700,000

In 2016 a review of the P.J. Cecile (Kensington) Storm Pump Station and existing storm sewer infrastructure within the contributing drainage area was conducted. The results indicated that the pump station cannot accommodate the future projected flows from the drainage area once some of the existing streets are reconstructed to an urban (or semi-urban) cross section. In addition, the recently completed Storm Drainage Master Plan confirmed the need for improvements at this pump station.

The proposed work includes the construction of a new pump station over the footprint of the existing structure with increased capacity and larger inlet and outlet piping. The estimated project cost of $9,700,000 includes $9,426,000 for storm sewers and pump stations and $274,000 for road reconstruction.

In May 2020, after being unsuccessful in our first two funding applications to the Disaster Mitigation and Adaptation (DMAF) funding program, the Town was invited to attended a teleconference with administrators of DMAF from Infrastructure Canada (INFC), where we were advised that funding was still available through the DMAF program. INFC invited Tecumseh to partake in a resubmission for a 'Special Spring 2019 Flooding Intake' application for the program that closed on July 17, 2020. Subsequent to this conference call, the Town resubmitted an updated application for the following projects:

- Scully & St. Mark's Storm Pump Station & Riverside Drive Trunk Storm Sewers project (Estimated cost 17.05M).
- P.J. Cecile Storm Pump Station Improvements project (Estimated cost $9.70M).

On October 21, 2020, the Town was advised that our funding application had been approved for both of the above noted projects (Total funding $10.7M).

Under the DMAF, all works must be completed by March 31, 2028. The P.J. Cecile (Kensington) Storm Pump Station is a major infrastructure improvement project that will require significant time to undertake the engineering design, obtain the required approvals and

complete construction. The DMAF Funding Agreement is expected to be received in early 2021. The ultimate design and construction schedule will need to be in accordance with the Funding Agreement. Administration recommends approval of sufficient budget allocation to commence the design in 2021. Once the Funding Agreement is received, a future report will be brought forward to Council to seek authorization to execute the agreement and to request allocation of the full municipal component of the project costs, $5.82M, as required by the Federal Government.

Funding for this project is to be provided from the following:

- Storm Sewer Lifecycle Reserve in the amount of $486,000
- Road Lifecycle Reserve in the amount of $14,000

ST 9. Turkey Creek Watershed Assessment – Phase 1

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$60,000**	$0	$0

Currently, various drainage/stormwater management studies are being undertaken in the Towns of Tecumseh, LaSalle and the City of Windsor. Many of these studies involve sub-watersheds of Turkey Creek or have the potential to be impacted by spill from the Turkey Creek watershed. These studies include Tecumseh's Oldcastle Stormwater Master Plan, Windsor's Sewer Master Plan and LaSalle's Howard-Bouffard Master Drainage Study. With the outlet of Turkey Creek extending through LaSalle to the Detroit River, LaSalle has raised questions with regard to potential flood impacts from both existing and proposed development within the Turkey Creek watershed.

The Oldcastle Stormwater Master Plan will include recommendations for drainage improvements for the Tecumseh portion of the Wolf Drain. The Wolf Drain drainage area is approximately 340 Ha with approximately 240 Ha being located in Tecumseh. The Wolf Drain outlets into the Cahill Drain, which crosses under the Herb Gray Parkway and ultimately outlets into the Turkey Creek between Malden Road and Matchette Road. The total drainage area for the Turkey Creek is approximately 5,700 Ha. While the Tecumseh portion of the Turkey Creek drainage area is relatively small, runoff from Tecumseh flows downstream through developed portion of LaSalle.

The existing floodplain mapping for Turkey Creek and related tributaries date back to the early 1980s and 1990s. Since the completion of this mapping, significant development has occurred in each municipality. In addition, the Herb Gray Parkway was constructed which included works on significant tributaries of Turkey Creek.

At the request of LaSalle, a meeting was convened in 2020 with engineering staff from all three municipalities and the Essex Region Conservation Authority (ERCA). Based on the extensive changes that have occurred in this watershed, it was agreed that the watershed would benefit from a more coordinated approach to updating hydrology and hydraulics for Turkey Creek and other primary tributaries (i.e. Cahill Drain) to confirm the inputs, assumptions and recommendations of the various on-going studies within the Turkey Creek watershed.

At the request of LaSalle, with input from both Tecumseh and Windsor, ERCA prepared a Request for Proposal (RFP) titled "Turkey Creek Watershed Hydrologic and Hydraulic Modeling". Based on their current involvement in the above noted studies, the Request for Proposal was submitted to Dillon Consulting Ltd. and Landmark Engineers Inc.

In general, the objectives for this undertaking is not to replace the other on-going studies, but rather to inform and provide the necessary information to allow for more consistent and coordinated solutions across the Turkey Creek Watershed. The primary objectives for this undertaking include the following:

- Updated hydrology for the entire Turkey Creek Watershed and its tributaries.
- Updated and combined hydraulic modeling of Turkey Creek and any necessary primary tributaries (e.g. Cahill Drain).
- Confirmation of potential drainage impacts on downstream receivers.
- Identification of the necessary assumptions relevant to each of the respective master drainage studies to allow for coordinated solutions within each of the more local undertakings (primarily Tecumseh's Oldcastle Stormwater Master Plan, Windsor's Sewer Master Plan and LaSalle's Howard-Bouffard Master Drainage Study).

In response to the RFP, Dillon Consulting Ltd. and Landmark Engineers Inc. submitted a joint submission that is currently under review. While the RFP requested a scope of work and fee estimate range for completion of the entire study, the Dillon/Landmark submission proposed a two-phase approach to meet the above note objectives. The phased approach will allow the team to gather and assess the available background data and previously completed modelling such that the scope of work and fees associated with the remaining work can be more accurately identified.

As a result, Phase 1 will primarily focuses on building out the necessary components of the hydrologic and hydraulic model, field investigation, as well as rainfall data collection and a complete review of available reports (i.e. historic floodline reports, drainage reports, drainage studies, etc.). Accordingly, Phase 1 is ultimately a scoping exercise to be used for Phase 2, which will include more refined computational models and is expected to deliver on the overall project objectives described above.

Administration is in agreement that the above noted study is warranted and recommends that Tecumseh should be a participating partner in the study. Participation in the study includes both technical and financial support. The financial component of the project would include ERCA's project management costs as well as Tecumseh's portion of the above noted Turkey Creek Watershed Hydrologic and Hydraulic Modeling study. The preliminary cost estimate for Phases 1 and 2 is approximately $375,000. Cost sharing arrangements have not yet been discussed. Administration recommends that an allowance of $60,000 be carried in the 2021 Capital Works Plan for this project.

It is important to note that, if the findings of this study identify problems in the downstream watercourses, additional studies/designs may be required to develop solutions for those problems. Furthermore, once solutions are developed, they will need to be implemented. If issues are identified downstream of the Wolf Drain, it is anticipated that Tecumseh would be requested to be a contributing partner in future studies and remedial works. At this time, it is premature to estimate potential future cost implications to the Town of Tecumseh.

Funding for this project is to be provided from the Storm Sewer Lifecycle Reserve in the amount of $60,000.

ST 10. Brighton Road Storm Pump Station Repairs

Previously Approved	**Requested for 2021**	Future Costs	Total Project Costs
$0	**$75,000**	$0	$75,000

Repairs are required at the Brighton Road Storm Pump Station. During routine inspections, Public Works staff determined that two of the four main pumps are starting to make noises that are not consistent with a properly operating pump. These pumps are critical components of the pump station and repairs are recommended before a major pump failure occurs.

Administration recommends that the two pumps be removed, inspected and rebuilt as required under the instruction and guidance of the pump manufacturer. Once rebuilt, the pumps will be reinstalled.

Funding for this project is to be provided from the Storm Sewer Lifecycle Reserve in the amount of $75,000.

Municipal Drain Projects

Town of Tecumseh is obligated to manage, repair, maintain and improve the Town's 120 Municipal Drains (totaling 221km) in accordance with the Drainage Act, including assessing costs to the benefitting upstream landowners according to the most current by-law. Municipal Drains are not municipal infrastructure and only the actual Town assessments are funded from the general tax rate.

There are currently over 165 active drainage projects that the Town is undertaking. These works include new municipal drains (2), maintenance of existing drains (91), drain improvements requiring an engineer's report (45) and apportionment agreements (28) all of which are at various stages of completion. The Drainage Superintendent receives requests for maintenance or repair and improvements for Municipal Drains, and determines which section of the Drainage Act is most suitable to proceed with the request. These drainage requests, and subsequent works, are addressed as they occur and are brought before Council for their approval on a project by project basis.

Funding for the Town's assessment for Municipal Drains will generally come from the Drains Lifecycle Reserve.

Consultations

Financial Services
Planning & Building Services

Financial Implications

The capital expenditures proposed for 2021 total just over $15.3M in addition to unfinished works carried forward from 2020, with a preliminary estimate of an additional $99.5M projected over the remaining four years of the five-year capital works plan.

Generally speaking, funding for most projects is covered through reserves, reserve funds and grants where reserves and reserve funds accumulate funds through annual budget allocations.

For reference, 2020 allocations to capital reserve/reserve funds total $14.1M, with $9.7M going towards general tax rate supported reserves (public works, parks, fire, etc.) and $4.4M going towards rate supported reserve funds (water and wastewater).

Although two of the Town's capital funding reserve/reserve fund categories are either in, or soon-to-be in a deficit position, the Town's overall capital funding reserve/reserve funds are relatively healthy and Administration is comfortable recommending the advancement of the projects identified in this report in advance of the 2021 budget approval.

Projected Lifecycle Reserve and Reserve Fund balances for 2021 are provided in the attached schedules.

Following formal 2021 budget adoption and a capital works strategic planning session with Council in early 2021, the PWES 2021-2025 five-year capital plan will be brought to Council for consideration, approval and adoption accompanied by updated Projected Lifecycle Reserve and Reserve Fund schedules for the five-year planning period.

Link to Strategic Priorities

Applicable	2019-22 Strategic Priorities
☒	Make the Town of Tecumseh an even better place to live, work and invest through a shared vision for our residents and newcomers.
☒	Ensure that Tecumseh's current and future growth is built upon the principles of sustainability and strategic decision-making.
☐	Integrate the principles of health and wellness into all of Tecumseh's plans and priorities.
☒	Steward the Town's "continuous improvement" approach to municipal service delivery to residents and businesses.
☐	Demonstrate the Town's leadership role in the community by promoting good governance and community engagement, by bringing together organizations serving the Town and the region to pursue common goals.

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Communications

Not applicable ☒

Website ☐ Social Media ☐ News Release ☐ Local Newspaper ☐

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This report has been reviewed by Senior Administration as indicated below and recommended for submission by the Chief Administrative Officer.

Prepared by:

John Henderson, P.Eng.
Manager Engineering Services

Reviewed by:

Tom Kitsos, CPA, CMA, BComm
Director Financial Services & Chief Financial Officer

Reviewed by:

Brian Hillman, MA, MCIP, RPP
Director Planning & Building Services

Reviewed by:

Phil Bartnik, P.Eng.
Director Public Works & Environmental Services

Recommended by:

Margaret Misek-Evans, MCIP, RPP
Chief Administrative Officer

Attachment Number	Attachment Name
1	Road Projects 2021
2	Sidewalk & Pathway Projects 2021
3	CWATS Projects 2021

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Attachment Number	Attachment Name
4	Bridge Projects 2021
5	Water Projects 2021
6	Wastewater Projects 2021
7	Storm Sewer Projects 2021
8	Municipal Drain Projects 2021
9	Major Project Summary – Oldcastle-North Talbot Sanitary Area
10	Major Project Summary – Oldcastle-8th Concession Sanitary Area
11	Major Project Summary – County of Essex Initiated Projects
12	Major Project Summary – Other Projects

Town of Tecumseh
Public Works Environmental Services
2021 Captial Works Plan

Roads	Construction	Engineering	Contingency	Total	2020	2021
Paving	$ 7,800,000	$ -	$ -	$ 7,800,000	$ 1,300,000	$ 1,300,000
Traffic Signal Controller Upgrade (w/ County) CFWD	$ 150,000	$ -	$ -	$ 150,000	$ 150,000	$ -
PW Yard (North) Expansion/Improvements	$ 60,000	$ -	$ -	$ 60,000	$ 30,000	$ 30,000
TTMP Bicycle Sharrows	$ 15,000	$ -	$ -	$ 15,000	$ -	$ 15,000
Traffic Signal Upgrades/Maintenance	$ 83,000	$ 12,450	$ 8,300	$ 103,750	$ -	$ -
Traffic Signal Reconstruction (Lesperance/McNorton)	$ 140,250	$ 24,750	$ -	$ 165,000	$ -	$ -
CR42/43 Construction CFWD+	$ 35,200	$ 10,300	$ 1,800	$ 47,300	$ 22,450	$ -
Tecumseh Hamlet SPA EA FSR CFWD+	$ -	$ 98,000	$ -	$ 98,000	$ 30,250	$ 67,750
Tecumseh Sigange Project	$ -	$ 16,000	$ -	$ 16,000	$ 16,000	$ -
Tecumseh Road CIP - Phase 1 CFWD	$ 10,131,900	$ 1,665,360	$ 946,000	$ 12,743,260	$ 350,000	$ -
Tecumseh Road CIP - Phase 2 CFWD	$ 5,579,980	$ 846,540	$ 538,020	$ 6,964,540	$ 50,000	$ -
Tecumseh Road CIP - Phase 3	$ 2,930,130	$ 445,078	$ 282,870	$ 3,658,078	$ -	$ -
Tecumseh Road CIP - Phase 4	$ 3,027,950	$ 459,522	$ 292,050	$ 3,779,522	$ -	$ -
Tecumseh Road CIP - Phase 5	$ 1,742,250	$ 271,418	$ 172,500	$ 2,186,168	$ -	$ -
Manning Road/ETLD Relocation - Phase 2 CFWD+	$ 686,100	$ 122,000	$ 34,300	$ 842,400	$ 4,500	$ 787,900
Manning Road Reconstruction - Phase 3 CFWD+	$ 5,719,900	$ 898,000	$ 286,000	$ 6,903,900	$ 45,500	$ 100,000
Sylvestre Drive Sanitary Sewer Extension CFWD+	$ 895,700	$ 173,500	$ 44,800	$ 1,114,000	$ -	$ -
Brighton Road Traffic Improvements	$ 30,000	$ -	$ -	$ 30,000	$ -	$ 30,000
Roads Needs Study	$ -	$ 133,000	$ -	$ 133,000	$ -	$ -
Various Watermain Replacement Projects 2021	$ 17,600	$ 3,700	$ 1,800	$ 23,100	$ -	$ 23,100
Scully & St Mark's Storm PS/Riverside Drive CFWD+	$ 1,183,000	$ 227,000	$ 118,000	$ 1,528,000	$ 43,600	$ 84,000
CR46/Webster/Laval Sanitary Sewer(LRPCP) CFWD	$ 1,769,300	$ 245,000	$ 88,500	$ 2,102,800	$ -	$ -
Delduca Drive Sanitary Sewer (LRPCP) CFWD+	$ 1,194,600	$ 194,200	$ 59,700	$ 1,448,500	$ -	$ 20,000
Lanoue Street Improvements CFWD+	$ 636,000	$ 291,900	$ 63,600	$ 991,500	$ 363,300	$ 125,000
Tecumseh Road Sanitary Sewer CFWD	$ 310,000	$ 67,000	$ 27,500	$ 404,500	$ 404,500	$ -
Riverside Drive In-line Storage Trunk Sanitary	$ 575,000	$ 116,250	$ 57,500	$ 748,750	$ -	$ -
Ure Street Sanitary Sewer (LRPCP)	$ 533,900	$ 80,100	$ 53,400	$ 667,000	$ -	$ -
PJ Cecile Storm PS *	$ 195,000	$ 59,000	$ 20,000	$ 274,000	$ -	$ 14,000
O'Neil Street Sanitary Sewer (LRPCP)	$ 617,500	$ 92,600	$ 61,800	$ 772,000	$ -	$ -
Moynahan-Henin-Regal Sanitary Sewer (LRPCP)	$ 755,300	$ 113,300	$ 75,500	$ 944,000	$ -	$ -
CP/Lesperance Crossing Improvements	$ -	$ 30,000	$ -	$ 30,000	$ -	$ 30,000
Traffic Calming Guideline Study	$ -	$ 20,000	$ -	$ 20,000	$ -	$ -
Annual Project Contingency	$ -	$ -	$ 1,500,000	$ 1,500,000	$ -	$ 250,000
Totals	$ 47,905,960	$ 7,004,268	$ 4,788,540	$ 59,698,368	$ 2,965,100	$ 4,156,050

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Town of Tecumseh
Public Works Environmental Sevices
2021 Capital Works Plan

Sidewalks/Pathways	Construction	Engineering	Contingency	Total	2020	2021
Sidewalk Repair Program	$ 414,000	$ -	$ -	$ 414,000	$ 69,000	$ 69,000
AODA Sidewalk Ramp Repair	$ 500,000	$ -	$ -	$ 500,000	$ -	$ -
Riverside Drive Trail (Lesperance-Manning) CFWD+	$ 881,400	$ 232,300	$ 88,100	$ 1,201,800	$ -	$ 351,800
Lesperance Road Trail (CR22 to CR42)	$ 885,000	$ 142,000	$ 177,000	$ 1,204,000	$ -	$ 137,500
Tecumseh Road Path (Arlington to DM Eagle) CFWD	$ 92,500	$ 5,000	$ 2,500	$ 100,000	$ 100,000	$ -
Riverside Drive Pathway (Arlington to Kensington)	$ 120,000	$ 18,000	$ 18,000	$ 156,000	$ -	$ -
CR34: Malden to CR19 (Multi-Use Trail)	$ 350,000	$ 52,500	$ 52,500	$ 455,000	$ -	$ -
Malden Road Pathway Extension	$ 25,000	$ -	$ -	$ 25,000	$ -	$ 25,000
Lesperance Road Trail (Riverside to McNorton)	$ 350,000	$ 52,500	$ 52,500	$ 455,000	$ -	$ -
CR42 / CR19 Roundabout (Sidewalks) CFWD	$ 16,500	$ -	$ 2,500	$ 19,000	$ 19,000	$ -
CR42: CR43 to Lesperance (Sidewalks)	$ 352,000	$ -	$ 10,000	$ 362,000	$ -	$ -
CR42: Lesperance to CR19 (Sidewalks) CFWD	$ 50,000	$ -	$ 8,000	$ 58,000	$ 29,000	$ -
Totals	$ 4,036,400	$ 502,300	$ 411,100	$ 4,949,800	$ 217,000	$ 583,300

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

CWATS Projects	Construction	Engineering	Contingency	Total	2020	2021
CWATS Study - Pike Creek/Tecumseh Road	$ -	$ 6,000	$ -	$ 6,000	$ 6,000	$ -
CR42 / CR19 Roundabout (Bike Lanes) CFWD	$ 11,000	$ -	$ -	$ 11,000	$ 11,000	$ -
CR42: CR43 to Lesperance (Bike Lanes)	$ 196,500	$ -	$ -	$ 196,500		$ -
CR42: Lesperance to CR19 (Bike Lanes) CFWD	$ 62,000	$ -	$ -	$ 62,000	$ 31,000	$ -
Total	$ 269,500	$ 6,000	$ -	$ 275,500	$ 48,000	$ -

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Bridges	Construction	Engineering	Contingency	Total	2020	2021
Bridge & Culvert Condition Assessment (<3m Span)	$ -	$ 75,000	$ -	$ 75,000		
Bridge & Culvert Needs Study (>3m Span)	$ -	$ 117,000	$ -	$ 117,000	$ 39,000	
Pike Creek at Baseline (1005)	$ 659,300	$ 131,900	$ 98,900	$ 890,100		
Culvert #37: Wolfe Drain at Outer - Improvements	$ 100,000	$ 25,000	$ 30,000	$ 155,000		
Culvert #34: Wolfe Drain at Pulleyblank - Improve.	$ 70,000	$ 17,500	$ 21,000	$ 108,500		
Townline Road Drain at 6th Concession Road (1014)	$ 155,000	$ 87,500	$ 7,800	$ 250,300		
Merrick Creek at 8th Concession Road (1013)	$ 155,000	$ 87,500	$ 7,800	$ 250,300	$ 310,000	
Culvert #45: South Talbot Road (CR11/STR Works)	$ 270,000	$ 41,000	$ 41,000	$ 352,000		
Culvert #42: Snake Lane Road	$ 416,200	$ 71,200	$ 62,400	$ 549,800		$ 62,300
Culvert #53: Snake Lane Road	$ 492,500	$ 71,200	$ 73,900	$ 637,600		$ 65,100
Culvert #54: Snake Lane Road	$ 492,500	$ 71,200	$ 73,900	$ 637,600		$ 65,100
Culvert #51: 8th Concession Road	$ 80,000	$ 60,000	$ 10,000	$ 150,000		
Culvert #70: 12th Concession Road	$ 85,000	$ 60,000	$ 15,000	$ 160,000		
Roadside Safety Improvements - Bridge #1010	$ 50,000	$ 10,000	$ 10,000	$ 70,000		
Culvert #48: Holden Road	$ 422,000	$ 64,000	$ 64,000	$ 550,000		
Colins Drain at Outer Drive (1016)	$ 300,000	$ 45,000	$ 45,000	$ 390,000		
Totals	$ 3,278,200	$ 943,100	$ 481,800	$ 4,703,100	$ 349,000	$ 442,500

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Watermains	Construction	Engineering	Contingency	Total	2020	2021
Water & Wastewater Master Plan Update (2016)	$ -	$ 57,500	$ -	$ 57,500	$ -	$ -
Tecumseh Road CIP - Phase 1	$ 430,000	$ 92,520	$ 43,000	$ 565,520	$ -	$ -
Tecumseh Road CIP - Phase 2	$ 298,900	$ 47,030	$ 29,890	$ 375,820	$ -	$ -
Tecumseh Road CIP - Phase 3	$ 157,150	$ 24,727	$ 15,715	$ 197,592	$ -	$ -
Tecumseh Road CIP - Phase 4	$ 162,250	$ 25,529	$ 16,225	$ 204,004	$ -	$ -
Tecumseh Road CIP - Phase 5	$ -	$ -	$ -	$ -	$ -	$ -
Manning Road/ETLD Relocation - Phase 2 CFWD+	$ 870,800	$ 155,000	$ 43,500	$ 1,069,300	$ 6,000	$ 1,038,300
Fire Hydrant Reflectors	$ 15,000	$ -	$ -	$ 15,000	$ -	$ 15,000
Banwell Watermain-Intersection to South of CPR	$ 443,200	$ 161,800	$ 133,000	$ 738,000	$ -	$ 130,900
Various Watermain Replacement Projects 2021	$ 734,600	$ 219,200	$ 131,200	$ 1,085,000	$ -	$ 1,085,000
Hwy3-CR34 Water Valve Replacement	$ 370,700	$ 30,000	$ 55,600	$ 456,300	$ -	$ 456,300
Hwy#3/Walker Rd Watermain Replacement CFWD	$ 1,422,300	$ 304,000	$ 100,000	$ 1,826,300	$ 1,691,700	$ -
Westlake Drive - San, Stm, Water	$ 85,000	$ 12,750	$ 12,750	$ 110,500	$ -	$ -
Watermain Anode Program - Inspection/Replacement	$ 160,000	$ 40,000	$ -	$ 200,000	$ -	$ 200,000
Water Loss Audit	$ -	$ 15,000	$ -	$ 15,000	$ -	$ -
Tecumseh Hamlet SPA EA FSR CFWD+	$ -	$ 98,000	$ -	$ 98,000	$ 30,250	$ 67,750
CR46/Webster/Laval Sanitary Sewer(LRPCP) CFWD	$ 1,111,200	$ 154,000	$ 55,600	$ 1,320,800	$ -	$ -
Delduca Drive Sanitary Sewer (LRPCP) CFWD	$ 25,400	$ 4,100	$ 1,300	$ 30,800	$ -	$ -
CR42/43 Construction CFWD	$ 959,400	$ 161,700	$ 47,900	$ 1,169,000	$ 758,600	$ -
Manning Trunk Water-CR22 to CPR (W-2B)	$ 1,701,000	$ 255,000	$ 340,000	$ 2,296,000	$ -	$ -
E Tecumseh Hamlet Watermain Connection (W-2A)	$ 416,000	$ 62,000	$ 83,000	$ 561,000	$ -	$ -
2020 Water and Wastewater Rates Study CFWD	$ -	$ 10,000	$ -	$ 10,000	$ 10,000	$ -
CR42 & CR43 Advanced Engineering	$ -	$ 25,000	$ -	$ 25,000	$ -	$ -
Zone 2 Water Booster/Storage Site Select (W-9,10)	$ -	$ 280,000	$ 70,000	$ 350,000	$ -	$ -
Zone 2 Booster Station (W-9)	$ 2,660,000	$ 399,000	$ 266,000	$ 3,325,000	$ -	$ -
Zone 2 Water Storage Facility (W-10)	$ 5,160,000	$ 774,000	$ 516,000	$ 6,450,000	$ -	$ -
CR19 @ CR46 Advanced Construction	$ 125,000	$ 18,750	$ 18,750	$ 162,500	$ -	$ -
West Tecumseh Trunk Watermain (W-1)	$ 2,040,000	$ 408,000	$ 306,000	$ 2,754,000	$ -	$ -
CR19 @ CR34 Advanced Construction	$ 40,000	$ 6,000	$ 6,000	$ 52,000	$ -	$ -
Totals	$ 19,387,900	$ 3,840,606	$ 2,291,430	$ 25,519,936	$ 2,496,550	$ 2,993,250

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Wastewater Projects	Construction	Engineering	Contingency	Totals	2020	2021
Water & Wastewater Master Plan Update (2016)	$ -	$ 57,500	$ -	$ 57,500	$ -	$ -
Tecumseh Road CIP - Phase 1	$ 400,000	$ 92,520	$ 40,000	$ 532,520	$ -	$ -
Tecumseh Road CIP - Phase 2	$ 298,900	$ 47,030	$ 29,890	$ 375,820	$ -	$ -
Tecumseh Road CIP - Phase 3	$ 157,150	$ 24,727	$ 15,715	$ 197,592	$ -	$ -
Tecumseh Road CIP - Phase 4	$ 162,250	$ 25,529	$ 16,225	$ 204,004	$ -	$ -
Tecumseh Road CIP - Phase 5	$ -	$ -	$ -	$ -	$ -	$ -
Manning Road/ETLD Relocation - Phase 2 CFWD+	$ 9,000	$ 2,000	$ 500	$ 11,500	$ -	$ -
Sylvestre Drive Sanitary Sewer Extension CFWD+	$ 505,900	$ 198,100	$ 25,300	$ 729,300	$ -	$ -
Pump Station Emergency Response Plan	$ -	$ 35,000	$ -	$ 35,000	$ -	$ -
SCADA Software/Server/Nodes Update	$ 46,250	$ -	$ -	$ 46,250	$ -	$ -
Manhole Restoration Program	$ 125,000	$ -	$ -	$ 125,000	$ 25,000	$ 50,000
Sylvestre Drive Sanitary PS Improvements	$ 143,000	$ -	$ -	$ 143,000	$ -	$ 15,000
Lakewood Sanitary PS Improvements	$ 88,500	$ -	$ -	$ 88,500	$ -	$ 25,000
St. Alphonse Sanitary PS Improvements	$ 31,500	$ -	$ -	$ 31,500	$ -	$ 31,500
Portable Generator for PS	$ 75,000	$ -	$ -	$ 75,000	$ -	$ -
Sanitary Metering Station Repairs	$ 10,000	$ -	$ -	$ 10,000	$ -	$ -
Westlake Drive - San, Stm, Water	$ 132,000	$ 20,000	$ 20,000	$ 172,000	$ -	$ -
Tecumseh Hamlet SPA EA FSR CFWD+	$ -	$ 113,000	$ -	$ 113,000	$ 30,250	$ 82,750
CR46/Webster/Laval Sanitary Sewer(LRPCP) CFWD	$ 1,225,500	$ 170,000	$ 61,300	$ 1,456,800	$ -	$ -
Scully & St Mark's Storm PS/Riverside Drive CFWD+	$ 321,000	$ 62,000	$ 32,000	$ 415,000	$ 20,550	$ 78,000
Delduca Drive Sanitary Sewer (LRPCP) CFWD+	$ 1,019,000	$ 165,700	$ 51,000	$ 1,235,700	$ -	$ 40,000
Sanitary Sewer Model Update	$ -	$ 315,000	$ -	$ 315,000	$ 45,000	$ 20,000
Riverside Drive In-line Storage Trunk Sanitary	$ 1,645,000	$ 246,750	$ 164,500	$ 2,056,000	$ -	$ -
CR42/43 Construction CFWD+	$ 626,900	$ 163,700	$ 31,400	$ 822,000	$ 44,900	$ 30,000
CR42 & CR43 Advanced Engineering	$ -	$ 16,000	$ -	$ 16,000	$ -	$ -
Tecumseh Road Sanitary Sewer CFWD	$ 1,400,000	$ 259,000	$ 180,000	$ 1,839,000	$ 1,689,000	$ -
Ure Street Sanitary Sewer (LRPCP)	$ 407,500	$ 61,100	$ 40,800	$ 509,000	$ -	$ -
West Tecumseh Trunk Sanitary (WW-1)	$ 5,210,000	$ 1,042,000	$ 781,500	$ 7,034,000	$ -	$ -
Diversion San Sewers (Intersection Rd) (WW-2)	$ 840,000	$ 168,000	$ 126,000	$ 1,134,000	$ -	$ -
Sylvestre Pumping Station Upgrade (WW-4)	$ 591,000	$ 103,000	$ 89,000	$ 783,000	$ -	$ -
MRSPA Sanitary Sewer (WW-12)	$ 1,020,000	$ 179,000	$ 153,000	$ 1,352,000	$ -	$ -
MRSPA Sanitary Lift Station (WW-13)	$ 855,000	$ 150,000	$ 128,000	$ 1,133,000	$ -	$ -
O'Neil Street Sanitary Sewer (LRPCP)	$ 471,300	$ 70,700	$ 23,600	$ 566,000	$ -	$ -
Moynahan-Henin-Regal Sanitary Sewer (LRPCP)	$ 576,400	$ 86,500	$ 28,800	$ 692,000	$ -	$ -
2020 Water and Wastewater Rates Study CFWD	$ -	$ 10,000	$ -	$ 10,000	$ 10,000	$ -
Totals	$ 18,393,050	$ 3,883,856	$ 2,038,530	$ 24,315,986	$ 1,864,700	$ 372,250

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Storm Sewers	Construction	Engineering	Contingency	Total	2020	2021
Tecumseh Road CIP - Phase 1	$ 700,000	$ -	$ 70,000	$ 770,000		
Tecumseh Road CIP - Phase 2	$ -	$ -	$ -	$ -		
Tecumseh Road CIP - Phase 3	$ -	$ -	$ -	$ -		
Tecumseh Road CIP - Phase 4	$ -	$ -	$ -	$ -		
Tecumseh Road CIP - Phase 5	$ -	$ -	$ -	$ -		
Pulleyblank-Crowder-Moro Sanitary Sewer	$ 665,000	$ 92,500	$ 33,300	$ 791,000		
Storm Drainage Master Plan	$ -	$ 600,000	$ -	$ 600,000		
Rossi Drive Sanitary Sewer	$ 386,500	$ 70,000	$ 19,300	$ 475,800		
Manning Road/ETLD Relocation - Phase 2 CFWD+	$ 1,498,700	$ 267,000	$ 74,900	$ 1,840,600	$ 11,000	$ 1,769,600
Manning Road Reconstruction - Phase 3 CFWD	$ 266,800	$ 42,000	$ 13,300	$ 322,100	$ 2,500	
Gouin Street Storm Sewer Extension	$ 140,000	$ 25,000	$ 35,000	$ 200,000		
Riverside Drive Trail (Lesperance-Manning)	$ 27,500	$ 7,200	$ 2,800	$ 37,500		$ 37,500
Lesperance/VIA Rail Improvements CFWD+	$ 123,600	$ 32,700	$ 6,200	$ 162,500	$ 31,000	$ 131,500
Sylvestre Drive Sanitary Sewer Extension CFWD	$ 43,500	$ 8,400	$ 2,200	$ 54,100		
Brighton Road Storm PS - Repairs	$ 75,000	$ -	$ -	$ 75,000		$ 75,000
SCADA Software/Server/Nodes Update	$ 5,250	$ -	$ -	$ 5,250		
West St. Louis Storm PS - Repairs	$ 51,000	$ 7,650	$ 7,650	$ 66,300		
Lesperance Road Storm PS - Repairs	$ 181,000	$ 18,100	$ 18,100	$ 217,200		
(East) St. Louis Storm PS - Repairs	$ 65,000	$ 9,750	$ 9,750	$ 84,500		
Manhole Restoration Program	$ 125,000	$ -	$ -	$ 125,000	$ 25,000	$ 50,000
Westlake Drive - San, Stm, Water	$ 120,000	$ 18,000	$ 18,000	$ 156,000		
Oldcastle Storm Drainage Master Plan	$ -	$ 490,000	$ -	$ 490,000		$ 40,000
Tecumseh Hamlet SPA EA FSR CFWD+	$ -	$ 496,000	$ -	$ 496,000	$ 219,250	$ 276,750
CR46/Webster/Laval Sanitary Sewer(LRPCP) CFWD	$ 448,700	$ 62,000	$ 22,400	$ 533,100	$ 75,000	
Scully & St Mark's Storm PS/Riverside Drive CFWD+	$ 11,694,000	$ 2,245,000	$ 1,168,000	$ 15,107,000	$ 733,100	$ 338,000
MRSPA Pond Design and Construction CFWD	$ 9,775,000	$ 1,660,000	$ 1,300,000	$ 12,735,000	$ 2,740,000	
Delduca Drive Sanitary Sewer (LRPCP) CFWD+	$ 932,500	$ 151,600	$ 46,600	$ 1,130,700	$ 75,000	$ 40,000
Lanoue Street Improvements	$ 35,600	$ 16,300	$ 3,600	$ 55,500		
Shoreline Management Plan CFWD	$ -	$ 350,000	$ -	$ 350,000	$ 350,000	
Stormwater Rate Study	$ -	$ 45,000	$ -	$ 45,000	$ 45,000	
P.J. Cecile Storm PS *	$ 6,733,000	$ 1,346,500	$ 1,346,500	$ 9,426,000		$ 486,000
Ure Street Sanitary Sewer (LRPCP)	$ 328,800	$ 49,300	$ 32,900	$ 411,000		
O'Neil Street Sanitary Sewer (LRPCP)	$ 380,300	$ 57,000	$ 19,000	$ 456,000		
CR42 & CR43 Advanced Engineering	$ -	$ 9,000	$ -	$ 9,000		
Breakwall Condition Assessment	$ -	$ 50,000	$ -	$ 50,000		
Moynahan-Henin-Regal Sanitary Sewer (LRPCP)	$ 465,100	$ 69,800	$ 23,300	$ 558,000		
TSDMP Implementation - CWB Inlet Improvements	$ 100,000	$ -	$ -	$ 100,000		
Turkey Creek Watershed Assessment - Phase 1	$ -	$ 60,000	$ -	$ 60,000		$ 60,000
Tecumseh Storm Drainage Master Plan Update	$ -	$ 150,000	$ -	$ 150,000		
Olympia-Astor-Solar Sanitary Sewer	$ -	$ -	$ -	$ -		
Totals	$ 34,170,100	$ 7,718,300	$ 4,185,200	$ 46,073,100	$ 4,306,850	$ 3,304,350

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Municipal Drains	Construction	Engineering	Contingency	Total	2020	2021
Manning Road/ETLD Relocation - Phase 2 CFWD+	$ 2,925,100	$ 521,000	$ 146,300	$ 3,592,400	$ 21,500	$ 3,465,900
Totals	$ 2,925,100	$ 521,000	$ 146,300	$ 3,592,400	$ 21,500	$ 3,465,900

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Oldcastle - North Talbot - Sanitary Area	Construction	Engineering	Contingency	Total	2020	2021
Olympia-Astor-Solar Sanitary Sewer	$ 649,500	$ 97,400	$ 65,000	$ 812,000	$ -	$ -
County Road 11 (South) Sanitary Sewer	$ 300,000	$ 45,000	$ 30,000	$ 375,000	$ -	$ -

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Oldcastle - 8th Concession - Sanitary Area	Construction	Engineering	Contingency	Total	2020	2021
CR46/Webster/Laval Sanitary Sewer(LRPCP) CFWD	$ 4,554,700	$ 631,000	$ 227,800	$ 5,413,500	$ 75,000	$ -
Delduca Drive Sanitary Sewer (LRPCP) CFWD+	$ 3,171,500	$ 515,600	$ 158,600	$ 3,845,700	$ 75,000	$ 100,000
Ure Street Sanitary Sewer (LRPCP)	$ 1,270,200	$ 190,500	$ 127,100	$ 1,587,000	$ -	$ -
O'Neil Street Sanitary Sewer (LRPCP)	$ 1,469,100	$ 220,300	$ 104,400	$ 1,794,000	$ -	$ -
Moynahan-Henin-Regal Sanitary Sewer (LRPCP)	$ 1,796,800	$ 269,600	$ 127,600	$ 2,194,000	$ -	$ -

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

County of Essex (Initiated) Projects	Construction	Engineering	Contingency	Total	2020	2021
Culvert #45: South Talbot Road (CR11/STR Works)	$ 270,000	$ 41,000	$ 41,000	$ 352,000	$ -	$ -
Westlake Drive - San, Storm, Water	$ 337,000	$ 50,750	$ 50,750	$ 438,500	$ -	$ -
CR42/43 Construction CFWD+	$ 1,621,500	$ 335,700	$ 81,100	$ 2,038,300	$ 825,950	$ 30,000
CR19 @ CR46 Advanced Construction	$ 125,000	$ 18,750	$ 18,750	$ 162,500	$ -	$ -
CR42: CR19 to CR43 (Sidewalks Bike Lanes) CFWD	$ 688,000	$ -	$ 20,500	$ 708,500	$ 90,000	$ -
CR19 @ CR34 Advanced Construction	$ 40,000	$ 6,000	$ 6,000	$ 52,000	$ -	$ -

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Town of Tecumseh
Public Works Environmental Services
2021 Capital Works Plan

Other	Construction	Engineering	Contingency	Total	2020	2021
Water & Wastewater Master Plan Update (2016)	$ -	$ 115,000	$ -	$ 115,000	$ -	$ -
Manning Road/ETLDRelocation - Phase 2 CFWD+	$ 5,989,700	$ 1,067,000	$ 299,500	$ 7,356,200	$ 43,000	$ 7,061,700
Manning Road Reconstruction - Phase 3 CFWD+	$ 5,986,700	$ 940,000	$ 299,300	$ 7,226,000	$ 48,000	$ 100,000
Tecumseh Road CIP - Phase 1 CFWD	$ 11,661,900	$ 1,850,400	$ 1,099,000	$ 14,611,300	$ 350,000	$ -
Tecumseh Road CIP - Phase 2 CFWD	$ 6,177,780	$ 940,600	$ 597,800	$ 7,716,180	$ 50,000	$ -
Tecumseh Road CIP - Phase 3	$ 3,244,430	$ 494,532	$ 314,300	$ 4,053,262	$ -	$ -
Tecumseh Road CIP - Phase 4	$ 3,352,450	$ 510,580	$ 324,500	$ 4,187,530	$ -	$ -
Tecumseh Road CIP - Phase 5	$ 1,742,250	$ 271,418	$ 172,500	$ 2,186,168	$ -	$ -
Riverside Drive Trail (Lesperance-Manning) CFWD+	$ 908,900	$ 239,500	$ 90,900	$ 1,239,300	$ -	$ 389,300
Lesperance Road Trail (CR22 to CR42)	$ 885,000	$ 142,000	$ 177,000	$ 1,204,000	$ -	$ 137,500
Riverside Drive Pathway (Arlington to Kensington)	$ 120,000	$ 18,000	$ 18,000	$ 156,000	$ -	$ -
Lesperance Road Trail (Riverside to McNorton)	$ 350,000	$ 52,500	$ 52,500	$ 455,000	$ -	$ -
Manhole Restoration Program	$ 250,000	$ -	$ -	$ 250,000	$ 50,000	$ 100,000
Hwy#3/Walker Rd Watermain Replacement CFWD	$ 1,422,300	$ 304,000	$ 100,000	$ 1,826,300	$ 1,691,700	$ -
Various Watermain Replacement Projects 2021	$ 752,200	$ 222,900	$ 133,000	$ 1,108,100	$ -	$ 1,108,100
Watermain Anode Program - Inspection/Replacement	$ 160,000	$ 40,000	$ -	$ 200,000	$ -	$ 200,000
Water Loss Audit	$ -	$ 15,000	$ -	$ 15,000	$ -	$ -
Zone 2 Water Booster/Storage Site Select (W-9,10)	$ -	$ 280,000	$ 70,000	$ 350,000	$ -	$ -
Zone 2 Booster Station (W-9)	$ 2,660,000	$ 399,000	$ 266,000	$ 3,325,000	$ -	$ -
Zone 2 Water Storage Facility (W-10)	$ 5,160,000	$ 774,000	$ 516,000	$ 6,450,000	$ -	$ -
Sylvestre Drive Sanitary Sewer Extension CFWD+	$ 1,445,100	$ 380,000	$ 72,300	$ 1,897,400	$ -	$ -
Sanitary Sewer Model Update	$ -	$ 315,000	$ -	$ 315,000	$ 45,000	$ 20,000
Lanoue Street Improvements CFWD+	$ 671,600	$ 308,200	$ 67,200	$ 1,047,000	$ 363,300	$ 125,000
Tecumseh Road Sanitary Sewer CFWD	$ 1,710,000	$ 326,000	$ 207,500	$ 2,243,500	$ 2,093,500	$ -
Riverside Drive In-line Storage Trunk Sanitary	$ 2,220,000	$ 363,000	$ 222,000	$ 2,804,750	$ -	$ -
MRSPA Pond Design and Construction CFWD	$ 9,775,000	$ 1,660,000	$ 1,300,000	$ 12,735,000	$ 2,740,000	$ -
Brighton Road Storm PS - Repairs	$ 75,000	$ -	$ -	$ 75,000	$ -	$ 75,000
West St. Louis Storm PS - Repairs	$ 51,000	$ 7,650	$ 7,650	$ 66,300	$ -	$ -
Lesperance Road Storm PS - Repairs	$ 181,000	$ 18,100	$ 18,100	$ 217,200	$ -	$ -
(East) St. Louis Storm PS - Repairs	$ 65,000	$ 9,750	$ 9,750	$ 84,500	$ -	$ -
Oldcastle Storm Drainage Master Plan	$ -	$ 490,000	$ -	$ 490,000	$ -	$ 40,000
TSDMP Implementation - CWB Inlet Improvements	$ 100,000	$ -	$ -	$ 100,000	$ -	$ -
Tecumseh Storm Drainage Master Plan Update	$ -	$ 150,000	$ -	$ 150,000	$ -	$ -
Shoreline Management Plan CFWD	$ -	$ 350,000	$ -	$ 350,000	$ 350,000	$ -
Breakwall Conditions Assessment	$ -	$ 50,000	$ -	$ 50,000	$ -	$ -
Scully & St Mark's Storm PS/Riverside Drive CFWD+	$ 13,198,000	$ 2,534,000	$ 1,318,000	$ 17,050,000	$ 797,250	$ 500,000
West Tecumseh Trunk Watermain (W-1)	$ 2,040,000	$ 408,000	$ 306,000	$ 2,754,000	$ -	$ -
West Tecumseh Trunk Sanitary (WW-1)	$ 5,210,000	$ 1,042,000	$ 781,500	$ 7,034,000	$ -	$ -
Diversion San Sewers (Intersection Rd) (WW-2)	$ 840,000	$ 168,000	$ 126,000	$ 1,134,000	$ -	$ -
P.J. Cecile Storm PS *	$ 6,928,000	$ 1,405,500	$ 1,366,500	$ 9,700,000	$ -	$ 500,000
2020 Water and Wastewater Rates Study CFWD	$ -	$ 20,000	$ -	$ 20,000	$ 20,000	$ -

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Summary of PWES 2021 Capital Works Projects		Wards
Roads		
RD 1	Tar & Chip, Asphalting and Crack Sealing	All
RD 2	Tecumseh Signage Project	All
RD 3	Lesperance/VIA Rail Improvements	3
RD 4	Lanoue Street Improvements	3
RD 5	Tecumseh Road Community Improvement Plan (CIP) – Streetscape Plan & Design	3
RD 6	Manning Road Improvements Project, Phase 3	2
RD 7	Traffic Signal Controller Upgrades	All
RD 8	Expansion/Improvements to the Public Works Yard (North)	3
RD 9	TTMP Bicylce Sharrows	All
RD 10	Brighton Road Traffic Improvements	2
RD 11	CP/Lesperance Crossing Improvements	4 & 5
RD 12	Traffic Calming Guideline Study	All
RD 13	Annual Project Contingency	All
RD 14	CWATS Study for Facility Enhancements for Crossing at Pike Creek/Tecumseh Road	2
Sidewalks and Pathways Projects		
SW 1	2021 Sidewalk Repair Projects	All
SW 2	County Road 42 Sidewalks and Bike Lanes (2020 - CR19/CR42 Roundabout)	5
SW 3	Tecumseh Road Multi-Use Pathway Re-construction (Arlington to DM Eagle Public School)	2
SW 4	Riverside Drive Trail	1 & 2
SW 5	Lesperance Road Multi-Use Trail - CR22 to CR42	4 & 5
SW 6	Malden Road Pathway Extension	5
Bridge Projects		
BR 1	Snake Lane Road Culverts (with Spans < 3.0m) – Culverts No. 42, 53 & 54	5
BR 2	Bridges (with Spans > 3.0m) – Baseline Road/Pike Creek Bridge No.1005 Bank Stabilization	5
Water Projects		
WA 1	Highway No.3 / County Road 11 Watermain Replacement	5
WA 2	County Road 42 and County Road 43 Improvements	5
WA 3	2020 Water and Wastewater Rates Study	All
WA 4	Fire Hydrant Reflectors	All
WA 5	County Road 43/Banwell Watermain – Intersection Road to South of CPR	4 & 5
WA 6	2021 Various Watermain Replacement Project	2 & 5
WA 7	Hwy 3/CR34 Water Valve Replacement	5
WA 8	Watermain Anode Program – Inspection/Replacement	All
Wastewater Projects		
WW 1	Tecumseh Road Sanitary Sewer – Lesperance to Southfield	3
WW 2	Sylvestre Drive Sanitary Sewer Extension	4
WW 3	County Road 46, Webster and Laval Sanitary Sewer Extension	5
WW 4	Del Duca Drive Sanitary Sewer Extension	5
WW 5	Sanitary Sewer Model Update and Flow Monitoring	All
WW 6	Manhole Restoration Program	All
WW 7	2021 Sanitary Pump Station Improvements	2, 4 & 5
Storm Sewer Projects		
ST 1	Shoreline Management Plan	1 & 2
ST 2	Stormwater Rate Study	All
ST 3	Manning Road Secondary Plan Area – Stormwater Facility	4
ST 4	Tecumseh Hamlet EA and Functional Servicing Study	4 & 5
ST 5	Oldcastle Storm Drainage Master Plan	5
ST 6	Manning Road Improvement Project, Phase 2	2
ST 7	Scully & St. Mark's Storm Pump Station & Riverside Drive Storm Sewers	2
ST 8	P.J. Cecile (Kensington) Storm Pump Station	2
ST 9	Turkey Creek Watershed Assessment – Phase 1	5
ST 10	Brighton Road Storm Pump Station Repairs	2

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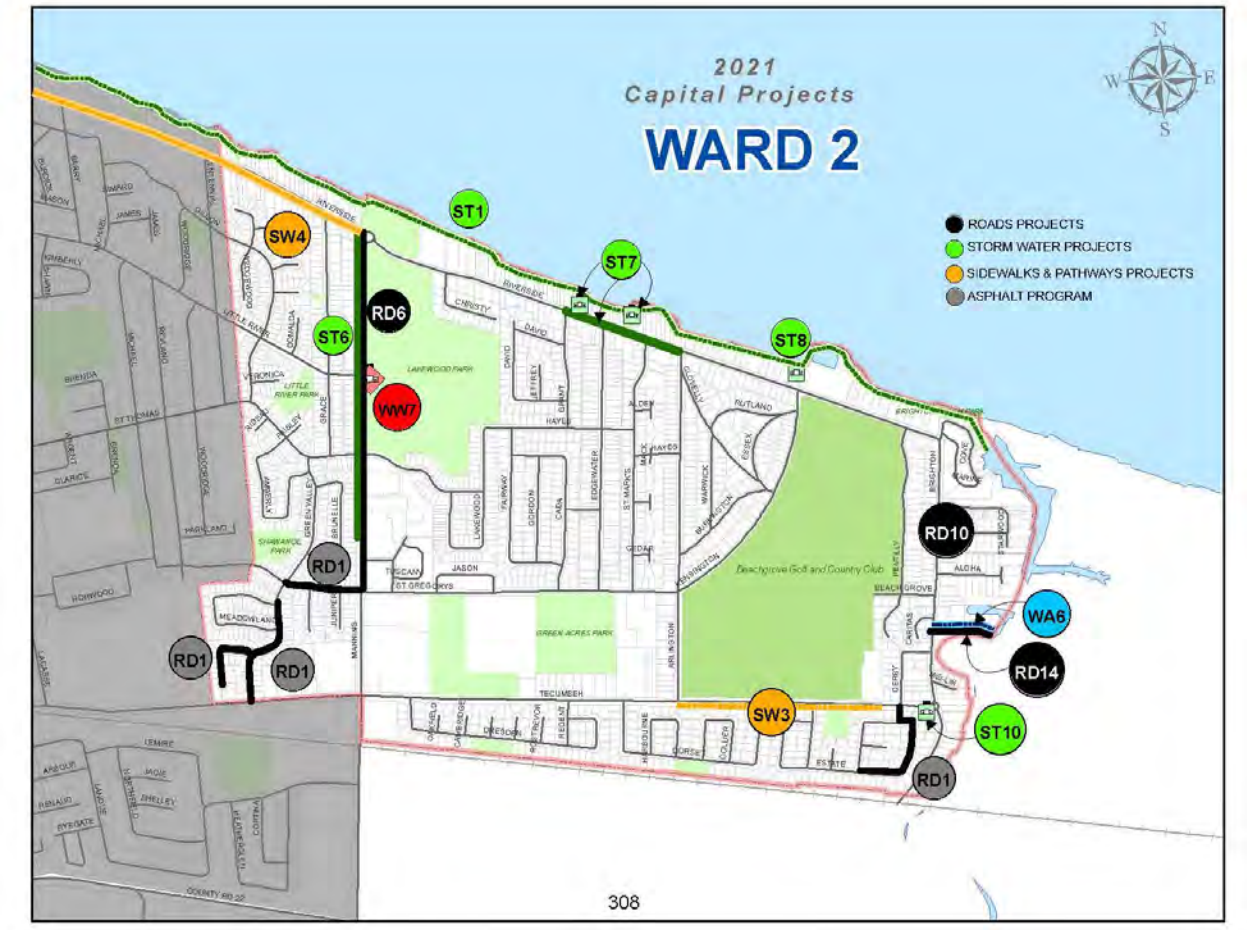

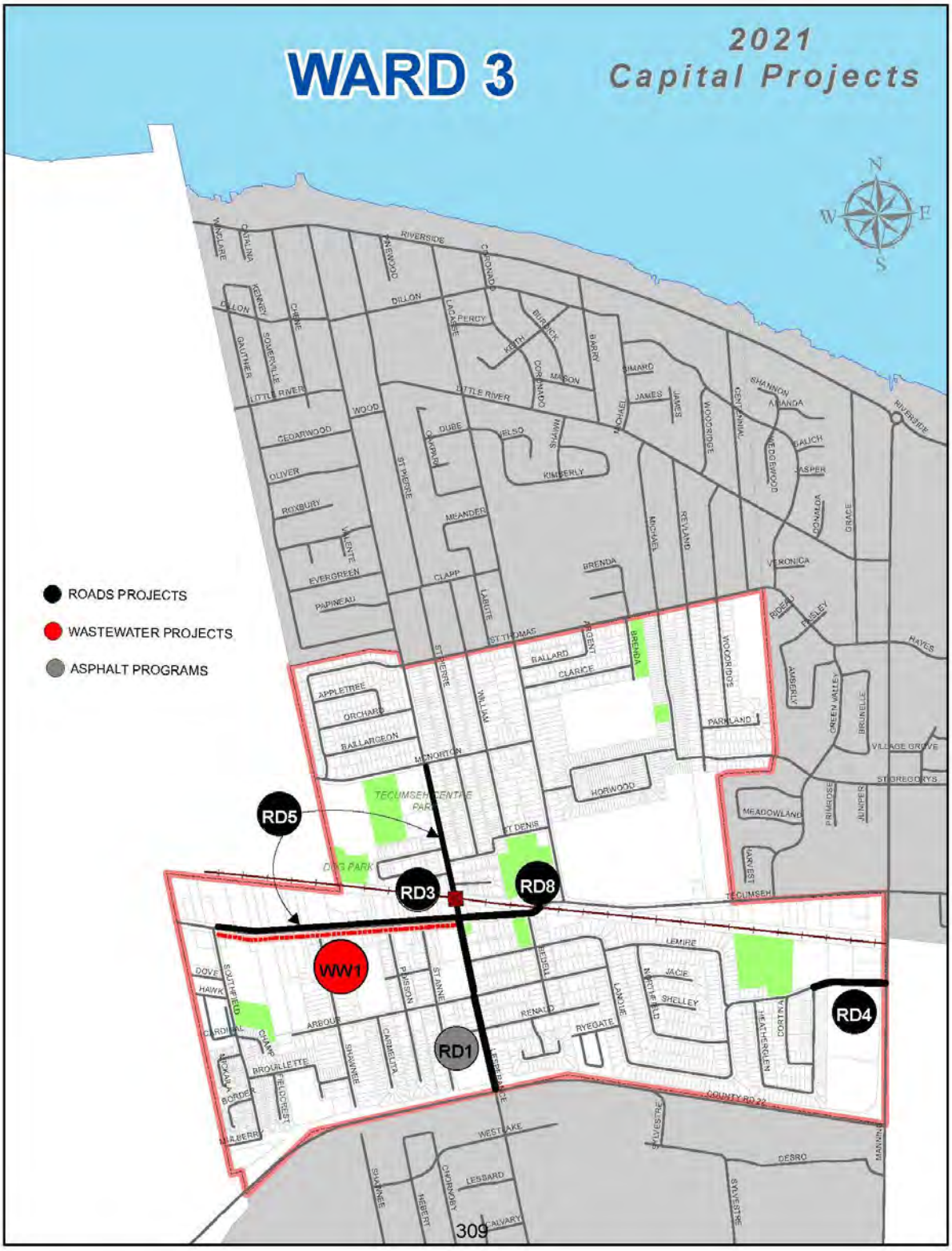

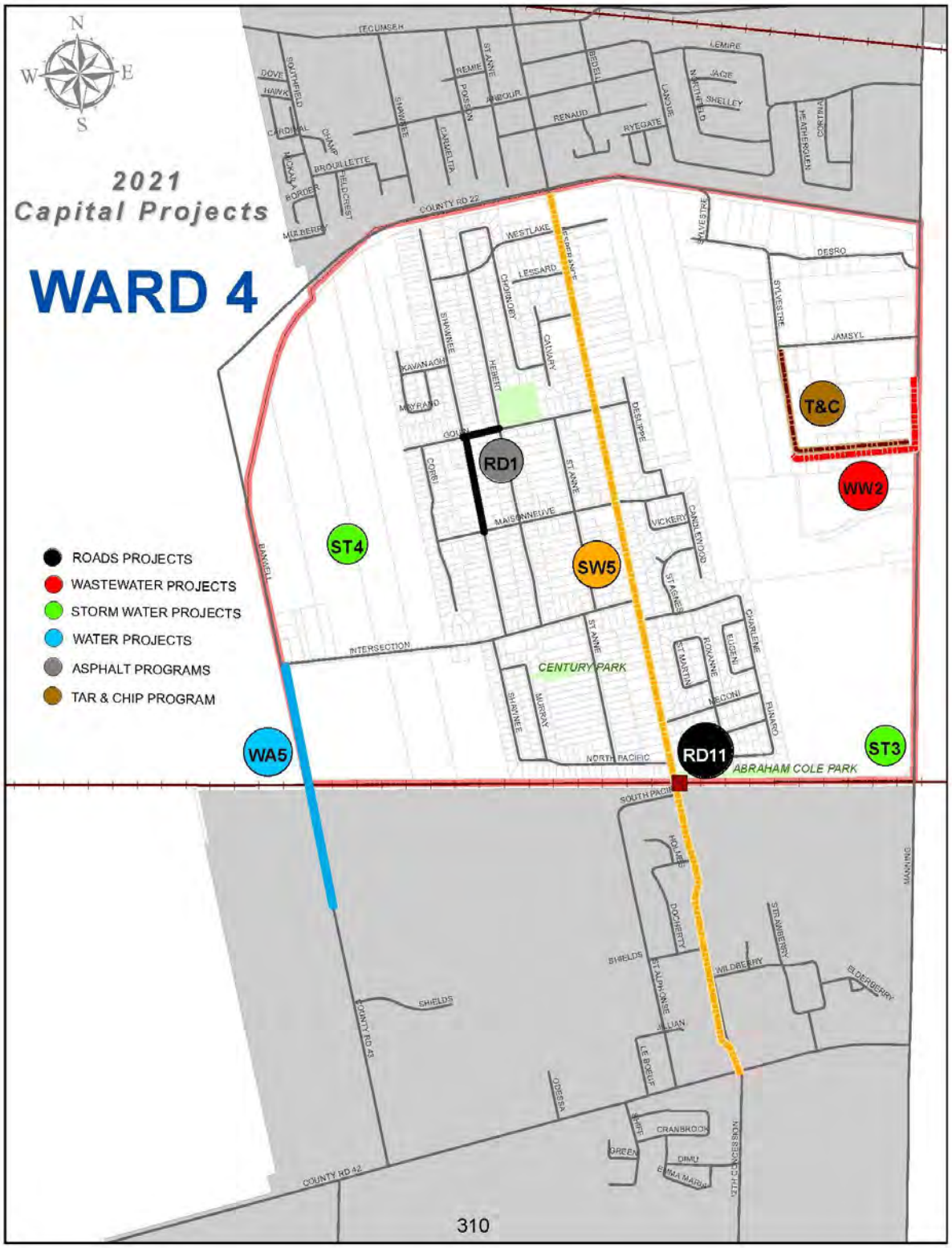

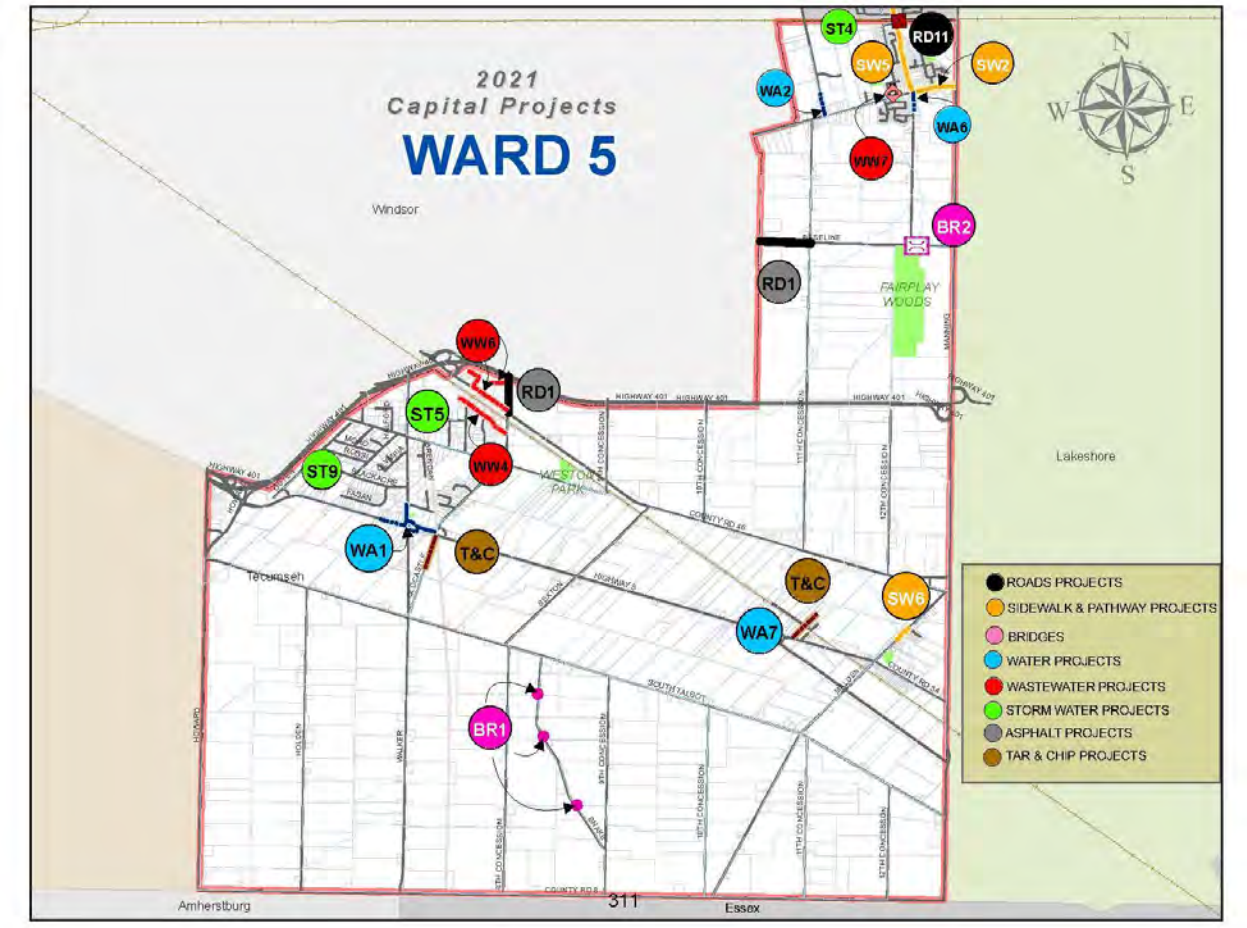

Attachment 14 - 2021 Roads Lifecycle Reserve Projection

LC Road (1500)	2021
Reserve Balance Start of Year	$ 11,178,000
Budget Allocation	$ 4,160,000
Sale of Electricity to Grid	$ 10,000
CWATS	$ -
County Connecting Link Agreement	$ -
Funds Available	**$ 15,348,000**
Committed	
IT GIS Tech % share	$ 28,150
Traffic Signal Controller Upgrade (with County)	$ 90,000
Lesperance/VIA Rail Improvements	$ 155,000
Delduca Drive Sanitary Sewer (LRPCP)	$ 76,450
Lanoue Street Improvements	$ 272,400
Scully & St. Mark's Storm PS/Riverside Drive	$ 26,100
Balance Committed	**$ 648,100**
Balance Uncommitted	**$ 14,699,900**
Proposed	
Road Paving - Asphalting (Note 1)	$ 1,300,000
PW Yard (North) Expansion/Improvements	$ 30,000
TTMP Bicycle Sharrows	$ 15,000
Tecumseh Hamlet SPA EA FSR	$ 67,750
Lesperance/VIA Rail Improvements	$ 1,279,300
Manning Road/ETLD Relocation - Phase 2	$ 787,900
Manning Road Reconstruction - Phase 3	$ 100,000
Brighton Road Traffic Circle Review	$ 30,000
Various Watermain Replacement Projects 2021	$ 23,100
Scully & St. Mark's Storm PS/Riverside Drive	$ 84,000
Delduca Drive (Sanitary Sewer LRPCP)	$ 20,000
Lanoue Street Improvements	$ 125,000
PJ Cecile Storm PS	$ 14,000
CP/Lesperance Crossing Improvements	$ 30,000
Annual Project Allocation	$ 250,000
Balance Proposed	**$ 4,156,050**
Balance Available	**$ 10,543,850**

Notes:

1) General allowance for asphalting

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Attachment 15 - 2021 Bridges Lifecycle Reserve Projection

LC Bridges (1660)		2021
Reserve Balance Start of Year	$	620,000
Budget Allocation	$	410,000
Funds Available	**$**	**1,030,000**
Committed		
N/A	$	-
Balance Committed	**$**	**-**
Balance Uncommitted	**$**	**1,030,000**
Proposed		
Culvert Condition Assessment (<3m Span)	$	-
Bridge/Culvert Needs Study (>3m)	$	-
Culvert #45: S.Talbot Road (CR11/STR Works)	$	-
Culvert #42: Snake Lane Road	$	62,300
Culvert #53: Snake Lane Road	$	65,100
Culvert #54: Snake Lane Road	$	65,100
Culvert #51: 8th Concession	$	-
Culvert #70: 12th Concession	$	-
Roadside Safety Improvements - Bridge #1010	$	-
Culvert #48: Holden Road	$	-
Pike Creek Drain at Baseline Road (1005)	$	250,000
Balance Proposed	**$**	**442,500**
Balance Available	**$**	**587,500**

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Attachment 16 - 2021 Sidewalks Lifecycle Reserve Projection

LC Sidewalk (1550)		2021
Reserve Balance Start of Year	$	401,000
Budget Allocation	$	74,000
Funds Available	**$**	**475,000**
Committed	$	-
Balance Committed	**$**	**-**
Balance Uncommitted	**$**	**475,000**
Proposed		
Sidewalk repair program (Note 1)	$	69,000
Balance Proposed	**$**	**69,000**
Balance Available	**$**	**406,000**

Notes:

1) General allowance

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Attachment 17 - 2021 Storm Lifecycle Reserve Projection

LC Storm Sewer (1650)		**2021**
Reserve Balance Start of Year	$	(1,129,400)
Budget Allocation	$	1,002,700
OCIF Grant	$	1,769,600
DMAF Grant	$	194,400
Funds Available	**$**	**1,642,900**
Committed		
Scully & St. Mark's Storm PS/Riverside Drive	$	557,100
Tecumseh Hamlet SPA EA FSR	$	131,550
MRSPA Pond Design and Construction	$	959,000
Shoreline Management Plan	$	237,100
CR#46/Webster/Laval Sanitary Ext. (LRPCP)	$	16,500
Delduca Drive (LRPCP)	$	22,500
Lesperance/VIA Rail Improvements	$	31,000
Balance Committed	**$**	**1,954,750**
Balance Uncommitted	**$**	**(311,850)**
Proposed		
Manning Road/ETLD Drain Relocation - Phase 2	$	1,769,600
Lesperance/VIA Rail Improvements	$	131,500
Manhole Restoration Program	$	50,000
Tecumseh Hamlet SPA EA FSR	$	276,750
Scully & St. Mark's Storm PS/Riverside Drive	$	338,000
Riverside Drive Trail (Lesperance-Manning)	$	37,500
Brighton Road Storm PS - Repairs	$	75,000
Oldcastle Storm Drainage Master Plan	$	40,000
Delduca Drive (LRPCP)	$	40,000
Shoreline Management Plan	$	-
P.J. Cecile Storm PS	$	486,000
Turkey Creek Watershed Assessment - Phase 1	$	60,000
Balance Proposed	**$**	**3,304,350**
PWES-2019-49		
Balance Available	**$**	**(3,616,200)**

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Attachment 18 - 2021 Wastewater Sewers Reserve Fund Projection

RF Wastewater Sewers (2550)	**2021**
Reserve Balance Start of Year	$ (2,554,000)
Estimated Allocation	$ 1,908,440
Estimated Interest	$ (34,000)
Development Charges	$ 150,000
Capital Sewer Connection Charges	$ -
Funds Available	**$ (529,560)**
Committed	
Debt payments - 2012 Non-DC debt	$ 57,400
IT GIS Tech % share	$ 28,700
2020 Water and Wastewater Rates Study	$ 10,000
CR42/43 Construction	$ 28,700
Tecumseh Hamlet SPA EA FSR	$ 18,150
Balance Committed	**$ 142,950**
Balance Uncommitted	**$ (672,510)**
Proposed	
Manhole Restoration Program	$ 50,000
Tecumseh Hamlet SPA EA FSR	$ 82,750
Delduca Drive (Sanitary Sewer LRPCP)	$ 40,000
Sanitary Sewer Model Update	$ 20,000
CR42/43 Const. including 12th&Banwell Watermains	$ 30,000
Total Proposed	**$ 222,750**
Balance Available	**$ (895,260)**

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Attachment 19 - 2021 Wastewater Facilities Reserve Fund Projection

RF Wastewater Facilities (2560)	**2021**
Reserve Balance Start of Year	$ 1,826,000
Estimated Allocation	$ 400,000
Estimated Interest	$ 20,000
Funds Available	**$ 2,246,000**
Committed	
Scully & St. Mark's Storm PS/Riverside Drive	$ 12,250
Balance Committed	**$ 12,250**
Balance Uncommitted	**$ 2,233,750**
Proposed	
Sylvestre Drive Sanitary PS Improvements	$ 15,000
Lakewood Sanitary PS Improvements	$ 25,000
St. Alphonse Sanitary PS Improvements	$ 31,500
Scully & St. Mark's Storm PS/Riverside Drive	$ 78,000
Total Proposed	**$ 149,500**
Balance Available	**$ 2,084,250**

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Attachment 20 - 2021 Watermain Reserve Fund Projection

RF Watermain (2520)	2021
Reserve Balance Start of Year	$ 5,512,000
Estimated Allocation	$ 1,706,133
Estimated Interest	$ 165,400
Development Charges	$ 50,000
MMF Grant	$ 53,000
Funds Available	**$ 7,486,533**
Committed	
Tools	$ 28,200
Meters	$ 11,300
IT GIS Tech % share	$ 28,700
Tecumseh Hamlet SPA EA FSR	$ 18,150
2020 Water and Wastewater Rates Study	$ 10,000
Hwy#3/Walker Rd Watermain Replacement	$ 818,800
Balance Committed	**$ 915,150**
Balance Uncommitted	**$ 6,571,383**
Manning Road/ETLD Drain Relocation -Phase 2	$ 1,038,300
Tecumseh Hamlet SPA EA FSR	$ 67,750
Fire Hydrant Reflectors	$ 15,000
Banwell Watermain-Intersection to South of CPR	$ 130,900
Various Watermain Replacement Projects 2021	$ 1,085,000
Hwy3-CR34 Water Valve Replacement	$ 456,300
Watermain Anode Program - Inspection/Replacement	$ 200,000
Oasis Payment Solution - MMF- cfwd	$ 20,000
Oasis Payment Solution - MMF- additional funding	$ 33,000
2021 Power Gate at the 1189 Lacasse yard.	$ 35,000
Total Proposed	**$ 3,081,250**
Balance Available	**$ 3,490,133**

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Attachment 21 - 2021 Water Facilities Reserve Fund Projection

RF Water Facilities (2530)	2021
Reserve Balance Start of Year	$ 7,395,000
Estimated Allocation	$ 175,000
Estimated Interest	$ 100,000
Funds Available	**$ 7,670,000**
Committed	$ -
Balance Committed	$ -
Balance Uncommitted	**$ 7,670,000**
Proposed	
Total Proposed	$ -
Balance Available	**$ 7,670,000**

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Appendix 7- Continual Improvement Report

TOWN OF Tecumseh
ONTARIO · CANADA

WATER DIVISION
REQUEST FOR NEW OR CHANGED DWQMS DOCUMENT

PLEASE PRINT ALL INFORMATON

Document Verified by (Initials Only)	

When completed, submit this form to the DWQMS Representative or alternate. Please attach a printed hardcopy with all revisions when requesting changes to an existing DWQMS document.

DWQMS Document Title: _____

DWQMS ID: _____

Operator Name (print): _____

Date of Submission: _____

Reason for Request:

- ☐ Enhances process control
- ☐ Supports regulatory requirements
- ☐ Required by the DWQMS
- ☐ Reduce risk
- ☐ Improve operational efficiency

Summary of Reason for Change / Addition:

_____
_____
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_____
_____

Operator's Name (print)			
Operator's Signature		Date:	

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version 2

Appendix 8 – Schedule C – Director's Directions for Operational Plans

Ontario — Ministry of the Environment and Climate Change

Schedule C – Director's Directions for Operational Plans (Subject System Description Form)
Municipal Residential Drinking Water System

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *
The Corporation of the Town of Tecumseh

Name of Municipal Residential Drinking Water System *
Tecumseh Distribution System

Subject Systems

☐ Check here if the Municipal Residential Drinking Water System is operated by one operating authority. Enter the name of the operating authority in the below table.

	Name of Operational Subsystems(If Applicable)	Name of Operating Authority *	DWS Number(s) *
1		The Corporation of the Town of Tecumseh	260004969

Provide the information outlined in the 'Contact Information' section for **each** Operational Subsystem.

Contact Information

Last Name *	First Name *	Middle Initial
Dupuis	Brad	
Title *	**Phone Number ***	
Manager, Water & Wastewater	519 791-6509	
Email Address *		
bdupuis@tecumseh.ca		

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