Creemore Water and Wastewater Master Servicing Plan

Township of Clearview
217 Gideon Street
Stayner ON L0M 1S0

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R.J. Burnside & Associates Limited
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Orangeville, ON L9W 3R4

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R.J. Burnside & Associates Limited

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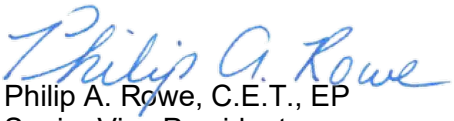


Philip A. Rowe, C.E.T., EP
Senior Vice President

Executive Summary

The Township of Clearview (Township) has completed a Water and Wastewater Master Servicing Plan (MSP) for the Village of Creemore (Creemore). The purpose of the Master Servicing Plan is to support the Township's Official Plan goals of creating more vibrant, healthy, and complete neighbourhoods while ensuring long-term affordability for the Township and stakeholders. The Township's Official Plan outlines objectives that include the use of master plans when needed to provide a foundation for long-term decisions associated with the anticipated growth of its communities. The Water and Wastewater MSP will identify solutions for the long-term drinking water and sanitary wastewater servicing needs for the existing community and the potential development lands generally east of Mary Street in Creemore. This Master Plan process used Master Plan Approach 2 of the Municipal Class Environmental Assessment (MCEA) process, which will allow for all Schedule B projects identified in the completed Master Plan to proceed to detailed design, approvals, and construction.

Alternative water and wastewater servicing solutions have been developed and evaluated based on their natural, physical, social / cultural, and financial impacts. In accordance with Approach 2 under the MCEA document (MCEA, October 2000 as amended in 2007, 2011 and 2015), this Master Plan report documents the completion of Phases 1 and 2 to satisfy the requirements for MCEA Master Plans. Most importantly, the report identifies the necessary projects that should be completed to achieve the objectives of the Master Plan over the planning horizon of 2042. This Master Plan identifies the methodology and rationale for identifying the required Schedule "A", "A+", "B", and "C" projects to accommodate and facilitate the identified growth for Creemore through 2042.

Public and stakeholder consultation was conducted throughout this study. A Notice of Study Commencement was advertised in September 2022, a Notice of Public Information Centre was advertised in November 2022 and a Public Information Centre was held in December 2022. A second notice of Public Information Center was advertised in November 2023. A second Public Information Center was held in December 2023. Comments received from review agencies, the general public, and Indigenous communities have been identified and addressed throughout this Master Plan. The study area for this Master Plan includes the entire settlement boundary for Creemore. The Master Plan also considers relevant regulatory requirements and policies including the Safe Drinking Water Act, Provincial Policy Statement, Growth Plan for the Greater Golden Horseshoe, the Township's Official Plan, and Simcoe County's Official Plan, among others. The growth identified in the MSP is generally in excess of the growth identified in these referenced planning documents but is consistent with the direction provided by the Township and is reflective of the needs of the identified development areas.

The identified growth needs in the 2042 planning horizon are based on the anticipated servicing needs identified by the Township for the Creemore Core area as well as population targets based on proposed plans of subdivisions and similar densities of development in those development areas for which a proposed plan of subdivision has yet to be put forward. The anticipated increase in equivalent service population over the 2042 planning horizon is 3,766 equivalent persons.

A detailed review of the study area was completed based on available information sources, supplementary data collection and analysis to establish a current inventory of the existing natural / social cultural, and technical environment. Each of the components of the technical environment, which includes the existing water and wastewater systems, was reviewed with respect to its condition, performance, and capacity. This includes the existing well supply, water distribution system and water storage as well as the wastewater collection system and the wastewater treatment plant (WWTP). The assessment of the existing water system indicates that it is adequate to meet the needs of the existing user base, whereas the assessment of the existing wastewater system confirms that at times the WWTP is not capable of processing all of the wastewater that it currently receives. The existing WWTP at times exceeds both its actual hydraulic capacity and its actual organic loading capacity and as such, there is currently very limited wastewater treatment capacity to support additional infill or development.

The water and wastewater servicing capacity associated with the forecasted needs of the 2042 planning horizon significantly exceeds the existing water and wastewater servicing capacity.

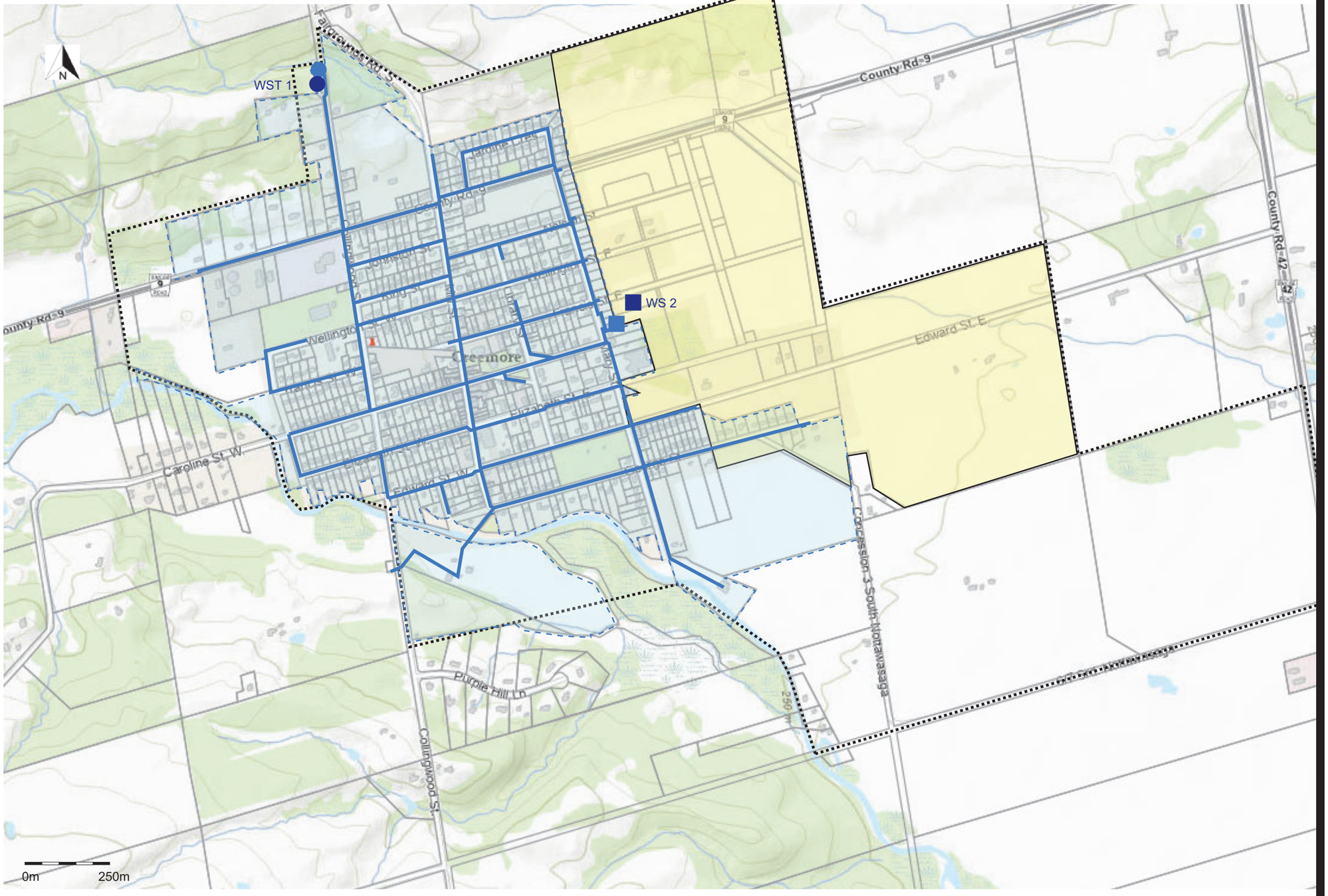
Within the Master Plan, alternative solutions for additional water supply capacity and water storage capacity were identified and evaluated. Following the evaluation of the alternatives, the preferred alternative to address the water servicing needs includes the development of additional groundwater sources and the construction of additional water storage. At the conclusion of the Master Plan, only one additional groundwater source has been identified. This additional groundwater source is anticipated to be located within the Creemore Commons subdivision and is expected to provide approximately 10 L/s which is significantly less than the identified need of an additional 30.1 L/s to address all the forecasted needs for the 2042 planning horizon. The preferred alternative to provide additional water storage has been identified as the construction of additional grade-level storage at the existing reservoir site at the north end of Collingwood Street. The Master Plan identifies that some additional watermains, external to the development area, are required to provide the necessary level of servicing. In other areas, existing watermains are required to be upsized to provide the necessary level of servicing. The MSP also identifies a number of existing watermains which should be upsized when their condition dictates their replacement, but these are not specifically required to address the forecasted growth needs for 2042.

The recommended water servicing projects are presented in Figure ES-1.

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE ES-1

PREFERRED WATER SOLUTION



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area

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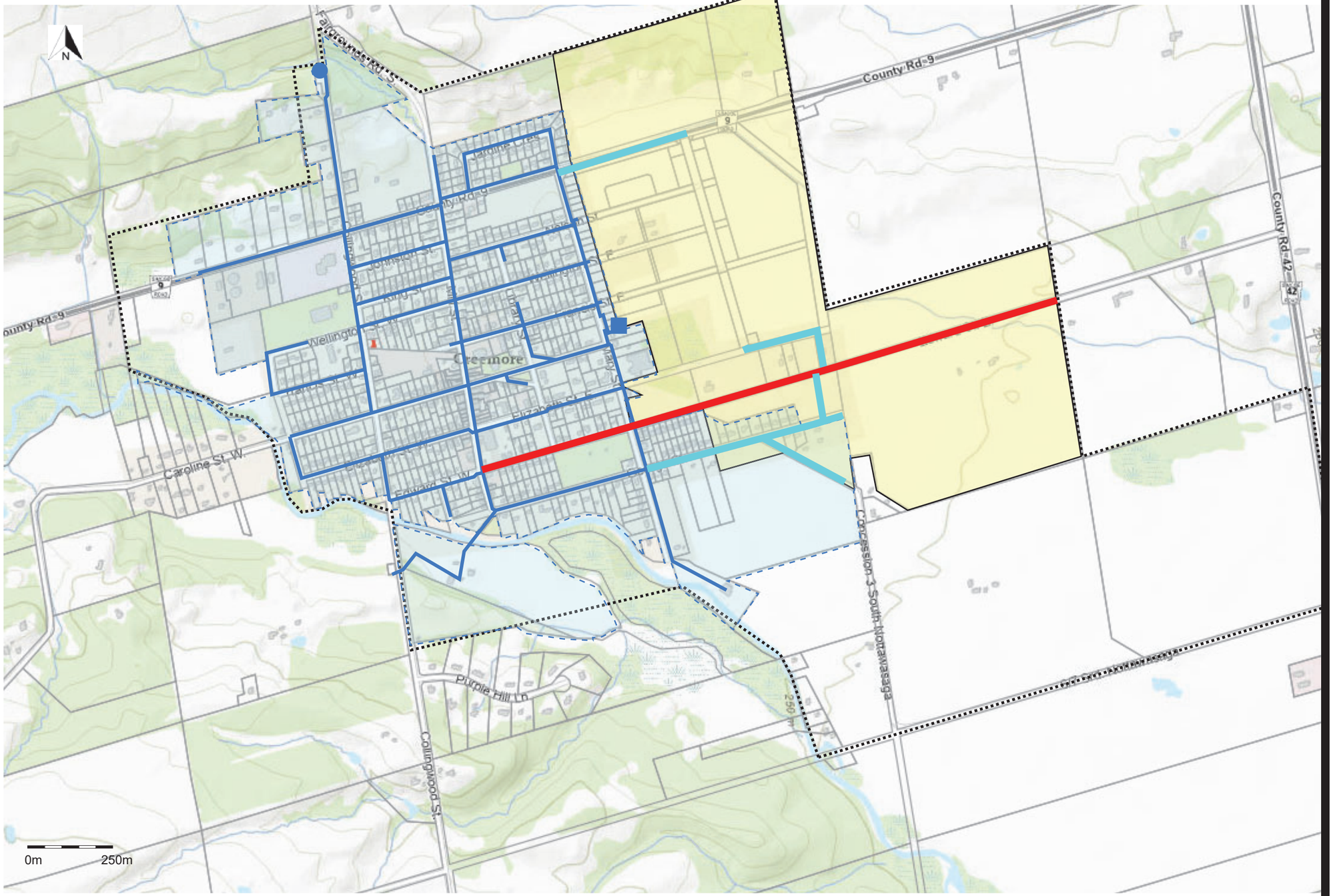
The additional watermain projects are presented in Figure ES-2.

Alternatives solutions for additional wastewater treatment capacity and wastewater conveyance were identified and evaluated as part of the MSP. Following the evaluation of the alternatives, the preferred alternative to address the required additional wastewater treatment capacity is to undertake an expansion of the existing WWTP at the existing WWTP site. The expansion of the WWTP to address the 2042 servicing needs will require an increase in the existing rated capacity of the WWTP which will be subject to further study in the form of a Schedule C MCEA. The preferred solution for wastewater conveyance is to establish a new gravity sewer collection system to service the Creemore East and in the future the Creemore North service areas. The gravity collection system servicing Creemore East and Creemore North will convey wastewater to a new sanitary sewage pumping station (SPS) to be located in the southwest corner of the Creemore East service area adjacent to Concession 3. The new sanitary SPS will convey wastewater to the upgraded WWTP via a sanitary forcemain.



TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE ES-2

WATER DISTRIBUTION SYSTEM UPGRADES

LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area
- Proposed 200 mm Watermain
- Proposed 300 mm Watermain

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The recommended wastewater servicing projects are identified in Figure ES-3.

The MSP has identified an implementation plan to provide the additional servicing capacity in two phases if necessary to balance development pressures and available funding. The phasing of the implementation plan is structured around the phased expansion of the existing WWTP.

The first phase of providing the required additional wastewater capacity would be achieved through upgrades to the existing WWTP that would allow it to operate at its existing rated capacity of 1,400 m^3/d. The first phase of wastewater works would also include the construction of the new SPS and forcemain as well as the gravity sewers from the new service areas being developed as part of the first phase to the new SPS. The single additional well would also be advanced as part of the first phase of work, as would the additional water storage facility. The associated level of infill and development that can be supported will be limited by the available water supply, currently estimated to be 25 L/s, until such time as available water supply can be further increased to align with wastewater treatment capacity.

The second phase would be undertaken after the completion of future studies to identify the preferred design for the expansion of the WWTP from 1,400 m^3/d to 2,100 m^3/d (Schedule C MCEA) and the water supply facilities that would increase the total water supply capacity to 40.1 L/s (Schedule B MCEA).

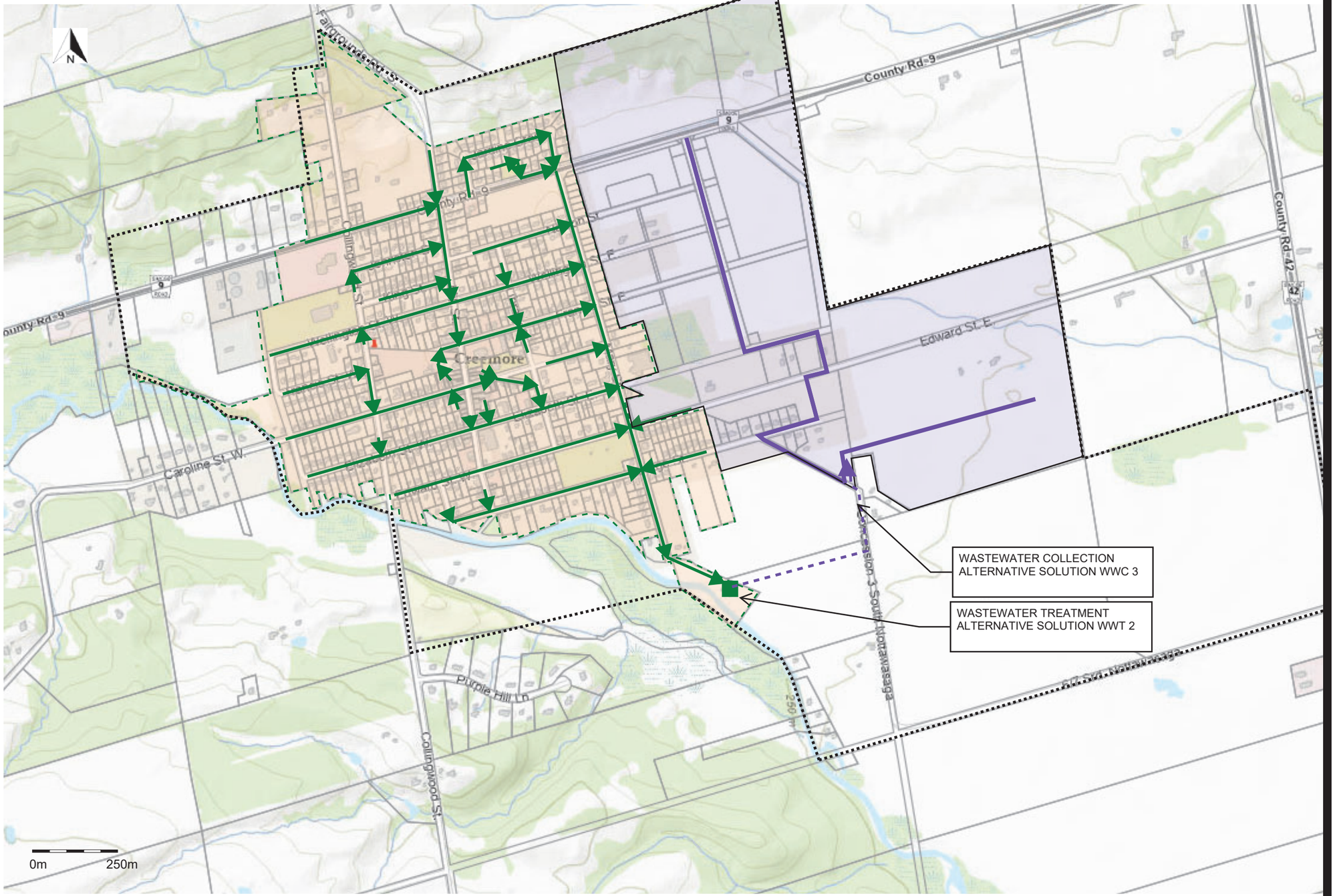
An Assimilative Capacity Study (ACS) of the Mad River was prepared in support of an expansion of the WWTP to 2,100 m^3. The report was submitted and reviewed by the Ministry of the Environment, Conservation, and Parks (MECP) and agreement has been reached with regard to future effluent limits and objectives associated with the expansion.

The opinions of probable costs for the various projects and the associated project durations are included in the report.

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE ES-3

PREFERRED WASTEWATER SOLUTION



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) has been retained by the Township of Clearview (Township) to complete a Water and Wastewater Master Servicing Plan (MSP) for the Village of Creemore (Creemore), referred to hereinafter as the Creemore Water and Wastewater Master MSP. The purpose of the MSP is to support the Township's Official Plan goals of creating more vibrant, healthy, and complete neighbourhoods while ensuring long-term affordability for the Township and its stakeholders. The Township's Official Plan outlines objectives that include the use of master plans when needed to provide a foundation for long term decisions associated with the anticipated growth of its communities. The Water and Wastewater MSP will identify solutions for the long-term drinking water and sanitary wastewater servicing needs for the existing community and the potential development lands which are generally east of Mary Street This Master Plan process will use Master Plan Approach 2 of the Municipal Class Environmental Assessment (MCEA) process, which will allow for all Schedule B projects identified in the completed Master Plan to proceed to detail design, approvals, and construction.

1.1 Background

The Creemore Drinking Water System is owned and operated by the Township and consists of a ground water supplied water treatment plant (WTP), a distribution system and water storage.

The Creemore Wastewater System includes the Creemore Wastewater Treatment Plant (WWTP) and a gravity sewer wastewater collection system, owned by the Township. The collection system is operated by the Township and the WWTP operation is contracted to the Town of Collingwood.

1.2 Master Plan Objectives

The Water and Wastewater MSP documents existing conditions, forecasts infrastructure needs to service growth, and evaluates alternative servicing strategies to define the preferred solution to meet the servicing needs of existing and future development to 2024. A 20-year interval corresponds to the general planning horizon and strategy for future growth in the Township's Official Plan, achieving common goals set out in the County of Simcoe (County) Official Plan and is consistent with provincial planning principles.

The key objectives of the MSP are as follows:

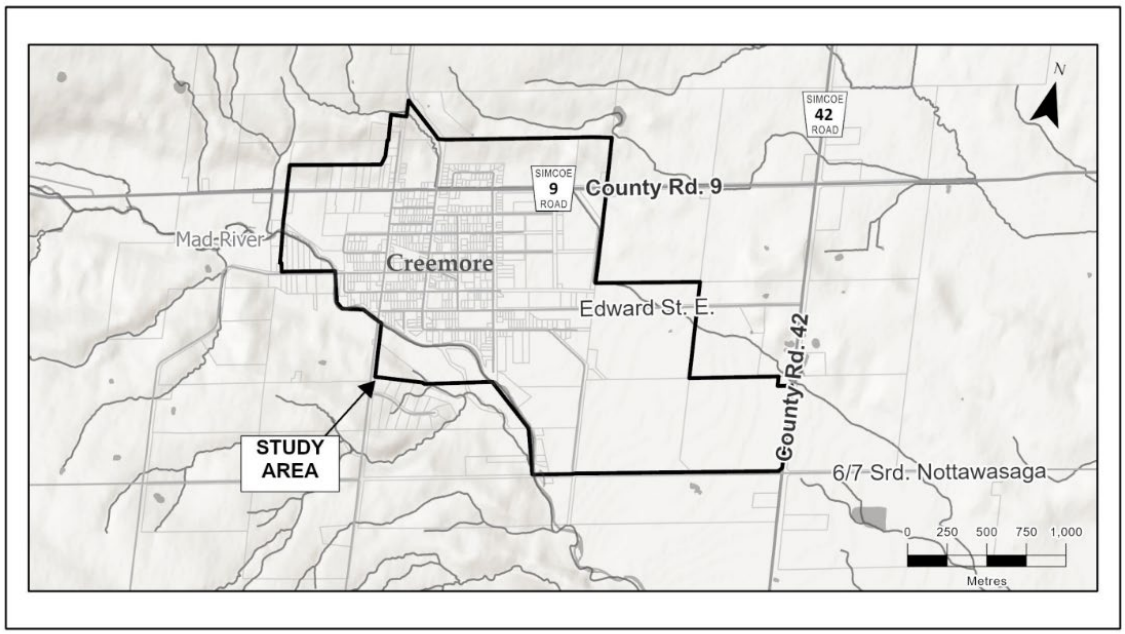
- Review planning forecasts to Service Area Boundary (SAB) buildout and determine the impacts on servicing needs for all water and wastewater infrastructure.

- Evaluate the ability of existing and planned water and wastewater infrastructure to efficiently and effectively service the Township's existing users and anticipated growth.
- Undertake a comprehensive review and analysis of the water and wastewater servicing requirements.
- Address key servicing considerations as part of the development and evaluation of servicing strategies, including:
  - Assess the level of service to existing users and anticipated growth;
  - Assess operational flexibility and system security and reliability;
  - Mitigate of impacts to natural, social, and economic environments;
  - Meet policy statements, regulations, and technical criteria;
  - Optimize existing infrastructure and servicing strategies;
  - Ensure the strategies are cost effective; and
  - Support a development staging strategy.
- Consider and develop sustainable servicing solutions with lifecycle considerations.
- Update the capital program cost estimate methodology, through use of updated industry trends and more detailed information from relevant Township studies and projects, to provide appropriate capital cost estimates.
- Utilize the updated water hydraulic model and updated wastewater worksheets for the analysis of servicing alternatives.
- Establish a complete and implementable water and wastewater capital program.
- Engage with the public, stakeholders and Indigenous communities.
- Complete the MSP in accordance with the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (MCEA) process for master plans.

1.3 Study Area

The Study Area encompasses the community of Creemore, from Country Road 9 and slightly beyond to the north, County Road 42 to the east, Nottawasaga Sideroad 6&7 and following the Mad River to the south, and Concession 5 South Nottawasaga to the west. The Study Area is shown in Figure 1.

Figure 1: Study Area



1.4 Problem Identification

The Problem / Opportunity Statement is defined as:

> *"The Township of Clearview has identified the need to develop a comprehensive Water and Wastewater Master Servicing Plan for the community of Creemore, to identify a cost-effective, water and wastewater servicing strategy for the lands within the existing settlement boundary.*
>
> *The strategy will consider the needs of both existing serviced areas and areas of future growth. The strategy will identify works required to address the needs of the community to 2042 while considering and making provisions for servicing lands within the study area that are expected to be developed post 2042."*

1.5 Master Planning Process

The Master Planning process should recognize the planning and assessment process of the MCEA for municipal infrastructure planning, as a streamlined Environmental Assessment process established by Ontario's Environmental Assessment Act, R.S.O. 1990.

1.5.1 Ontario Environmental Assessment Act

The Ontario Environmental Assessment Act (EAA) and the associated Codes of Practice require proponents to examine and document the environmental effects that might result from major projects or activities.

The Act defines the environment broadly as:

1. Air, land, or water.
2. Plant and animal life, including man.
3. The social, economic and cultural conditions that influence the life of man or a community.
4. Any building, structure, machine or other device or thing made by man.
5. Any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirect from activities of man.
6. Any part or combination of the foregoing and the interrelationships between any two or more of them.

The purpose of the Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation, and wise management of the environment in the Province.

1.5.2 Municipal Class Environmental Assessment

The Municipal Class Environmental Assessment (MCEA) process was developed by the Municipal Engineers Association (MEA), in consultation with the Ministry of Environment, Conservation, and Parks (MECP), as an alternative method to Individual Environmental Assessments for recurring municipal projects that were similar in nature, usually limited in scale and with a predictable range of environmental impacts, which are responsive to mitigating measures. The MCEA establishes an approved environmental assessment (EA) process for municipal roads, water, wastewater, and transit projects in accordance with the EAA. Through the MCEA process, municipalities can plan municipal works on a project-by-project basis. However, in many cases, it may be beneficial to undertake a planning process by considering a group of related projects or an overall system, such as water and wastewater infrastructure planning. This can be achieved through the Master Plan process. Master Plans outline a framework for planning for subsequent projects and / or developments.

A Master Plan must address at least Phase 1 and 2 of the MCEA process:

- Phase 1 - Problem or Opportunity Identification: Involves the development of a clear statement of the issue that the municipality wishes to resolve. In this situation, this is

the development of the Creemore Water and Wastewater MSP to address water servicing and wastewater servicing.

- Phase 2 - Identification and Evaluation of Alternative Solutions: Involves identifying and describing reasonable and feasible solutions in sufficient detail to address the problem or opportunity defined in Phase 1 so that there is a good understanding of their respective advantages, disadvantages, and impacts. Phase 2 concludes with the selection of a “preferred alternative”, or group of alternatives, which is where municipal infrastructure master plans typically conclude. The detailed evaluation of project-specific environmental effects and mitigation measures occurs in subsequent project-specific studies, which for Schedule C projects are carried out under Phases 3 and 4 of the MCEA.

1.5.3 Master Planning Process and Framework

The following are distinguishing features of Master Plans:

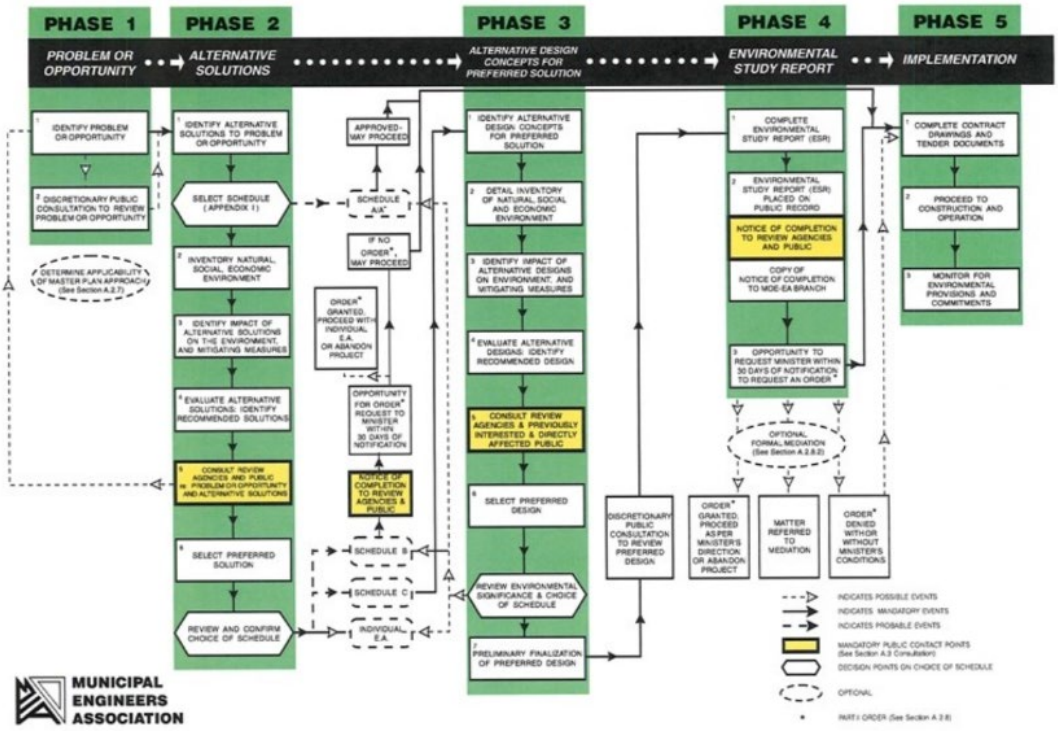
- The scope of Master Plans is broad and usually includes an analysis of the system to outline a framework for future works and developments. Master Plans are not typically undertaken to address a site-specific problem.
- Master Plans typically recommend a set of works which are distributed geographically throughout the study area, and which are implemented over an extended period.
- Master Plans provide the context for the implementation of the specific projects, which make up the plan and satisfy, as a minimum, Phases 1 and 2 of the MCEA process. Notwithstanding that these works may be implemented as separate projects, collectively these works are part of a larger management system.
- Master Plan studies in essence conclude with a set of preferred alternatives and, therefore, by their nature, Master Plans will limit the scope of alternatives, which can be considered at the implementation stage.

Given the broad scope of Master Plans, there are several approaches to conducting them. Various approaches are set out in the MCEA process. The two most common approaches are Approach 1 and Approach 2. Master Plans completed under Approach 1 can identify a preferred servicing solution but are not conducted at a level of detail to fulfill MCEA requirements for specific Schedule B and Schedule C projects identified as part of a Master Plan. Rather, Master Plans completed under an Approach 1 MSP would form the basis for further Schedule B and Schedule C projects. Alternatively, under Approach 2, those projects identified in the Master Plan are investigated in sufficient detail to address the requirements of Phases 1 and 2 of the MCEA. At the conclusion of the Master Plan under Approach 2, the Schedule B projects identified in the Master Plan can then move forward to design and implementation.

This Water Wastewater MSP is completed under Approach 2, which will allow for all Schedule B projects identified in the completed Master Plan to proceed to detail design, approvals, and construction either by the Township or others via a servicing coordination agreement or front ending agreement, at the completion of this MSP. Schedule C projects identified in the MSP are required to complete Phases 3 and 4 of the MCEA process prior to implementation.

The MCEA process is illustrated in Figure 2.

Figure 2: MCEA Planning and Design Process



2.0 Planning Context

2.1 Federal Planning Policies

2.1.1 Fisheries Act

Construction activities that have the potential to impact fish or fish habitat must be constructed and operated in compliance with the Federal Fisheries Act. If the “death of a fish by means other than fishing,” or the “harmful alteration, disruption or destruction of fish habitat” will likely result from a project, the proponent responsible for the activities is required to obtain an Authorization from Fisheries and Oceans Canada (DFO) as per Paragraph 34.4(2) and 35(2)(b) of the Fisheries Act.

The Federal Fisheries Act prohibits causing the “death of fish by means other than fishing,” and the “harmful alteration, disruption or destruction (HADD) of fish habitat”. If construction activities have the potential to cause the death of fish, or HADD of fish habitat, then the project must be submitted to the DFO as a Request for Review. The proponent responsible for the activities is required to obtain an Authorization from DFO as per Paragraph 34.4(2) and 35(2)(b) of the Fisheries Act.

Should project activities occur below the highwater mark of any identified watercourses or headwater drainage features, an assessment of potential impacts to fish and fish habitat is required. DFO has provided standardized Codes of Practice and Measures to Protect Fish and Fish Habitat to mitigate contraventions of the Fisheries Act.

Proponents are required to ensure that activities meet the criteria outlined on the Fish and Fish Habitat Protection Program website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) and are responsible for the implementation of best management practices (i.e., Codes of Practice) into the project design.

If it is determined that impacts of the proposed works can be avoided and a HADD is unlikely to occur, then the project does not require a review by the DFO. If HADD is anticipated because of the project, even following the application of feasible avoidance and mitigation strategies, then DFO review is recommended, and authorization may be required.

2.1.2 Migratory Bird Convention Act

The Migratory Birds Convention Act, 1994 (MBCA) and the Migratory Bird Regulations (MBR) are federal legislative requirements that are binding on members of the public and all levels of government, including federal and provincial governments. The legislation protects certain species, controls the harvest of others, and prohibits commercial sale of all species.

One key responsibility under the MBCA is described in Section 6 of the associated MBR: “Subject to subsection 5(9), no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, or have in his possession a live migratory bird, or a carcass, skin, nest or egg of a migratory bird except under authority of a permit therefore.”

The “incidental take” of migratory bird nests or the disturbance, destruction or taking of the nest of a migratory bird is prohibited under Section 6 of the MBR under the authority of the MBCA. Nests’ contents (eggs and young) are protected by virtue of the MBCA, which has implications on development and construction activities that might occur during the breeding season (Canadian Wildlife Service, July 2012).

2.2 Provincial Planning Policies

2.2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides a vision for land use planning in Ontario that encourages the efficient use of land, resources and public investment in infrastructure. The 2020 PPS is the complimentary policy document to the Planning Act, 1990, issued under Section 3 of the Act.

The PPS states that municipal projects should be directed to existing settlement areas, create stronger and improved communities, and have little to no impact on the natural features of the area. In general, projects should have consideration for future needs to ensure the benefits of the project are far-reaching. Section 1.6 of the PPS contains specific guidance on infrastructure and public service facilities:

> *"1.6.1 Infrastructure and public service facilities shall be provided in an efficient and cost-effective manner that prepares for the impacts of a changing climate while accommodating projected needs.*
>
> *Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning and growth management so that they are:*
>
> *a) financially viable over their life cycle, which may be demonstrated through asset management planning; and*
>
> *b) available to meet current and projected needs.*
>
> *1.6.3 Before consideration is given to developing new infrastructure and public service facilities:*
>
> *a) the use of existing infrastructure and public service facilities should be optimized; and*
>
> *b) opportunities for adaptive re-use should be considered, wherever feasible.*
>
> *1.6.5 Infrastructure and public service facilities should be strategically located to support the effective and efficient delivery of emergency management services, and to ensure the protection of public health and safety in accordance with the policies in Section 3.0: Protecting Public Health and Safety."*

As such, improvements made to public infrastructure, including the potential improvements to provide water and wastewater infrastructure in the Study Area, are consistent with the PPS.

On April 6, 2023, the Province released for public comment a proposed Provincial Planning Statement (PPS, 2023) to streamline provincial land use planning policy and incorporate the housing-focused policies of the Provincial Policy Statement, 2020 (PPS, 2020) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe 2019 The proposed PPS, 2023 included natural heritage policies and related definitions; however, , there were overall few modifications from the natural heritage policies found in the PPS, 2020. From April 6 to August 4, 2023, the Province undertook consultation on the draft of the proposed PPS, 2023. Following input, the Province has developed an updated proposed PPS, with new and updated policies supporting increased intensification (e.g., around transit and redevelopment of low-density commercial plazas and strip malls), scoping protections for employment areas, and promoting a range and mix of housing options, including housing for students and seniors. the Ministry of Municipal Affairs and Housing (MMAH) released the updated proposed PPS for comment from April 10, 2024 to May 10, 2024.

2.2.2 Endangered Species Act

The Endangered Species Act, 2007 (ESA) provides protection for Species At Risk (SAR) and their habitat. The ESA is now administered by the MECP and provides policies for the protection of Extirpated, Endangered and Threatened species. Species listed as Provincially rare or of special concern do not receive legal protection under the Provincial ESA; however, they may receive protection from some agencies, such as Provincial and National parks, or other Acts, such as the Ontario Fish and Wildlife Conservation Act, which prohibits the killing, capturing, injuring, harassment, and trapping of specially protected species.

The ESA helps protect species (Section 9) and their habitat (Section 10). Section 9(1)(a) of the ESA states:

> *"no person shall kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species"*

Section 10(1)(a) of the ESA states:

> *"no person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario List as an endangered or threatened species"*

The ESA includes general habitat regulations, as well as species-specific habitat regulations. Species up listed to Endangered or Threatened, automatically receive general habitat protection under the ESA. The Province is then required to prepare a species recovery strategy and establish a habitat regulation according to requirements of the ESA.

Regulatory amendments under the ESA were issued by the Province in 2022 which streamlines ESA Authorizations for activities that have “predictable effects and common and routine mitigation actions with well understood requirements to minimize adverse impacts.” Proponents are still required to avoid and minimize impacts on SAR and their habitats.

The use of a SAR Conservation Fund has been enabled for five designated conservation fund species when they seek permits and agreements related to these species (Eastern Whip-poor-will, Blanding’s Turtle), or register for conditional exemptions (Eastern Meadowlark, Bobolink, Butternut).

The SAR List is updated from time to time; therefore, it is the proponent’s responsibility to practice due diligence to ensure that the ESA and its regulations are not violated. It is also the proponent’s responsibility to be apprised of any amendments to the Act that may come into force for the duration of this project.

2.2.3 Clean Water Act - Source Water Protection

As a result of the Clean Water Act (O.Reg.287/07), communities in Ontario are required to develop Source Protection Plans to protect their municipal sources of drinking water. These plans identify risks to local drinking water sources and develop strategies to reduce or eliminate these risks.

Ontario’s Source Water Protection initiative is focused on protecting municipal drinking water sources. Key areas include Wellhead Protection Areas (WHPA) (areas that drain down toward municipal wells), Highly Vulnerable Aquifers (HVA) (where groundwater lies close to the ground surface), and Significant Groundwater Recharge Areas (SGWRA)(areas that feed aquifers).

A review of the MECP Source Water Protection Information Atlas indicates the Study Area is located within the Nottawasaga Valley Source Protection Area. A portion of the Study Area - between Wellington Street and Elizabeth Street East is located within a WHPA, with a vulnerability score between A and F. A portion of the Study Area - south of George Street and East of Mary Street is located within a SGRA with a score of between 2 and 6. The entire Study Area is located in a HVA.

The Clean Water Act defines a “prescribed threat” as “an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water and includes an activity or condition that is prescribed by source protection regulation as a drinking water threat.”

The Province has identified 22 activities that could pose a threat if they are present in vulnerable areas as listed in Section 1.1 of the Clean Water Act, 2006 (O.Reg. 287/07). The project activities associated with the establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage is governed under the Ontario Water Resources Act, R.S.O. 1990., C.O.40 and associated regulations. As such, project activities are not anticipated to pose an increased risk to drinking water.

2.3 Local Planning Policies

2.3.1 County of Simcoe Official Plan

The County of Simcoe (County) Official Plan was most recently consolidated in February 2023. Prepared under the Planning Act R.S.A 1990 c.P.13, as amended, of the Province of Ontario, the plan provides policy for land use planning. Taking into consideration the economic, social, and environmental impacts of land use and developmental decisions, the plan is designed to assist in growth management.

The goals of the Official Plan are as follows:

- To protect, conserve, and enhance the County’s natural / cultural heritage.
- To achieve wise management and use of the County’s resources.
- To implement growth management to achieve lifestyle quality, and efficient / cost-effective municipal servicing, development, and land use.
- To achieve coordinated land use planning among the County’s local municipalities, and other jurisdictions.
- To further community economic development which promotes economic sustainability.
- To positively influence the creation of built environments for people of all ages and abilities, to establish healthy communities, and enhance quality of life.
- To promote socially and physically accessible rural and urban communities.
- To promote, protect, and enhance public health and safety.

Section 3 of the Official Plan outlines the County’s growth management strategy. This strategy is based on the four following themes:

- The direction of a significant portion of growth and development to settlements where it can be effectively serviced, with a particular emphasis on primary settlement areas;
- Enabling and managing resource-based development including agriculture, forestry, aggregates, and tourism / recreation;

- The protection and enhancement of the County' natural heritage system, cultural features, and heritage resources, including water resources; and
- The development of communities with diversified economic functions and opportunities, and a diverse range of housing options.

Land use and sensitive features within the Study Area are identified on applicable schedules of the Official Plan. Schedule 5.1 - Land Use Designations identifies the Study Area as a settlement area. Schedule 5.2.2 - Streams and Evaluated Wetlands identified the Mad River and its tributaries located within the Study Area. Schedule 5.2.4 - Wellhead Protection Areas and Surface Water Intake Protection Zones illustrates a wellhead protection area in the east central area of the study area. Schedule 5.2.5 illustrates the study area is located within an HVA. The majority of the Study Area is not considered a significant groundwater recharge area, with the exception of the southeast corner of the study area, as illustrated on Schedule 5.2.6.

2.3.2 Township of Clearview Official Plan

The Township of Clearview (Township) Official Plan (OP) establishes goals, and policies that will direct the community's growth and development and also provide for the range of tools that will help the community achieve its vision and goals. The Township's previous OP (2001) was based on forecasts for population growth and housing needs to 2021. The Township is in the process of updating the OP to better reflect the current needs of the community, plan for growth in population, housing, and employment between now and 2031. A draft of the new OP was made available in August of 2023 and has yet to be adopted by council and approved by the County.

Land use within the Study area is identified on draft Schedule A - Municipal Structure, draft Schedule B - Land Use Plan, and draft Schedule C - Natural Heritage System Rural Area as part of the urban settlement area. Draft Schedule B-4 - Land Use Plan Creemore identifies Commercial, Residential, Greenland, Natural Heritage, Hazard Lands, Wetlands, and Open Space land uses in the Study Area. Land Use draft Schedule D - Water Resources and draft Schedule D-3 - Water Resources Creemore identifies the Study Area as including an HVA and a WHPA. The Study Area is also located in Area 2: Creemore which is identified as a Special Policy area under Section 13 of the OP.

The following sections have been considered as they apply to this Study Area and the development of water and wastewater solutions:

Section 4 of the OP establishes permitted uses, general development principles, and priorities for zoning within each of the Township's land use designations. Section 5 of the OP identifies the Natural Heritage features that comprise the Township's Natural Heritage System and sets the requirements for any applications proposing development or site alteration in or adjacent to any such features. Section 7 of the OP outlines

Infrastructure and Municipal Services including water and sewage services. This section addresses the provision of water and sewage services. Section 9 of the OP Cultural Heritage Resources (CHR) which outlines policies to promote the identification, preservation and restoration of CHR.

This study supports the achievement of the OP's growth management objectives to direct the majority of development to Urban Settlement Areas where full municipal water and sewage services already exist or can be extended in a cost-effective and fiscally responsible manner.

The Study Area is located within the regulated area of the Nottawasaga Valley Conservation Authority (NVCA). As of April 1, 2024, O.Reg. 172/06 Nottawasaga Valley Conservation Authority Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses is replaced with Prohibited Activities, Exemptions and Permits (O.Reg. 41/24).

The NVCA will continue to be responsible for regulating activities in natural and hazardous areas to avoid the loss of life and damage to property due to flooding and erosion. Under the new regulation, pollution and conservation of land will no longer be considered in permit reviews.

3.0 Future Growth and Servicing Needs Assessment

The servicing needs identified in the MSP are driven by the projected service population for the study area. The development of the water and wastewater service population is detailed in the Projected Service Population technical memo provided in Appendix A. This assessment is summarized in the sections below.

3.1 Existing Population

A community profile summary of Creemore, available from Statistics Canada, was referenced to identify historical residential populations. The residential population (i.e., persons residing in a private dwelling unit) of Creemore was identified as 1,170 persons in 2016 and grew by 24 persons (2.1%) to a residential population of 1,194 persons in 2021. The same Statistics Canada community profile identified that the typical private dwelling houses 2.5 persons.

It is noted that the boundary of the Statistics Canada community profile does not include all of the lands within the Study Area and hence the total residential population within the Study Area is considered to be higher. However, the 2.5 persons per dwelling is considered applicable to derive the existing service population.

There are currently 481 residential water connections, resulting in a residential service population of 1,203 persons for the water system. The equivalent water service population is estimated at 2,190 persons.

There are currently 451 residential sanitary connections, resulting in a residential service population of 1,128 persons for the wastewater system. The estimated equivalent existing wastewater service population is estimated at 2,050 persons.

3.2 Planned and Potential Development

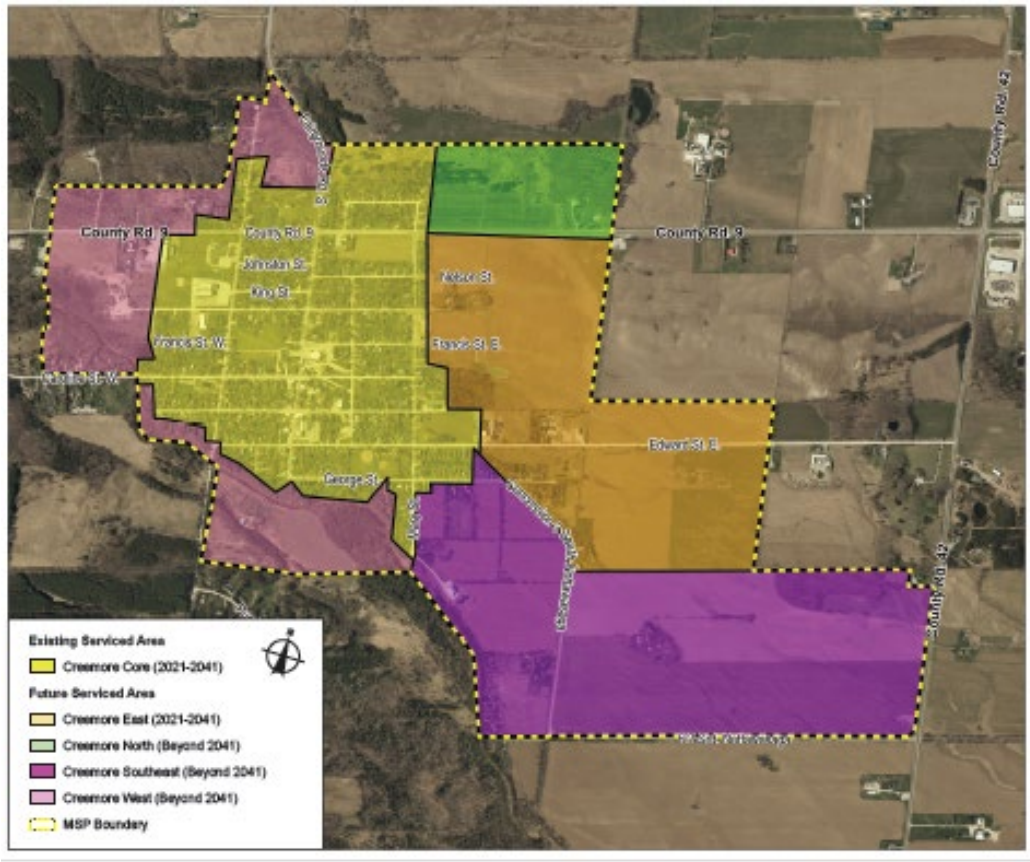
According to the Statistics Canada 2016 census, the population of Creemore was estimated at approximately 1,170 persons. From 2016 to 2021, the population increased by 2.1%. The growth in population in Creemore is low when compared to the population change of 4.7% in the Township, the Provincial population growth average of 5.8% and the national average of 5.2% during the same period. According to the County OP, the population of Clearview Township is projected to be 19,700 persons by 2031.

C.N. Watson prepared a development charges background study that forecasted the construction of a total of 745 additional residential units (1,899 persons) in Creemore between 2019 and 2039. C.N. Watson forecasted that 381 of the additional units (1,001 persons) would be needed by 2029.

The development community has communicated its interest in identifying a servicing plan for Creemore that would allow them to construct an expected residential unit count that is in excess of the C.N. Watson forecast.

The planned and potential development for the MSP study area was evaluated by considering the study area on the basis of five sub-areas; Creemore Core, Creemore West, Creemore North, Creemore East, and Creemore Southeast. The location and size of each is presented in Figure 3.

Figure 3: Study Area – Sub-Areas



The existing serviced customers are generally located within the Creemore Core area. Outside the Creemore Core area, existing homes are generally on individual private services. The Master Plan is being advanced on the basis that there will be no additional growth on municipal services in Creemore West and no additional development on municipal services in Creemore Southeast.

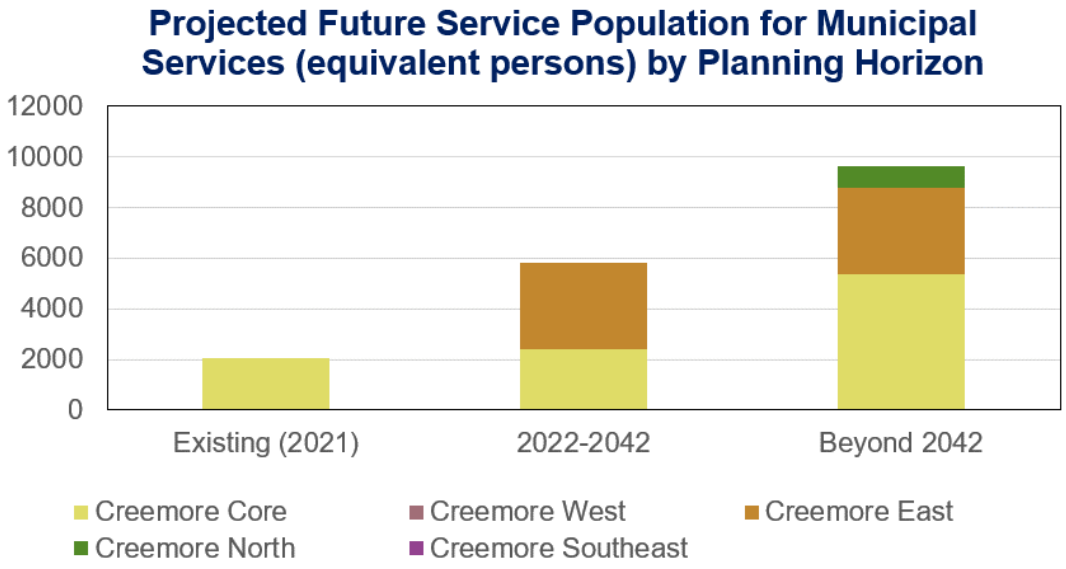
The anticipated infill and development are expected to be located in Creemore Core, Creemore North, and Creemore East.

At build out, the Creemore Core area is projected to have an equivalent service population of 5,417 persons. The sanitary collection system has been designed to accommodate this growth within the Creemore Core. The existing WWTP would need to be expanded to accommodate it.

Within the 20-year planning horizon (2042), some growth (infill and intensification) is anticipated within the Creemore Core. All of the lands within Creemore East are expected to be developed within this time horizon. Additional growth is expected after 2042 within Creemore Core and Creemore North.

The additional equivalent service population anticipated in the 20-year planning period within Creemore Core and Creemore East is 3,766 persons. The projected service populations reflect an assumption of 3.0 persons per future unit as detailed in Appendix A. The distribution and amount of growth by service over time are presented in Figure 4.

Figure 4: Projected Population



4.0 Existing Conditions

4.1 Natural Environment

A review of existing natural features and secondary source information was conducted to assess the potential for Species At Risk (SAR) habitat within the study area.

A summary of the findings is provided in the sections below. The Existing Natural Features technical memorandum is provided in Appendix A.

4.1.1 General Physiography

A review of available mapping by the Ontario Geological Survey was undertaken to characterize the general topography and surficial and bedrock geology of the study area.

The study area is relatively flat with an elevation of approximately 255 m to 265 m above sea level.

The study area is located within the Horseshoe Moraines physiographic region of Southern Ontario (Chapman and Putnam, 1984).

Surficial geology mapping illustrates the study area is primarily located within the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member, and Eastview Member consisting of shale, limestone, dolostone, and siltstone deposits (Ontario Geological Survey, 2003).

4.1.2 Terrestrial Features

Vegetation communities in the Study Area were assessed and described according to the Ecological Land Classification (ELC) System for Southern Ontario, First Approximations (Lee et al., 1998, updated to 2008 where applicable). A total of 17 communities were identified using ELC vegetation community types. Of these, 11 are culturally influenced communities, the remaining 6 communities are forest. All of the communities identified are considered to be relatively common in Ontario. Sensitive vegetation communities or provincially significant plant species were not observed within the study area during the field assessment. The vegetation communities within the Study Area are as follows:

- Agriculture (AG)
- Agricultural Infrastructure (IAG)
- Treed Agriculture (TAG)
- Hedgerows (CUH1)
- Cultural Meadows (CUM)
- Cultural Plantations (CUP)
- Cultural Thickets (CUT)
- Cultural Woodlands (CUW)
- Open Pasture (OAGM4)
- Commercial and Institutional (CVC)
- Single Family Residential (CVR_3)
- Forest Coniferous (FOC)
- Forest Deciduous (FOD)
- Forest Mixed (FOM)
- Swamp (Deciduous (SWD)
- Mixed (SWM)
- Open Water (OA)

4.1.3 Species at Risk

Species at Risk, Threatened and Endangered, are species listed as protected by law under the Provincial Endangered Species Act (ESA 2007) or the Federal Species at Risk Act (SARA) (2002). Special Concern species do not have species or habitat protection

under Ontario's ESA (2007) or the Federal SARA (2002), however, they may receive protection by some agencies, such as Provincial and National parks, or other Acts, such as the Ontario Fish and Wildlife Conservation Act and the Migratory Birds Convention Act (MBCA), which prohibits the killing, capturing, injuring, harassment, and trapping of specially protected species.

Several SAR were identified through background review to have the potential to be present in the study area.

Based on field observations, potential marginal habitat exists in the study area for the following provincial Special Concern species:

- Eastern Wood-pewee (*Contopus virens*)
- Wood Thrush (*Hylocichla mustelina*)
- Monarch (*Danaus plexippus*)

These Special Concern species were not observed within the study area during the field assessment completed in 2022.

Based on field observations, potential habitat exists in the study area for the following Threatened and Endangered Species protected under the Provincial ESA (2007):

- Eastern Meadowlark (*Sturnella magna*)
- Little Brown Myotis (*Myotis lucifugus*)
- Northern Myotis (*Myotis septentrionalis*)
- Tri-colored Bat (*Perimyotis subflavus*)

Incidental observation of a male Meadowlark was heard calling during breeding bird season in appropriate habitat (Mixed Meadow: MEM), adjacent to the Mary Street right-of-way in the southwest of the study area.

During the 2022 site visit, the potential for suitable bat roost habitat trees for Little Brown Myotis, and Northern Myotis were observed within the Study Area. Mature tree species with preferred characteristics and snags were present in communities within the ROWs in the Study Area, located adjacent to open fields and within 1 km of the Mad River as a potentially preferred permanent water body source for foraging. Potential habitat trees suitable for Tri-colour Bat maternity roosting were not observed. During field observations, one audio call was identified to be that of Northen Myotis, no other SAR bat calls were detected. No visuals of bats were recorded entering / exiting candidate trees.

Based on the lack of additional SAR bat calls and the late hour of the one bat call detected, the single call is inferred to be from an individual male bat passing by while foraging, rather than a female roosting in trees on-site. The Ontario Recovery Strategy for Little Brown Myotis, Northern Myotis and Tri-colored Bat (2019) states that:

> *"maternity sites may be identified based on any feature where two or more Little Brown Myotis, Northern Myotis or Tri-colored Bat have been observed in, or observed to exit from the feature, between May 15 and July 31."*

The single call from a male bat does not meet the definition for a maternity roost. As such, the candidate bat habitat trees are not considered to provide maternity roost habitat for Species at Risk bats. While maternity roosts were not observed, individual males may occasionally use some trees within the study area for transient roosts.

4.1.4 Aquatic Habitat

The watercourse located along the southern boundary of the Study Area, known as the Mad River and its contributing unnamed tributary, located in the northeastern portion of the study area may be considered direct fish habitat as defined under the Fisheries Act.

The Ministry of Natural Resources and Forestry (MNRF) Aquatic Resource Area (ARA) mapping classifies the Mad River as a cold-water system while its tributaries are undefined. During the site visit, the unnamed tributary was dry where observed, and considered to be a potential indirect fish habitat based on the limited defined bed and bank observed. Although observed to be dry during the site visit, there is the potential for flows, sediment, and nutrients to be conveyed downstream during seasonal periods of high water. No fish were observed.

Based on field observations, potential fish habitats exist in the study area.

4.1.5 Hydrogeology

The existing Creemore water system is served by two groundwater wells. The existing hydrogeological setting was reviewed as documented in the Desktop Hydrogeology Review technical memo included in Appendix A.

4.2 Cultural Environment

4.2.1 Archaeological Resources

A Stage 1 Archaeological Assessment was completed in November 2022 by Archeoworks Inc. A copy of the Stage 1 Archeological Assessment is provided in Appendix A. The Stage 1 determined that parts of the study area have archaeological potential and recommended a Stage 2 Archaeological Assessment be completed prior to any construction activities if areas of archaeological potential are impacted by the preferred water and wastewater solution.

A Stage 2 Archaeological Assessment was completed in November 2023. A copy of the Stage 2 Archaeological Assessment is provided in Appendix A. Archaeological resources were not encountered during the Stage 2 Archaeological Assessment and the study area is considered free of archaeological concern.

4.2.2 Built Heritage and Cultural Heritage Landscapes

A review of the Built Heritage and Cultural Heritage Landscapes was conducted by MHBC. The findings of the Cultural Heritage Assessment Report (CHAR) are provided in Appendix A. Three potential cultural heritage landscapes were identified within the study area as well as three potential built heritage resources located adjacent to the study area. With the implementation of the recommendations within the report, no further cultural heritage studies are required.

4.2.2.1 Wastewater System

Wastewater generated in Creemore is conveyed by a gravity sewer system to the existing Creemore WWTP. The gravity sewer system and WWTP are relatively new having been constructed in 1999. There are no existing sanitary pumping stations within the existing collection system.

The headworks of the WWTP includes a pumping station to lift wastewater into the treatment facility. The WWTP is equipped with standby power. The WWTP includes a flow equalization tank, which was added in 2015. The effluent from the WWTP is discharged to the Mad River at the WWTP site. The WWTP is based on a membrane bio-reactor treatment process. The Creemore WWTP was the first membrane bio-reactor facility constructed in Ontario.

5.0 Creemore Drinking Water System

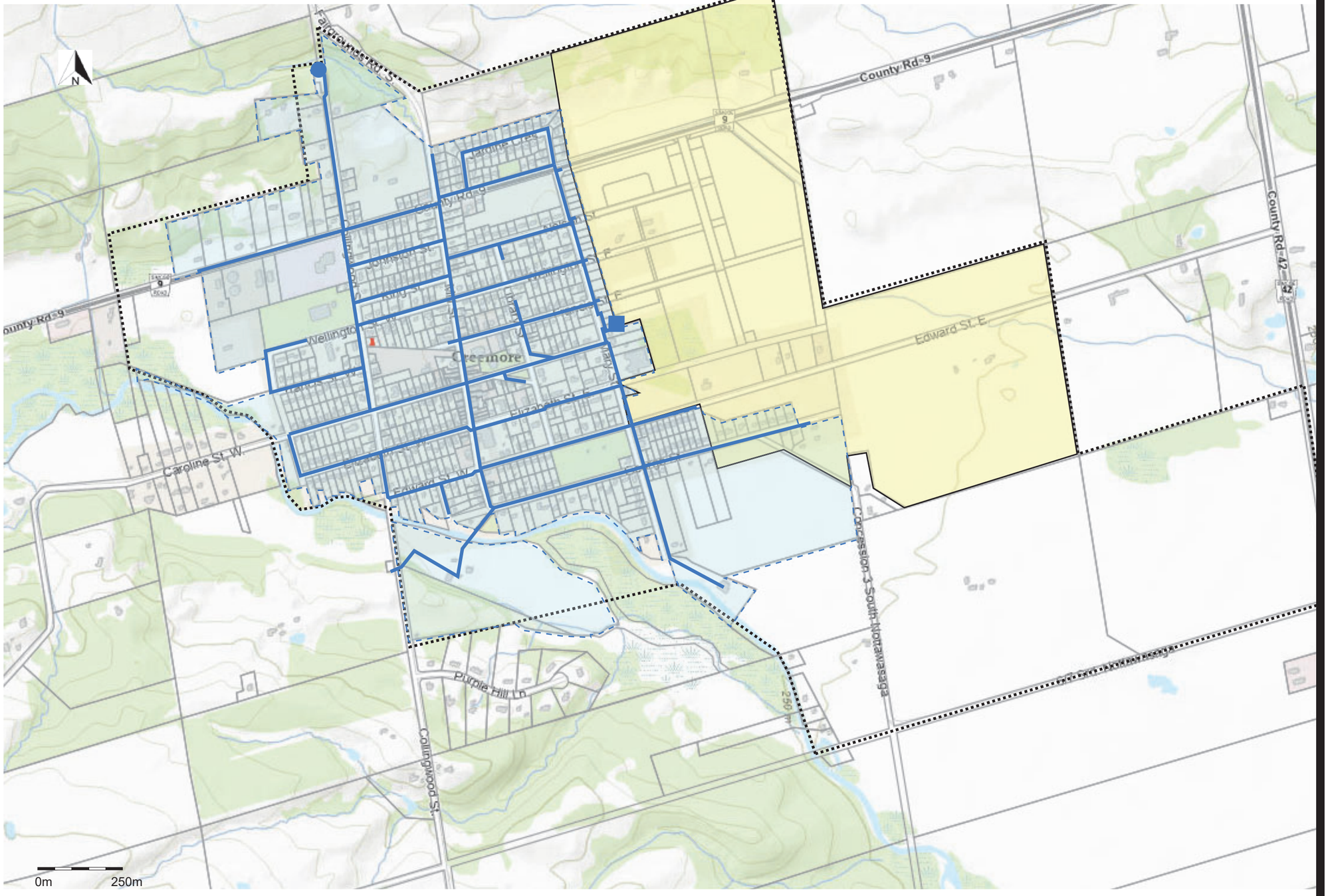
The Creemore Drinking Water System (DWS) is classified as a large municipal residential system and is owned and operated by the Township and consists of a ground water supplied WTP a distribution system and water storage. A technical memo documenting the water system review is located in Appendix A and includes a system inventory, a review of historical water demands, and identification of the spare hydraulics associated with the Creemore Drinking Water System. Key aspects of the technical memo are presented in the following sections.

A plan showing the existing drinking water system is provided as Figure 5.

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE 5

EXISTING WATER SYSTEM



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area

BURNSIDE

5.1 Inventory of the Drinking Water System

5.1.1 Water Supply and Treatment

The existing water supply and treatment facility for the Creemore DWS consists of two wells, a small building housing controls, buried chlorine contact piping, and standby power located outdoors in a weatherproof enclosure. The treatment provided consists of primary and secondary disinfection using sodium hypochlorite.

The water taking from the wells is authorized under Permit to Take Water (PTTW) Number P-300-7059802876. The total authorized taking is 2,880 m^3/d with up to 1,440 m^3/d taken from each well.

The Creemore WTP has a rated capacity of 2,688 m^3/d (31.1 L/s) as identified on Municipal Drinking Water License (MDWL) 099-105 Issue 4.

The facility is equipped with controls that limit the taking from each well to 15 L/s in order to maintain compliance with the MDWL rating.

As such, the treated water discharge is limited to 2,592 m^3/d. The firm water supply capacity is 1,296 m^3/d.

The well pumps start and stop in response to the water level in the water reservoir located in the distribution system.

5.1.2 Water Storage

The Creemore DWS included a grade-level concrete reservoir with a capacity of 1,570 m^3. The high water level (HWL) at this facility is 307.35 m. The existing elevation at the site is approximately 305 m.

The facility is located on a relatively small parcel with limited property to the north, west, or east. There is potential for expansion to the south of the existing facility.

A structural condition assessment of the reservoir was completed for the Township by WSP in 2022. The report identified a number of recommendations under the groupings of immediate, short term and long term. These recommended works will be undertaken by the Township as part of the state of good repair work program.

5.1.3 Water Distribution System

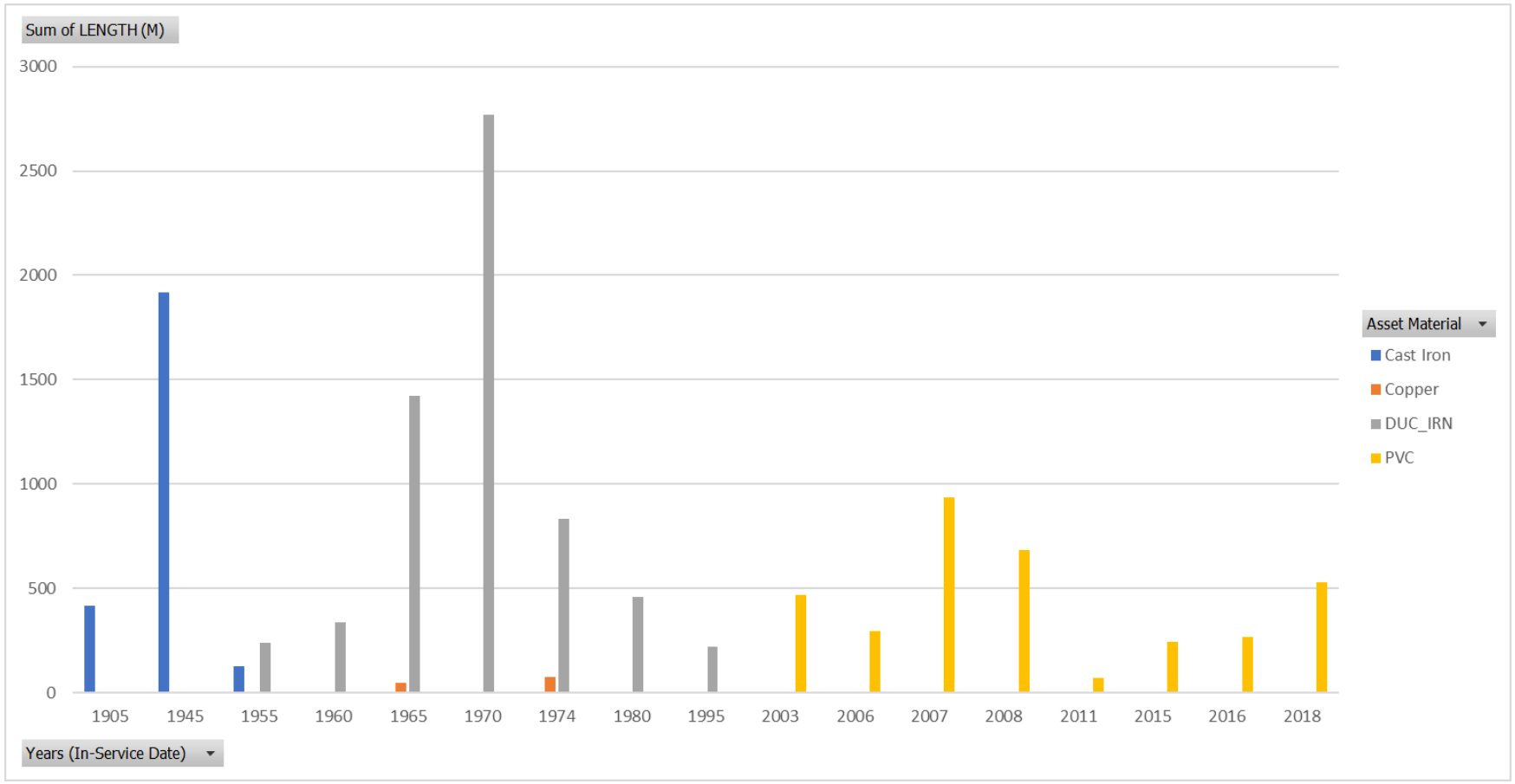
The system includes approximately 12,350 m of watermain. The majority of watermains have diameters between 100 mm and 300 mm. Watermains vary in age with the oldest being over 100 years old. The watermains are generally cast iron, ductile iron, and PVC. Please refer to Table 1 for the distribution of materials by diameter.

Table 1: Watermain by Diameter, Materials, and Length

Dia.(mm)	Length (m) by Material				Total Length (m)
	Copper	Cast	Ductile	PVC	
<100	120		67		187
100		1540	693		2233
150		505	4861	2141	7507
200		418		51	469
250				938	938
300			661	355	1016

The distribution of watermains by material and age is illustrated in Figure 6.

Figure 6: Watermain Length by Materials by Age



The majority of the 100 mm diameter piping is cast iron and installed prior to 1945. The newest 100 mm pipe is ductile iron and was installed in 1974.

5.2 Spare Hydraulic Capacity of Supply

For a DWS such as Creemore's, which includes floating storage in the distribution system, the water supply system (treated water from the wells) is required to satisfy the maximum day demand.

The firm well supply capacity as identified above is 1,296 m^3/s and the three-year average maximum day demand is 854 m^3/d; thus the spare physical supply capacity of treated water is 442 m^3/d (34% remaining).

Prior to determining how much of this capacity is available to service additional growth, the figure must be reduced to reflect existing allocations that are not yet being used, as well as any provisions for infilling and intensification.

5.3 Spare Water Storage Capacity

The existing water storage facility is required to supply water when the water system demand is greater than the water supply rate. Water storage is typically sized to address needs for equalization, fire protection, and emergencies.

For the current existing water system service population of 2,190 equivalent persons and an existing average day demand of 414 m^3/d, using the standard MECP maximum day demand factor and a fire flow allowance of 95 L/s for two hours, the recommended water storage volume for the existing user base is 1,146 m^3 or 73% of the existing reservoirs capacity of 1,570 m^3. Hence the existing facility is adequate for the current service population.

5.4 Existing and Design Water Demands

5.4.1 Existing Average and Maximum Daily Flows

The water production records supplied by the Township were reviewed for 2017 through 2021.

- Over the most recent three-year period, the average daily demand, as determined based on water production is 414 m^3/d.
- Over the most recent three -year period, the maximum day demand, as determined based on water production is 854 m^3/d.
- Over the most recent three -year period, the ratio of maximum day demand to average day demand varied from 1.99 to 2.17.

5.4.2 Per Customer Usage

There are currently approximately 545 water users on the Creemore DWS. This includes 481 residential accounts and 64 Industrial / Commercial / Institutional (ICI) accounts. Over the most recent three years, the average number of residential accounts is estimated at 474 accounts.

The 2021 StatsCan Data identifies an average household population of 2.5 persons per dwelling unit for the Creemore Population centre.

As such, the average residential serviced population over the last three years for the water system is estimated to be 1,185 persons.

5.4.3 Unaccounted for Water

Over the three-year period of 2019 to 2021, the volume of unaccounted water varied between 10% and -2%. In the preceding years, unaccounted water was higher and is attributed to a significant watermain leak that took considerable time to locate. The current levels are reasonable.

5.4.4 Design Unit Water Demands

The MECP guidelines recommend an allowance of between 270 and 450 L/person per day for average daily residential water demand and additional allowances made for non-residential uses. The Township's Engineering Standards currently require development be engineered based on an allowance of 450 L/person per day for water demand. As detailed in Water System Review technical memo, located Appendix A, the historical per capita residential water demand appears to less than the lower end of the MECP guideline. However, it is noted that past significant watermain leaks have been difficult to locate given the geological conditions in the service area, and the unaccounted-for water during this period was significant.

An average daily water demand allowance of 350 L/person per day is recommended for planning the water supply, treatment, pumping, and storage facilities.

The actual ratio of maximum daily demand to average day demand from 2017 to 2021 has ranged from 1.68 to 2.17. This is consistent with slightly less than typical MECP-suggested maximum day factors.

For the planning of the water system, the maximum day factors as recommended in the MECP guidelines will be used. For projected service populations between 2,001 and 10,000 persons, the recommended maximum day factor is 2.0.

5.5 Projected Water Demands and Storage Requirements

5.5.1 Projected Water Demands

The project water demands and water storage requirements derived to address the needs of the existing users, and the projected growth for the 20-year planning horizon and at build out are presented in the Flows and Demands technical memo located in Appendix A.

To satisfy the projected service population at the end of the 20-year planning period, the Creemore DWS will require a firm supply capacity of 3,464 m^3/d or 40.1 L/s. This exceeds the current firm capacity of 1,296 m^3 or 15 L/s.

To satisfy the projected service population at the build out, the Creemore DWS will require a firm supply capacity of 6,121 m^3/d or 70.8 L/s. This exceeds the current firm capacity of 1,296 m^3 or 15 L/s.

To satisfy the projected service population at the end of the 20-year planning period, the Creemore DWS will require a total of 2,379 m^3 of water storage capacity, assuming fire protection at a rate of 144 L/s for two hours. This exceeds the current storage capacity of 1,570 m^3.

To satisfy the projected service population at build out the Creemore DWS will require a total of 4,049 m^3 of water storage capacity assuming fire protection at a rate of 144 L/s for two hours. This exceeds the current storage capacity of 1,570 m^3.

5.6 Water Distribution System Modelling

The computerized water distribution model of the Creemore DWS was reviewed and updated to assess existing conditions and identify required upgrades to support the forecasted growth. This analysis is documented in the Water System Modelling Technical Memo located in Appendix A.

The existing water distribution system generally has pressure within acceptable ranges during Average Day Demand (ADD), Maximum Day Demand (MDD) and Peak Hour Demand (PHD) scenarios. Some areas have pressures in excess of the MECP recommended range of 50 to 70 psi under MDD but are less than 80 psi.

The existing system was assessed to determine the available fire flows across the distribution system, during a period of maximum day demand, while maintaining a minimum pressure of 20 psi throughout the distribution system. There are a considerable number of locations in the existing distribution system where a fire flow of 79 L/s was not available. The locations are presented in Figure 3 of the Water System Modelling Technical Memo located in Appendix A. These locations are generally along the east

side of the service area, along small diameter watermain on Edward Street and along the east limits of Edward Street and George Street.

The model was also used to identify the needs associated with the areas of proposed development.

5.7 Problems and Opportunities for Drinking Water System

5.7.1 Water Supply and Treatment

The Creemore DWS supply does not have the capacity to support the water demands forecasted for 2042.

This existing facility is in reasonable condition for its age but is located on a small parcel of land that provides little opportunity for expansion.

The developer of Area CE-1 is obliged under their conditions of draft plan approval to provide a water supply well as part of their development. Work to support the provision of this well is underway but the capacity of this well has yet to be fully confirmed. This well and the associated treatment and pumping are expected to be located within the lands being developed. The preliminary estimate of the supply capacity is 10 L/s. Additional wells will be required to support the water demands of the study area as forecasted for 2042.

5.7.1.1 Unallocated Water System Capacity

As identified in Section 5.2, the spare hydraulic capacity as of the end of 2021 was determined to be 442 m^3 per day. A background study prepared by Burnside in October 2021 identified that the unallocated capacity of the water supply system was 147 units. The assumptions about the water demand per unit in the October 2021 memo are slightly different than the assumptions used in the forecasts included in the Master Plan.

5.7.2 Storage

The Creemore DWS storage facility does not have the capacity to satisfy the projected water storage needs forecasted for 2042.

A background study prepared in Burnside in October 2021 identified that the existing water storage facility was adequate to provide the water storage associated with the unallocated water supply system capacity of 147 units. The assumptions about the water demand per unit in the October 2021 memo are slightly different than the assumptions used in the forecasts included in the Master Plan.

A condition assessment of the existing water storage facility was conducted in 2022 by WSP. The study identified several issues with the condition of the existing facility and recommended a number of repairs.

This existing facility is located on land at the North end of Collingwood Street. The site is constrained to the West, North, and East, but there appears to be adequate land to the South which would permit doubling the existing storage capacity by twinning the existing reinforced concrete grade-level storage facility.

Under their conditions of draft plan approval, the developer of the Area CE-1 lands are obliged to provide water storage as part of their development. The elevations within the development are not suitable for a grade-level water storage facility unless it is equipped with pumps. The Township is not supportive of a grade-level facility with pumps.

There are lands outside the Area CE 1 lands with sufficient elevation to support a grade-level facility. Those lands are located North and South of the existing service area.

Elevated storage could be located within the Creemore Core or Creemore East areas.

5.7.3 Distribution

Watermains that are less than the recommended minimum diameter of 150 mm should be upsized when replacement is required.

There are a number of dead-end watermains in the existing system. This should be avoided where possible.

Select existing watermains are expected to need to be extended and / or upsized to support servicing the proposed areas of development.

6.0 Alternative Solutions for Water System

The alternative solutions presented below are focused on supporting municipal water services for the Creemore Core, Creemore East, and Creemore North areas. The Creemore West and Creemore Southeast service areas are expected to continue to be serviced using individual servicing.

6.1 Identification of Alternative Water Solutions

The alternative solutions for the improvements to the water systems are presented as alternative solutions for the water supply and alternative solutions for water storage in the following sections.

6.1.1 Alternative Solutions for Water Supply

The existing water supply and treatment facility does not have adequate capacity to address the forecasted water demand for 2042. Several alternative solutions to address the water supply have been identified and are described below.

6.1.1.1 Do Nothing

Under this alternative solution, the status quo with regard to the water supply system is maintained. New connections to the water system would be limited to the capacity that can be supported by the existing DWS. The do nothing alternative is required to be considered as a reference point in the evaluation of the alternative solutions.

6.1.1.2 Reduce Water Demand

Under this alternative solution, additional water conservation initiatives would be introduced and or existing measures enhanced to reduce existing water demands and the forecasted water use associated with additional users. Typical measures include low flow fixtures, watering restrictions, water metering and adjustment of water rates.

6.1.1.3 Optimize the Existing Water System

Under this alternative solution, works, and / or measures including the addition or replacement of equipment and new operational practices would be considered to close the gap between the available water supply from the facility and its existing rated capacity.

6.1.1.4 Expand the Existing Water System (Beyond Rated Capacity) - Connect to an Adjacent System - WS1

Under this alternative solution, the needed additional supply would be provided by establishing a connection to an existing nearby water system. The closest existing Township municipal drinking water systems are located in Stayner and New Lowell. This alternative considers a connection to the groundwater supplied Stayner DWS. For the purpose of the evaluation, it is assumed that a connection to the Stayner DWS would be made at the Stayner Reservoir Site on Airport Road. The connecting watermain would extend from the existing Creemore DWS approximately 2.1 km east along County Road 9 and then 4.7 km north along County Road 42 to the limit of the Stayner DWS adjacent to the existing Airport Road Water Reservoir. It is anticipated that a water booster pumping station would be required to convey water from the Stayner Reservoir to the existing Creemore DWS. The Creemore Wells would remain in operation. This alternative solution is illustrated in Figure 7.

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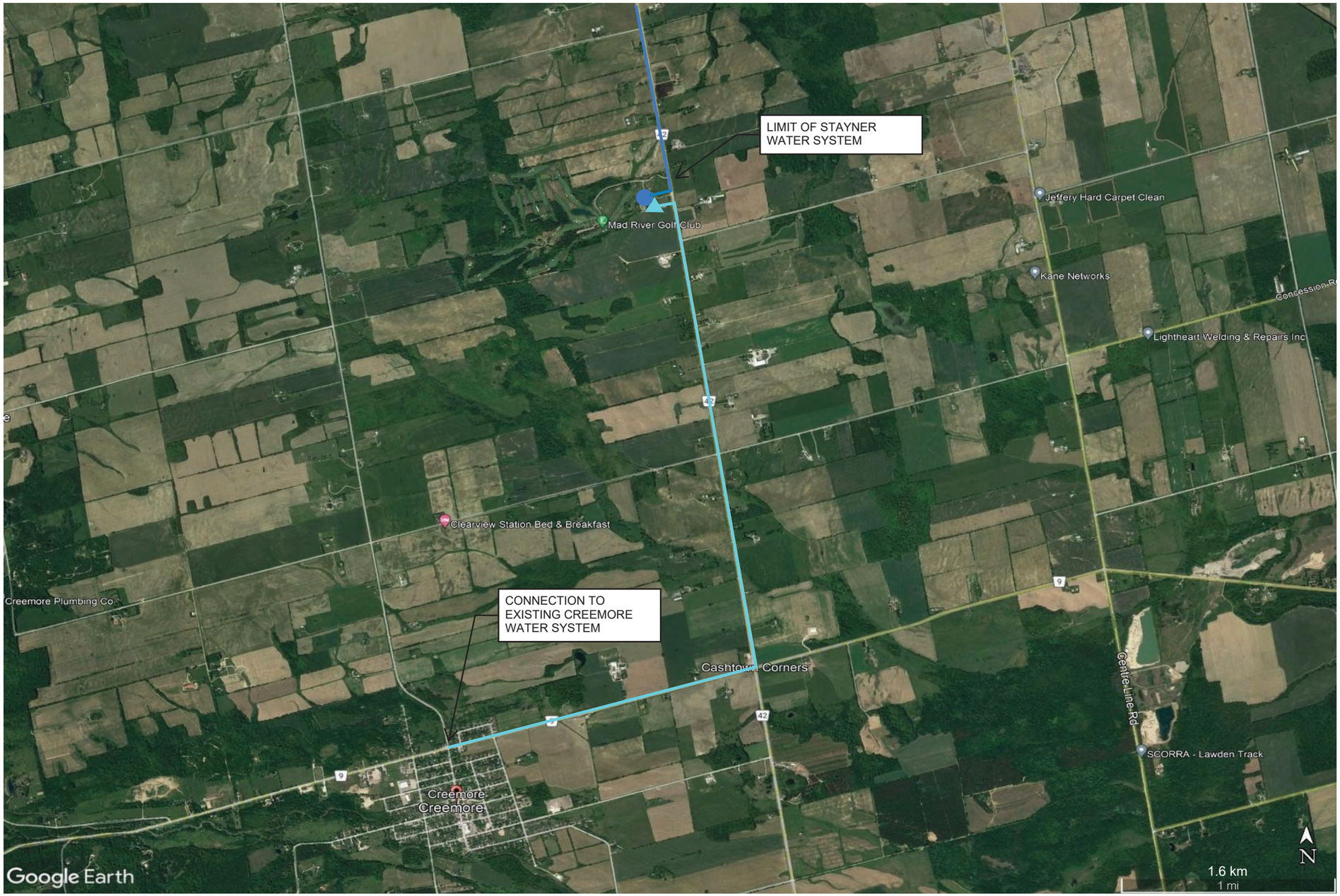
FIGURE 7

ALTERNATIVE WATER SUPPLY SOLUTION WS 1



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Pumping Station
- Proposed Water Service Area

BURNSIDE

6.1.1.5 Expand the Existing Water System (beyond rated capacity) - Additional Groundwater Wells – WS2

This alternative solution would see additional groundwater resources developed in the Creemore area to satisfy the forecasted water demand and the associated new water treatment facilities constructed. The source of additional supply is expected to be located within the southwest corner of the Creemore East Area CE-1 lands. The supply facility would, after the required treatment, connect directly to the expanded water distribution system that is associated with the development of Area CE-1 This alternative solution is illustrated in Figure 8.

6.1.1.6 Expand the Existing Water System (beyond rated capacity) – Connect To Surface Water Source – WS3

This alternative solution would see a connection to the Collingwood-Alliston water pipeline that conveys treated water from the Collingwood WTP to Alliston. The Collingwood WTP draws water from Georgian Bay. The alternative assumes that a connection would be made to the pipeline in New Lowell as the pipeline passes through that community near the existing New Lowell water treatment facility. The existing New Lowell DWS is already connected to the pipeline to address some of the water demand in that community. It anticipated that emergency storage would need to be constructed at the New Lowell WTP property and that a waster booster station also located at the New Lowell WTP property would be required to convey the water approximately 9.4 km along County Road 9 to the Creemore DWS. This alternative solution is illustrated in Figure 9.

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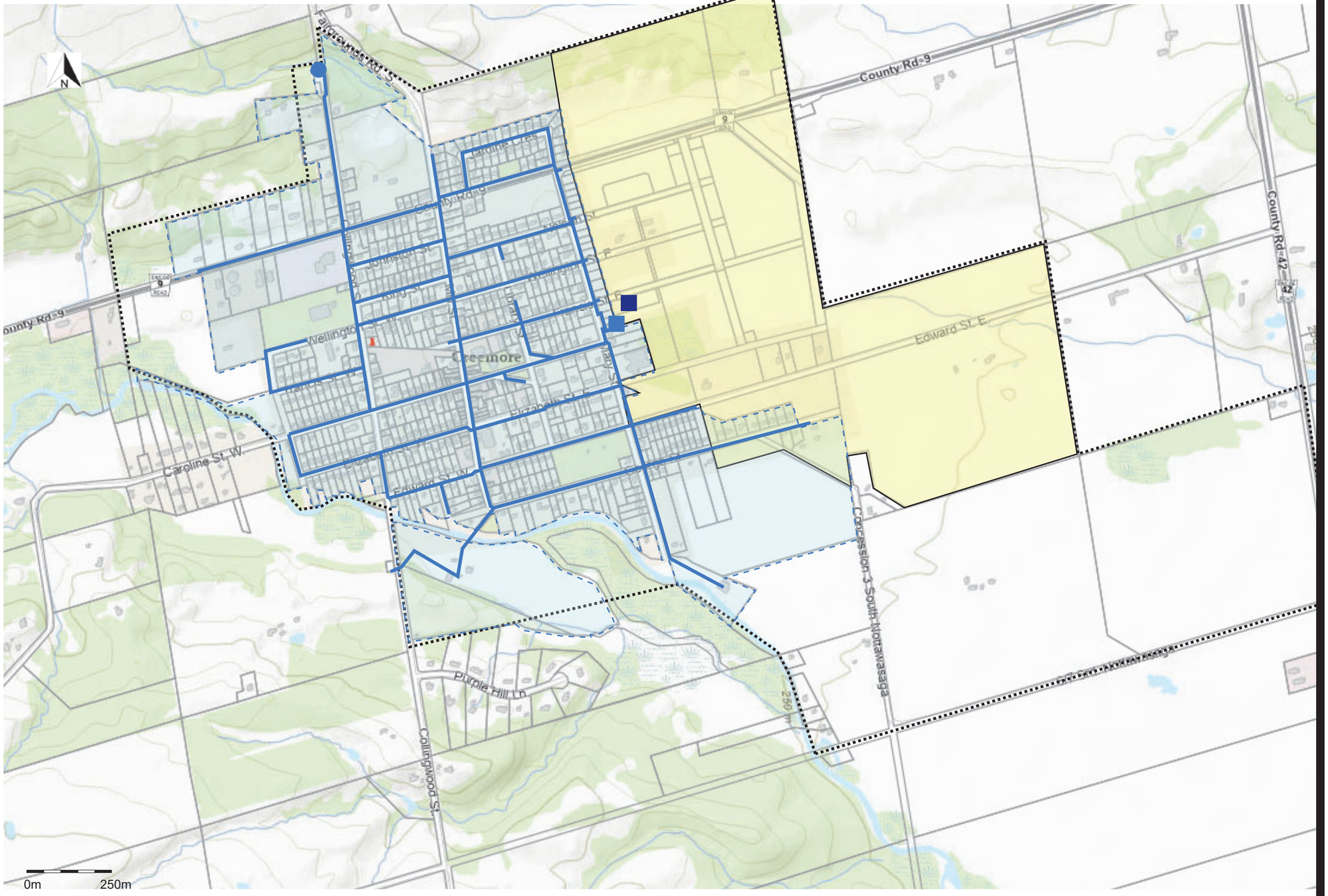
FIGURE 8

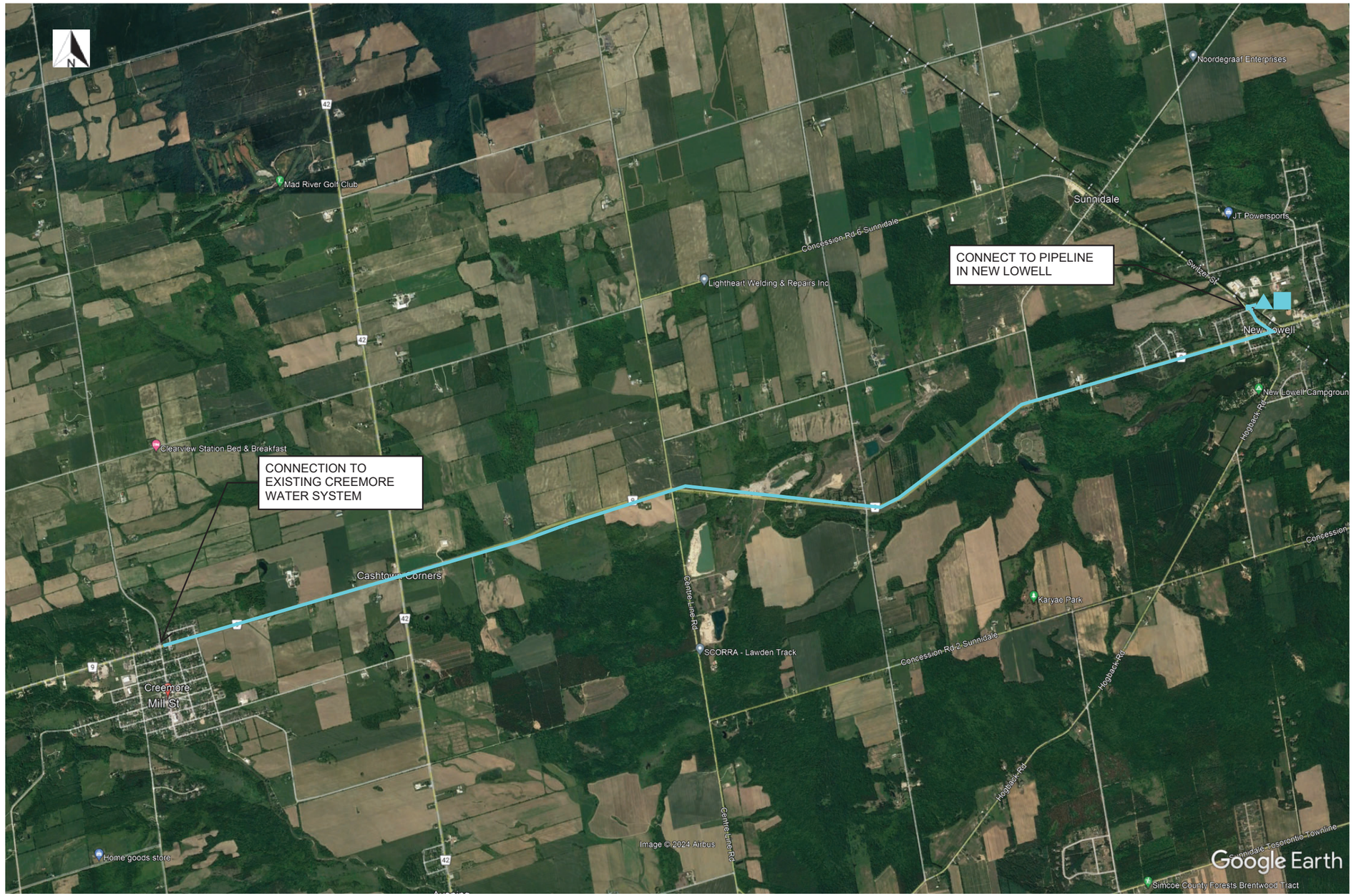
ALTERNATIVE WATER SUPPLY SOLUTION WS 2



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area

BURNSIDE



TOWNSHIP OF CLEARVIEW
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MASTER SERVIVING PLAN

FIGURE 9

ALTERNATIVE WATER SUPPLY SOLUTION WS 3

LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Pumping Station
- Proposed Water Service Area

BURNSIDE

6.1.2 Water Storage

The alternatives described here are associated with storing treated water as required to support an expansion of the existing drinking water system and connection to the existing distribution system. The total volume required to support the 2042 servicing needs is 2,379 m^3.

The existing grade-level water storage facility, located at the north end of Collingwood Street in Creemore is not large enough to support the forecasted growth. The existing water storage facility provides treated water storage to address equalization, fire and emergency needs.

Several alternative solutions to provide the required water storage are illustrated in Figure 10 and described in the following sections.

6.1.2.1 Grade Level Storage, North Creemore – Alternative WST1

Under this Alternative Solution, additional grade-level storage would be provided at the existing site adjacent to the existing facility. The existing facility would remain. The new facility would be connected to the existing watermain that serves the existing reservoir. The facilities would generally work in tandem, although one could be isolated while the other remains in service. It is proposed to twin the existing cel, providing a total storage volume of 3,140 m^3.

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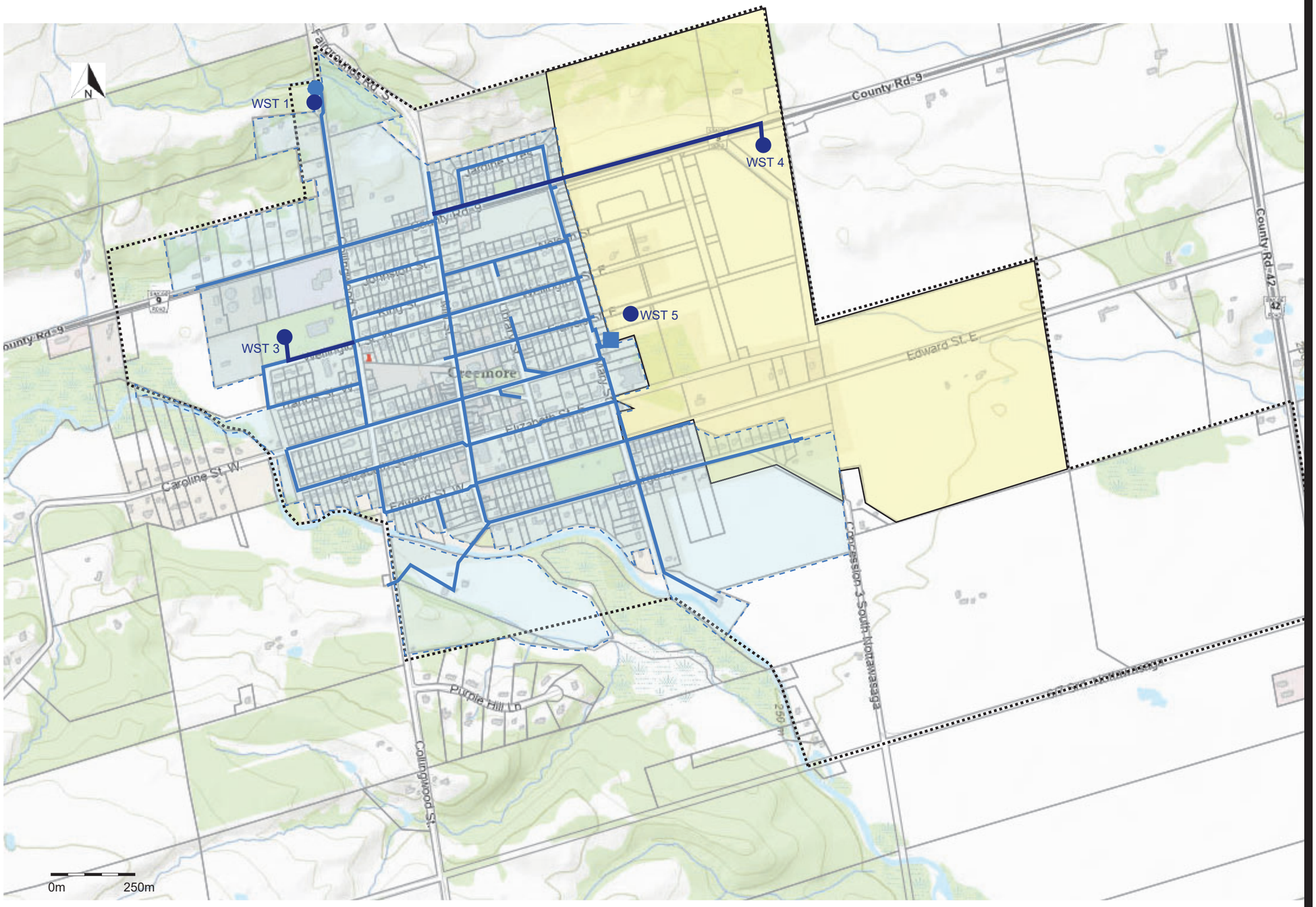
FIGURE 10

ALTERNATIVE WATER STORAGE SOLUTIONS



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area

BURNSIDE

6.1.2.2 Grade Level Storage, Southwest Creemore – Alternative WST2

Under this Alternative Solution, new grade-level storage would be provided south of the Creemore Core area. A suitable Township owned site was not available. For the analysis, the potential sites are considered to be in proximity to an abandoned former municipal water reservoir. Access to this area is limited. Approximately 1.0 km of watermain would be required to connect to the existing DWS. A significant portion of this would require easements on private lands. Land acquisition would also be required. The existing municipality facility would be abandoned. The new facility would result in a slightly higher hydraulic grade line (HGL) and have a capacity of 2,379 m^3.

6.1.2.3 Elevated Storage, West Creemore – Alternative WST3

Under this Alternative Solution, the existing water storage facility would be abandoned and replaced with elevated water storage on municipal lands west of the existing community centre. Approximately 300 m of watermain would be required to connect to the existing DWS. As elevated storage is not expandable and to realize economies of scale it is recommended the storage be sized for the required build out volume of 4,059 m^3.

6.1.2.4 Elevated Storage, East Creemore – Alternative WST4

Under this Alternative Solution, the existing water storage facility would be abandoned and replaced with elevated water storage to be located on development lands. Approximately 1.0 km of watermain would be required to connect to the existing DWS. As elevated storage is not expandable and to realize economies of scale it is recommended the storage be sized for the required build out volume of 4,059 m^3.

6.1.2.5 Grade Level Storage with Pumping, East Creemore – Alternative WST5

Under this Alternative Solution, the existing water storage facility would remain and additional grade-level storage with pumping would be provided at the site of the additional ground water well. A small amount of watermain would be required to connect to the expanded water distribution system. The water storage volume is assumed to be 809 m^3/d.

6.2 Evaluation Criteria

The evaluation of alternatives is a step-by-step process that compares alternatives that are feasible within the project environment and meet the project objectives outlined in the Problem / Opportunity Statement.

The impacts of the alternatives are evaluated relative to each other, against a set of equally weighted criteria, including possible mitigating measures. The criteria are developed under four major categories; Natural Environment, Socio-Cultural

Environment, Financial Environment, and the Technical Environment, following a review of the existing conditions in the study area and identification of key considerations. The criteria and indicators for each environment are presented in Table 2. The indicators may vary slightly between evaluation tables.

Table 2: Typical Evaluation Criteria

Criteria	Sub Criteria	Indicator
Natural Environment	Vegetation / Tree Removal	Removal of existing trees and vegetation.
	Terrestrial Habitat (Breeding Birds, General Wildlife, Habitat Connectivity)	Effect on wildlife and habitat. Changes to habitat connectivity.
	Fisheries / Aquatic Habitat	Change or removal of existing aquatic habitat.
	Natural Features (Wetland, Wooded Area)	Disturbance to designated woodlands and wetlands
	Species at Risk (Bats, Birds, Butternut)	Negative Effect on Species at Risk and habitat.
	Water Resources (Groundwater, Drainage Features, Source Water Protection)	Impact to aquifers and groundwater. Decreased/increased infiltration. Negative impact on floodplains. Disruption of natural drainage. Increased sedimentation to watercourses due to construction activities.
	Impact on Climate Change (Greenhouse Gas Emissions, Carbon Sinks, Resilience, or Vulnerability)	Impact to carbon sinks (vegetation removal). Potential for greenhouse gas emissions. Impact to resilience or vulnerability. Change in air quality.
Socio-Cultural	Conformity to Municipal Policies and Development Planning	Ability to conform local policy and planned development post 2042.
	Heritage Resources (Archaeological Features, Built Heritage, and Cultural Heritage Landscapes)	Potential for negative impact cultural heritage features. Potential for negative impact archaeological resources.

Criteria	Sub Criteria	Indicator
	Local Residents Nuisance Impacts (Noise, Visual Impact)	Perceivable changes to existing noise levels. Visual impacts / aesthetics. Temporary disruption to residents during construction.
	Municipal Services (Snow Removal, Garbage Pickup)	Disruption of municipal services.
	Land Acquisition Requirements	Need for land acquisition.
	Conformity to Agency Policy (NVCA, MECP, NEP)	Ability to conform to provincial environmental policy.
Financial	Cost of Construction of the System	No impact above existing conditions.
	Costs associated with typical operation and maintenance of the system	No impact above existing conditions.
	Costs associated with private property requirements, including easements, land purchases, restoration of private lands.	No impact above existing conditions.
Technical	Addresses Operational Requirements (Capacity, Level of Service)	Provides reliable water service to existing serviced areas and areas of future growth. Ease of operation and maintenance.
	Design Constraints	Ability to maximize existing infrastructure. Ease of construction.
	Impact to Existing Utilities	Alteration to above-ground and underground utilities.

Each Alternative Solution is assessed with regard to the magnitude of its potential impact in the sub-criteria. By considering the impacts on the sub-criteria the magnitude of the potential impact of the alternative solution on the criteria can be estimated. Through this process, each alternative solution is classified on a continuum from least preferred to most preferred.

Each Alternative Solution is also assessed with regard to its ability to satisfy the problem statement.

6.3 Evaluation of Alternative Solutions

6.3.1 Evaluation of Water Supply Alternative Solutions

Section 6.1.1 identifies the long list of alternative solutions for to address the projected deficit with regard to water supply capacity.

The long list of alternative solutions was subject to preliminary screening to confirm which alternatives should be advanced for a more detailed screening.

The Do Nothing alternative solution (Section 6.1.1.1) does not provide the required additional water supply capacity and was hence screened out and not carried forward for detailed evaluation.

The alternative solution to Reduce Water Demand (Section 6.1.1.2) on its own does not provide the required additional water supply capacity, as per capita demands are currently relatively low providing limited opportunity to create additional capacity and the capacity deficit is significant. Hence this option was screened out and not carried forward for detailed evaluation. This option could be combined with other options.

The alternative solution to Optimize the Existing Water System (Section 6.1.1.3) on its own does not provide the required additional water supply capacity, as the facility is capable of running very close to its approved capacity, providing limited opportunity to create additional capacity and the capacity deficit is significant. Hence this option was screened out and not carried forward for detailed evaluation. This option could be combined with other options.

The detailed evaluation matrix for the alternative solutions for water supply is included in Appendix B.

Based on the evaluation of alternative solutions for water supply outlined above, the preferred solution for water supply is Alternative Solution WS2 - Additional Groundwater. Only a fraction of the required additional water supply is specifically confirmed in terms of its location. At the completion of the Master Plan, the supply facility associated with that well will be considered to have satisfied its EA requirements. This represents part of solution WS2 and is referred to WS2-A moving forward. For the balance of the additional groundwater supply required to address the forecasted demand for the 20-year planning horizon additional investigations are required to be undertaken to confirm the location of the additional wells. Once sources are identified, additional EA study will be required to satisfy the EA requirements for these sources.

6.3.2 Evaluation of Water Storage Alternative Solutions

Section 6.1.1 identifies the long list of alternative solutions for to address the projected deficit with regard to water storage capacity.

The long list of alternative solutions was subject to preliminary screening to confirm which alternatives should be advanced for a more detailed screening.

The detailed evaluation matrix for the alternative solutions for water supply is included in Appendix B.

Based on the evaluation of alternative solutions outlined above, the preferred solution for water supply is additional grade-level water storage at the existing site as per alternative solution WST1.

6.3.3 Summary

Based on the evaluation of alternative solutions outlined above, the preferred solution for water supply is Alternative Solution WS2 - Additional Groundwater Supply in combination with Addition Grade Level Storage as per alternative solution WST1.

Only a fraction of the required additional water supply is specifically confirmed in terms of its location. At the completion of the Master Plan, the supply facility associated with that well will be considered to have satisfied its MCEA requirements. For the balance of the additional groundwater supply required to address the forecasted 20-year planning horizon, additional investigations are required to be undertaken to confirm the location of the additional wells. Once groundwater sources are identified, subsequent MCEA study will be required to satisfy the MCEA requirements and / or other regulatory requirements as applicable at the time.

7.0 Creemore Wastewater System

The Creemore Wastewater System is owned by the Township. The collection system is operated by the Township. The Creemore WWTP is operated by the Town of Collingwood under contract to the Township.

The review of the existing wastewater system is documented in the Wastewater System Review technical memo included in Appendix A. The technical memo includes a system inventory, a review of historical flows, and identification of the spare hydraulic capacity associated with the Creemore WWTP. Key aspects of the technical memo are presented in the following sections.

A plan showing the existing wastewater system is provided as Figure 11.

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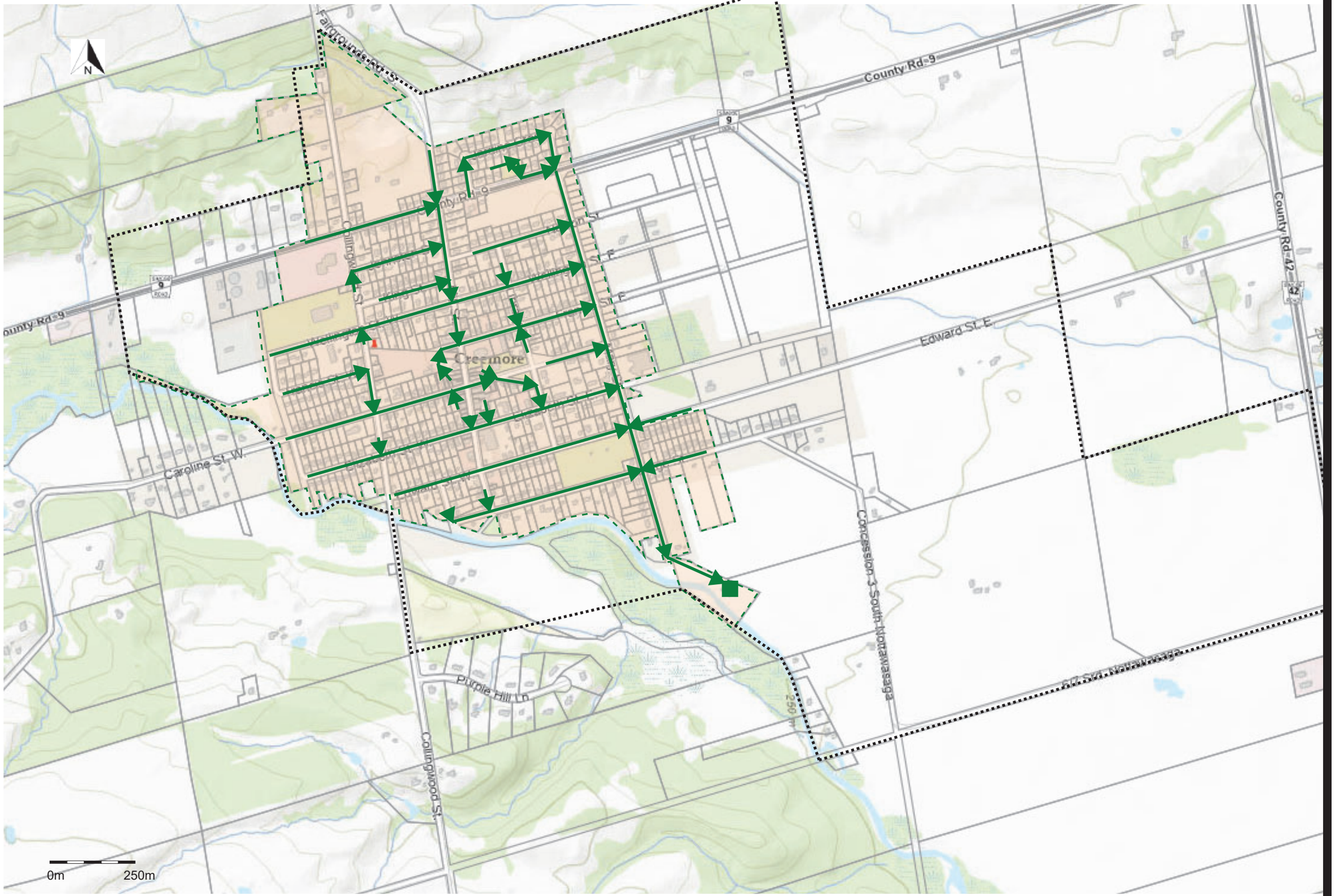
FIGURE 11

EXISTING WASTEWATER SYSTEM



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

BURNSIDE

7.1 Inventory of Wastewater System

7.1.1 Wastewater Treatment System

The Creemore wastewater treatment system consists of a centralized WWTP located at 83 Mary Street in Creemore, Ontario. The facility is approved for an average daily flow (ADF) of 1,400 m^3/d as identified in ECA 3281-AKGR3E dated April 6, 2017.

In 1999, Stage I of the plant was constructed with a design ADF of 860 m^3/d (including infiltration allowance). The original design basis was developed to accommodate 1,500 persons, commercial properties, and the Creemore Springs Brewery. The Stage I peak design flow was 2,955 m^3/d (including infiltration).

It was originally envisioned that the plant would someday be upgraded to handle 1,000 additional persons and modifications made to accommodate an associated Stage II average day flow of 1,400 m^3/d (including infiltration allowances). The extent of works required associated with this upgrade appears to have been anticipated, at the time of the original design, to be nominal and are not well documented. The extent of works required to reach an ADF treatment capacity of 1,400 m^3/day now appears to be significant.

In 2015, an equalization tank was installed at the WWTP in order to provide temporary storage of influent wastewater when the influent flow rate to the WWTP exceeded the ability of the WWTP to process incoming wastewater. The temporarily stored wastewater is returned to the head of the plant for processing once the high influent flow rates subside.

In 2017, the WWTP was upgraded to provide more air supply to the treatment process to compensate for wastewater loading in excess of the original design assumptions.

7.1.2 Wastewater Collection System

Wastewater generated in Creemore is conveyed by a gravity sewer system to the existing Creemore WWTP. The gravity sewer system and WWTP are relatively new, having been constructed in 1999. There are no existing sanitary pumping stations within the collection system.

The diameters of the existing sewers range from 200 mm to 375 mm, and the total installed length is 9,841 m. The majority of the sewer (9,450 m) was constructed using Ultra Rib PVC pipe. Newer sewers are PVC. Please refer to Table 3 for the distribution of sewer mains by diameter, material, and length.

Table 3: Sewer Mains by Diameter, Materials and Length (m)

Diameter (mm)	PVC (m)	Ultra Rib PVC (m)	Total Length (m)
200	392	7795	8186
300		732	732
375		922	922

7.1.3 Existing Flows

The historical flow data for influent to the Creemore WWTP is documented in the annual report prepared for the facility. The influent flow data is summarized in Table 4.

Table 4: Historical WWTP Flows

Year	ADF (m^3/d)	MDF (m^3/d)	Max Day Factor
2017	369.0	1011.0	2.7
2018	420.0	822.0	2.0
2019	413.0	1009.0	2.4
2020	377.0	607.0	1.6
2021	400.0	592.0	1.5

Over the most recent three-year period, the average daily flow, as determined based on effluent flow from the WWTP is 398 m^3/d or 46% of the Stage I design ADF.

Over the most recent three-year period, the maximum daily flow (MDF), as determined based on effluent flow from the WWTP is 736 m^3/d.

The MDF in 2020 and 2021 was significantly lower than the MDF between 2017 and 2019, although average flows were steadier. The Township did not undertake any significant inflow and infiltration (I/I) studies or repairs just prior to 2020 so the reason for the reduction in peak flow is uncertain. It could be attributed to lower rainfall, snow melt related events, or could be associated with pandemic related changes in customer behavior that may have impacted Industrial / Commercial / Institutional (ICI) users significantly.

7.1.4 Per Customer Flows

It is estimated that the residential service population between 2019 and 2021 was 1,110 persons. The historical wastewater flow per person is therefore estimated at 339 L/person per day. This is inclusive of existing average infiltration and the flow contributions from non-residential users.

Actual wastewater flows from the existing user base are not metered on an account basis. Assuming that wastewater rates are in proportion to billed water use, and netting out the contributions of industrial and commercial users, the per person estimated

wastewater flow rates are slightly below the MECP's design guideline of 270 to 450 L/persons per day.

7.1.5 Inflows and Infiltration

The Township undertook an extensive work program to identify and reduce inflow and infiltration between 2006 and 2009 and made repairs to sewer mains, sewer maintenance holes, and sanitary laterals. The program was effective, reportedly reducing the plant ADF by 25% and more significant reductions to peak flows.

A 1,400 m^3/d equalization tank was installed in 2015. The method of diverting flows to and returning flows from the equalization tank is operator intensive and disruptive to the existing sludge digestion process.

An inflow and infiltration study has not been undertaken since the installation of the equalization tank. Private connections, such as roof leaders and sump pumps disconnected during I/I reduction programs have a tendency to become reconnected over time.

A past study by Burnside (completed in January 2020) identified that between 2013 and 2018, the ratio between the MDF and ADF to the WWTP ranged from 1.47 to 4.02.

7.1.6 Historical Influent Characteristics

Historically, the wastewater received at the Creemore WWTP is significantly stronger the typical municipal wastewater. The most notable differences being the elevated Biological Oxygen Demand (BOD5). The ratio of Nitrogen (N) to BOD5 and the pH level are also lower than typical. This variation is generally attributed to the discharge from a local industry. The discharges from the industry are in compliance with an existing overstrength agreement between the Township and the industry. The average influent characteristics between 2017 and 2023 are summarized in Table 5.

Table 5: Historical Influent Quality 2017-2023

	BOD5 (mg/L)	**TSS (mg/L)**	**TAN (NH_3-N) (mg/L)**	**TP (mg/L)**
Average[1]	1039	300	27	15

[1] Excludes 2020 – Pandemic Year

BOD5 - Biological Oxygen Demand, TSS - Total Suspended Solids, TAN - Total Ammonia Nitrogen, TP - Total Phosphorus

7.1.7 Historical Effluent Characteristics

The existing WWTP has at times had challenges meeting the compliance limits identified in the ECA, and more frequently the lower effluent objectives. The compliance issues are typically associated with TP and TAN concentrations, although some events typically

attributed to the membranes themselves have impacted CBOD5 and TSS. It is noted that the membranes are not intended to reduce dissolved phosphorus and TAN concentration in the wastewater effluent and as such, these issues are typically attributed to challenges with the upstream biological treatment process. Additional detail is provided in the Wastewater System Review technical memo included in Appendix A.

7.2 Spare Hydraulic Capacity

As outlined in the Wastewater System Review technical memo included in Appendix A, the WWTP works as constructed are interpreted to have been constructed to provide a capacity of 860 m^3/d. Based on the historical ADF of 398 m^3/d, a spare hydraulic capacity of 432 m^3/d would be expected. However, the existing facility is not capable of performing at its design capacity of 860 m^3/d. This is evident based on a number of events which required excess flows to be diverted either to equalization storage temporarily and / or hauled off-site. The bottleneck on the hydraulic capacity is attributed the rate of flow that will pass through the membranes.

Blue Sky Energy Engineering and Consulting Inc. (Blue Sky) conducted a review of the plant capacity in September 2020 and subsequently evaluated the capacity of the membrane filtration process in the Fall of 2021 and Winter of 2022. Their most recent investigation has established the existing WWTP hydraulic capacity as equivalent to an ADF of 512 m^3/d, but notes that the sludge digestion and storage systems are undersized for a flow rate of 512 m^3/d based on the properties of the wastewater being received.

The spare hydraulic capacity of the existing treatment plant is therefore estimated to be 512 m^3/d day less 398 m^3/d, or 114 m^3/d.

Prior to determining how much of this limited capacity is available to service additional growth, the figure must be reduced to reflect existing allocations that are not yet being used, as well as any provisions for infilling and intensification.

In addition, as the existing sludge digestion at the WWTP system is already considered to be undersized, any additional allocations will aggravate this issue.

7.3 Unallocated Hydraulic Reserve Capacity

As identified in Section 7.2, the spare hydraulic capacity as of the end of 2021, based on the most recent assessment of the ability of the WWTP (February 2022) was determined to be 114 m^3/day. A background study prepared by Burnside in October 2021, assuming a higher treatment capacity, identified the unallocated capacity of the wastewater system was 108 units as of October 2021. The assumptions about the wastewater demand per unit are slightly different from the assumptions used in the forecasts included in the Master Plan.

7.4 Projected Wastewater Needs

This section summarizes the wastewater servicing needs associated with the 2042 planning horizon. The following sections summarise the projected wastewater flows and the projected wastewater characteristics.

7.4.1 Design Unit Wastewater Flows

The assumptions for unit wastewater demands are related to the assumed water demands in Section 5.4.4. The assumed average daily dry weather wastewater flow is therefore assumed to be 350 L/person per day and equal to the assumed average daily water demand. For the purpose of estimating the capacity of wastewater pumping and treatment facilities, an infiltration allowance of 90 L/person per day is added to the average dry weather flow and an allowance of 227 L/person per day is added to the peak flows. The peak wastewater flow is estimated by multiplying the average dry weather flow by the Harmon peaking factor and adding the Peak Infiltration allowance.

7.4.2 Projected Wastewater Flows

The development of the projected wastewater flows is detailed in the Flows and Demand Technical Memo included in Appendix A. The project wastewater flows are derived to address the needs of the existing users and the projected growth for the 20-year planning horizon.

To satisfy the projected service population at the end of the 20-year planning period the wastewater treatment facility will need to accommodate an average daily flow of 2,100 m^3/d and peak flow of 6,800 m^3/d. This projected average daily flow significantly exceeds the current estimated average daily flow capacity of 518 m^3. The 2042 ADF also exceeds the Stage I design ADF of 860 m^3/d and Stage II design ADF of 1,400 m^3/d. The 2042 PF exceeds the Stage I design PF of 2,955 m^3/d as well as the Stage II design PF of 4,640 m^3/d.

To satisfy the projected service population at the build out, the wastewater treatment facility will need to accommodate an ADF of 3,725 m^3/d and PF of 11,230 m^3/d. This projected average daily flow significantly exceeds the current estimated average daily flow capacity of 518 m^3. The projected wastewater flows are summarised in Table 6 and it is noted that the existing (2021) PF value is a calculated value, not a historical value.

Table 6: Projected Wastewater Flows

	ADF (m^3/d)	PF (m^3/d)
Existing (2021)	398	1,899
2042	2,100	6,800
Ultimate	3,725	11,230

7.4.3 Projected Wastewater Characteristics

Historically, the wastewater received at the Creemore WWTP is significantly stronger than typical municipal wastewater. The historical wastewater characteristics are discussed in Section 7.1.6.

The detailed design of upgrades will need to give due consideration to the atypical historical characteristics of the wastewater received at the WWTP and any projected changes in these characteristics.

7.4.4 Projected Effluent Limits

The Township has completed an Assimilative Capacity Study (ACS) of the Mad River based on a sampling program conducted over 2022 and 2023. The report has been submitted to and reviewed by the MECP. The MECP provided comments and through correspondence agreed to a set of Effluent Limits that would apply to an expansion of the rated capacity of the existing WWTP from 1,400 m^3/d to an ADF of 2,100 m^3/d. The ACS and follow up correspondence are included in Appendix A. The future Effluent Limits as agreed are detailed in Table 7.

Table 7: Future Effluent Limits

Effluent Parameter	Monthly Average Concentration (mg/L unless otherwise indicated)
CBOD5	10.0
Total Suspended Solids	10.0
Total Phosphorus	0.2
Total Ammonia Nitrogen	2.7 (June 1 to September 30) 3.9 (October 1 to May 30)
Dissolved Oxygen	4.0
E. Coli	200 CFU/100 mL

7.5 Problems and Opportunities for the Wastewater System

7.5.1 Wastewater Treatment

The forecasted 20-year flow exceeds the previously planned capacity of the existing WWTP and as a result the various existing unit processes in the WWTP lack the capacity to address the forecasted 20-year flows.

The WWTP was the first membrane bio reactor (MBR) - based municipal WWTP in Ontario and capable of providing a high level of treatment as a result of the membranes that are a key part of the treatment process. The original MBR facilities are now recognized as having a high number of operational and maintenance issues.

The strength of influent wastewater received at the WWTP significantly exceeds the assumptions in the original design basis.

The invert of the inlet to the existing SPS integrated into the existing headworks is relatively shallow and, as such, the proposed additional development areas will not drain to the existing SPS by gravity.

The existing screening technology is not consistent with current best practices for MBR wastewater treatment facilities.

The current method of equalizing influent flow rates is operationally intensive and disruptive to the operation of the sludge digester.

The wastewater loading to the plant is such that the mixed liquor suspended solids (MLSS) concentration in the bio reactor is typically well in excess of the level recommended by the membrane manufacturer.

The membrane treatment step has been demonstrated to be a major bottleneck in terms of the hydraulic capacity of existing WWTP.

The method of cleaning the membranes is not consistent with current best design practices. Each membrane cassette must be removed form the process tank to conduct chemical cleans, one cassette at a time. This is a labour-intensive and time-consuming process. Newer designs support chemical cleans being completed in place, which is less time-consuming.

Each of the two membrane trains contains four membrane cassettes. Within each train there are components that lack redundancy such that a single failure will result in a full train being offline.

Despite the flow to the plant being low relative to the original design flow, the sludge, processing, and storage facilities are considered to be near or at capacity.

The UV disinfection equipment is old and lacks redundancy.

The existing WWTP is located within the Mad River floodplain. The main floor is above the flood line elevation. The Township has an exception which allows for the plant including an expanded facility to be located within the floodplain.

7.5.2 Wastewater Collection

A past study has identified that the existing gravity sewer that services the Creemore Core area (or Mary Street Sewer Catchment) does not have the capacity to service lands outside the planned catchment area (Burnside, December 2021).

The elevation of the groundwater table in the study area varies seasonally. The timing of construction needs to be considered to minimize the impact of an elevated groundwater on construction costs.

Initially, the collection system suffered from extraneous flows. Between 2006 and 2009 the Township undertook an inflow and infiltration reduction program to reduce extraneous flows. The Township considered this program to be successful. The Township continues to inspect the system on an ongoing basis for evidence of high extraneous flows.

Alternative sewage collection approaches, such as pressure gravity sewers, are less prone to infiltration and are generally installed at shallower depths than conventional gravity sewer. However, they introduce significant additional operating and maintenance concerns. Conditions which favour their use are rolling topography, bedrock close to surface, and a low density of development. These conditions do not generally apply in the proposed service area.

8.0 Alternative Solutions for Wastewater System

The alternative solutions presented below are focused on supporting municipal wastewater services for the Creemore Core, Creemore East and Creemore North areas. The Creemore West and Creemore Southeast service areas are expected to continue to be serviced using individual servicing.

8.1 Identification of Alternative Wastewater Solutions

The alternative solutions for improvements to the wastewater system are presented as alternative solutions for wastewater treatment and alternative solutions for wastewater collection in the following sections.

8.1.1 Alternative Solutions for Wastewater Treatment

The existing wastewater treatment facility does not have adequate capacity to address the forecasted wastewater flows for 2042. The actual capacity of the existing wastewater treatment facility is well below the design capacity of the facility as constructed and further below the current approved capacity for the facility.

8.1.1.1 Do Nothing

Under this alternative solution, the status quo with regard to the wastewater system is maintained. New connections to the wastewater system would be limited to the capacity that can be support by the existing wastewater system. The Do Nothing alternative is required to be considered as a reference point in the evaluation the alternative solutions.

8.1.1.2 Reduce Wastewater Flow

Under this alternative solution, additional works and measures would be implemented to reduce the wastewater flow that is received at the existing WWTP. These initiatives can be grouped into two categories. The first is initiatives that would reduce water demand, which in turn reduces wastewater flows. The second is initiatives focused on reducing inflow and infiltration to the wastewater system.

8.1.1.3 Upgrade Existing WWTP - WWT1

Under this alternative solution, additional equipment would be added or replaced, and / or operation practices modified such that the upgraded existing facility would be able to effectively operate at its currently approved capacity of 1,400 m^3/d. The location of the existing plant is illustrated in Figure 12.

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WATER AND WASTEWATER
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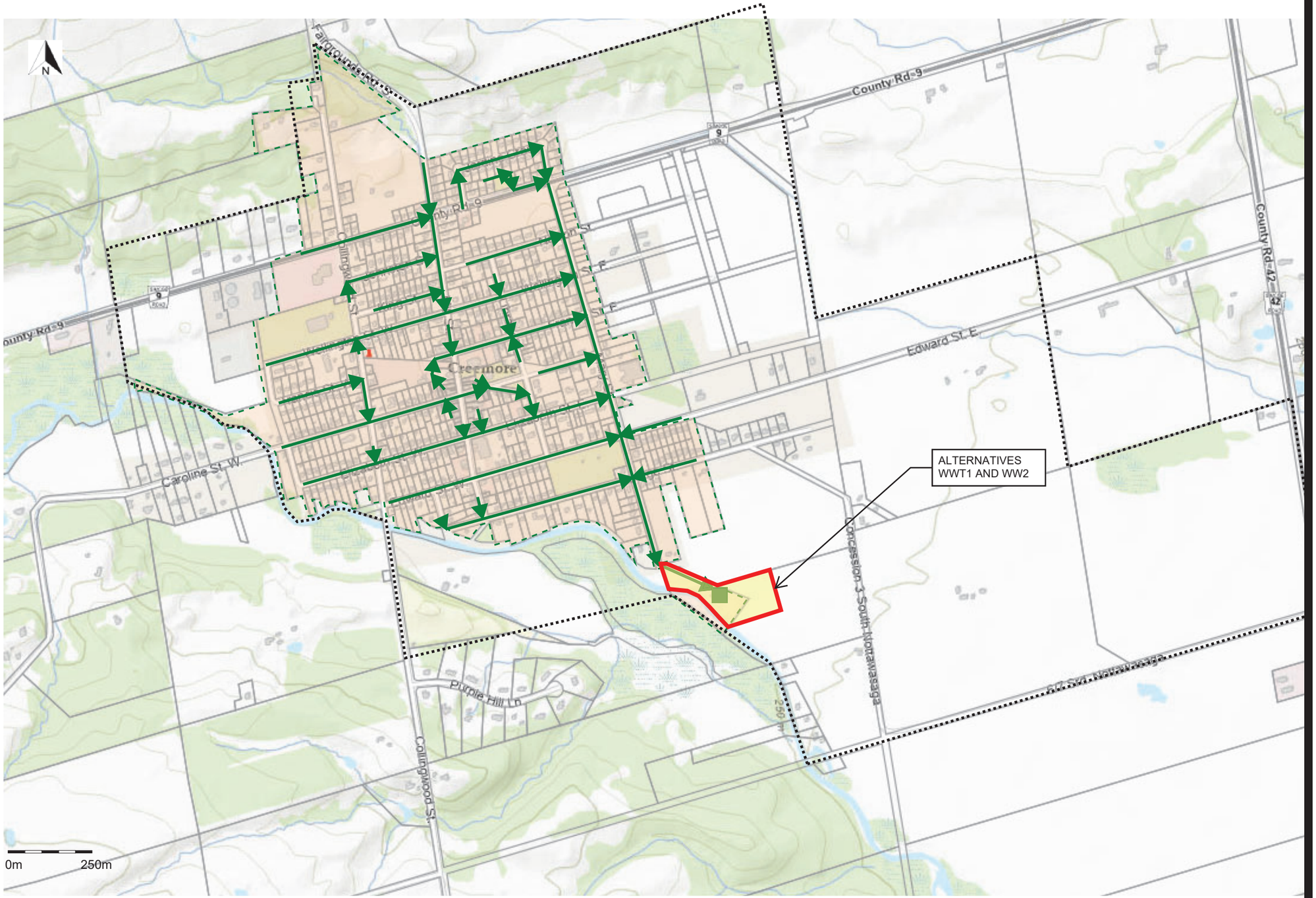
FIGURE 12

WASTEWATER TREATMENT ALTERNATIVES WWT1 AND WWT2



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

BURNSIDE

8.1.1.4 Expand the Existing WWTP at Existing Site - WWT2

Under this alternative solution, the existing facility would be expanded at the existing site to effectively operate at a capacity of 2,100 m^3/d. The existing outfall would remain. The location of the expanded facility is illustrated in Figure 12.

8.1.1.5 New WWTP at New Site - WWT3

Under this alternative solution, the existing treatment facility would be retired and a new facility would be established at a new site, including establishing a new outfall. The new facility would have a capacity of 2,100 m^3/d. For the purpose of the evaluation, the new location was assumed to be down gradient of the existing WWTP, generally southeast, located in proximity to the Mad River.

8.1.2 Alternative Solutions for Wastewater Collection

The alternatives described here are associated with collecting and conveying wastewater to the existing WWTP site.

The existing gravity sewer system is generally located upgradient from the Creemore East and Creemore North sub-areas and was originally designed to accommodate properties located on and west of Mary Street. While it is technically possible to convey wastewater to the existing sewer network via pumping stations and forcemains, past studies (Burnside 2021) have identified that the existing sewers do not have capacity to accommodate wastewater from areas outside of the Creemore Core area. As such, the collection alternatives are generally focused on conveying the wastewater via new gravity sewers and/or forcemains to the existing WWTP site.

All existing flows to the existing WWTP are conveyed by gravity to the influent pumping station which is integrated into the headworks of the existing WWTP. The existing influent pumping station has an approved firm peak flow capacity of 34.2 L/s or 2,955 m^3/d with some provision for upgrading to 53.7 L/s or 4,640 m^3/d. This capacity is not adequate to accommodate the anticipated 2042 peak flows.

8.1.2.1 Wastewater Collection Alternative - WWC1

Under this alternative, all lands associated with Creemore North and Creemore East would drain by gravity to the existing WWTP site. The sewers would be located within proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements and on the WWTP property. The gravity sewer would discharge to a new headworks building suitably deep to accommodate the new incoming gravity sewer. In this alternative, the existing SPS in the headworks could be redirected by gravity to the new headworks building. This alternative solution is illustrated in Figure 13.

8.1.2.2 Wastewater Collection Alternative - WWC2

Under this alternative, all lands associated with Creemore North and Creemore East (excluding Development Area CE-3 Lands) would drain by gravity to a new SPS located at the existing WWTP. Development Area CE-3 would drain to a new SPS located in the southeast corner of Development Area CE-3. This pumping station would discharge via forcemain to the gravity sewer draining the balance of the lands. The sewers and forcemains would be located within the proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements, and on the WWTP property. In this alternative, the proposed forcemain would discharge to a new headworks building at the existing WWTP site. The existing SPS could be redirected to the new headworks building. This alternative solution is illustrated in Figure 14.

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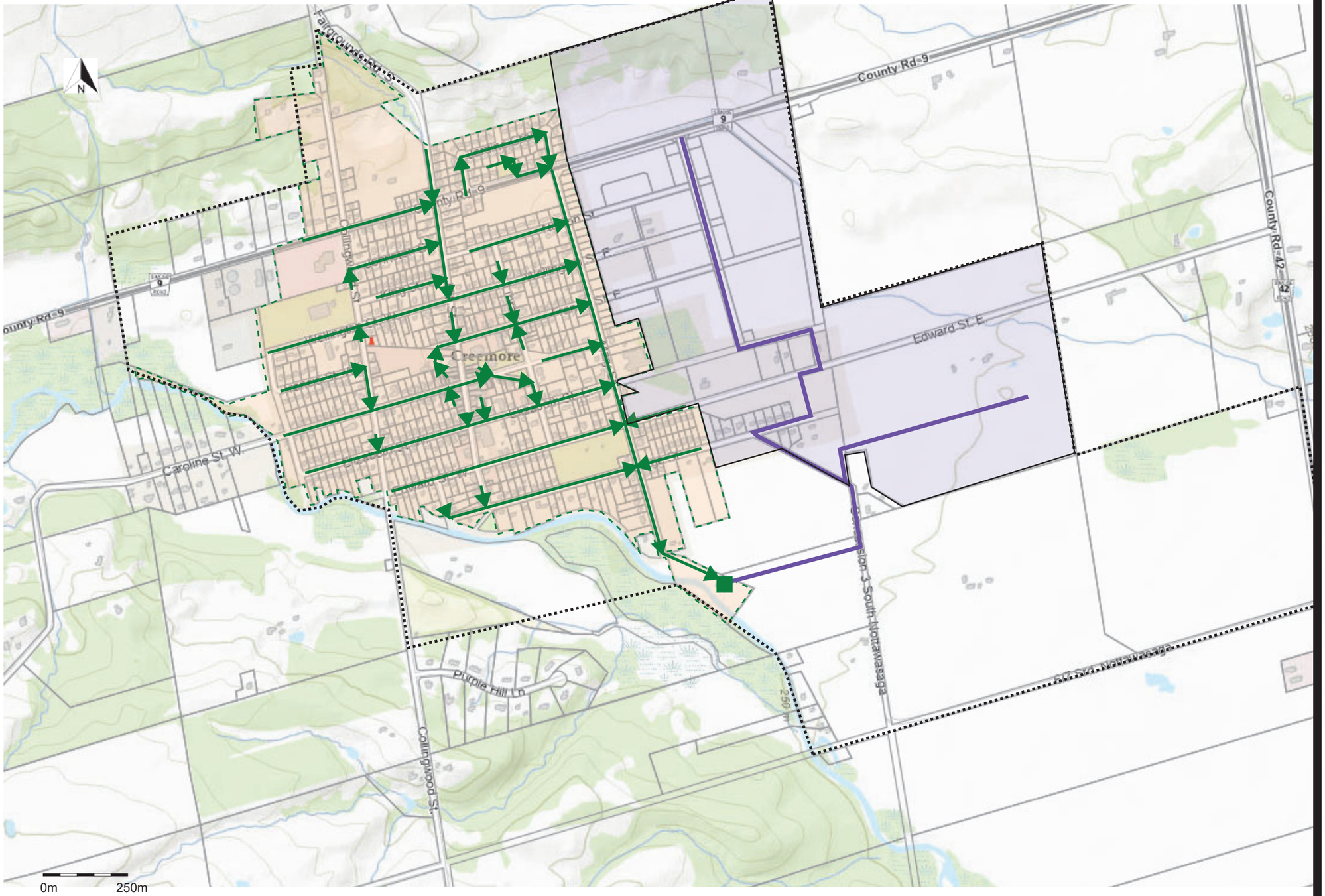
FIGURE 13

WASTEWATER COLLECTION ALTERNATIVE WWC 1



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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WATER AND WASTEWATER
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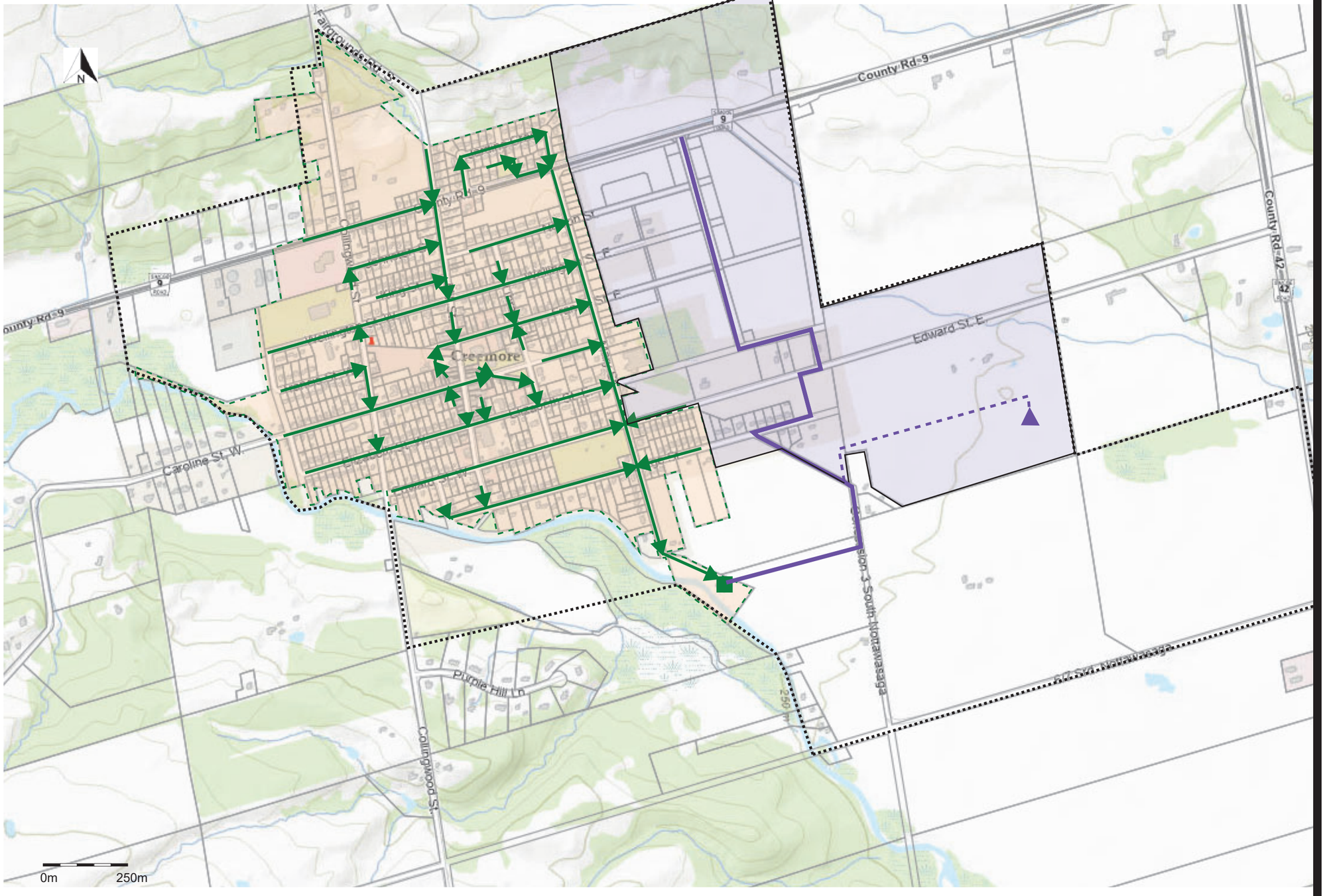
FIGURE 14

WASTEWATER COLLECTION ALTERNATIVE WWC 2



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

BURNSIDE

8.1.2.3 Wastewater Collection Alternative - WWC3

Under this alternative, all lands associated with Creemore North and Creemore East would drain by gravity to a new SPS to be located at the south east end of Development Area CE-2. The sewers and forcemains would be located within the proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements, and on the WWTP property. In this alternative, the proposed forcemain would discharge to a new headworks building at the existing WWTP. The existing SPS could be redirected to the new headworks building. This alternative solution is illustrated in Figure 15.

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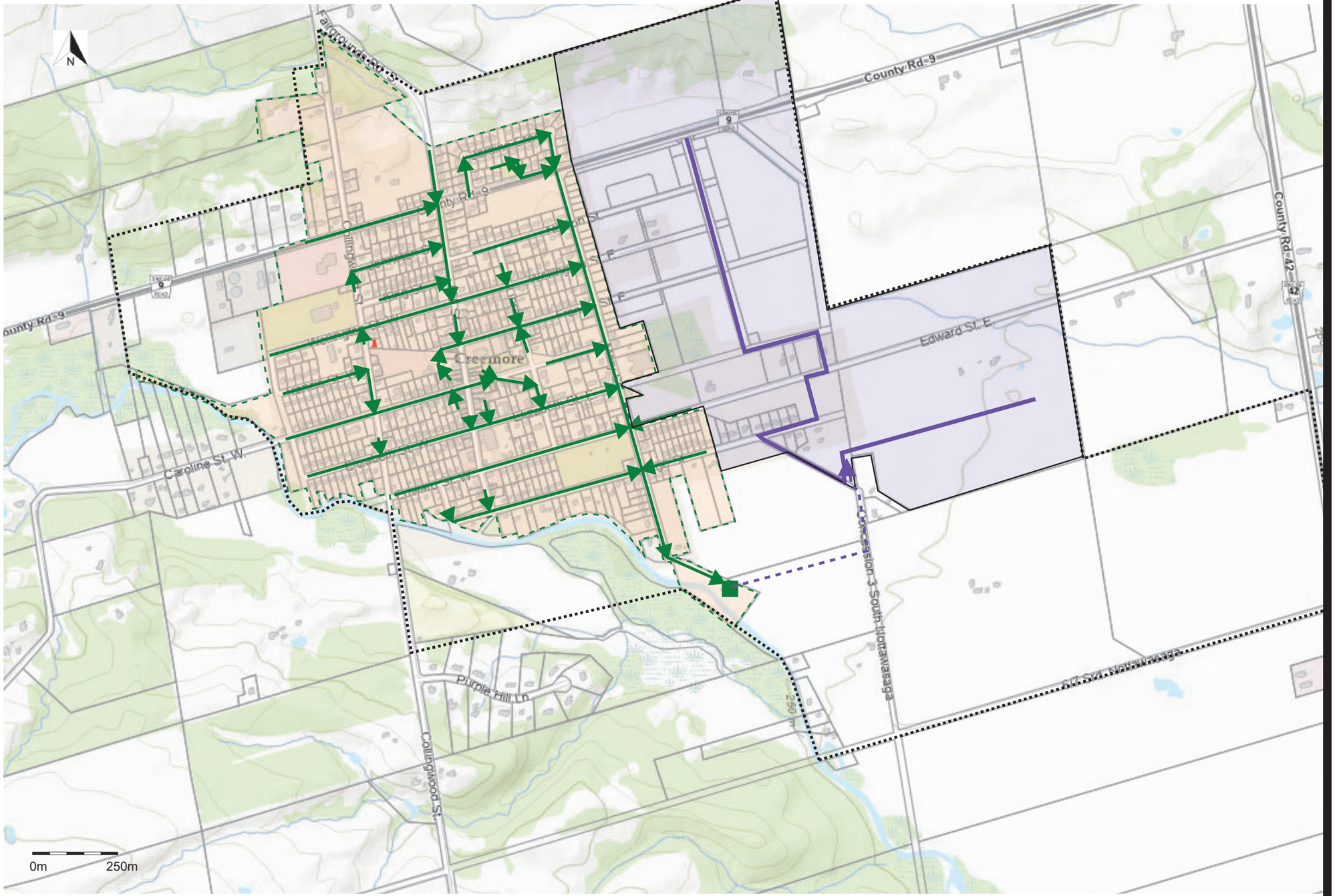
FIGURE 15

WASTEWATER COLLECTION ALTERNATIVE WWC 3



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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8.1.2.4 Wastewater Collection Alternative - WWC4

Under this alternative, all lands associated with Creemore North and Creemore East would drain by gravity to a new SPS located in the southeast corner of Development Area CE-3. The new SPS on Development Area CE-3 would convey wastewater via forcemain to the existing WWTP site. The sewers and forcemains would be located with proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements and on the WWTP property. In this alternative the proposed forcemain would discharge to a new headworks building at the existing WWTP site. The existing SPS could be redirected to the new headworks building. This alternative solution is illustrated in Figure 16.

8.1.2.5 Wastewater Collection Alternative - WWC5

Under this alternative, all lands associated with Creemore North and Creemore East would drain by gravity to a new SPS to be located at the south end of the Development Area CE-2. The new SPS would convey wastewater via forcemain to the existing sewer on Mary Street. The Mary Street sewer, downstream of the point of connection would need to be replaced with a larger diameter sewer. The sewers and forcemains would be located within proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements and on the WWTP property. In this alternative the incoming Mary Street sewer would be redirected to a new headworks building. The existing SPS located in the existing headworks building would be abandoned or repurposed. This alternative solution is illustrated in Figure 17.

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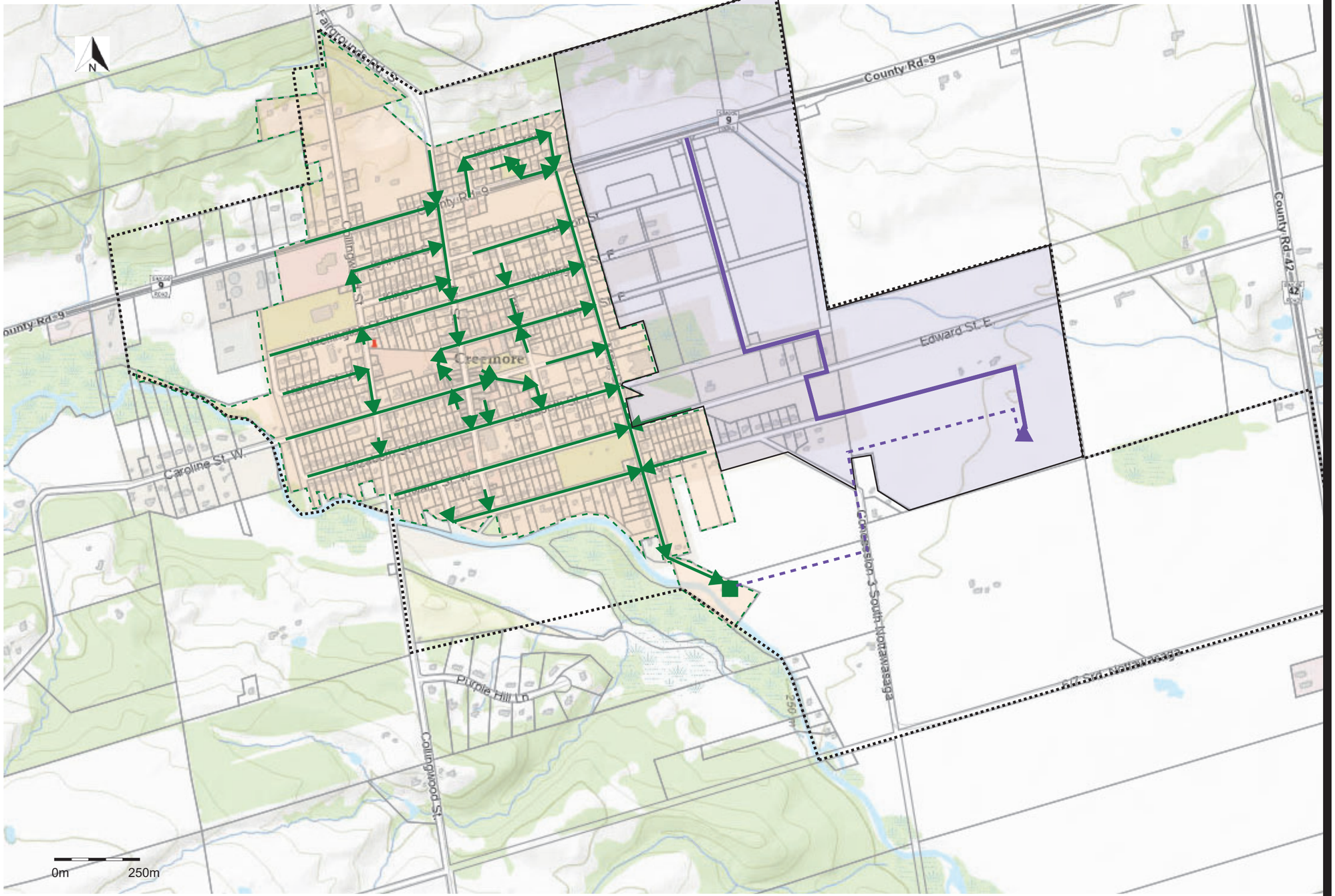
FIGURE 16

WASTEWATER COLLECTION ALTERNATIVE WWC 4



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

BURNSIDE

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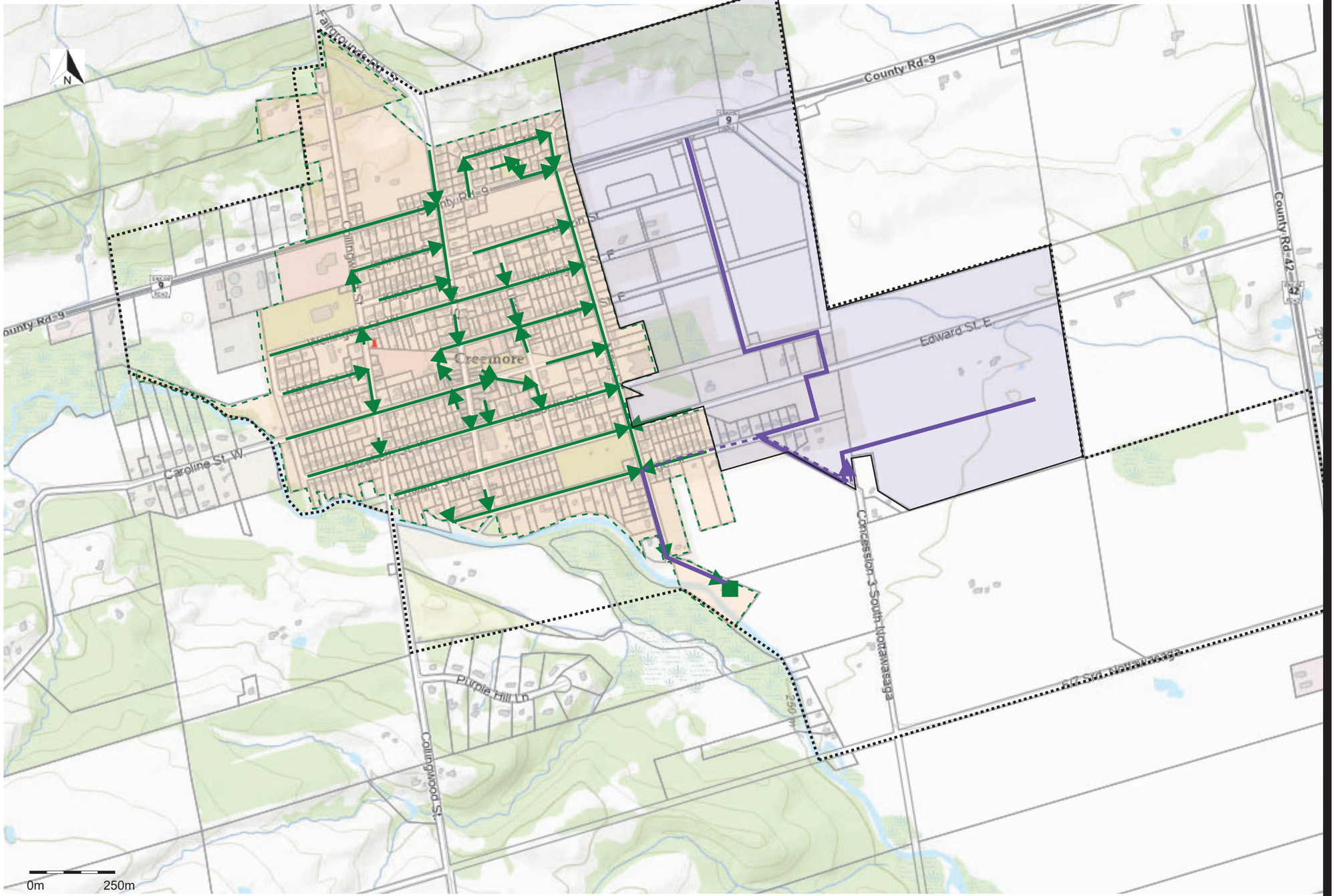
FIGURE 17

WASTEWATER COLLECTION ALTERNATIVE WWC 5



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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8.1.2.6 Wastewater Collection Alternative - WWC6

Under this alternative, all lands associated with Creemore North and Creemore East (except Development Area CE-3) would drain by gravity to a new SPS to be located at the south end of Development Area CE-2. The Development Area CE-3 would drain by gravity to a new SPS located in the southeast corner of the Development Area CE-3. This SPS would convey wastewater to the new pumping station on Development Area CE-2. The new SPS on Development Area CE-2 would convey wastewater via forcemain to the existing WWTP site. The sewers and forcemains would be located within proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements and on the WWTP property. In this alternative, the proposed forcemain would discharge to a new headworks building. The existing SPS could be redirected to the new headworks building. This alternative solution is illustrated in Figure 18.

8.1.2.7 Wastewater Collection Alternative - WWC7

Under this alternative, all lands associated with Creemore North and Creemore East (except Development Area CE-3) would drain by gravity to a new SPS to be located at the south end of the Development Area CE-2. The new SPS on Development Area CE-2 lands would convey wastewater via forcemain to the existing WWTP site. The Development Area CE-3 would drain by gravity to a new SPS located in the southeast corner of the Development Area CE-3 Lands. This pumping station would also, in a separate forcemain, convey wastewater to the existing WWTP site. The sewers and forcemains would be located within proposed rights-of-way within the proposed developments, existing municipal rights-of-way, existing utility easements and on the WWTP property. In this alternative, both proposed forcemains would discharge to a new headworks building at the existing WWTP site. The existing SPS would be redirected to the new headworks building. This alternative solution is illustrated in Figure 19.

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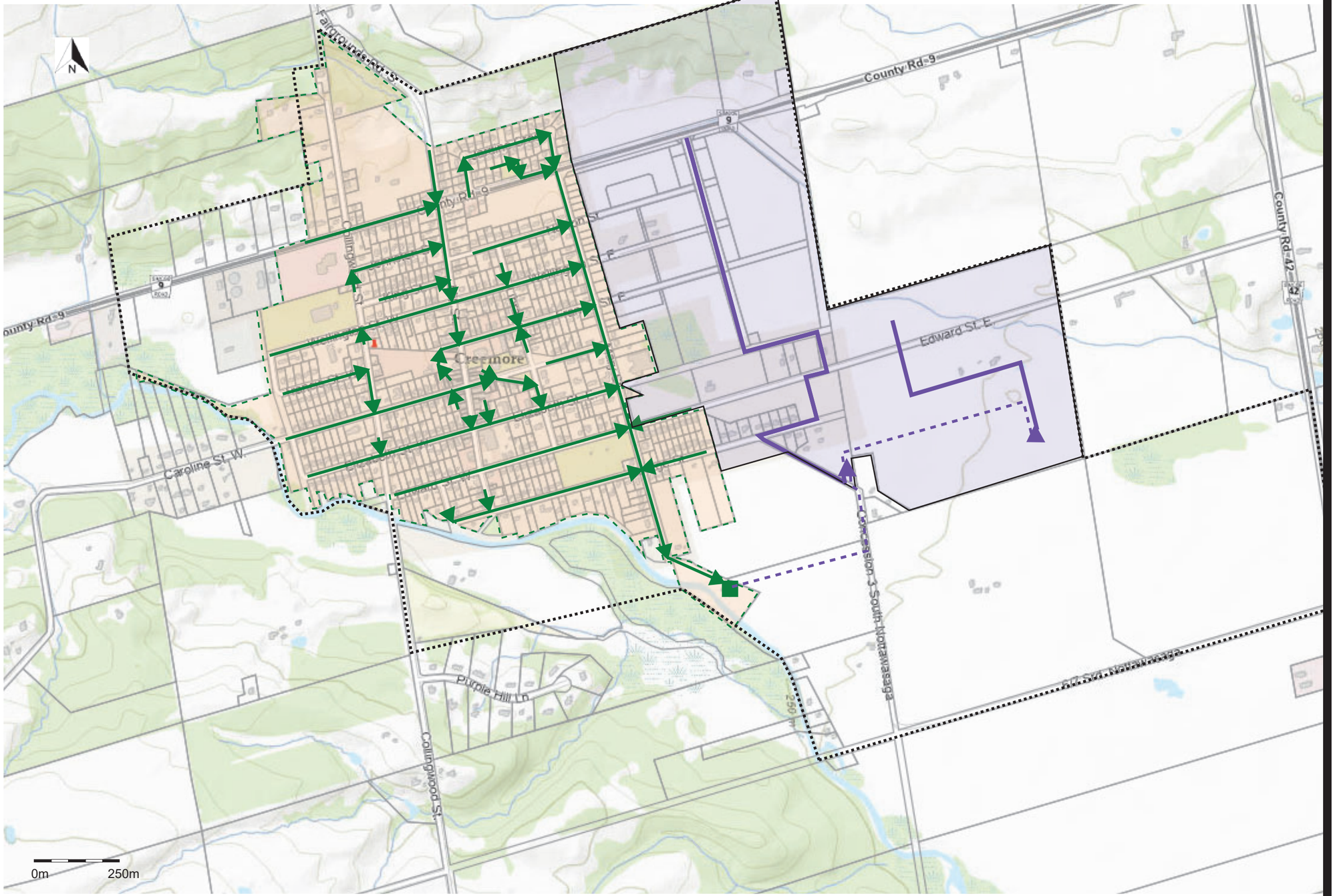
FIGURE 18

WASTEWATER COLLECTION ALTERNATIVE WWC 6



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
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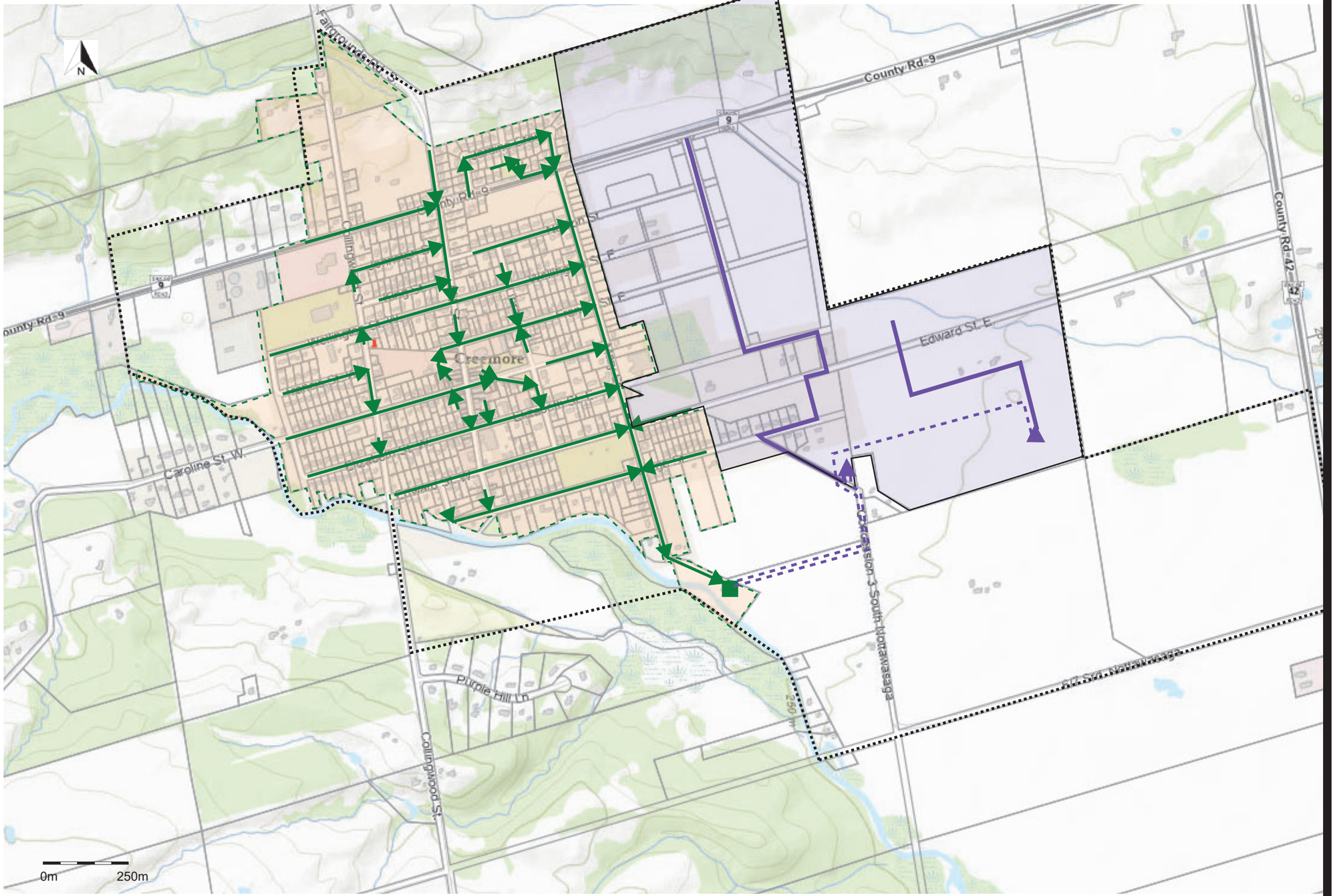
FIGURE 19

WASTEWATER COLLECTION ALTERNATIVE WWC 7



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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8.2 Evaluation Criteria

The evaluation of alternatives is a step-by-step process that compares alternatives that are feasible within the project environment and meet the project objectives outlined in the Problem / Opportunity Statement.

The impacts of the alternatives are evaluated relative to each other, against a set of equally weighted criteria, including possible mitigating measures. The criteria are developed under four major categories: Natural Environment, Socio-Cultural Environment, Financial Environment, and the Technical Environment, following a review of the existing conditions in the study area and identification of key considerations. The typical criteria and indicators for each environment are presented in Table 2. The indicators may vary slightly between evaluation tables.

8.3 Evaluation of Alternative Solutions

8.3.1 Evaluation of Wastewater Treatment Solutions

Section 8.1.1 identifies the long list of alternative solutions to address the projected deficit with regard to wastewater treatment capacity.

The long list of alternative solutions was subject to preliminary screening to confirm which alternatives should be advanced for a more detailed screening.

The Do Nothing alternative solution (Section 8.1.1.1) does not provide the required additional wastewater treatment capacity and was hence screened out and not carried forward for detailed evaluation.

The alternative solution to Reduce Wastewater Flow (Section 8.1.1.2) on its own does not provide the required additional wastewater treatment capacity, as per capita flows are currently relatively low, providing limited opportunity to create additional capacity and the capacity deficit is significant. Hence, this option was screened out and not carried forward for detailed evaluation. This option could be combined with other options.

The detailed evaluation matrix for the alternative solutions for wastewater treatment is included in Appendix B.

Based the evaluation of alternative wastewater treatment solutions the preferred wastewater treatment solution to address the required serving capacity associated with the 2042 forecast is WWT2 - Expansion of the Existing WWTP at the Existing Site.

8.3.2 Evaluation of Wastewater Collection Systems

Section 8.1.2 identifies alternative solutions for wastewater collection.

The detailed evaluation matrix for the alternative solutions for wastewater collection is included in Appendix B.

Based the evaluation of alternative solutions the preferred wastewater collection solution to address the required serving capacity associated with the 2042 forecast is WWC3, which would see the Creemore East and Creemore North service area wastewater conveyed by gravity to a new SPS to be located at the south end of development Area CE-2. The new SPS would convey wastewater to the expanded WWTP by forcemain.

8.3.3 Summary

Based the evaluation of alternative solutions outlined above the preferred solution to address the required serving capacity associated with the 2042 forecast is to expand the existing WWTP at the existing plant site (WWT2) in combination with wastewater collection alternative WWC3. Alternative WWC3 would see the Creemore East and Creemore North service area wastewater conveyed by gravity to a new SPS to be located at the south end of development Area CE-2. The new SPS would convey wastewater to the expanded WWTP by forcemain.

The preferred wastewater servicing solution is presented in Figure 20.

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WATER AND WASTEWATER
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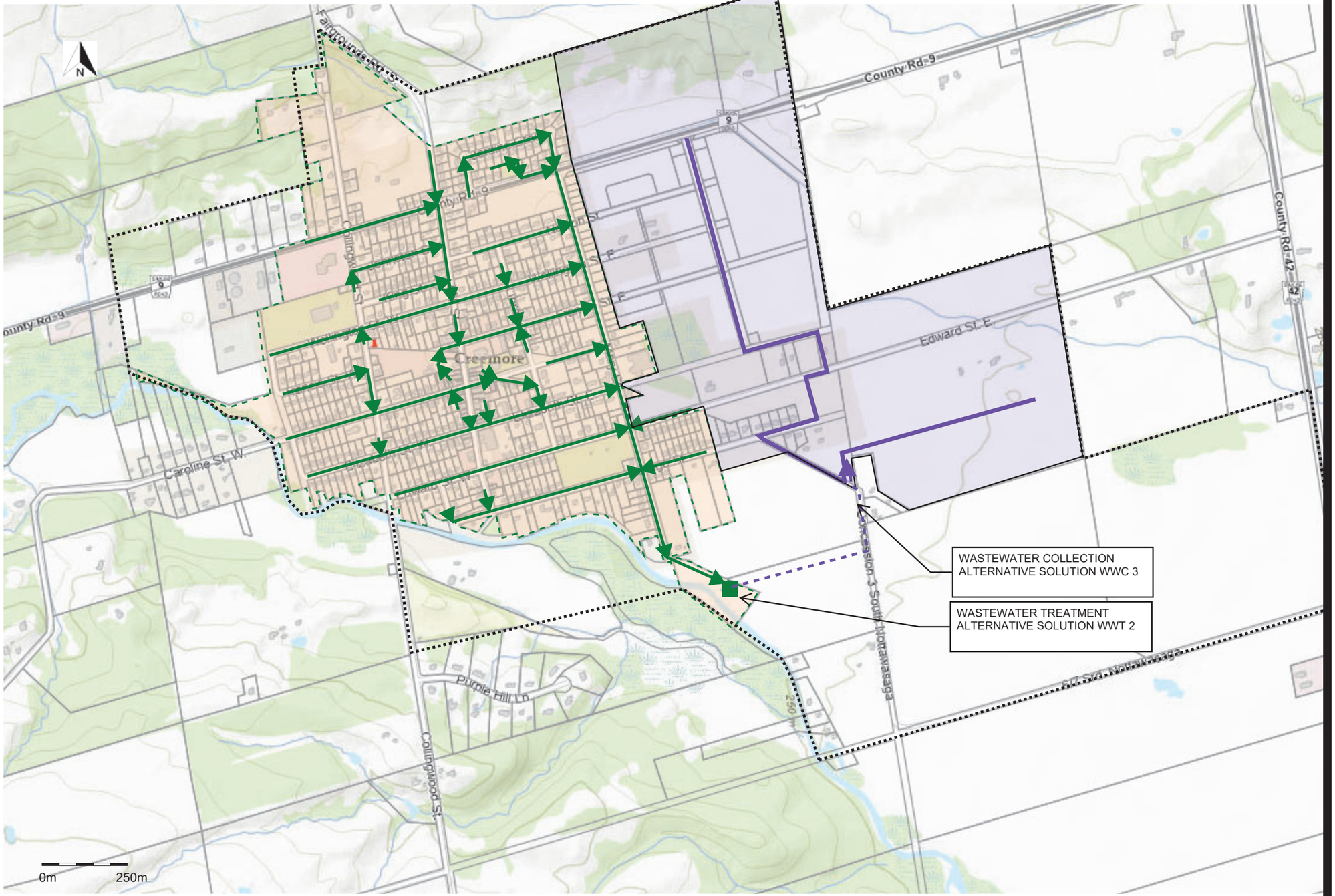
FIGURE 20

PREFERRED WASTEWATER SOLUTION



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

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9.0 Consultation Summary

Consultation is an important part of the MCEA process to ensure that anyone with an interest in the project has an opportunity to provide input into the Township's decision-making process before a project is finalized. Comments received throughout the MCEA process are incorporated into the evaluation of the Alternatives.

The level of consultation under Master Plan Approach 2 must be sufficient to fulfill the requirements of Schedule B projects. Schedule B project requirements include two mandatory public points of contact during the MCEA process. The mandatory points of public contact for this project included a Notice of Commencement and a Notice of Completion. Additional points of contact with the public included two Public Information Centres (PIC) held to obtain input on the project.

A project webpage on the Township's website at https://www.clearview.ca/news-events-meetings/special-projects/creemore-water-and-wastewater-master-servicing-plan was established to provide project information, including project notices, PIC materials and information on how to ask questions or provide comment, including contact information for the project team members..

A Project Contact List was developed as a mailing list to distribute project notices. The Project Contact List consisted of technical and Provincial agencies, utilities, and Indigenous communities that may have an interest in the project, as well as stakeholders within the study area that indicated an interest in the project. Throughout the MCEA process, the Project Contact List was used to maintain contact information for those interested in the project, as well as to summarize comments received about the project and responses from the study team. A copy of the Project Contact List is provided in Appendix C. Copies of correspondence are also provided in Appendix C.

9.1 Project Notices

Project Notices (Notice of Commencement, Notice of PIC1, Notice of PIC2) were published in the Creemore Echo and the Wasaga Sun (moved to online publication only in September 2023), posted on the Township's website and the News section of Clearview.ca, emailed to the latest news subscribers and posted to the Township Twitter account. Project Notices were emailed or mailed to regulatory agencies, municipalities, and Indigenous communities on the Project Contact List. Copies of Notices are provided in Appendix C.

The Notice of Commencement for the project was advertised in the Creemore Echo on September 15, 2022 and September 22, 2022.

Notice of PIC1 was published in the Creemore Echo on November 17, 2022 and November 27, 2022, and in the Sun on November 18, 2022 and November 28, 2022.

The Notice of PIC2 was published in the Creemore Echo on November 24, 2023 and December 1, 2023, and in the Sun on November 23, 2023 and November 30, 2023.

A Notice of Completion will be published in the Creemore Echo and the Stayner / Wasaga Sun (online publication), posted on the Township's website and the News section of Clearview.ca, emailed to the latest news subscribers, posted to the Township Twitter account, and emailed or mailed to those on the Project Contact List. The Notice of Completion will provide members of the public with the dates and locations where the Project File Report can be reviewed as well as names and addresses of people to whom they can send their comments during the 30-day public comment period.

9.2 Indigenous Communities Consultation

The MECP has developed guidance on the steps to rights-based consultation with Indigenous Communities. Indigenous communities with a potential interest in the project were identified through correspondence and direction provided by the MECP (correspondence: Chunmei Liu, Regional Environmental Planner, MECP, dated August 15, 2022). A copy of the correspondence with the MECP is provided in Appendix C.

Individual correspondence with project notices was sent by email / mail to Indigenous communities. Follow-up phone calls were made to Indigenous Communities that may have an interest in the study to confirm receipt of the notices and inquire about their level of interest in the Project and determine if the communities had any concerns or questions about the Project. Additional correspondence was sent by email / mail to Indigenous communities for notification of the coordination for Stage 2 Archaeological Assessment and ask for any comments or interest in participating in the Stage 2 Assessment.

Chippewas of Georgina Island expressed an interest in reviewing the plans completed and Schedule B projects that are proceeding. The Notice of PIC2 including a link to the PIC2 materials identifying the preferred servicing solutions and future studies was provided by email. A copy of the Master Plan study including identified future projects will be provided to Chippewas of Georgina at the conclusion of the study.

Saugeen Ojibway Nation (SON) requested to have their archaeologist attend a site visit during the Stage 2 Archaeological Assessment (AA). Burnside's archaeological sub-consultant, Archeoworks Inc. coordinated a site visit with SON's archaeologist to monitor during the Stage 2 field work. SON Archaeology subsequently reviewed the Stage 2 report and found no concerns.

Huronne Wendat Nation requested to review the Stage 2 Archaeological Assessment report. A copy of the draft Stage 2 AA was provided as requested. Huronne Wendat Nation reviewed the draft Stage 2 AA and found it satisfactory, with no further

investigation requested. The Huronne Wendat Nation requested to be kept informed of any chance find and any future archaeological work within areas of interest to the Nation. All project changes or other development in the area will require a new consultation with the Huronne Wendat Nation.

A summary of communications and comments received from Indigenous communities throughout the project is provided in the Project Contact List in Appendix C and summarized below in Table 8.

Table 8: Indigenous Communities Consultation

Community	Notices Sent	Comments Received	Correspondence Sent
Beausoleil First Nation	231124_Email. PIC2 231024_Email. Stage 2 AA. 221117_Email. PIC1 220915_Email. NOCm	231031_Call. follow up call with Lua Mandor, confirmed receipt of the stage 2 AA notice and indicated she would respond to the email detailing the level of interest in the study.	231124_Email. Burnside sent email with Notice of PIC2 231103_Email. from Burnside updated information stage 2 AA now scheduled for mid-November, please respond with level of interest. 231027_Call. follow up call to confirm receipt of Notice Stage 2 AA. no answer - left voicemail with contact info, will call back 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_Call. Follow up call made on the Notice of PIC1 (30 Nov), voice msg left. 221018_Call. Burnside left message for J. Sandy to confirm receipt of NOCm, and left email address to reply whether NOCm had been received. 220915_Email. NOCm
Chippewas of Mnjikaning First Nation (Rama)	231124_Email. PIC2 231024_Email. Stage 2 AA. 221117_Email. PIC1 220915_Email. NOCm	231031_Email response from Ben Benson, no comments or concerns to provide to this MSA 221219_Email. Samantha Craig-Curnow sent email noting that the community is in a transitional period, and that Sharday James is no longer the Community Consultation Worker and requested to direct any future correspondence to consultation@ramafirstnation.ca; and to remove shardayj@ramafirstnation.ca.	231124_Email. Burnside sent email with Notice of PIC2 231031_Call. follow up call with Ben Benson, confirmed receipt of the stage 2 AA notice and indicated he would respond to the email detailing the level of interest in the study. 231027_ Call. follow up call to confirm receipt of Notice Stage 2 AA. no answer - left voicemail with contact info, will call back 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_ Call. Follow up call made on the Notice of PIC1 (30 Nov), voice msg left. 221117_Email. Burnside sent Notice of PIC1. 221018_Call. Burnside left message for S. James to confirm receipt of NOCm, and left email address to reply whether NOCm had been received. 220915_Email. NOCm

Community	Notices Sent	Comments Received	Correspondence Sent
Chippewas of Georgina Island	231124_Email. PIC2 231024_Email. Stage 2 AA. 221117_Email. PIC1 220915_Mail. Hard copy NOCm	231031_Email. response from J.L. Porte Thanks for reaching out regarding this project. asked if all 7 Williams Treaty First Nation's have been contacted. Requested the link with the included plans completed and schedule B projects that are proceeding.	231124_Email. Burnside sent email with Notice of PIC2 231107_Email. Burnside sent email response: the following WTFN have been contacted:Chippewas of Beausoleil First Nation, Chippewas of Mnjikaning First Nation (Rama), Chippewas of Georgina Island First NationIn addition, Saugeen Ojibway Nation (SON) and the Nation Huronne-Wendat have been notified. Chippewas of Mnjikaning have responded that they have no comments or concerns to provide for the project. Burnside also received email response from Beausoleil. Burnside has not received email response from Huronne-Wendat. SON's archaeologist will be making a site visit during the Stage 2 work. Currently preparing for a PIC (Dec 7) a link to materials will be provided. Also preparing stage 2 AA, location of area to be assessed was provided, inquired level of interest and/or if CGIFN would like to review the Stage 2 AA report. 231031_Call. follow up call to confirm receipt of Notice Stage 2 AA, no answer, voicemail available, left message. 231027_Call. follow up call to confirm receipt of Notice Stage 2 AA. no answer - no voicemail available, will call back. 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_ Call. Follow up call made on the Notice of PIC1 (30 Nov), The operator noted that Natash is on Mat leave. Connected to JL Port (extension 4226) 221117_Email. Burnside sent Notice of PIC1 221018_Call. Burnside left message for N. Charles to confirm receipt of NOCm, and left email address to reply whether NOCm had been received. 220915_mail. NOCm
Williams Treaty First Nation Coordinator	231124_Email. PIC2 231024_Email. Stage 2 AA. 221117_Email. PIC1		231124_Email. Burnside sent email with Notice of PIC2 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_Follow up call made on the Notice of PIC1, The phone number does not work 221117_Email. Burnside sent Notice of PIC1
Saugeen Ojibway Nation (Environment Office)	231124_Email. PIC2231024_Email. Stage 2 AA.221117_Email. PIC1220915_Email. NOCm	231102_Email. Natalie Kuipers responded Emily Martin is no longer working with the SON Environment Office. Natalie is currently coordinating the archaeology within the R&I department with the R&I manager being Charlene Leonard. Indicated archaeologist Dr Rob Martin, would like to make a site visit and will liaise with Archeoworks to organize. Included the cost for the site visit. 221117_Email. Lester Anoquot responded that the NoPIC #1 will be forwarded to Council.	231124_Email. Burnside sent email with Notice of PIC2. 231115_Email. Archeoworks confirmed successful coordination with SONs archaeologist for participation in Stage 2 AA 231031_follow up call to confirm receipt of Notice Stage 2 AA. no answer, left voicemail with contact info. 231027_Follow up call to confirm receipt of Notice Stage 2 AA. no answer - left voicemail with contact info, will call back 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_Call. Follow up call made on the Notice of PIC1, left a voice msg for the Chief office ext. 1103. 221117_Email. Burnside sent Notice of PIC1 221018_Call. Burnside left message for L. Anoquot to confirm receipt of NOCm, and left email address to reply whether NOCm had been received. 220915_Email. NOCm

Community	Notices Sent	Comments Received	Correspondence Sent
Nation Huronne-Wendat	231124_Email. PIC2 231103_Email. Stage 2 AA 231024_Email. Stage 2 AA. 221130_Email. PIC1 221117_Email. PIC1 220915_Email. NOCm	240515_Email. Marie-Sophie Gendron provided comments on Stage 2 AA draft review, regarding this consultation the Huronne-Wendat Nation will ask no further investigation, Huronne-Wendat reviewed the Stage 2 AA report and found it satisfactory. All project changes or other development in the area will require a new consultation towards the Huronne-Wendat Nation. Please note the Huronne-Wendat Nation requests to be kept informed of any chance find and any future archaeological work within areas of interest to the Nation. 240508_Email. Marie-Sophie Gendron responded waiting on approval to send comments, should be able to send by Friday May 10 or beginning of the next week. Will send invoice with the letter. 240418_Email. Marie-Sophie Gendron responded to draft Stage 2 AA email: acknowledged receipt of draft, will be in touch soon. 231124_Email. Marie-Sophie Gendron responded to Stage 2 AA email chain with apologies for late response, understood the fieldwork was completed earlier this month. Would like to participate in this project by reviewing the report of the Stage 2 AA. Attached to email is a quote for participation on this project. Asked when the report was expected to be ready. Indicated they would ask a 30 day time period to review the report and asked if that would fit with the expected timeline. 221130_Email. Burnside noted as per phone conversation this morning, please find attached the NoPIC #1. It was noted that the notice was sent to the community initially on 17 November, 2022, and the phone call was to follow up to ensure the community had received the notice. 221117_Email. Email to adminstration@cnhw.qu.ca failed.	240507_Email. Burnside sent follow up email to stage 2 AA draft circulation, inquired if Huronne-Wendat could provide comments following review. Burnside requested invoice for quote previously received. 240326_Email. Burnside provided a copy of the draft Stage 2 AA for review with a request for comments by April 25, 2024. 231124_Email. Burnside sent email with Notice of PIC2 231110_Email. Burnside sent email chain of Stage 2 AA info to MSG as per autoresponse info from DL. 231109_Email. Burnside sent follow up email to DL, received autoresponse: on vacation from November 8 to November 17 any request that cannot wait contact Marie-Sophie Gendron at Marie-Sophie.gendron@wendake.ca 231103_Email. Burnside sent notice stage 2 AA email to DL 231103_Call. follow up call to Dominique Lesage, had not received notice stage 2 AA from consultations, broken call but understood that if it was emailed they would respond with level of interest through email. 231031_Call. no answer, left voicemail with contact info. 231027_Call. follow up call no answer - left voicemail with contact info, will call back Monday Oct 30 231024_Email. Burnside sent email with Notice of Stage 2 AA. 221130_Call. Burnside spoke with Tina Durand to ensure receipt of the NoPIC #1. Tina Durand noted the new email as Tina.Durand@Wendake.ca. Burnside noted that staff would sent NoPIC #1 to revised email, and Tina Durand responded that she would be passing the notice to others. 221117_Email. Burnside sent Notice of PIC1 221018_Call. Burnside left message for Grand Chief Remy Vincent to confirm receipt of NOCm, and left email address to reply whether NOCm had been received. 220915_Email. NOCm

9.3 Public Information Centres

The Study conducted two in-person Public Information Centres (PIC's) to allow opportunity for the public to provide input into the planning and design of the Project.

Details for each of the PIC's are provided below. Copies of the PIC Summary Reports are provided in Appendix C.

9.3.1 PIC 1

PIC1 was held at the Creemore Community Centre on December 1, 2022, as an in-person drop-in style format with project information displayed around the room. Members of the project team were present to discuss the project with interested members of the public and answer questions. Attendees were greeted upon arrival, encouraged to sign in, and made aware of the opportunity to provide comments using a printed comment form available at PIC 1, a digital comment form available on the Township's webpage, or by contacting the Project Team with written comments.

Presentation material provided background information on the existing environment of the Study Area, an overview of the Master Plan process, preliminary alternative solutions, requested input on the alternative solutions, and identified next steps.

Following the PIC 1, project information materials were posted to the Town's webpage for the project for the public to view or download anytime during the PIC 1 comment period until January 13, 2023.

A total of ten people attended the PIC 1. Written comments were received from five members of the public, including two comment sheets and three emails during the comment period for PIC 1.

Comments within the written comments included the following themes:

- The capital costs associated with the proposed alternatives.
- The anticipated population growth of the surrounding potential development that the servicing is intended to be sized for.
- Public and Indigenous Communities Consultation.
- Preservation of Creemore's unique sense of identity.
- Concerns with the spreading of bio-sludge and solids.
- High ground water table and its potential impact on the alternative solutions.

Details of PIC 1 and a copy of the comments received are available in the PIC 1 Summary Report available in Appendix C.

9.3.2 PIC 2

PIC 2 was held at the Creemore Community Centre on December 7, 2023, as an in-person, drop-in style format with project information displayed around the room and representatives from the study team present to answer questions and discuss the project with interested members of the public. Attendees were greeted upon arrival, encouraged to sign in, and made aware of the opportunity to provide comments using a printed comment form available at the PIC, a digital comment form available on the Township's webpage, or by contacting the Project Team with written comments.

Presentation material described the project, the proposed alternative solutions, and identified next steps in the process.

Following PIC 2, project information materials were posted to the Town's webpage for the project for the public to view or download anytime during the PIC comment period until January 22, 2024.

A total of 15 people attended PIC 2, excluding the members of the project team and Township council representatives. Written comments were received from two members of the public at PIC 2. Comments from one member of the public were received through the online comment form during the comment period following PIC 2.

Comments within the written comments included the following themes:

- Drinking water system alternatives and quantity of water needed.
- Projected population.

Details of PIC 2 and a copy of the comments received are available in the PIC 2 Summary Report available in Appendix C.

10.0 Preferred Solutions

The MSP has identified the need for additional water and wastewater infrastructure to provide the required capacity to address the forecasted water demands and wastewater flows associated with the 20-year planning horizon (2042) and identify the preferred solution in terms of the various components required.

10.1 Water Projects

Based on the evaluation of alternative water solutions and input received from the public, the preferred water solution to address the required serving capacity associated with the 2042 forecast includes construction of additional ground water supply (WS2), additional water storage (WST1), and additional watermains.

The well under development in Area CE-1 is expected to provide 10 L/s. This would increase the firm capacity of the water system to 25 L/s which is not adequate to address the forecasted total water demand of 40.1 L/s for 2042. Additional hydrogeological investigations will be required to locate additional groundwater sources. Once suitable sources are located, an additional study would be required to address MCEA requirements.

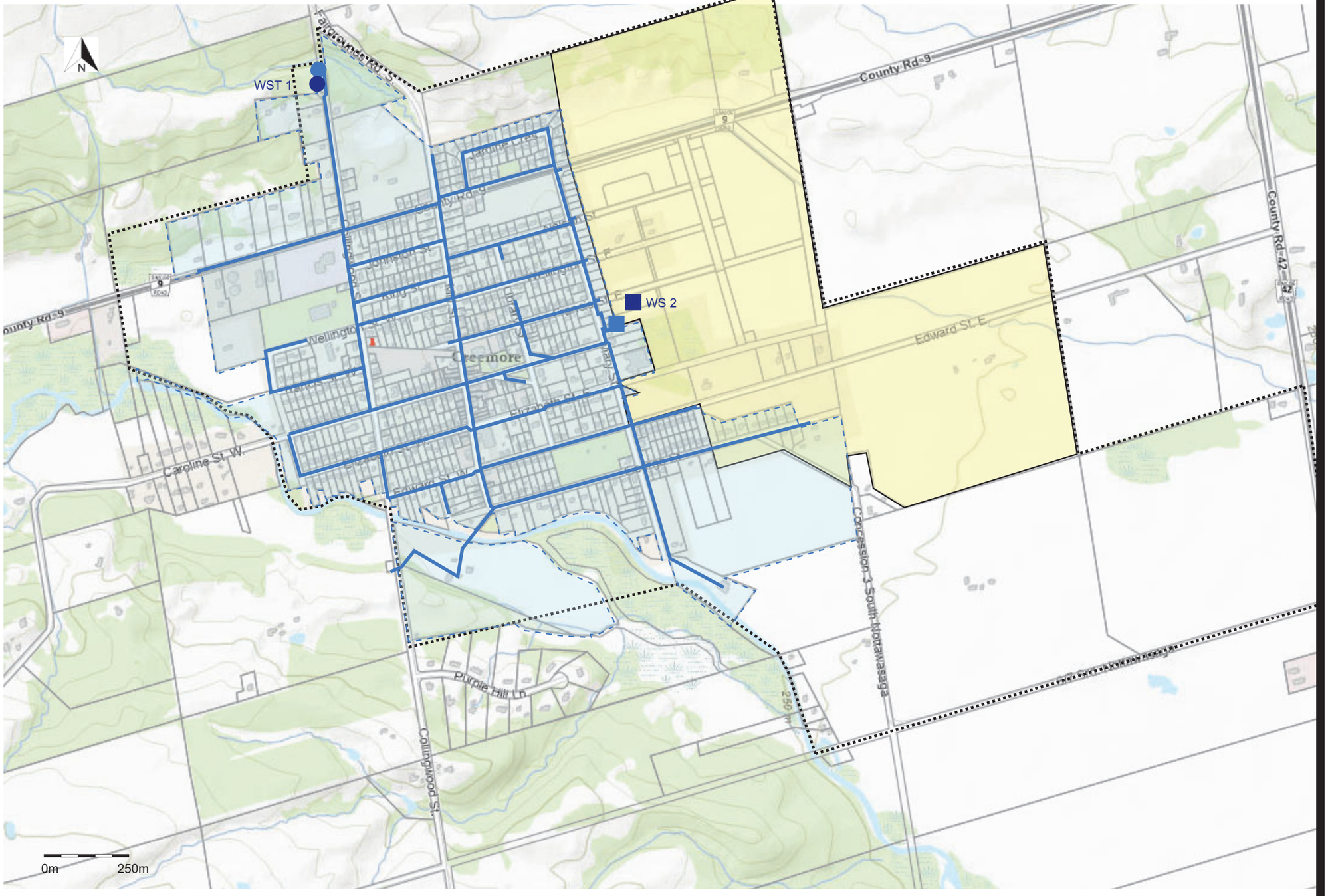
The study has concluded that the preferred method of providing the additional water storage to address the needs identified in the 2042 forecast includes the construction of additional grade-level storage at the site of the existing grade-level reservoir.

The preferred water servicing solution is presented in Figure 21.

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE 21

PREFERRED WATER SOLUTION



LEGEND

- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area

BURNSIDE

The specific water projects associated with the preferred solution are summarized in Table 9.

Table 9: Water Projects

Project No.	Description	MCEA Schedule [1]	Future MCEA Study
WST1	Grade Level Water Storage 1,570 m^3	A	No
WS2-A	Additional Well and Pumphouse 10 L/s	B	No
WS2-B	New Additional Well(s) and Pumphouse(s)	B	Yes
W1	300 mm dia Watermain on Edward Street from Mill Street East Limit of Edward Street at Area CE-3.	A	No
W2	200 mm dia Watermain on George Street from Mary Street to East limit of George Street	A	No
W3	200 mm dia Watermain on Concession 3 from George Street to SPS Block	A	No
W4	200 mm dia Watermain on Street A from George Street to Edward Street.	A	No
W5	200 mm dia Watermain on Elizabeth Street and Easements	A	No
W6	300 mm dia Watermain on Edward Street from East Limit of Area CE-2 to West Limit of CE-3	A	No
W7	200 mm dia watermain on County Road 9	A	No

1) In accordance with the Municipal Engineers Association Municipal Class Environmental Assessment Manual (October 2000, as amended 2007, 2011 & 2015)

The MSP has identified WS2 - Additional Groundwater as the preferred solution for additional groundwater supply. The MCEA requirements associated with WS2-A have been addressed as part of the Master Plan, under Approach 2, which meets the requirements for Schedule B type projects. With exception, the location of additional groundwater supply (WS2-B) that is required to fully implement WS2 has not yet been identified and will require additional MCEA study to address the MCEA requirements associated with establishing that supply.

The required watermains described in Table 9 are illustrated in Figure 22.

10.1.1 Additional Watermain Improvements

As identified in Section 5.1.3, there are a significant number of watermains in the existing system that have a nominal diameter of less than 150 mm. The MECP generally recommends that watermain diameters be 150 mm or greater. It is recommended that these mains be increased in diameter to 150 mm or greater when replacement is

required based on condition and / or future growth and development needs are to be accommodated.

In addition, there are a number of dead-end mains which could be looped to provide improved water circulation.

10.2 Wastewater Projects

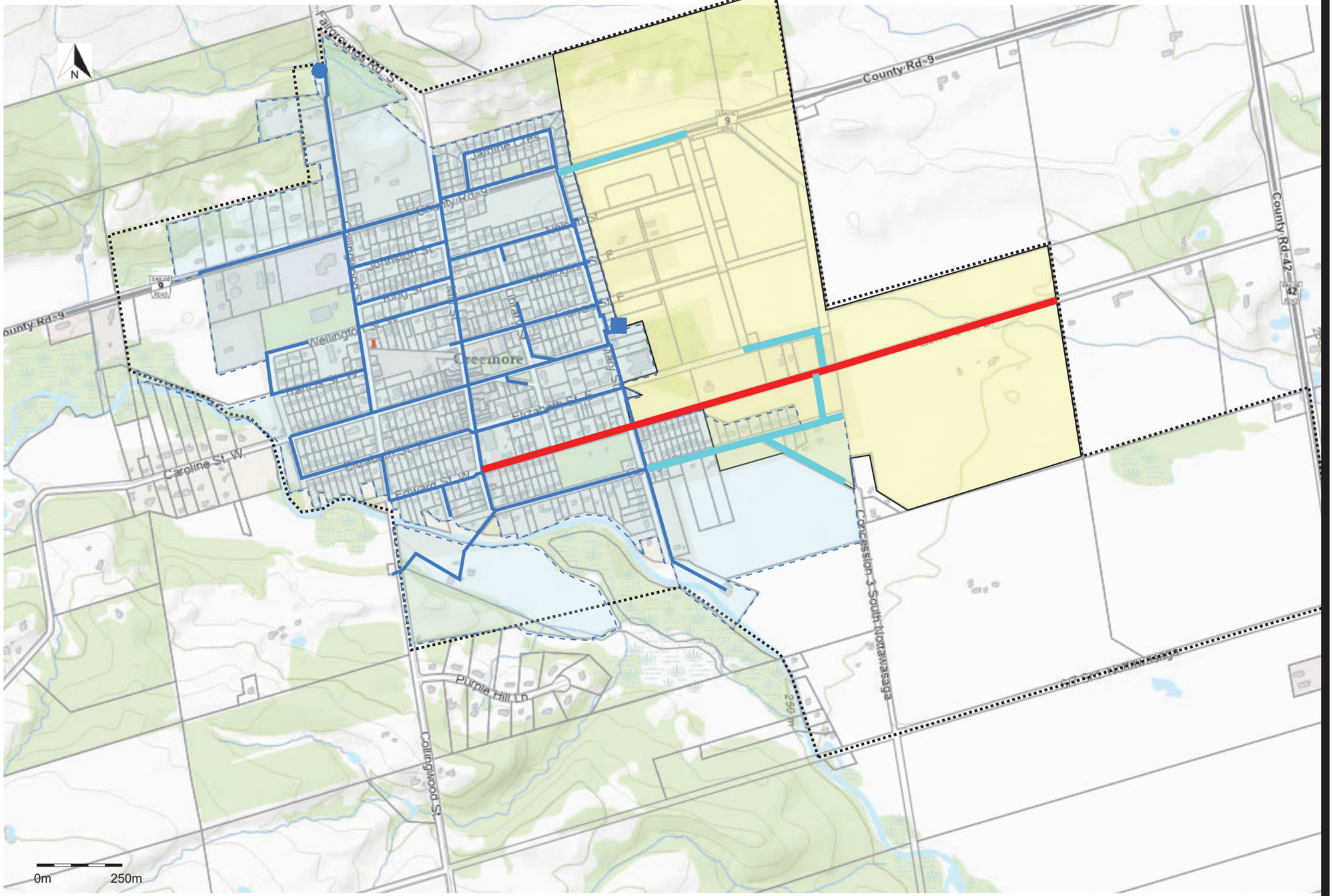
Based on the evaluation of alternative solutions and input received from the public, the preferred wastewater solution to address the required serving capacity associated with the 2042 forecast is to expand the existing WWTP at the existing plant site (WWT2) in combination with wastewater collection alternative WWC3. Alternative WWC3 would see the Creemore East and Creemore North service area conveyed by gravity to a new SPS to be located at the south end of development Area CE-2. The new SPS would convey wastewater to the upgraded WWTP site by forcemain.

The preferred wastewater servicing solution is presented in Figure 23.

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE 22

WATER DISTRIBUTION SYSTEM UPGRADES



LEGEND

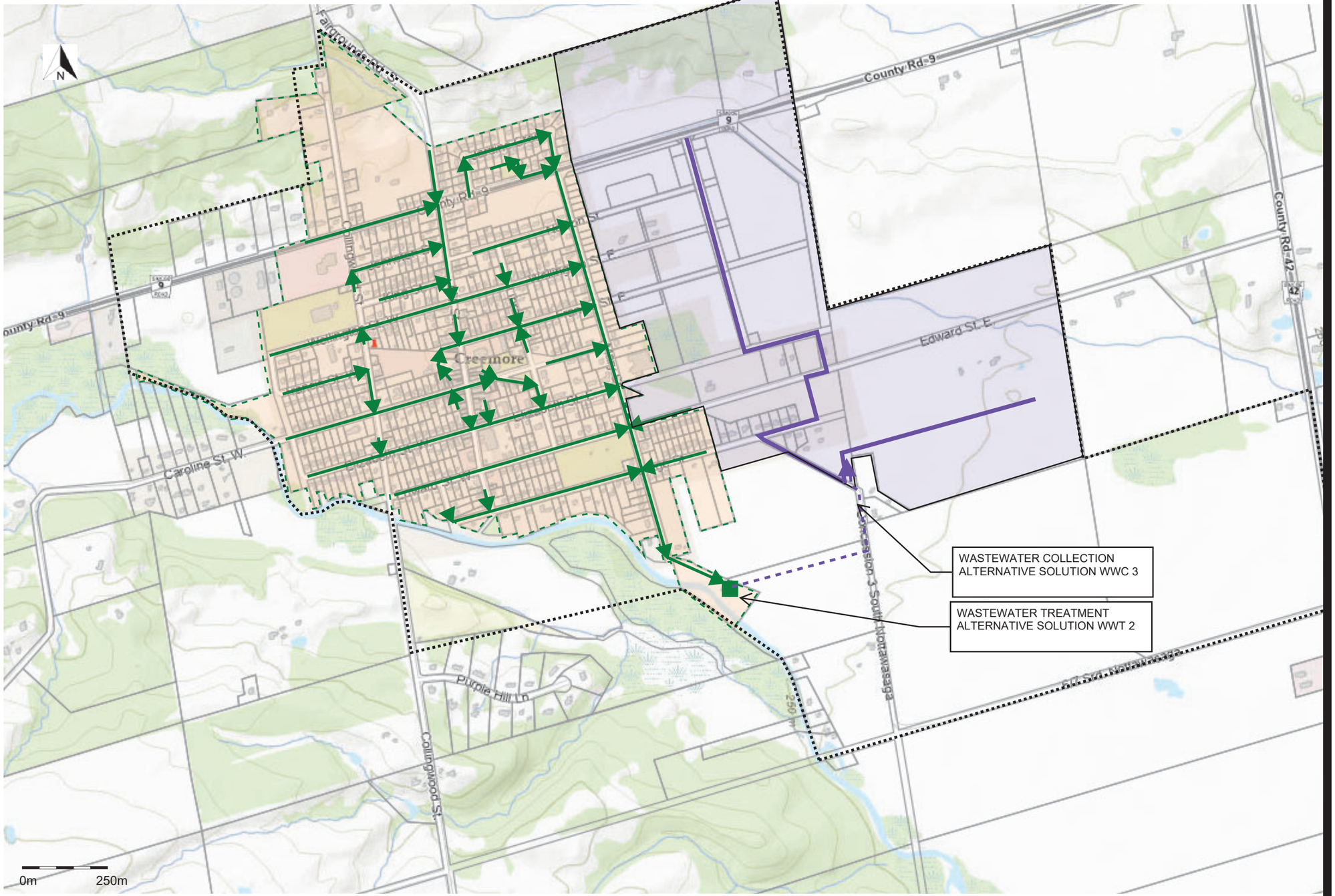
- Existing Watermain
- Existing Well Supply
- Existing Water Storage
- Existing Water Service Area
- Master Servicing Plan Study Area
- Proposed Watermain
- Proposed Water Supply
- Proposed Water Storage
- Proposed Water Service Area
- Proposed 200 mm Watermain
- Proposed 300 mm Watermain

BURNSIDE

TOWNSHIP OF CLEARVIEW
WATER AND WASTEWATER
MASTER SERVIVING PLAN

FIGURE 23

PREFERRED WASTEWATER SOLUTION



LEGEND

- Existing Sanitary Sewer
- Existing Wastewater Treatment Plant
- Existing Sanitary Drainage Area
- Master Servicing Plan Study Area
- Proposed Sanitary Sewer
- Proposed Sanitary Forcemain
- Proposed Sanitary Pumping Station
- Proposed Sanitary Drainage Area

BURNSIDE

The MSP has identified alternative solution WWT2, expansion of the existing WTTP at the existing site to a rating of 2,100 m^3/d as the preferred solution to provide the required wastewater treatment capacity. An expansion beyond the exiting rated capacity is a Schedule C activity and as such, additional MCEA study is required to upgrade the facility to 2,100 m^3/d.

Subject to available funding, there are opportunities to phase the implementation of the preferred wastewater solution in order to accelerate the timeline for making some of the additional capacity available. It is anticipated that expansion would be undertaken in two steps. First project WWT2A which consists of upgrades to the existing facility would be undertaken such that it can perform at its existing rated capacity of 1,400 m^3/d.

An expansion beyond the exiting rated capacity is a Schedule C activity and as such additional MCEA study is required to identify the preferred design for the second step which includes project WWT-B expanding the facility from 1,400 m^3/d to 2,100 m^3/d.

The wastewater projects associated with the preferred wastewater solutions are summarized in Table 10.

Table 10: Wastewater Projects

Project No.	Description	MCEA Schedule [1]	Future MCEA Study
WWT2-A	Upgrade existing WWTP to 1400 m^3/d ADF	B	No
WWT2-B	Upgrade existing WWTP to 2100 m^3/d ADF at Existing Location	C	Yes
WWC3-A	Sanitary Sewer from County Road 9 to Edward Street	A	No
WWC3-B	Sanitary Sewer from Edward Street to SPS	A	No
WWC3-C	Sanitary Sewer from Area CE-3 to SPS	A	No
WWC3-D	Sanitary Sewage Pumping Station in Area CE-2	B	No
WWC3-E	Sanitary Forcemain from SPS to WWTP	A	No

1) In accordance with the Municipal Engineers Association Municipal Class Environmental Assessment Manual (October 2000, as amended 2007, 2011 & 2015)

11.0 Environmental Effects and Mitigation

The potential environmental effects associated with the proposed improvements within the Study Area and proposed measures to mitigate negative effects on the project environment have been identified and are summarized in Table 11.

Mitigation measures are intended to inform the future Detailed Design and be included in the mitigation and monitoring measures developed during the Detailed Design and reporting process. These mitigation measures will be enforced during construction within the Special Provisions section of the Tender Documents, as applicable.

All Design and Construction Reports and Plans are expected to be based on a best management approach that is focused on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of the impacted areas.

Table 11: Mitigating Measures

Environment	Potential Effects	Proposed Mitigation Measures and Future Commitments
Trees and Vegetation	Loss of trees and vegetation. Trees adjacent to the ROW may be subject to impacts within the rootzone from grading and other construction activities. Identified vegetation communities in the study area are considered to be relatively common in Ontario. Impact to sensitive vegetation communities or significant plant species is not anticipated.	• Minimize disturbance to existing vegetation. Adjust grading prior to construction to reduce impacts to trees by increasing the steepness of slopes in isolated locations, where feasible. • Disturbed areas shall be stabilized and re-vegetated with an appropriate seed mix upon project completion and restored to a pre disturbed state where practical. An appropriate seed mix will be selected based on consultation with the appropriate reviewing agency (NVCA). • Erosion and Sediment Control (ESC) measures shall be developed during the detailed design phase of the project and installed prior to commencement of grading or vegetation disturbance. • Protection measures (e.g., tree protection, erosion and sediment control) are recommended where construction is proposed to protect trees from grading impacts and when adjacent construction is occurring to prevent access, stockpile and storage within adjacent vegetation communities including wetlands. • A certified arborist should carry out or oversee the mitigation of any impacts to trees, including proper pruning techniques (crown or root) throughout the construction period and before contractor demobilization. • An Environmental Inspector shall be engaged during the construction phase to review ESC measures that will also act as tree protection measures for deficiencies. The Environmental Inspector will identify all deficiencies and ensure the Contractor will address the deficiencies.
Wildlife and Wildlife Habitat and Species at Risk	Temporary displacement of and disturbance to wildlife and wildlife habitat, including Species at Risk bats and birds during the construction phase (e.g., vegetation removals, noise disturbance). Potential for disturbance or destruction of migratory breeding birds, their nests, and their habitat during the construction phase (e.g., vegetation removals, noise disturbance). Impact to potential habitat of Eastern Meadowlark is not anticipated as proposed works are to be completed outside of appropriate habitat in the southwest of the study area.	• The footprint of proposed disturbed areas shall be minimized as much as possible. • Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between wintering and summer habitats). • To reduce the risk of potential impact to wildlife, including SAR, vegetation clearing should not be completed between April 1 to October 31 to avoid the active period for the following: – Breeding birds – Broadly from April 1 to August 31 for most species (regardless of the calendar year). Active nests (nests with eggs or young birds) of protected migratory birds cannot be destroyed at any time of the year. – Bat species – Considered to be between April 1 to October 31, of any calendar year. • Eastern Meadowlark habitat (MEM) in the southwest of study area is to be avoided. If habitat is removed, registration of the activity with the MNRF is required. • Temporary silt fence barriers are recommended to exclude wildlife (i.e., amphibians and reptiles) from the earthworks and construction activities in areas adjacent to low-lying areas and watercourses. Temporary exclusion fencing shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning. The excluded area shall be searched immediately following fencing installation for any wildlife that may have become trapped. Any wildlife shall be permitted to escape, to a suitable habitat. • If a nesting migratory bird or SAR protected under ESA is identified within or adjacent to the construction site and the activities are such that continuing works in that area would result in a contravention of the MBCA or ESA, all activities shall stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures / with the Township. • Should SAR be identified, all activities shall stop and MECP, responsible for administering SAR under the ESA, shall be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the Region, the MECP and / or Environment Canada. • An Environmental Inspector shall be engaged during the construction phase to review ESC measures that protect adjacent natural features and prevent certain wildlife such as reptiles and amphibians from entering the work zone. The Environmental Inspector will identify all deficiencies and ensure the Contractor will address the deficiencies.

Environment	Potential Effects	Proposed Mitigation Measures and Future Commitments
Fish and Fish Habitat	Potential to impact fish and fish habitat through sediment mobilization during construction.	• A request for project review should be submitted to the DFO if in-water works are anticipated. • In-water works are subject to timing windows (July 15 to September 30) to be confirmed with the MNRF during the detailed design phase of the project.. ESC shall be installed throughout the work area to prevent sedimentation of the watercourse or other sensitive features present. Inspection of the ESC measures is recommended during construction to ensure that they protect the watercourse. Implementation of the ESC measures shall conform to recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS) and the requirements of the NVCA.
Surface Water	Potential for localized water quality impacts as a result of spills and sediments entering a watercourse due to the following project activities: • Stockpiling • Excavation • Construction WWTP effluent quality parameters are dictated by the MECP and testing of the effluent is completed as part of the approval process, no additional mitigation measures are recommended. Impact of flow volume from WWTP on river flows as it relates to flooding issues is not considered significant, no impact anticipated.	• The footprint of disturbed area should be minimized as much as possible; for example, vegetated buffers and setbacks should remain untouched adjacent to the watercourse wherever possible. • All equipment and personal protective equipment must arrive on-site clean to prevent the potential transfer of invasive species (e.g., *Phragmites australis*) to the local environment. • Implementation of the erosion and sediment control measures should conform to recognized standard specifications, such as OPSS and the requirements of the NVCA. ESC measures shall be installed and maintained during the work phase, until the site has been stabilized. Control measures shall be inspected daily to ensure they are functioning and shall be maintained as required. If control measures are not functioning properly, no further work shall occur until the problem is resolved. • In-water operation of heavy equipment shall be avoided and operation on the banks of a watercourse will be minimized to the extent feasible. Wherever possible, machinery should be operated above the high-water mark. • Stockpiled material shall be stored and stabilized at least 30 m from the watercourse. All materials and equipment shall be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering adjacent natural features. • All equipment fueling and maintenance shall occur at least 30 m from the watercourse to ensure that no deleterious substances enter the waterway. • The Contractor shall be required to develop spill prevention and contingency plans for construction and operational phases of the project. Personnel shall be trained in how to apply the plans and the plans will be reviewed to strengthen their effectiveness and ensure continuous improvement.

Environment	Potential Effects	Proposed Mitigation Measures and Future Commitments
Soil and Groundwater	Potential for localized groundwater quality impacts as a result of spills during construction. Potential dewatering of the work area may be required. Potential reduction of baseflow in watercourse downstream of dewatering zone of influence. Potential for impacts to shallow groundwater wells during construction. Potential for excess soil as a result of excavation and construction of underground utilities.	• Refueling of equipment and fuel storage shall be conducted in designated areas at least 30 m away from the watercourses and any existing wells. • The Contractor shall be required to develop Spill Prevention and Contingency Plans for construction and operational phases of the project. • Geotechnical conditions should be reviewed when design details are known. The groundwater conditions and dewatering requirements shall be fully assessed including the need for Site Specific Hydrogeological Site Assessment and application for a PTTW or EASR, as applicable during additional investigation and / or analysis in order to finalize the geotechnical and hydrogeological recommendations during detailed design. • The contractor shall be required to implement a construction monitoring and mitigation program to ensure there are no negative impacts to existing private wells and surface water features due to short-term construction dewatering, or that impacts are suitably mitigated. The monitoring and mitigation plan will be a condition of any permits for dewatering. • Locations of the wells should be confirmed in a well survey conducted within the Study Area to identify any shallow wells in close proximity that could be potentially impacted by the construction. The well survey is recommended to be completed during the detailed design phase of the project. • A well interference and reporting protocol should be established before construction that outlines the actions taken should a complaint from a private well owner be received and ensures that a supply of water is provided for the private resident. Mitigation measures should include the following: • Notification of residents of construction with contact information. • A reporting and investigation protocol to address complaints. • Supply of alternate water source in case of confirmed impact. • ESC shall be installed throughout the work area to prevent sedimentation of the watercourse or other sensitive features present. Inspection of the ESC measures is recommended during construction to ensure that they protect the watercourse. Implementation of the ESC measures shall conform to recognized standard specifications, such as Ontario Provincial Standards Specification (OPSS) and the requirements of the NVCA. • Groundwater collected through dewatering will be discharged back into the watercourse feature to mitigate any changes to baseflow. • Activities involving the management of excess soil should be completed in accordance with O.Reg. 406/19 and the MECP's current guidance document titled "Management of Excess Soil – A Guide for Best Management Practices" (2016, Updated 2021). All waste generated during construction must be disposed of in accordance with ministry requirements.
Air Quality	Temporary increase in dust in air, emissions from construction activities.	• A complaint response protocol for nuisance impacts including dust emissions will be prepared during the detailed design phase of the project and implemented prior to construction. • The construction contractor will be required to develop a Construction Management Plan that specifically addresses dust controls and contingency plans to mitigate dust when it occurs. • Vehicles / machinery and equipment shall be in good repair, equipped with emission controls, as applicable and operated within regulatory requirements. The contractor shall also be required to implement dust suppression measures to reduce the potential for airborne particulate matter resulting from construction activities. This should be in the form of water applications on exposed soils.
Visual	Visual impact of proposed works	• During the design of upgraded works, the visual impact of the facility from the east should be mitigated through the implementation of appropriate screening measures such vegetation, trees and berms to the extent these can be incorporated without impacting performance of the proposed works.
Noise	Temporary nuisance noise during construction activities.	• A complaint response protocol for nuisance impacts including construction noise shall be prepared during the detailed design phase of the project and implemented prior to construction. • Noise control measures shall be implemented where required during the construction phase, such as restricted hours of operation and the use of appropriate machinery and mufflers. The noise produced by the equipment can be limited through proper equipment maintenance.
	Ongoing noise from WWTP.	• A background noise study should be completed to assess baseline noise levels associated with existing WWTP and works incorporated into the design of upgrades to the WWTP to mitigate noise levels to regulated levels.

Environment	Potential Effects	Proposed Mitigation Measures and Future Commitments
Property Impacts	Property loss due to property acquisition to accommodate proposed utility infrastructure is not anticipated.	• Should property acquisition be required for this project will be undertaken by the Township with the objective to respect and protect individual rights and to provide fair compensation within the framework of applicable municipal and provincial policies and associated legislative instruments governing the acquisition of property.
Built Heritage, Cultural Heritage Landscapes	There are no buildings or structures of identified built heritage resources located within the project area zone of influence. Potential impact to cultural landscapes is anticipated to be limited as a result of the proposed works.	The following recommendations are excerpted from the Cultural Heritage Assessment Report completed by MHBC and provided in Appendix A of this report: • Ensure that changes to grading and drainage do not impact the river and its associated vegetation. This is expected to be achieved through other facets of the project including the protection of surface and ground water and natural heritage features. • If feasible, install fencing along the south and west shoulder of Concession 3 South • Nottawasaga within the Project Area to allow for continuous use of the Trail. • It is recommended that this report be circulated to MCM and made available to any other interested parties. If changes are made to the preferred option, further cultural heritage studies will be required.
Archaeology	Potential impact to archaeological resources is not anticipated. The study area is considered free of archaeological concerns based on the findings of the archaeological assessment completed for the study area.	The following mitigation is excerpted from the Stage 2 Archaeological Assessment Report completed by Archeoworks Ltd. and provided in Appendix A of this report: • Should construction activities associated with this project (i.e., construction laydown areas, etc.) extend beyond the assessed limits of the study area, further archaeological investigation will be required prior to construction activities to assess the archaeological potential of these lands. • No construction activities shall take place within the study area prior to the MCM (Archaeology Programs Unit) confirming in writing that all archaeological licensing and technical review requirements have been satisfied

12.0 Implementation

It is anticipated that the preferred water solution will be undertaken in at least two steps, subject to confirmation of the number of additional groundwater wells required to address the forecasted 2042 water demands, budget constraints and development pressures.

12.1 Phase 1

The first phase of the water system would incorporate the following:

- An additional groundwater well in Area CE-1 (WS2-A).
- Additional water storage (WST1).
- Distribution system improvements to support Area CE-1.
- Distribution system improvements to support Area CE-2.

The first phase of the wastewater solution is expected to include:

- Upgrading of the existing WWTP to 1,400 m^3/d.
- The addition of a SPS in Area CE-2.
- Gravity sewers from Areas CE-1 and CE-2 to the SPS in Area CE-2, and forcemain from Area CE-2 to the existing WWTP.

As such, the first phase of the work would, subject to final permitting and approval of the additional well increase the firm capacity of the municipal drinking water system to 25 L/s and increase the wastewater treatment capacity to 1,400 m^3/d. The capacity of water supply is the limiting element associated with the first phase of implementation. It is anticipated that once initiated it would take approximately four years for design, approval, and construction of the Phase 1 works.

12.2 Phase 2

The second phases of woks would include the following:

- Additional groundwater sources and associated water treatment and watermains to connect to the existing system and increase the firm capacity of the water system to 40.1 L/s. These works require further study in the form of a MCEA or equivalent to satisfy the requirements of the Environmental Assessment Act prior to proceeding to design and approvals. Should the implementation of the WWTP expansion be delayed, subject to the needed studies being in place, additional ground water facilities could be implemented in advance of implementing Phase 2 as described herein, such that the water supply capacity identified in Phase 1 is increased to align with the wastewater treatment capacity identified in Phase 1.
- Distribution system improvement to support Area CE-3.

- Gravity sewers from Area CE-3.
- Expansion of the WWTP from 1,400 m^3/d ADF to 2,100 m^3/d. These works require further study in the form of a Schedule C Municipal Class EA to satisfy the requirements of the Environmental Assessment Act prior to proceeding to design and approvals.

The completion of the second phase of the works would address the water and wastewater serving needs associated with the 2042 forecast.

12.3 Planning and Capital Budget

The schedule of projects, project costs, and timing are included in Appendix A.

13.0 Conclusions and Recommendations

The Township of Clearview has completed a water and wastewater MSP. The study has concluded that the forecasted needs for water supply, water storage and wastewater treatment significantly exceed the capacity of the existing water and wastewater infrastructure. The forecasted needs associated with 2042 include the existing users in the Creemore Core service area, anticipated infill in the Creemore Core area, and the anticipated development associated with the Creemore East service area.

The study has concluded that the preferred method of providing the additional water supply and water storage infrastructure to satisfy the 2042 water demands includes an expansion of this existing water system using additional groundwater wells as the supply source. The first step in implementing additional groundwater resources is expected to be a new groundwater well located in the Creemore Commons subdivision in the Creemore East service area. The location of this well is documented in the MSP. Additional investigations and future study will be required to identify the balance of groundwater sources required to meet the servicing needs associated with the 2042 forecast. Until such time as these additional resources are added to the system, not all of the anticipated 2042 water supply needs can be addressed.

The study has concluded that the preferred method of providing the additional water storage to address the needs identified in the 2042 forecast includes the construction of additional grade-level storage at the site of the existing grade-level reservoir.

The study has identified required watermain improvements external to the limits of areas CE-1, CE-2, and CE-3.

The study has concluded that the preferred method of providing additional wastewater treatment capacity is through an expansion of the existing WWTP. The expansion will require an increase in the rated capacity of the existing WWTP and therefore will be

subject to further study in the form of a Schedule C MCEA prior to proceeding to design approval and construction.

The study has identified that improvements to the existing WWTP could be undertaken to increase its ability to function at its currently approved capacity of 1,400 m^3/d. The study has concluded that this work could proceed in advance of completion of the Schedule C MCEA to expand rated capacity.

This study has identified that a new sanitary SPS will be required in the Creemore East area to convey wastewater from Creemore East and eventually Creemore North to the existing WWTP site.

Based on the conclusions presented in the MSP, the following actions are recommended subject to available funding and municipal priorities:

- Complete a Schedule C MCEA to expand the existing WWTP from 1,400 m^3/d to 2,100 m^3/d and subsequently undertake the detailed design approvals and construction to implement this preferred solution. Until such time as the expanded WWTP is in place, the available servicing capacity for wastewater will be less than the 2042 need.
- Proceed with the detailed design, approvals, and construction of upgrades to the existing WWTP to provide a wastewater treatment capacity of 1,400 m^3/d.
- Proceed with the detailed design, approvals, and construction of the sanitary SPS to be located in area CE-2 and the associated gravity sewers and forcemain.
- Proceed with a Hydrogeological investigation to identify and develop the additional groundwater resources necessary to provide the water supply associated with the 2042 needs forecast. Once a viable groundwater source is identified, proceed with the Schedule B MCEA activities required for these additional groundwater resources and subsequently undertake the detailed design, approvals, and construction of these additional groundwater supply facilities.
- Proceed with the detailed design, approvals, and construction of the additional water storage.
- Proceed with the detailed design, approvals, and construction of the additional watermains required to service the proposed areas of development.
- Proceed with the detailed design, approvals, and construction associated with upsizing existing undersized water mains in the Creemore Core area that are required to be replaced to service development in the Creemore East area, when the condition of these undersized mains warrants replacement.

14.0 References

Conservation Ontario, Drinking Water Source Protection http://conservationontario.ca/conservation-authorities/source-water-protection/, accessed April 10, 2024

Design Brief for the Creemore Area Sewage Works, Marshall Macklin Monaghan, May 1999

Endangered Species Act, 2007, Section 9(1), 10(1)

Technical Memo on Mary St. Sanitary Sewer Capacity, R.J. Burnside & Associates, December 14, 2021

Creemore Reservoir Structural Condition Assessment Report, WSP, December 2022

Township of Clearview, Creemore Water Works, Engineers Report, October 2000

PW1-23 Summary Report, Creemore Commons Residential Development, C.F. Crozier & Associates Inc., April 2024.

Creemore Water and Wastewater System Capacity, R.J Burnside & Associated Limited, Oct 18, 2021.

Creemore WWTP Feasibility Study, R.J. Burnside & Associates Limited, January 2020

Capacity Assessment and Future Upgrade Options for the Creemore WWTP, Blue Sky Energy Engineering and Consulting Inc., Sept. 2020.

Membrane Performance Testing – Interim Results Creemore WWTP (Draft), Blue Sky Energy Engineering and Consulting Inc., Oct 2021.

Membrane Performance Testing Creemore WWTP, Blue Sky Energy Engineering and Consulting Inc., June 2022.

Ministry of Natural Resources and Forestry, Species at Risk in Ontario, various species http://www.ontario.ca/environment-and-energy/species-risk-ontario-list, accessed April 2024;

Ministry of Municipal Affairs and Housing, Provincial Policy Statement (PPS), 2020

Municipal Engineers Association (MEA) 2015. Municipal Class Environmental Assessment.

Ontario Geological Survey. *Surficial Geology of Southern Ontario*. Ontario Geological Survey, open data, https://www.ontario.ca/data/surficial-geology-southern-ontario, accessed January 2018

Ontario Geological Survey. *Bedrock Geology of Ontario*, Ontario Geological Survey, open data, https://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth, accessed January 2018

Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits (O.Reg. 41/24)

Ontario Regulation. 287/07, under the Clean Water Act, 2006

Statistics Canada. Census of Population 2021, https://www12.statcan.gc.ca/census-recensement/index-eng.cfm (accessed April 12, 2024).

The County of Simcoe Official Plan, Consolidated February 2023

The Township of Clearview Official Plan, September 2001, approved January 29, 2002, Consolidated January 2019.

Development Charges Background Study, Township of Clearview, C.N. Watson & Associated Economists Ltd., February 2019

R.J. Burnside & Associates Limited