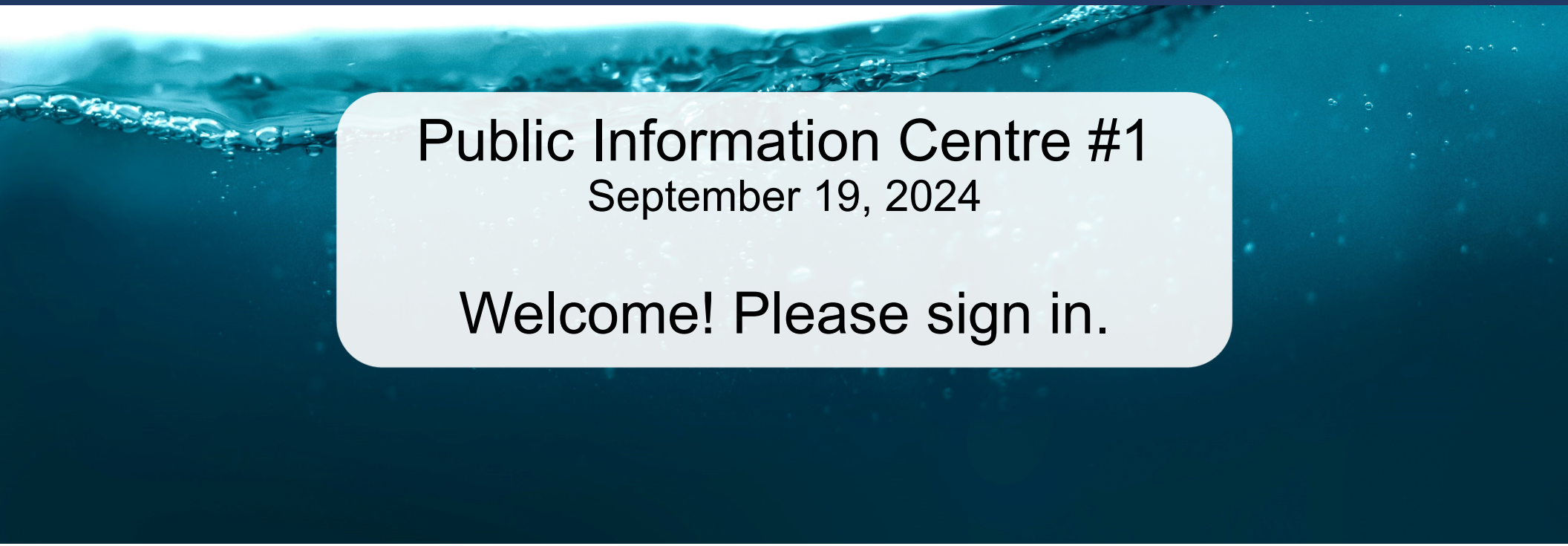
TOWNSHIP OF HAMILTON
WATER SUPPLY MASTER PLAN



Public Information Centre #1

September 19, 2024

Welcome! Please sign in.

The Municipal Class Environmental Assessment Master Plan Process

Class EA Process

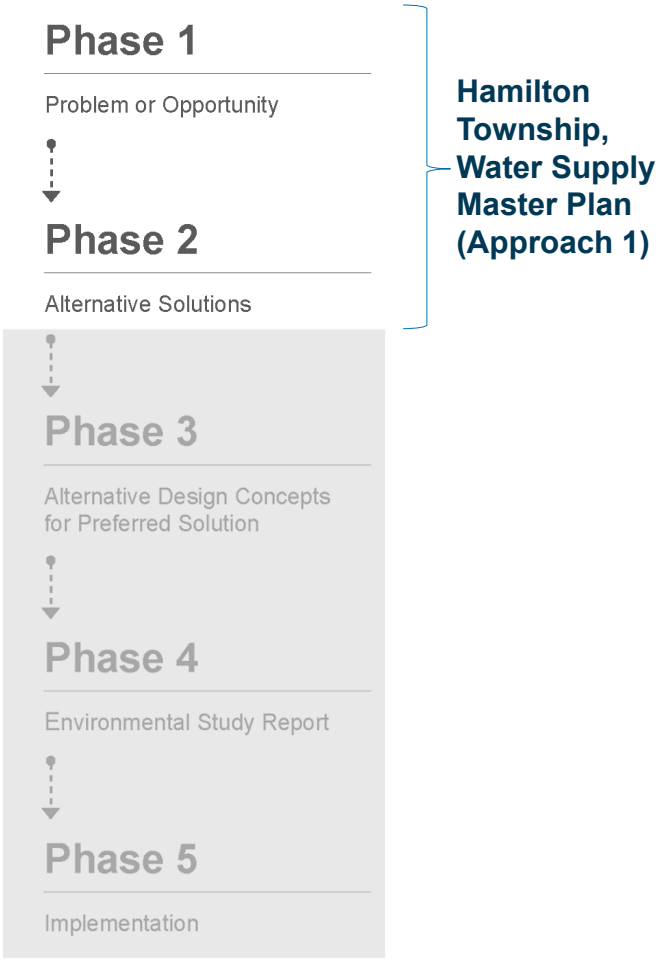
The *Ontario Environmental Assessment (EA) Act*, R.S.O., 1990 requires that projects corresponding to municipal infrastructure projects, including roads, water, and wastewater projects follow an approved planning process set out in the Municipal Class EA document prepared by the Municipal Engineers Association (MEA).

Master Plan Process

Master Plans are conducted under the framework of the MEA Class EA Process. They are a planning tool that identifies infrastructure and other requirements for the existing and future land use, through the application of environmental assessment principles. The current Master Plan is intended to satisfy Phases 1 and 2 of the Municipal Class EA process (i.e., *Approach 1*).

Master Plan Approach 1

This approach concludes at the end of Phases 1 and 2. With this approach, the Master Plan is being completed at a broad level of assessment and may require further detailed assessment at the project-specific level.



Master Plan Methodology and Timeline

Master Plan Phase 1 – Identify Problem or Opportunity

Tasks:

- Review and collect background information.
- Develop residential, institutional, commercial, and industrial development and population growth projections for short, mid, and long-term scenarios.
- Define level of service for existing conditions.
- Review water supply, treatment and storage capacity.
- Model water distribution.
- Undertake public consultation activities.
- Finalize Master Plan Phase 1 Report.

Master Plan Phase 2 – Identify and Evaluate Alternative Solutions

Tasks:

- Identify servicing needs under future growth scenarios.
- Develop alternative servicing solutions.
- Develop an implementation/phasing plan.
- Undertake public consultation activities.
- Finalize Master Plan Phase 2 Report.
- Publish Master Plan Report for 30-day public review.

Project Timeline

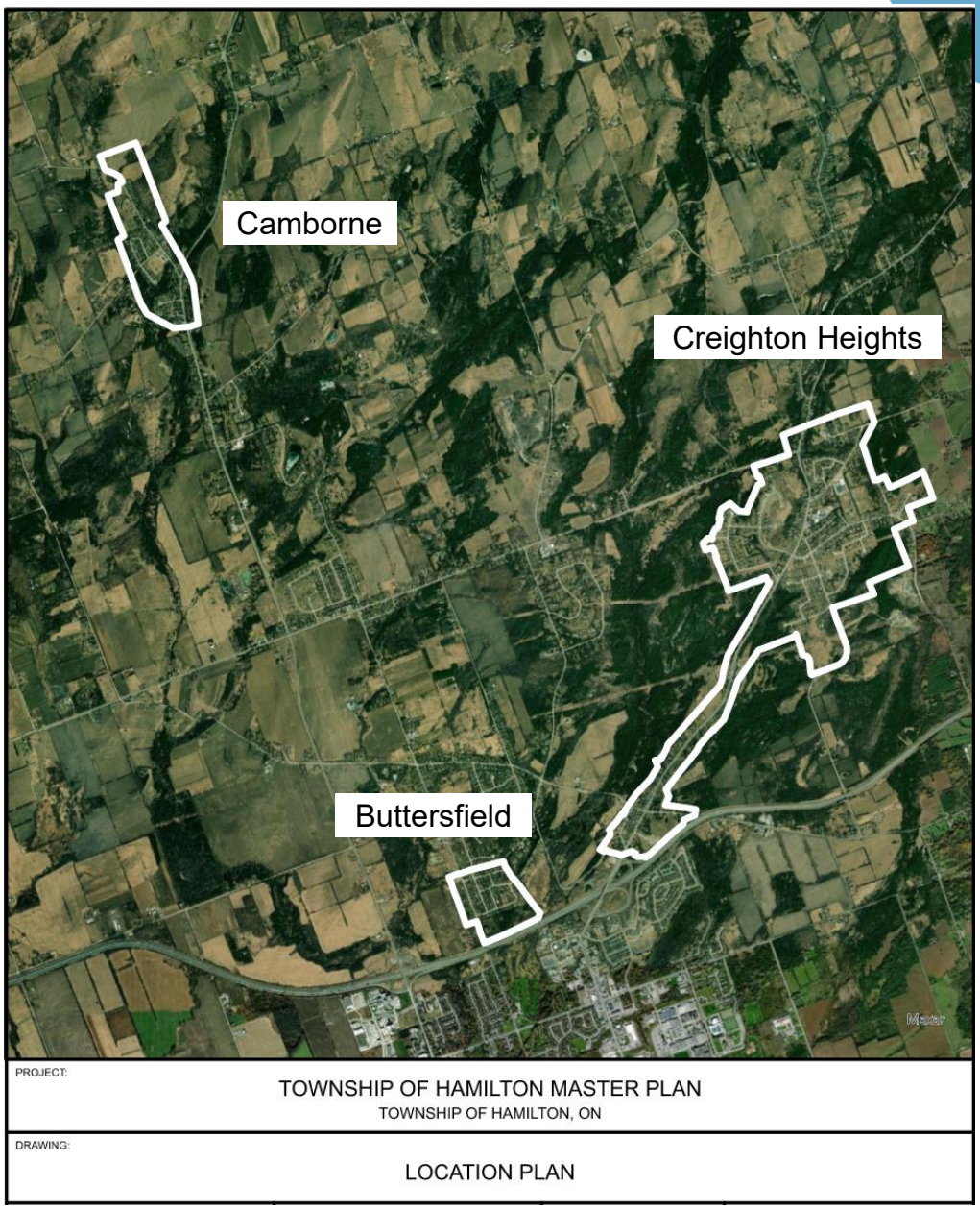
Objectives of the Township of Hamilton Water Master Plan Phase 1

- Develop a strategy to accommodate existing serviced population and future growth;
- Establish short-term, mid-term, long-term and build-out growth projections;
- Provide a description of existing conditions and constraints associated with water, infrastructure;
- Determine the residual capacity for water supply/treatment/storage;
- Estimate timing for when rated capacity of each system will be reached;
- Establish design basis for future servicing;
- Identify land use, planning, and natural environment constraints;
- Consult with public and stakeholder agencies, and
- Define a Problem/Opportunity Statement.

Overview of the Township's Existing System

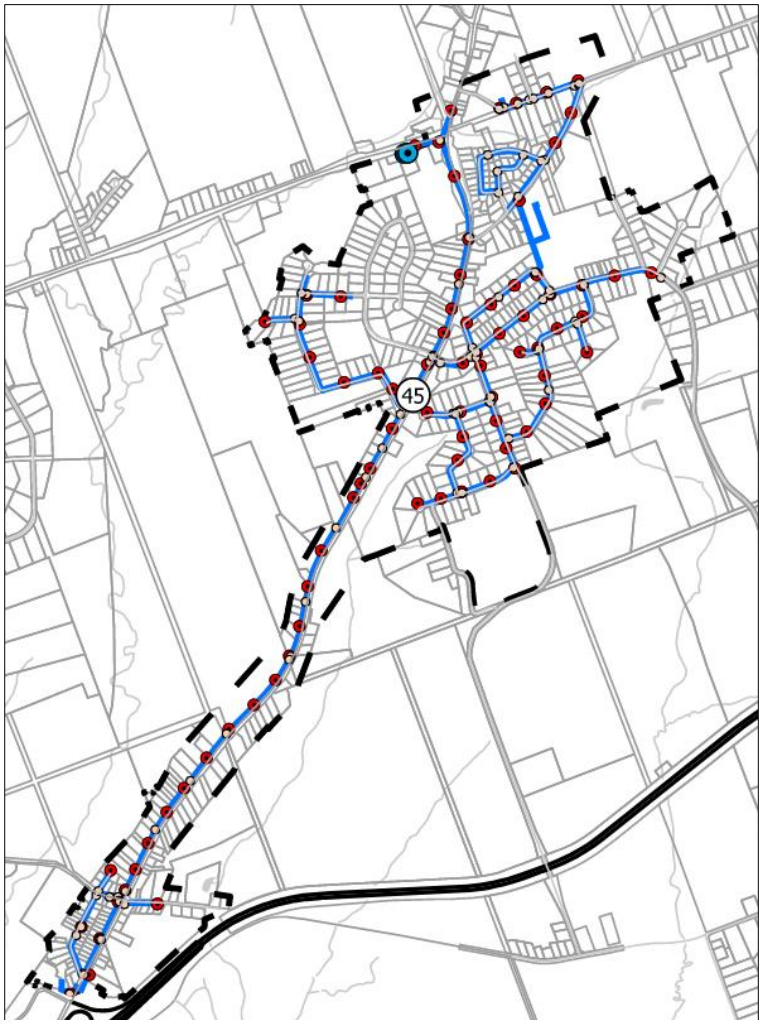
Consists of 3 municipal drinking water systems

- **Creighton Heights**
  - 3 groundwater wells
  - Water treatment plant & distribution system
  - Serviced population approx. 1,283
- **Camborne**
  - 2 artesian groundwater wells
  - Water treatment plant & distribution system
  - Serviced population approx. 182
- **Buttersfield**
  - Distribution System
  - Water supply from Cobourg
  - Serviced population approx. 292



Creighton Heights

- Operated under the MECP Municipal Drinking Water License (MDWL) Number 139-102 and Drinking Water Works Permit (DWWP) Number 139-202
- Groundwater wells TW6, and TW7 are primary production, rated 979 m^3/day. TW1 is back-up, rated for 225 m^3/day
- Treatment
  - Greensand filters (Iron and manganese removal)
  - Methane stripper
  - UV Primary Disinfection
  - Sodium hypochlorite (secondary disinfection)
  - High-lift pumps
- In ground two-celled water storage reservoir with 1,130 m^3 storage capacity
- 14 km of watermain, 4 pressure zones, 78 Fire hydrants
- Several dead ends, two of which releases water 24/7 to maintain chloramine residuals



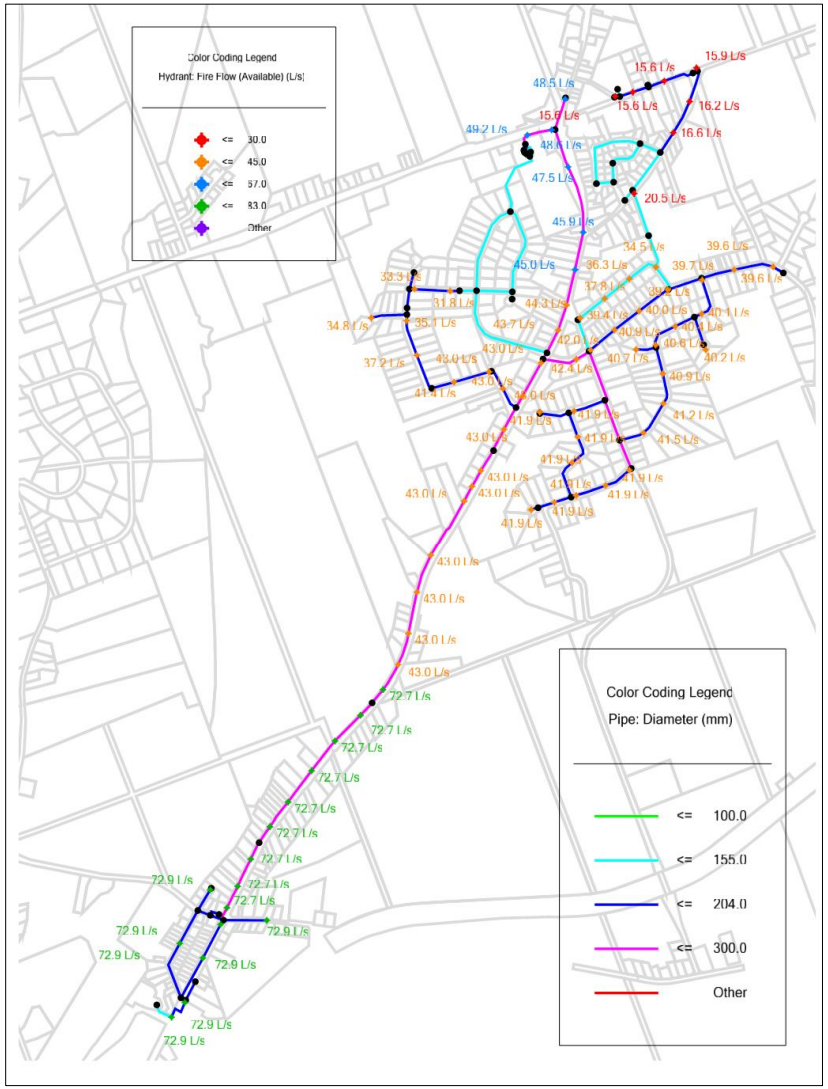
Creighton Heights Operational Challenges

Water Supply (Groundwater)	Water Treatment	Distribution
• Wells do not produce as much as rated capacities, even after rehabilitation • 75 homes disconnected from Cobourg were connected to Creighton Heights water system, contributing to increased demand and an additional pressure zone • Water Treatment Plant rated capacity is lower than the approved groundwater taking limit.	<u>Water quality:</u> • Source water quality is poor, requiring treatment for iron, manganese, methane and ammonia <u>Plant operational challenges:</u> • Challenging plant hydraulics (frequent pipe turns, choke points and significant head loss through sand filters). • No way to bypass and divert flow from high lift pumps for servicing and shut down. • Methane stripper does not have redundancy. • High O&M costs • Plant runs constantly dry summer months to keep up with demand.	• No watermain looping resulting in flushing at dead ends to maintain residuals (wasting ~30 m^3/d during summer months). • Leaks at old PRV chambers • Annual flushing with free chlorine for watermain denitrification. • 2” feeder to school is undersized. • Operators manually turn on the distribution pumps to provide additional flow during fire flow events. • Several properties on private wells are failing and are requesting to be connected onto the water distribution system.

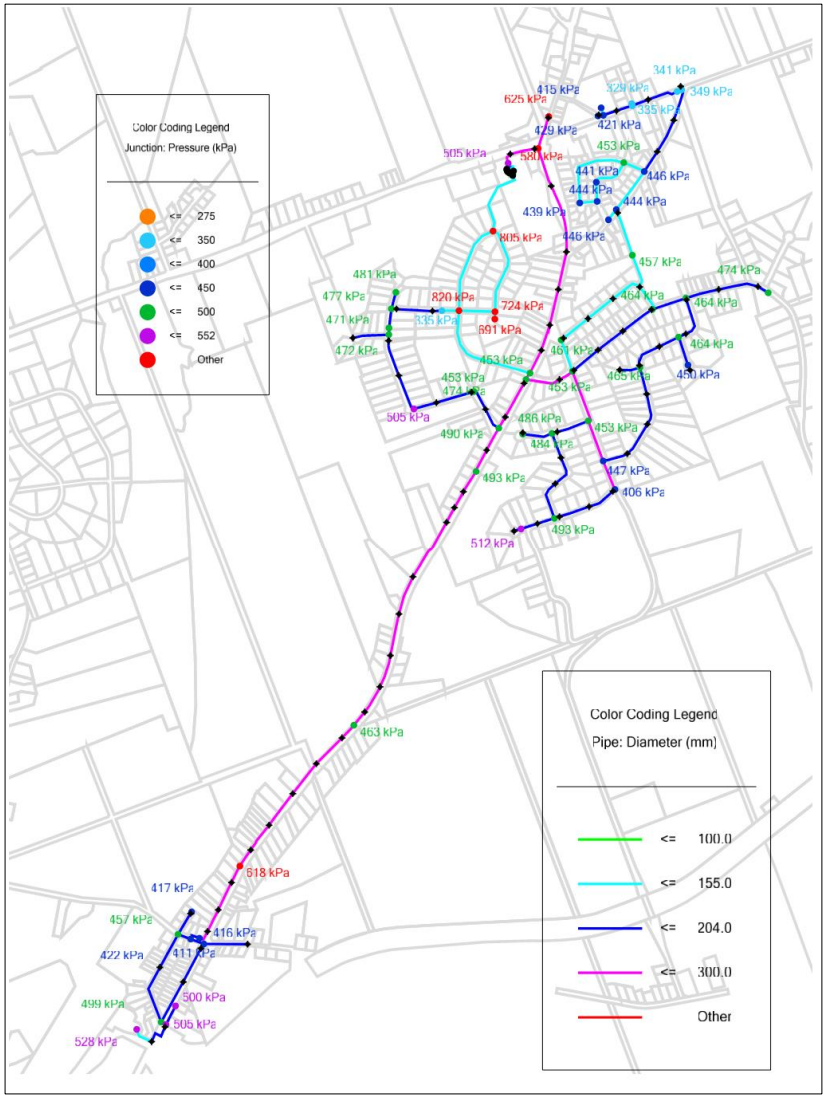
Existing Water Distribution System: Creighton Heights

Water Distribution WaterCAD ® Modelling Results:

- At max day fire flow and peak flow conditions, the existing water system experiences fire flow and pressure limitations.
- More than 80% of fire hydrants not able to provide recommended flow rate under Fire Underwriter Survey (FUS).



Water Distribution Flows under Existing Maximum Day Demand + Fire Flow



Water Distribution Pressure under Existing Peak Hour Demand

Overview of Estimated Future Growth: Creighton Heights

Residential Developments
(Including Potential Service Connections by Existing Properties)

Development Timeframe	Additional Units	Estimated Population Increase
Short-Term (0-5 Years; 2024-2029)	69 units	198 people
Mid-Term (5-10 Years; 2029-2034)	35 units	88 people
Long-Term (10-20 Years; 2034-2044)	487 units	932 people

Institutional / Commercial / Industrial Developments

Development Timeframe	Development Type	Estimated Growth
Long-Term (10-20 Years; 2034-2044)	Commercial	9.06 Hectares

Maps of future developments are available
Please see a member of the project team.

Servicing Constraints: Creighton Heights

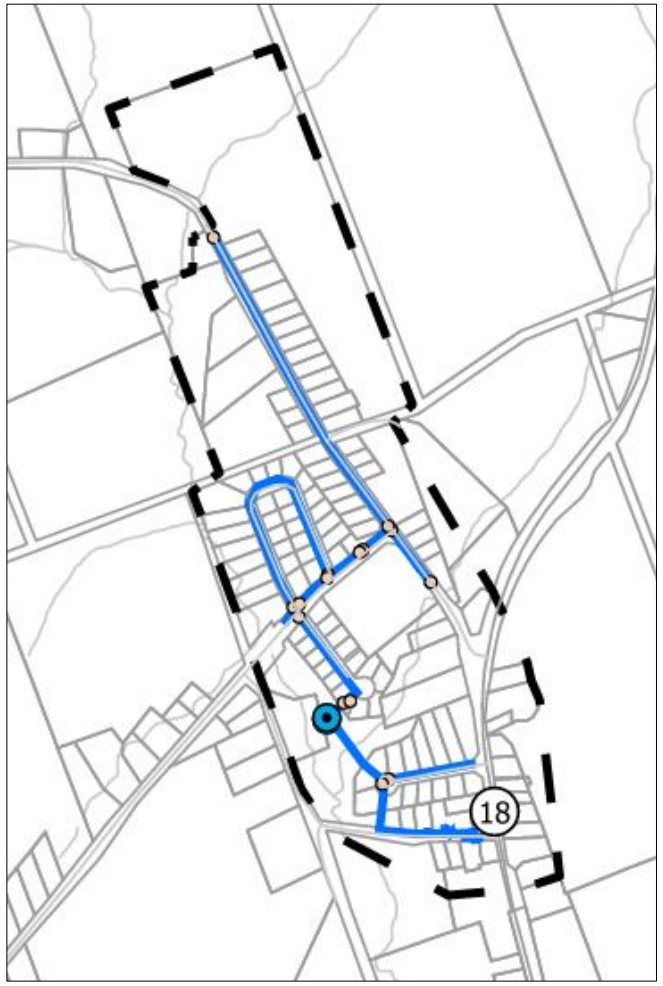
	Water Supply (Groundwater)	Water Treatment	Water Storage	Water Distribution
Existing	Have reached 51% of water taking limits Reach 99% of current production limits	Have reached 68% of the existing capacity	Have reached 98% of the existing capacity	Future servicing requirements will be identified in Phase 2 of the Master Plan
Short-Term (0-5 Years)	Reach 59% of water taking limits Reach 110% of current production limits	Reach 79% of the existing capacity	Reach 103% of the existing capacity	
Mid-Term (5-10 Years)	Reach 63% of water taking limits Reach 117% of current production limits	Reach 83% of the existing capacity	Reach 107% of the capacity	
Long-Term (10-20 Years)	Reach 140% of water taking limits Reach 260% of current production limits	Reach 186% of the existing capacity	Reach 182% of the existing capacity	

Camborne

- Operated under the MDWL number 139-103 and DWWP Number 139-203.
- Artesian Wells 1A and 2A
- Water Treatment Plant
  - Sodium hypochlorite (primary disinfection)
  - Greensand filters (iron removal)
  - High Lifts
  - Pressure Tanks
- Two-celled water storage reservoir with 206 m^3 capacity
- 2.5 km of watermain and no fire hydrants

Operational Challenges

- **Water Supply & Treatment**
  - No concerns
- **Distribution**
  - Fire protection is not currently provided.
  - Sand buildup in watermains.
  - Insufficient number of connections of existing properties to the new Kennedy Road watermain. Frequent water bleeding is needed to manage water age and water quality.



PROJECT:
TOWNSHIP OF HAMILTON MASTER PLAN
TOWNSHIP OF HAMILTON, ON

DRAWING:
CAMBORNE STUDY AREA WITH KEY INFRASTRUCTURE

Wells
Valve Box
Watermain
Water Course
Waterbody
Study Area
Road Class
Highway
Arterial; Collector
Others

Overview of Estimated Future Growth: Camborne

Potential Service Connections by Existing Properties

Development Timeframe	Additional Units	Estimated Population Increase
Short-Term (0-5 Years; 2024-2029)	33 units	99 people
Mid-Term (5-10 Years; 2029-2034)	1 units	3 people
Long-Term (10-20 Years; 2034-2044)	2 units	6 people

Institutional / Commercial / Industrial Developments

Development Timeframe	Development Type	Estimated Growth
N/A	N/A	N/A

Maps of future developments are available
Please see a member of the project team.

Future Servicing Constraints: Camborne

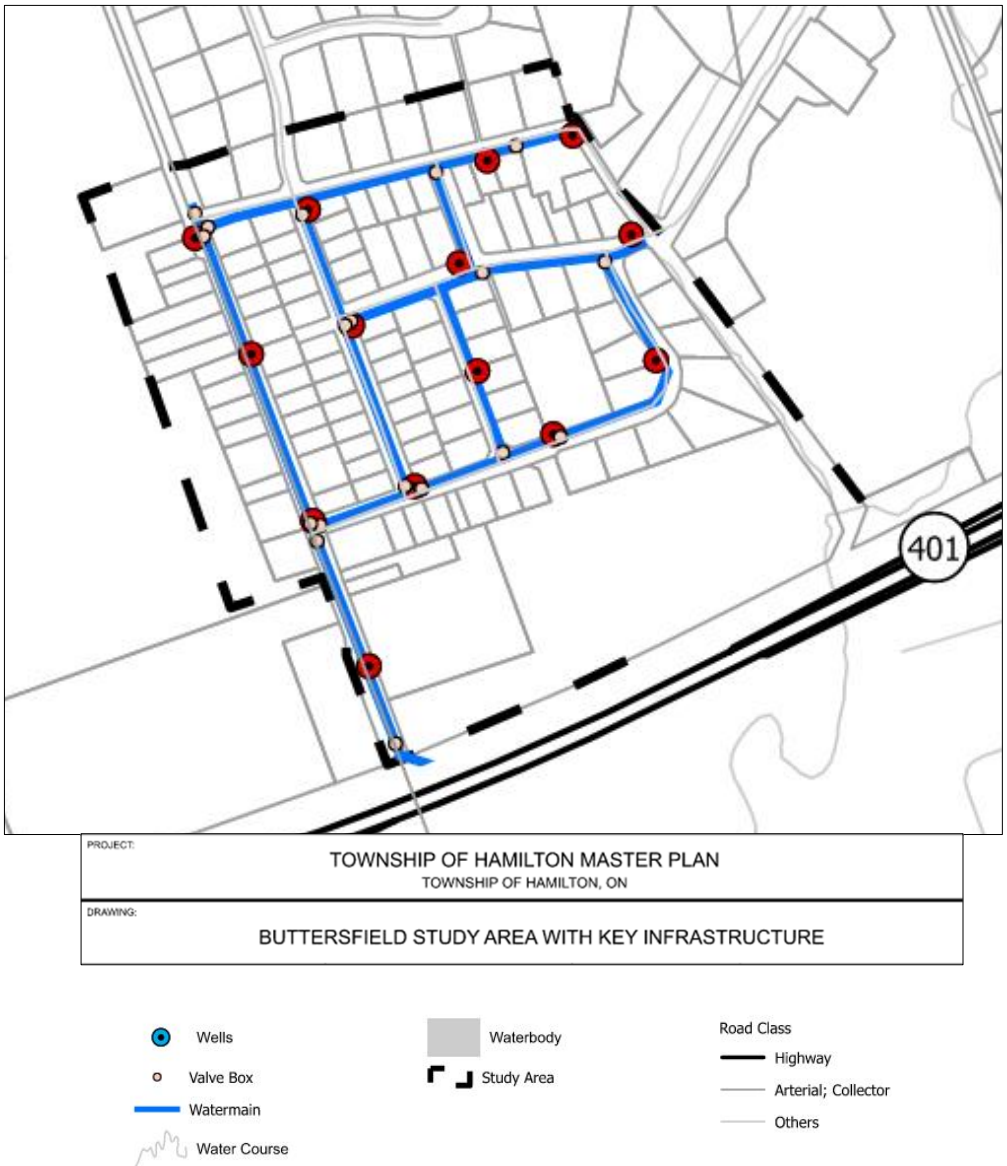
	Water Supply (Groundwater)	Water Treatment	Water Storage	Water Distribution
Existing	Have reached 36% of the existing capacity	Have reached 50% of the existing capacity	Have reached 54% of the existing capacity	No further investigation required.
Short-Term (0-5 Years)	Reach 39% of the existing capacity	Reach 67% of the existing capacity	Reach 82% of the existing capacity	
Mid-Term (5-10 Years)	Reach 39% of the existing capacity	Reach 67% of the existing capacity	Reach 83% of the capacity	
Long-Term (10-20 Years)	Reach 40% of the existing capacity	Reach 68% of the existing capacity	Reach 85% of the existing capacity	

Buttersfield

- Operated under the MECP MWDL number 139-201, and DWWP number 139-201
- Water is provided by the Cobourg Water Treatment Plant operated under LUSI
- Community is serviced by a single 400 mm diameter watermain crossing under Highway 401 from Cobourg

Operational Challenges

- **Water Supply & Treatment**
  - Water supply is provided by the Town of Cobourg.
  - No noted concerns
- **Distribution**
  - Single watermain servicing community, under Highway 401 from Cobourg; there is no secondary supply of drinking water available if this watermain is offline
  - Age of distribution pipes and valves requiring ongoing maintenance and review.



Overview of Estimated Future Growth: Buttersfield

Residential Developments

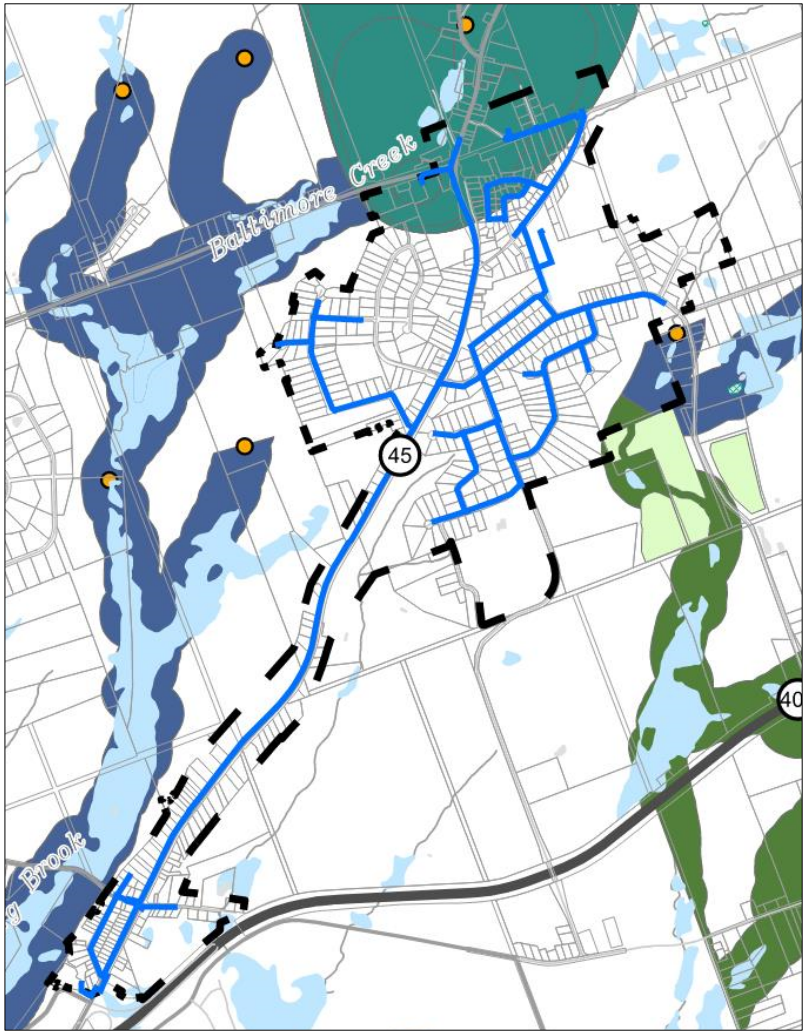
Development Timeframe	Additional Units	Estimated Population Increase
Short-Term (0-5 Years; 2024-2029)	0 units	0 people
Mid-Term (5-10 Years; 2029-2034)	10 units	30 people
Long-Term (10-20 Years; 2034-2044)	0 units	0 people

Institutional / Commercial / Industrial Developments

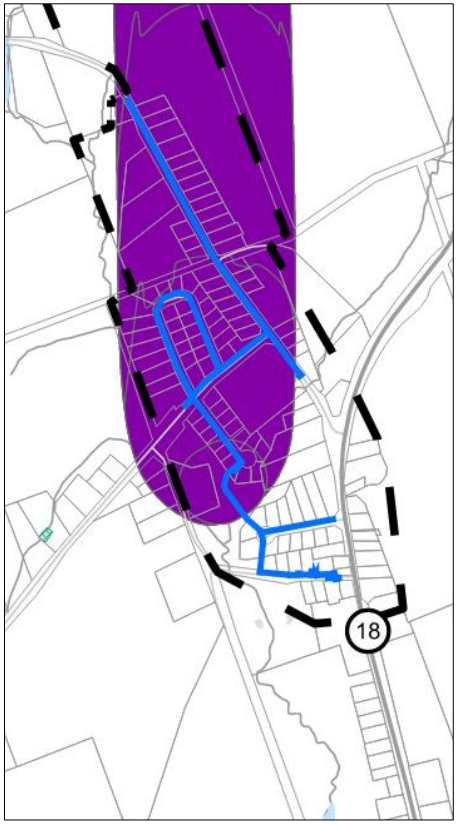
Development Timeframe	Development Type	Estimated Growth
N/A	N/A	N/A

Maps of future developments are available
Please see a member of the project team.

Environmental Considerations



Creighton Heights



Camborne

Buttersfield

Legend

- Watermain
- Watercourse
- Study Area
- Waterbody
- Candidate ANSI, Life Science
- Thermal Regime - Cold
- Aggregate Extraction Area

Wetland

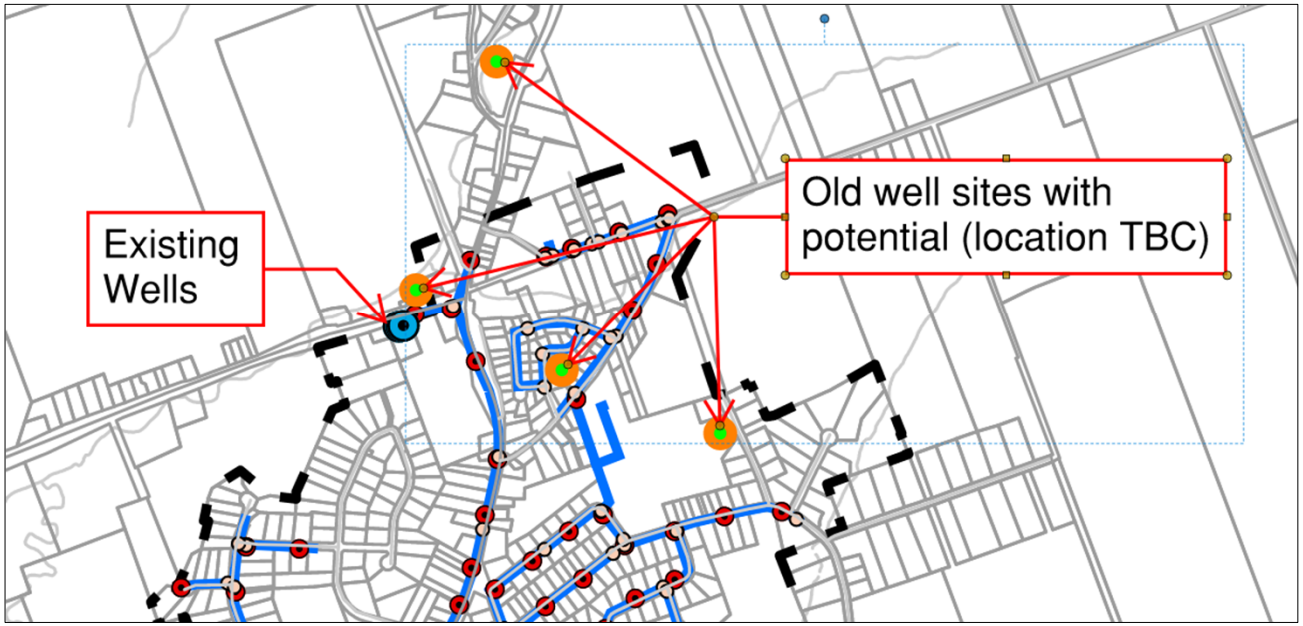
- Evaluated-Provincial
- No Data

Source Water Protection

- IPZ Modelled Stream
- WHPA Creighton HeightS
- WHPA Camborne
- Wellhead Protection Zone Scores A_D
- Wellhead Protection Zones A_D
- Intake Protection Zones 12
- Intake Protection Zone 3

Hydrogeological Desktop Review

- A desktop hydrogeological review was conducted by Blumetric Environmental.
- The review concluded there are additional groundwater resources available in the community to meet future demands
- Potential well site recommendations for further investigations:
  - An additional large diameter production well in the existing WTP well field.
  - Assess old well sites that have potential to provide additional groundwater.



Problem/Opportunity Statement

The Township of Hamilton drinking water servicing consists of the following water systems: Creighton Heights, Camborne and Buttersfield.

The Creighton Heights drinking water system is supplied by three groundwater wells. Despite the Township's effort in rehabilitation, the wells have a maximum production rate that is significantly lower than the approved water taking limits. The raw water contains ammonia, iron, manganese and methane, making treatment challenging. There will be insufficient water supply, treatment and storage to accommodate future growth. In addition, the distribution system contains dead ends with require wasting to maintain residuals. The physical configuration of the system is challenging, leading to limitations in fire flow and pressure.

The Camborne drinking water system is supplied by two artesian groundwater wells. While there is sufficient water supply, treatment and storage to accommodate the existing and future growth, there is an insufficient number of connections of existing properties to the new Kennedy Road Watermain, which results in wasting to maintain residuals.

The Buttersfield drinking water system is serviced by the Town of Cobourg through a single watermain crossing under Highway 401. It is expected that that Cobourg will continue to service the community into the future. However, there is no secondary water supply if the single watermain is offline.

There is an opportunity through the Master Planning process to review the water systems and servicing strategies holistically and develop a strategic plan that can be prioritized and implemented logically with the intended goal of addressing future servicing needs and ensuring appropriate performance and reliability of Township's water systems for the upcoming planning period of 20 years and beyond.

Next Steps…

Moving Forward in the Project

Collect and address comments from Public Information Centre #1.

Finalize Phase 1 of the Master Plan Report.

Begin Phase 2 of the Master Plan (Future Servicing Needs, Alternative Servicing Solutions, Implementation and Phasing Plan).

Collect and address comments from Public Information Centre #2 (Winter 2025).

Finalize recommendations of the Phase 2 Master Plan and Publish for 30-day Public Review (Spring 2024).

Preliminary Options for Creighton Heights
Water Supply Options
1. Do nothing 2. Rehabilitate existing wells; limit community growth; practice water conservation 3. Install new drinking water wells 4. Switch water supply and connect to Town of Coburg 5. Decentralize water supply and install communal systems
Water Treatment
1. Do nothing 2. Expand water treatment plant capacity
Water Storage
1. Do nothing 2. Expand treated water storage at water treatment plant 3. Provide treated water storage in the distribution system
Water Distribution
1. Do nothing 2. Improve water distribution system network for pressure and/or fire flow

How to Participate

- Send written comments to the project contacts at the Township and J.L. Richards listed below. Please respond by October 3, 2024.

Susan Jingmiao Shi, P.Eng., M.Eng.	Anita Schoenleber
Associate, Senior Environmental Engineer J.L. Richards & Associates Limited Phone: 343-302-5406 Email: sshi@jlrichards.ca	Manager of Water Operations Township of Hamilton Phone: 905-342-2810 Email: aschoenleber@hamiltontownship.ca

- Visit the Municipality website at **Water Supply Master Plan - Township of Hamilton (hamiltontownship.ca)** for more updates.