



BURNSIDE

**Fergus Golf Club Redevelopment
Environmental Assessment –
Environmental Study Report**

Fergus Development Inc.



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Environmental Assessment -
Environmental Study Report**

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**R.J. Burnside & Associates Limited
292 Speedvale Avenue West Unit 20
Guelph ON N1H 1C4 CANADA**

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Executive Summary

Fergus Development Inc. is undertaking a Schedule C Municipal Class Environmental Assessment (MCEA) Study to evaluate alternatives for water and wastewater servicing required for the redevelopment of part of the Fergus Golf Club lands.

According to Section A.1.3 of the Municipal Class Environmental Assessment (2023) Document and as per the Ontario Environmental Assessment (EA) Act and O. Reg. 345/93, private sector developers, such as Fergus Development Inc., are exempt from the requirements of the EA Act unless the project is a Schedule C project and provides services for residential development.

In accordance with O. Reg. 345/93, a private sector developer is subject to the MCEA where they are:

- Conducting a project listed in Schedule 'C' of the MCEA
- The project is provided for residents of a municipality

The definition of “the project is provided for residents of a municipality” by the Ministry of Environment, Conservation and Parks (MECP) is that it means ‘residential development’. Using this interpretation means that private sector developers constructing projects for residential developments are subject to the EA Act pursuant to the provision of O. Reg. 345/93. Private sector developers in accordance with this Regulation are only formally designated as subject to the MCEA process when they are carrying out Schedule ‘C’ activities for residential projects.

A redevelopment has been proposed and is primarily focused on the SE Site, where Fergus Development Inc. proposes to modify the existing 1996 planning approvals for a rural, recreation based residential condominium community into a development with 118 residential lots. The SE site is also proposed to have approximately 3,600 m of 12 m wide condominium roadways, a stormwater management (SWM) pond and a pumping station.

Study Area

The Fergus Golf Club is located along the western side of 3rd Line. The existing golf course consists of two parcels; the northwest (NW) parcel, situated on the north side of Wellington Road 19, and the southeast (SE) parcel, which consists of the former Fairview Golf Club, is situated on the south side of Wellington Road 19.

The Study Area for the MCEA consists of two parcels; the northwest parcel, which is 42.35 ha, situated on the north side of Wellington Road 19, and the southeast parcel, which is 39.85 ha, situated on the south side of Wellington Road 19.

Planning Context Overview

Provincial, regional, and municipal planning documents set the policy and planning framework for consideration in MCEA studies. For this MCEA these documents include the Migratory Birds Convention Act, Provincial Policy Statement, A Place to Grow: Growth Plan for the Greater Golden Horseshoe, Bill 108: More Homes More Choice: Ontario's Housing Supply Action Plan, Bill 23: More Homes Built Faster, Endangered Species Act, County of Wellington Official Plan, and Township of Centre Wellington Official Plan.

Problem Opportunity Statement

The project opportunity statement defines the principal starting point in the undertaking of the MCEA Study and assists in defining the scope of the project. The Project Opportunity Statement for this MCEA Study is as follows:

*Fergus Development Inc. is undertaking the redevelopment of a part of the Fergus Golf Club lands, which will provide single detached rural recreational-based housing, based on the findings of a servicing study, on the SE Site. This redevelopment will contribute to satisfying the need and market demand for recreational focused housing in the Township of Centre Wellington and the County of Wellington. To service the new housing units, Fergus Development Inc. needs to **consider options to provide cost-effective and environmentally sound means of providing a potable water supply and wastewater servicing.** Alternatives will be examined as part of the MCEA Study including the impacts of alternatives on the natural, socio-cultural, technical and financial environment.*

Built Environment

The Fergus Golf Club is currently serviced by existing wells throughout the site. There are two existing wells on the NW Site (North Irrigation Well and Clubhouse Well) and two existing wells (South Irrigation Well and Old Clubhouse Well) on the SE Site. Another Well on the northern parcel, PW2-1, was installed as part of the site investigations for the proposed redevelopment.

The Clubhouse is located on the NW Site and is serviced by the Clubhouse Well for water supply and an onsite sewage treatment and dispersal bed system. There is currently no sanitary service within the SE Site. The existing house on the south side is assumed to be serviced by an onsite sewage system as well as by an existing well for water supply.

A drainage swale runs through the middle of the SE Site. This swale is an abandoned portion of the Black Drain, the most upstream end now abuts the southern limit of the SE site. The remaining drainage swale within the SE site will maintain the function of the former portion of the Black Drain.

The Study Area is adjacent to both 3rd Line and Wellington Road 19. 3rd Line features one travel lane in each direction. Wellington Road 19 also features one travelled lane in each direction and is designated as a County Road in the County of Wellington Official Plan.

The Elora Cataract Trailway runs adjacent the Study Area to the south, providing an expansive recreational trail system linking Elora in the west to Forks of the Credit Provincial Park in the east, travelling through Fergus, Belwood, Hillsburgh, and Erin.

Physical Environment

In general, the areas proximal to Irvine Creek and Black Drain, including the majority of the SE Site, are located in spillways. Between the two, across the southern two-thirds of the NW Site and off-site to the east, lies a drumlinized till plain. The surficial soils at the SE Site consist mainly of relatively thin distal deposits of sand and gravel overlying glacial till deposits. The Study Area is located within the Guelph Drumlin Field physiographic region of southern Ontario.

Golder and Associates Ltd. conducted a hydrogeological investigation between March 22 and March 31, 2021. A copy of the Hydrogeological Investigation Report can be found in Appendix A.

The Black Drain is a municipal drain and formerly entered the SE Site from Wellington Road 19, flows south through the existing wetland areas, continues south-west eventually draining into Irvine Creek. Irvine Creek generally flows in a southwesterly direction connecting to the Grand River in Elora. The portion of the Black Drain within the property has recently been abandoned in accordance with the Drainage Act and approved by Centre Wellington Council on June 26, 2023.

Natural Environment

Beacon was retained by Fergus Development Inc. to natural heritage studies for the Study Area; this included the preparation of an Environmental Impact Study (EIS) for the proposed residential redevelopment and a Preliminary Natural Heritage Technical Memo addressing the Study Area for the proposed water and wastewater servicing. A copy of the Environmental Impact Study Report and the Preliminary Natural Heritage Features Assessment Technical Memorandum can be found in Appendix C.

Socio-Cultural Environment

Currently no archaeological sites are registered within 1 km of the Study Area. The closest registered archaeological site, AkHb-1, is located approximately 3.7 km east of the Study Area.

A review of previous archaeological assessments undertaken within the limits of the Study Area or within 50 m of the Study Area was completed. The review determined that no archaeological assessments have previously been undertaken within 50 m of the Study Area.

In 2021, Golder Associates Ltd., a member of WSP, conducted a Stage 1 Archaeological Assessment for the Fergus Golf Club property, which included the current Study Area. This Stage 1 Archaeological Assessment concluded that the current use of the Study Area as a golf course indicates the property has been subjected to some level of subsurface disturbance, though it is not possible through visual assessment to determine to what extent the development of the golf course impacted subsurface cultural remains that may be present. A copy of the Stage 1 Archaeological Assessment Report is provided in Appendix D.

The Stage 2 Archaeological Assessment followed the recommendations of the previous Stage 1 Archaeological Assessment and consisted of test pit survey at 5 m and 10 m intervals. Given the isolated and non-diagnostic nature of the finds, Locations 1 and 2 are concluded to have no further cultural heritage value or interest as the sites do not meet the criteria identified in Section 2.2, Standard 1a of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011) for determining the need for Stage 3 site-specific assessment. A copy of the Stage 2 Archaeological Assessment Report is provided in Appendix E.

Alternative Solutions

The following alternative solutions for water servicing were identified to address the Project Opportunity Statement:

- Alternative 1 – Do Nothing
- Alternative 2 – Connect to an Existing Municipal Water Supply System
- Alternative 3 – New Onsite Communal Water Supply and Treatment System

Alternative Design Concepts

The following alternative design concepts for water servicing were identified for the preferred solution:

Primary Disinfection Treatment

- Alternative 1a – Ultraviolet Primary Disinfection
- Alternative 1b – Chlorine Primary Disinfection

Aesthetic Treatment for Hardness

- Alternative 2a – Ion Exchange
- Alternative 2b – Softening Membranes
- Alternative 2c – Crystallization Technology

Water Storage

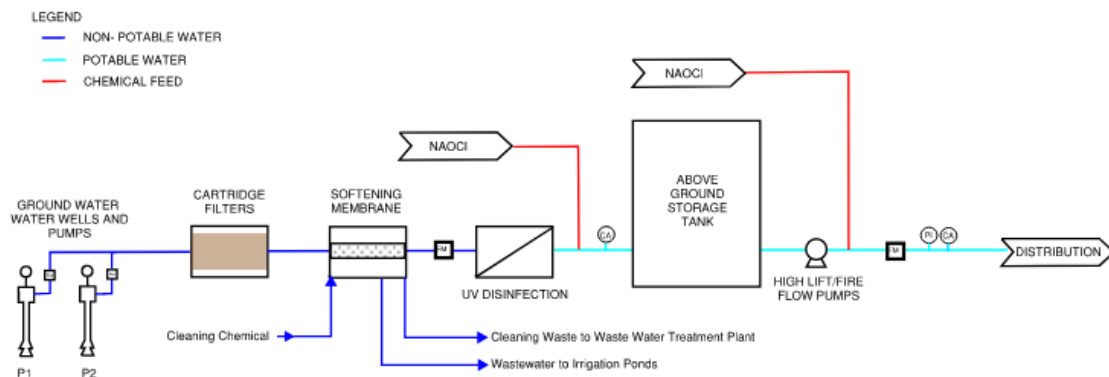
- Alternative 3a – Above Ground
- Alternative 3b – Below Ground

Description of the Preferred Design Concept

The preferred water servicing design concept is based on utilizing UV light and chlorination for primary disinfection, softening membranes to reduce water hardness, chlorination for secondary disinfection (required) and treated water to be stored within an above ground reservoir.

The preferred design process flow diagram is illustrated in Figure E.1-1.

Figure E.1-1: Proposed Process Flow Diagram



Potential Environmental Impacts, Mitigation and Future Commitments

The potential environmental effects associated with construction of the proposed water and wastewater treatment facilities within the Study Area have been identified and are summarized in Table 8.1 of this report. In general, mitigation measures have been proposed for the following aspects of the environment.

- Natural Environment

- Trees and Vegetation
- Wildlife and Wildlife Habitat
- Physical Environment
 - Soil and Groundwater
- Socio-Economic Environment
 - Air Quality
 - Noise
- Cultural Environment
 - Cultural Heritage
- Transportation and Built Environment
 - Human Health and Safety
 - Transportation Infrastructure

Climate Change Considerations

At the detailed design stage, Low Impact Development (LID) features will be considered to promote climate resiliency. Water impacts may be reduced through the consideration of Greyter Water Systems to reuse greywater and thereby reduce water demands.

The proposed undertaking will result in some vegetation removal during grading activities. Vegetation loss (and related carbon sink removal) is anticipated to be minimized as much as possible by reducing the footprint of grading activities where feasible.

Infrastructure is susceptible to deterioration from freeze-thaw events and drainage features may be impacted by increased precipitation events that are becoming more prevalent in Southern Ontario due to climate change effects which can result in potential flooding and erosion. The Detailed Design and associated drainage infrastructure will consider peak flows and capacity.

General Approval and Permit Requirements

A permit approval will be required from GRCA in accordance with O. Reg. 150/06 Grand River Conservation Authority: Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses for construction works in GRCA regulated areas. A Permit to Take Water (PTTW) will be obtained from MECP for the new water supply well. An Environmental Compliance Approval (ECA) will be obtained from MECP for the wastewater treatment facility. Additional permits and approvals are summarized in Section 10.0.

Study Consultation

Public and Stakeholder consultation was completed throughout the study including the following:

- Development of a stakeholder contact list, including federal, provincial, ministries / agencies, including the Grand River Conservation Authority (GRCA).
- Confirmation of project interest with identified Indigenous communities including Haudenosaunee Development Institute, Mississaugas of the Credit First Nation, Huron Wendat Nation, and Six Nations of Grand River First Nation.
- Development of a project specific webpage on R.J. Burnside & Associates (<https://www.rjburnside.com/fergusGEA/>).
- Distribution of project noticed including publishing in the local newspaper and mailings / emails.
- Holding two public information centers.
- Communication with Indigenous communities.
- Public release of Environmental Study Report.

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Disclaimer

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1.0 Introduction

The Fergus Golf Club is located along the western side of 3rd Line. The existing golf course consists of two parcels; the northwest (NW) parcel, situated on the north side of Wellington Road 19, and the southeast (SE) parcel, which consists of the former Fairview Golf Club, is situated on the south side of Wellington Road 19.

A redevelopment has been proposed and is primarily focused on the SE Site, where Fergus Development Inc. proposes to modify the existing 1996 planning approvals for a rural, recreation based residential condominium community into a development with 118 residential lots. The SE site is also proposed to have approximately 3,600 m of 12 m wide condominium roadways, a stormwater management (SWM) pond and a pumping station. There are no previous sewage works approvals to be amended. The existing sewage system on site is an Ontario Building Code (OBC) approved system for 5,500 L/day at the existing golf course.

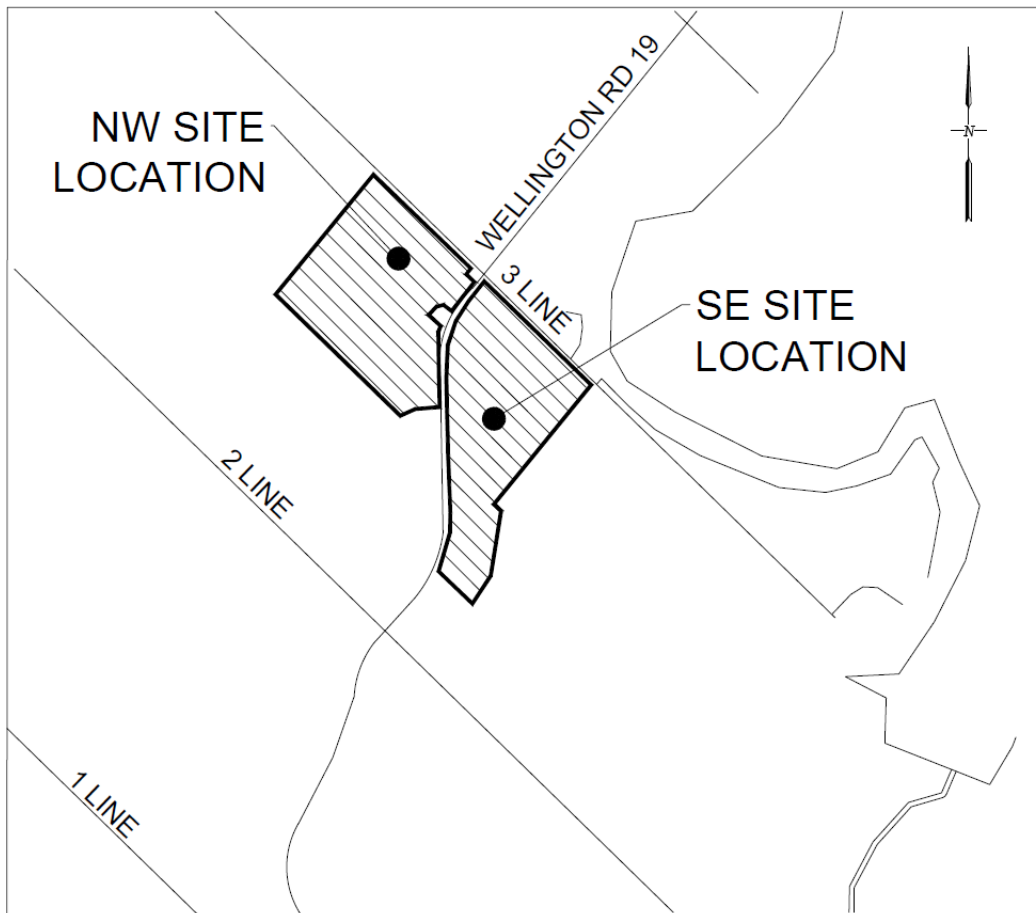
The NW Site will maintain the 18-hole golf course (to be redesigned), and contain the water supply system, the water treatment system, the wastewater treatment system, and the effluent disposal, currently proposed as irrigation for the 18-hole golf course.

To undertake water and wastewater servicing for the proposed redevelopment, the Province requires completion of a Schedule C Municipal Class Environmental Assessment (MCEA) Study.

1.1 Description of the Study Area

The Study Area for the MCEA consists of two parcels; the northwest parcel, which is 42.35 ha, situated on the north side of Wellington Road 19, and the southeast parcel, which is 39.85 ha, situated on the south side of Wellington Road 19.

The Study Area is illustrated in Figure 1-1.

Figure 1-1: Study Area

1.2 Municipal Class EA Process

Fergus Development Inc. is undertaking a MCEA Study to evaluate alternatives for water and wastewater servicing required for the redevelopment of part of the Fergus Golf Club lands.

According to Section A.1.3 of the Municipal Class Environmental Assessment (2023) Document and as per the Ontario Environmental Assessment (EA) Act and O. Reg. 345/93, private sector developers, such as Fergus Development Inc., are exempt from the requirements of the EA Act unless the project is a Schedule C project and provides services for residential development.

In accordance with O. Reg. 345/93, a private sector developer is subject to the MCEA where they are:

- Conducting a project listed in Schedule 'C' of the MCEA
- The project is provided for residents of a municipality

The definition of “the project is provided for residents of a municipality” by the Ministry of Environment, Conservation and Parks (MECP) is that it means ‘residential development’. Using this interpretation means that private sector developers constructing projects for residential developments are subject to the EA Act pursuant to the provision of O. Reg. 345/93. Private sector developers in accordance with this Regulation are only formally designated as subject to the MCEA process when they are carrying out Schedule ‘C’ activities for residential projects.

The Fergus project requires a communal well water supply, water treatment facility and communal wastewater treatment plant all which meet the MCEA Schedule C definition / list of water and wastewater projects requirements. The MCEA does not differentiate between Private or Public entities on the noted Schedule C projects. Where the MCEA document remains silent on Private vs Public, it means that the proponent is not relevant to the requirement for a MCEA. Therefore, Fergus Development Inc. must complete a MCEA Study for the Fergus Golf Club Redevelopment.

1.2.1 Proponency

Under the MCEA (2023) Document, all Ontario municipalities and their public utilities commissions, private sector developers carrying out and undertaking designated by O. Reg. 345/93 made under the *EA Act* (in accordance with section 15.1 of O. Reg. 334 made under the *EA Act*), and the Ontario Clean Water Agency may proceed with an undertaking set out in the class of undertakings pursuant to MCEA.

The MCEA (2023) Document defines Private Sector Developers as a developer of land other than land belonging to Her Majesty in right of Ontario, a public body, or a municipality.

O. Reg. 345/93 (Designation and Exemption – Private Sector Developers) made under the *EA Act*, designates certain undertakings by private sector developers as undertakings subject to the *EA Act*. Generally, O. Reg. 345/93 designates road, water or wastewater projects provided for the residents of a municipality that are classified as Schedule C in the MCEA.

Accordingly, those projects to be undertaken by private sector developers which are designated as an undertaking to which the *EA Act* applies are subject to all of the requirements of the MCEA.

1.2.2 Project Schedules

This MCEA is being scoped as a Schedule C MCEA as the undertaking of the communal well water supply, water treatment facility and communal wastewater treatment plant involve potential solutions that would meet the following Schedule C water and wastewater projects as per Appendix 1 Table B of the MCEA (2023) Document:

- Project 10a Construct new water system including a new well.
- Project 10b Construct new water system including a water distribution system.
- Project 15c Construction new water treatment plant or expand existing water treatment plant beyond existing rated capacity.
- Project 29c Construct new sewage treatment plant or expand existing sewage treatment plant beyond existing rated capacity including outfall to receiving water body.
- Project 36 Provide for land application of sewage effluent through spray irrigation system or overland flow.

We also note that on Dec 1, 2022, Jacobs, the Township's review engineer for the wastewater treatment system, commented that a *"Class EA review process is recommended in any event. This will allow the developer to arrive at a preferred strategy that satisfies the natural, environmental, socio and economic benefits accruing to the development, the Township, and other key stakeholders."*

1.2.3 Class EA Schedule Confirmation

Burnside has reviewed and confirmed the appropriate Schedule for this undertaking. Fergus Development Inc. must complete a Schedule C Municipal Class EA for the Fergus Golf Club Redevelopment.

The purpose of this EA Study is to identify a preferred solution and design concept that provides a cost-effective and environmentally sound means of providing water supply, treatment, and distribution, as well as wastewater collection, treatment, and disposal for the Site with sufficient capacity to service existing and proposed facilities. Alternatives will be examined as part of the EA Study including the potential impacts of alternatives on the social, cultural, natural, and financial environment.

1.2.3.1 Class Environmental Assessment Section 16(6) Order (formerly Part II Order)

Section 16 Order requests were previously known as Part II Order requests. The MECPP has the authority and discretion to make an Order under Section 16 of the *EA Act*. A Section 16 Order may require that the proponent of a project going through a MCEA process:

1. Submit an application for approval of the project before they proceed. This is generally referred to as an Individual Environmental Assessment.
2. Meet further conditions in addition to the conditions in the Class EA. This could include conditions for:
 - a) Further study

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- b) Monitoring
- c) Consultation

The minister can also refer a matter in relation to a Section 16(6) Order request to mediation.

A Section 16(6) Order can be requested if:

- You have outstanding concerns that a project going through a Class EA process may have a potential adverse impact on constitutionally protected Aboriginal and treaty rights.
- You believe that an Order may prevent, mitigate, or remedy this impact.

In accordance with the requirements of the MCEA, this ESR is available for public review and comment for a period of 45 calendar days following the publication of the Notice of Completion.

Interested people may provide written comments to our project team within the comment period. All comments and concerns should be sent directly to the Fergus Development Inc. contact below:

Theyonas Manoharan, P.Eng.
Project Manager

Fergus Development Inc.
3190 Steeles Avenue East, Suite 300
Markham ON L3R 1G9
Tel: 905-477-1177 x 257
Email: TheyonasM@geranium.com

In addition, a request may be made to the MECP for an order requiring a higher level of study (i.e., requiring an individual / comprehensive MCEA approval before being able to proceed), or that conditions be imposed (e.g., require further studies), only on the grounds that the requested order may prevent, mitigate, or remedy adverse impacts on constitutionally protected Aboriginal and Treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name for the Ministry.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual / comprehensive environmental assessment), how an order may prevent, mitigate, or remedy those potential adverse impacts, and any information in support of the statements in the request. This will ensure that the ministry is able to efficiently begin reviewing the request.

The request should be sent in writing or by email to:

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Ministry of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

and

Director, Environmental Assessment Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto ON M4V 1P5
EABDirector@ontario.ca

Requests must also be sent to:

Fergus Development Inc.
3190 Steeles Avenue East, Suite 300
Markham ON L3R 1G9

If the Minister does not receive a request for a Section 16 Order within the 30 calendar days, then the project will move forward to Detailed Design, approvals process and subsequent implementation of the Preferred Design Concept.

2.0 Planning Context

2.1 Federal Planning Context

2.1.1 Migratory Birds Convention Act

The Migratory Birds Convention Act, 1994 (MBCA) and the Migratory Bird Regulations protects nests, eggs and young of certain species, controls the harvest of others and prohibits commercial sale of all species. The “incidental take” of migratory bird nests or the disturbance, destruction or taking of the nest of a migratory bird are prohibited under Section 6 of the Migratory Bird Regulations under the authority of the MBCA. MBCA has implications on development and construction activities that might occur during the breeding season.

Vegetation removal is required for the implementation of the project. To reduce the risk of contravening the *Migratory Bird Convention Act*, timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and / or structure works (construction, maintenance) during the breeding bird period – broadly from April 1 to August 31 for most species (regardless of the calendar year). In addition to avoidance of timing windows, mitigation measures will also be implemented.

2.2 Provincial Planning Context

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:

- d) financially viable over their life cycle, which may be demonstrated through asset management planning; and*
- e) 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 supply, treatment, and wastewater treatment in the Study Area are consistent with the PPS.

2.2.2 A Place to Grow: Growth Plan for the Greater Golden Horseshoe

A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020 consolidation), is a Provincial Plan that directs how regional growth in the Greater Golden Horseshoe (GGH) is to be managed. The plan carries policies forward from the PPS, working to reduce development sprawl and providing direction in where intensification should take place.

The Greater Golden Horseshoe area is to have *“sufficient housing supply that reflects market demand and what is needed in local communities. Thriving, livable, vibrant, and productive urban and rural areas will foster community health and individual well-being.”*

Section 2.2.9 of the Growth Plan provides the policies regarding development in Rural Areas which are relevant for the proposed redevelopment for this study.

Section 4 of the Growth Plan details the protection of natural features within the GGH. Within the Natural Heritage System (NHS):

iii. the removal of other natural features, not identified as key natural heritage features and key hydrologic features is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible

Climate change is also addressed in Section 4 of the Growth Plan. According to the growth plan, in planning to reduce greenhouse gas emissions and address the impacts of climate change, municipalities are encouraged to:

“develop strategies to reduce greenhouse gas emissions and improve resilience through the identification of vulnerabilities to climate change, land use planning, planning for infrastructure including transit and energy, green infrastructure, and low impact development, and the conservation objectives in policy 4.2.9.1.”

2.2.3 Bill 108, More Homes More Choice: Ontario’s Housing Supply Action Plan

In May 2019, Ontario released the Housing Supply Action Plan. This Plan documented the severity of the housing shortage across the Province and the related housing affordability challenges.

In December 2021, the Province established a Housing Affordability Task Force to consult with municipalities, the public and industry on additional means by which to increase market housing supply.

On February 8, 2022, the Ministry of Municipal Affairs and Housing published the Report of the Ontario Housing Affordability Task Force, which highlights expert recommendations for additional measures to increase the supply of market housing to address the housing crisis. Among its 15 recommendations, the Task Force urges the province to “set a bold goal of adding 1.5 million homes over the next 10 years and updating planning guidance to make that a priority.” The effect of this would be to effectively double the amount of new housing that is delivered on an annual basis over recent levels for the next decade.

The proposed redevelopment aligns with the mission of the Housing Supply Action Plan and the Task Force’s recommendations, by modestly contributing to the supply of new market housing in the Greater Golden Horseshoe.

2.2.4 Bill 23, More Homes Built Faster

Bill 23, also known as the *More Homes Built Faster Act*, received Royal Assent on November 28, 2022. It is a piece of Ontario legislation that aims to increase the supply of housing by reducing barriers to new development. This Bill works towards the Government’s plan to achieve the construction of 1.5 million homes by 2032.

Bill 23 implements additional recommendations from the Ontario Housing Affordability Task Force Report. It establishes automatic zoning regarding height and density near significant transit station, with municipalities required to update their zoning by-laws within a year to reflect Official Plan policies related to major transit station areas. Changes to several existing acts were also proposed, including the *Conservation Authorities Act*, *Planning Act*, *Municipal Act*, *Development Charges Act*, and the *Ontario Heritage Act*.

2.2.5 Endangered Species Act

The Endangered Species Act (ESA) protects species listed as endangered and threatened by the Committee on the Status of Species and Risk in Ontario (COSSARO). The purposes of the ESA are:

- To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge
- To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk
- To promote stewardship activities to assist in the production and recovery of species that is at risk

Section 9 of the ESA prohibits the killing, harming, harassing, possession, collection, buying and selling of extirpated, endangered, and threatened species on the Species at Risk in Ontario (SARO) List; and Section 10 prohibits the damage or destruction of

protected habitat of species listed as extirpated, endangered or threatened on the SARO List.

There are a number of species protected under the ESA that occur within the County of Wellington with some degree of regularity. Seasonally appropriate field studies are typically required to determine if these species are present or using the landscapes to fulfill a part of their life cycle.

2.3 Regional Planning Context

2.3.1 County of Wellington Official Plan

The County of Wellington Official Plan (the “OP”), approved in 1999, and as amended, provides general policies and guidelines for development of lands in the County.

The land use schedule for Centre Wellington is indicated on Schedule B1 of the OP. The Study Area land use consists of mainly Recreational use. There are some areas of Prime Agricultural Land, Greenlands, and Core Greenlands indicated on the SE site as well as an area of Core Greenlands on the northern part of the NW site.

Section 5 of the OP discusses the Greenlands System which contains landscapes, resources and ecological systems that are essential to environmental and public health in Wellington. The Greenlands System will ensure that natural features and areas and their natural beauty will be retained for future generations. Under the OP Greenlands and Core Greenlands include:

- Provincially Significant Wetlands
- All other wetlands
- Habitat of endangered or threatened species and fish habitat
- Hazardous lands
- Areas of Natural and Scientific Interest (ANSI)
- Streams and Valleylands
- Woodlands
- Environmentally sensitive areas
- Ponds, lakes, and reservoirs

Development Control detail is provided in Section 5.6 of the OP and includes policy on permitted uses, development impacts, and Conservation Authority regulations. Recreational Areas and Permitted Uses are outlined in Section 6.7, and Policy direction for Prime Agricultural Land Use is covered in Section 10.3 of the OP.

Section 9 of the OP provides specific local policies and policy areas for the individual municipalities of the County. Centre Wellington is addressed under Section 9.2.2, with the “Fergus Golf Course Recreational / Residential Area” pertaining to the SE Site.

Source Water protection policy and vulnerable areas are discussed in Section 4.9.5. Vulnerable Areas identified within the County include Wellhead Protection Areas (WHPA's), Surface Water Intake Protection Zones (IPZ's), and Issue Contributing Areas (ICA's). All new sewage and water services in vulnerable areas are subject to the policies of Section 4.9.5 of the OP. The Study area is not currently located in an identified vulnerable area within the County; however, the new well for the development will create a WHPA.

Water and Sewage is discussed under Section 11.2 of the OP. This section outlines the types of services, objectives for water and sewage services, servicing options assessment, primary and secondary urban centre policies, and rural system servicing.

Storm Water Management direction and policy is found under Section 11.2 of the OP.

2.3.1.1 County of Wellington Official Plan Amendment 119

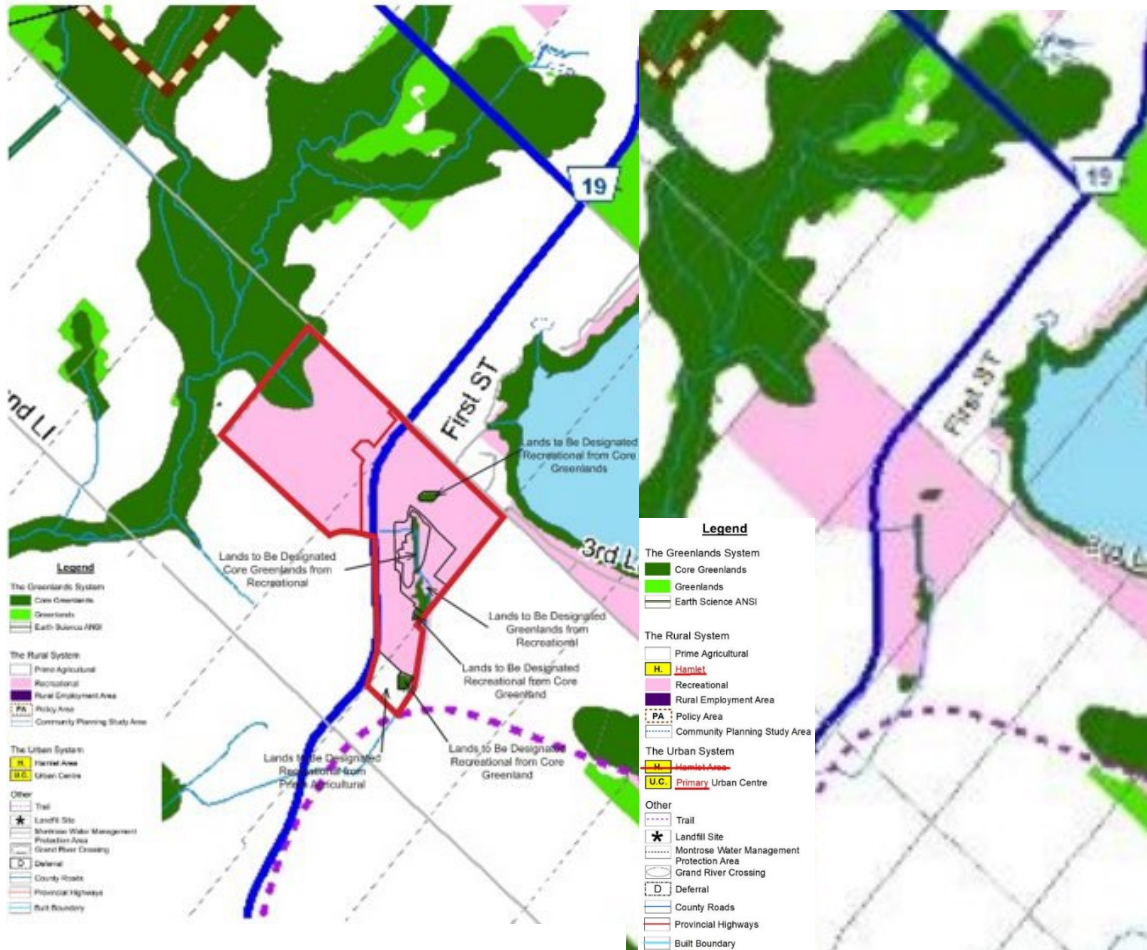
{Note: This report was written after Oct 23, 2023, when the Province of Ontario announced the potential reversal of OPA 119, described below. As of the writing of this document, it is unclear whether there are specific implications for the site and whether it may affect the approved Draft Plan.}

Official Plan Amendment (OPA) 119 was approved by the Province on April 11, 2023. The OPA included modifications to the existing site-specific policy that pertains to this project. OPA 119 implements the recommended growth structure from Phase 1 of the County's municipal comprehensive review and positions the County to consider future growth in accordance with the Provincial Growth Plan for the Greater Golden Horseshoe. Section 9.2.2 of the County Official Plan has been amended to allow additional residential lots, subject to a servicing capacity study to the satisfaction of the approval authority. Given the historic residential permission and golf course uses, the minimum distance separation requirement for the residential units has been removed. Maintenance facilities have been added to the list of permitted uses. Minor mapping changes were made to reflect field studies conducted in the last two years including:

- 20.24 acres (8.19 hectares) of land modified from Recreational to Core Greenlands
- 7.80 acres (3.16 hectares) of land modified from Core Greenlands & Agriculture to Recreational

On October 23, 2023, the Ministry of Municipal Affairs and Housing announced they would be introducing legislation to reverse the official plan decisions for Barrie, Belleville, Guelph, Hamilton, Ottawa and the City of Peterborough, the Regional Municipalities of Halton, Niagara, Peel, Waterloo and York, as well as Wellington County. The impacted municipalities have 45 days as of October 23, 2023, to submit changes and updates to the Province. No decisions that would affect the implementation of OPA 119 have been made as of the date of this report.

Figure 2-1: Centre Wellington Official Plan Land Use Schedule Updates Through OPA 119



2.3.2 Township of Centre Wellington Official Plan

Township of Centre Wellington has an Official Plan (approved May 31, 2005), but it only applies to the urban centers of Fergus and Elora and is therefore not applicable to the Study Area.

The Township of Centre Wellington is within a two-tier municipal structure, with Wellington County as the upper-tier and Centre Wellington as the lower-tier. Given the location of the Study Area, the County OP applies to the rural areas of the Township and therefore is the operative OP.

3.0 Need and Justification

The proposed redevelopment will provide additional rural recreation-based residential uses to the Township and County, addressing market demand for this dwelling type in a recreationally focused development. This type of housing is expected to appeal to a

range of age groups that are looking for an active lifestyle outside of an urban setting. At the same time, the proposed redevelopment is within close proximity to many retail, service commercial, health care and other services located in Fergus and Elora. The proposed redevelopment will assist in meeting the social, health, and well-being requirements of current and future residents of the Township and County. Currently there are no municipal sanitary services available along Wellington Road 19. Since there is no reasonably possible connection to a municipally owned treatment system, onsite servicing is required.

The project requires a communal well water supply, water treatment facility and communal wastewater treatment plant all which meet the MCEA Schedule C definition / list of water and wastewater projects requirements.

3.1 Project Opportunity Statement

The project opportunity statement defines the principal starting point in the undertaking of the MCEA Study and assists in defining the scope of the project. The Project Opportunity Statement for this MCEA Study is as follows

*Fergus Development Inc. is undertaking the redevelopment of a part of the Fergus Golf Club lands, which will provide single detached rural recreational-based housing, based on the findings of a servicing study, on the SE Site. This redevelopment will contribute to satisfying the need and market demand for recreational focused housing in the Township of Centre Wellington and the County of Wellington. To service the new housing units, Fergus Development Inc. needs to **consider options to provide cost-effective and environmentally sound means of providing a potable water supply and wastewater servicing.** Alternatives will be examined as part of the MCEA Study including the impacts of alternatives on the natural, socio-cultural, technical and financial environment.*

4.0 Description of the Environment

4.1 Built Environment

4.1.1 Existing Infrastructure

The Fergus Golf Club is currently serviced by existing wells throughout the site. There are two existing wells on the NW Site (North Irrigation Well and Clubhouse Well) and two existing wells (South Irrigation Well and Old Clubhouse Well) on the SE Site. Another Well on the northern parcel, PW2-1, was installed as part of the site investigations for the proposed redevelopment.

The Clubhouse is located on the NW Site and is serviced by the Clubhouse Well for water supply and an onsite sewage treatment and dispersal bed system. There is currently no sanitary service within the SE Site. The existing house on the south side is assumed to be serviced by an onsite sewage system as well as by an existing well for water supply.

A drainage swale runs through the middle of the SE Site. This swale is an abandoned portion of the Black Drain, the most upstream end now abuts the southern limit of the SE site. The remaining drainage swale within the SE site will maintain the function of the former portion of the Black Drain.

4.1.2 Roads and Trails

The Study Area is adjacent to both 3rd Line and Wellington Road 19. 3rd Line features one travel lane in each direction. Wellington Road 19 also features one travelled lane in each direction and is designated as a County Road in the County of Wellington Official Plan.

The Elora Cataract Trailway runs adjacent the Study Area to the south, providing an expansive recreational trail system linking Elora in the west to Forks of the Credit Provincial Park in the east, travelling through Fergus, Belwood, Hillsburgh, and Erin.

4.2 Physical Environment

4.2.1 Physiography and Geology

In general, the areas proximal to Irvine Creek and Black Drain, including the majority of the SE Site, are located in spillways. Between the two, across the southern two-thirds of the NW Site and off-site to the east, lies a drumlinized till plain.

The surficial soils at the SE Site consist mainly of relatively thin distal deposits of sand and gravel overlying glacial till deposits. The glacial till deposits are exposed at surface in the area along Wellington Road 19, being comprised of the Tavistock Till (i.e., with a fine-grained matrix) in the vicinity of 3rd Line, and the Port Stanley Till (ablation till) further to the west.

4.2.2 Topography and Drainage

The Study Area is located within the Guelph Drumlin Field physiographic region of southern Ontario. The Guelph Drumlin Field contains drumlins that are spread out more than in other drumlin areas. The till of this region is stony, with large surface boulders. The sides of the valleys have broad sand and gravel terraces, while the bottom of the valleys contain swamps. There are also several eskers in this region that cross the area in the same general direction as the drumlins.

Localized topography of the Study Area is generally flat. The soils of the Study Area have been mapped as mainly Burford Loam and Perth Loam with a small portion of London Loam in the NW Site, while the SE Site contains Burford Loam, Listowel Loam, Parkhill Loam, Hillsburg Fine Sandy Loam, and Harriston Loam (Hoffman et al 1963). The bedrock deposits in the vicinity date to the Middle and Lower Silurian Periods and consist of the Guelph Formation.

The Grand River flows in a southwest direction in the area of the Lake Belwood reservoir located less than 100 m from the SE Site at its closest point. Locally the SE Site is within the Irvine Creek subwatershed. Irvine Creek and its tributaries generally flow in a southwest direction and discharge into the Grand River in Elora. At its closest point, Irvine Creek is located approximately 150 m from the SE Site.

The ground surface at the SE Site is gently undulating, with elevations ranging from approximately 424 metres above sea level (masl) to 437 masl. There is a high ground elevation of 437 masl in the southwestern part of the SE Site. The SE Site is generally trough-shaped, draining from the west, northeast and east to central low point, which in turn drains southward via Black Drain.

The upstream limit of Black Drain is currently present at the south limit of the SE Site. A drainage swale through the site receives run off from roadside drainage ditches on Wellington Road 19 and drains eastward to the central wetland area. Subsequently, a drainage swale flows in a south direction through the low portion of the SE Site, connects to the upper limit of the Black Drain which ultimately discharges into Irvine Creek approximately 2.5 km west of the SE Site.

Three small irrigation / aesthetic ponds are located adjacent to the north limit of the central forested area. The smallest pond, approximately 40 m by 15 m, is located approximately 300 m south of 3rd Line. The other two ponds, approximately 78 m by 30 m and 53 m by 25 m, are located approximately 210 m and 440 m south of 3rd Line, respectively. The ponds will not be retained post-development.

Four unevaluated wetlands, ranging in size from approximately 70 m by 70 m to approximately 275 m by 25 m, are located centrally on the site from approximately 140 m to 850 m south of 3rd Line. The largest and central wetland, located on either side of Black Drain, will be retained in the central 5.31 ha open space block. The three smaller wetlands will not be retained post-development.

Black Drain

The Black Drain is a municipal drain and formerly entered the SE Site from Wellington Road 19, flows south through the existing wetland areas, continues south-west eventually draining into Irvine Creek. Irvine Creek generally flows in a southwesterly direction connecting to the Grand River in Elora.

There are six external drainage areas that flow through the SE Site and ultimately reach the existing Black Drain:

1. EXT1 (7.93 ha) coming into the SE Site via roadside ditches and a culvert under Wellington Road 1, which forms the start of the Black Drain.
2. EXT2 (0.34 ha) is located on the south side of Wellington Road 19 and includes the south half of Wellington Road 19 and the roadside ditch. This area spills into the site via a drainage ditch, east of the Black Drain.
3. EXT3 (1.23 ha) is located on the south side of Wellington Road 19 and includes the south half of Wellington Road 19 and the roadside ditch. It also includes the west side of 3rd Line and the roadside ditch.
4. EXT4 (0.18 ha) is located on the west side of 3rd Line and the roadside ditch at the south end of the SE Site. It currently appears that this drainage is held in the ditch and ultimately spills into the site via a low point on the east side of the SE Site.
5. EXT5 (8.51 ha) sheet drains towards the SE Site from the lands to the south.
6. EXT6 (15.73 ha) also sheet drains towards the SE Site from the lands to the south.

The portion of the Black Drain within the property has recently been abandoned in accordance with the Drainage Act and approved by Centre Wellington Council on June 26, 2023. The remainder of the Black Drain remains in place and will be the legal outlet for stormwater runoff from the site. The former Black Drain within the site will continue to function to convey flow from Rd 19 to the existing upstream end of the Black Drain.

4.2.3 Soil Conditions

A preliminary geotechnical investigation was completed by Golder Associates Limited. Based upon the findings, the Study Area is covered by topsoil underlain by sandy silty sand, silty clay to clayey silt with sand to silt with sand and silty clay to clayey silt tilt. The topsoil thickness generally ranged from 150 mm to 300 mm with the underlying organic silt layer extending to depths of about 0.70 m and 0.90 m (Elev. 425.70 m and 434.10 m). In addition, cobbles and boulders in the till deposit were detected within the site.

4.2.4 Hydrogeological Conditions

Golder and Associates Ltd. conducted a hydrogeological investigation between March 22 and March 31, 2021. A copy of the Hydrogeological Investigation Report can be found in Appendix A.

Water well records

Water well records were obtained from the MECP, approximately 96 water well records were reported within 500 m of the SE and NW Sites. Of the 96 well records, 90 have water supply (e.g. domestic, geothermal, stock watering) as their designated use. The remaining wells are either abandoned or have no use listed. Of the 90 water supply wells, 69 (77%) are completed in the bedrock and 21 (23%) are completed in the overburden. The depths of the overburden wells range from 5.2 m to 65.8 m (average 16.5 m) and the depths of the bedrock wells range from 29.9 m to 108.5 m (average 55.6 m). All of the overburden water wells within 500 m of the SE and NW Sites are located east of 3rd Line and are associated with the residential properties near Lake Belwood. It is noted that historically there was not a requirement to register dug wells with the MECP, and they can be under-represented in the water well record database.

There are four existing bedrock wells on the NW Site and SE Site used by Fergus Golf Club. The North Irrigation Well (MOE#6712549) and Clubhouse Well (MOE#6714026) are located on the NW Site and completed in bedrock to depths of 86.0 m and 74.7 m, respectively. The water supply wells were generally reported to encounter thin surficial topsoil or various fill materials overlaying clay or sandy units that sometimes-contained gravel and / or boulders (i.e. are interpreted as glacial till), which commonly contained confined sand or gravel layers / units are inferred to be the overburden aquifers utilized by the private wells. The bedrock consisted of shale and limestone.

Drilling and Well Monitoring

During the geotechnical field investigation a total of eighteen boreholes were advanced on both the SE and NW Site to depths between about 3 m and 10 m below existing ground surface. Groundwater monitoring wells were installed in 16 of the boreholes to monitor groundwater levels and allow further testing. Groundwater level measurements were recorded immediately following drilling procedures. The ground water level results varied from 0.60 m to 7.30 m below ground level. The shallower water table depths were generally located in the southern portion of the SE Site, adjacent to the existing wetlands and black drain.

Boreholes BH21-9, BH21-10, BH21-12, BH21-13, BH21-14, and BH21-15 were advanced on the NW Site in the general area of the proposed leaching beds. In general, subsurface conditions encountered at the boreholes typically consist of a surficial topsoil layer underlain by a native soil deposit consisting of sandy silty clay or clayey silt with sand containing varying amounts of gravel. The deposits are in turn underlain by a silty-clay to clayey silt and silt and sand glacial till deposits. Some granular layers of silty sand and gravel are present within and above the till deposit.

Hydraulic Conductivity

The hydraulic conductivity estimates from screened intervals that included non-cohesive soil units are most likely to be representative of the hydraulic conductivity of those units and ranged from 2×10^{-7} m/s to 4×10^{-6} m/s with a geometric mean of 7×10^{-7} m/s ($n = 4$). The hydraulic conductivity estimates from screened intervals that included mainly cohesive and non-cohesive soils and glacial till units ranged from 8×10^{-9} m/s to 6×10^{-6} m/s. These values are considered reasonable for the units tested.

4.2.5 Water Supply Investigation

Golder Associates carried out a water supply exploration investigation to assess the feasibility of a water supply for the proposed subdivision. A copy of the Water Supply Investigation Report can be found in Appendix B.

A new supply test well (PW21-1) was constructed on the NW Site in May 2021. The well was completed to a depth of approximately 91.4 m within the bedrock aquifer. The bedrock is overlain by approximately 29.9 m of sandy to gravelly silt till. Three bedrock monitoring wells were also constructed on the NW site to characterize the geology and allow for groundwater level monitoring. All well drilling was completed by Well Initiatives using conventional rotary drilling equipment. The wells are constructed to Ontario Regulation 903 standards. In addition, a number of shallow overburden monitoring wells were also constructed on the NW Site as part of other investigations. Aquifer testing was conducted at the new supply test well (PW21-1) through a variable stepped rate pumping test and a constant rate pumping test.

The water supply potential was assessed with test well construction, monitoring well construction, and aquifer testing at the site. The drilling at the new supply test well (PW21-1) identified fractured dolostone capable of producing high well yields. Preliminary estimates of flow during drilling indicated the well could pump at a rate of approximately 8.8 L/s or more. The testing rate is higher than the estimated rate of 7.8 L/s required for the proposed development.

Water quantity from a well in a bedrock aquifer is often dependent on the number and size of fractures intercepted by the well. The new supply test well PW21-1 demonstrated the ability to yield 8.8 L/s for a period of 72 hours while recording drawdown within the well of 12.8 m. The available drawdown is approximately 20.4 m. At the proposed rate of 7.8 L/s, it is estimated that the drawdown in PW21-1 would decrease to approximately 11.3 m or 55% of the available drawdown after 72 hours of pumping. The pumping cone of influence is estimated to extend 600 m from PW21-1 when pumping at 7.8 L/s. There are approximately five private residences within 600 m of PW21-1. Based on a review of water well records in the area, the available drawdown in surrounding wells (static water level to pump intake) ranges from approximately 16 m

to 40 m. The closest private residence is located approximately 390 m west of PW21-1. The anticipated interference at this location will be less than 1.0 m.

As such, there is a suitable water supply at this location and drawdown at private wells would be minor (<1 m). There are no anticipated impacts to surface water features from the use of PW21-1 due to the thick low-permeability overburden (glacial till).

4.2.6 Source Water Protection

The Study Area is located within the Grand River Source Water Protection Area within the Lake Erie Source Protection Region. Section 7 of Volume II in the Plan includes policies regarding the Township of Centre Wellington. All applicable policies will be followed in the detailed design phase.

4.2.6.1 Vulnerable Areas

Wellhead Protection Areas

Wellhead Protection Area (WHPA) is an area related to a wellhead and within which it is desirable to regulate or monitor drinking water threats. WHPAs are delineated for threats to quality and quantity.

The NW Study Site is entirely located within a WHPA-D with a vulnerability scoring of two as illustrated in Figure 4-1 and Figure 4-2.

Figure 4-1: Wellhead Protection Areas

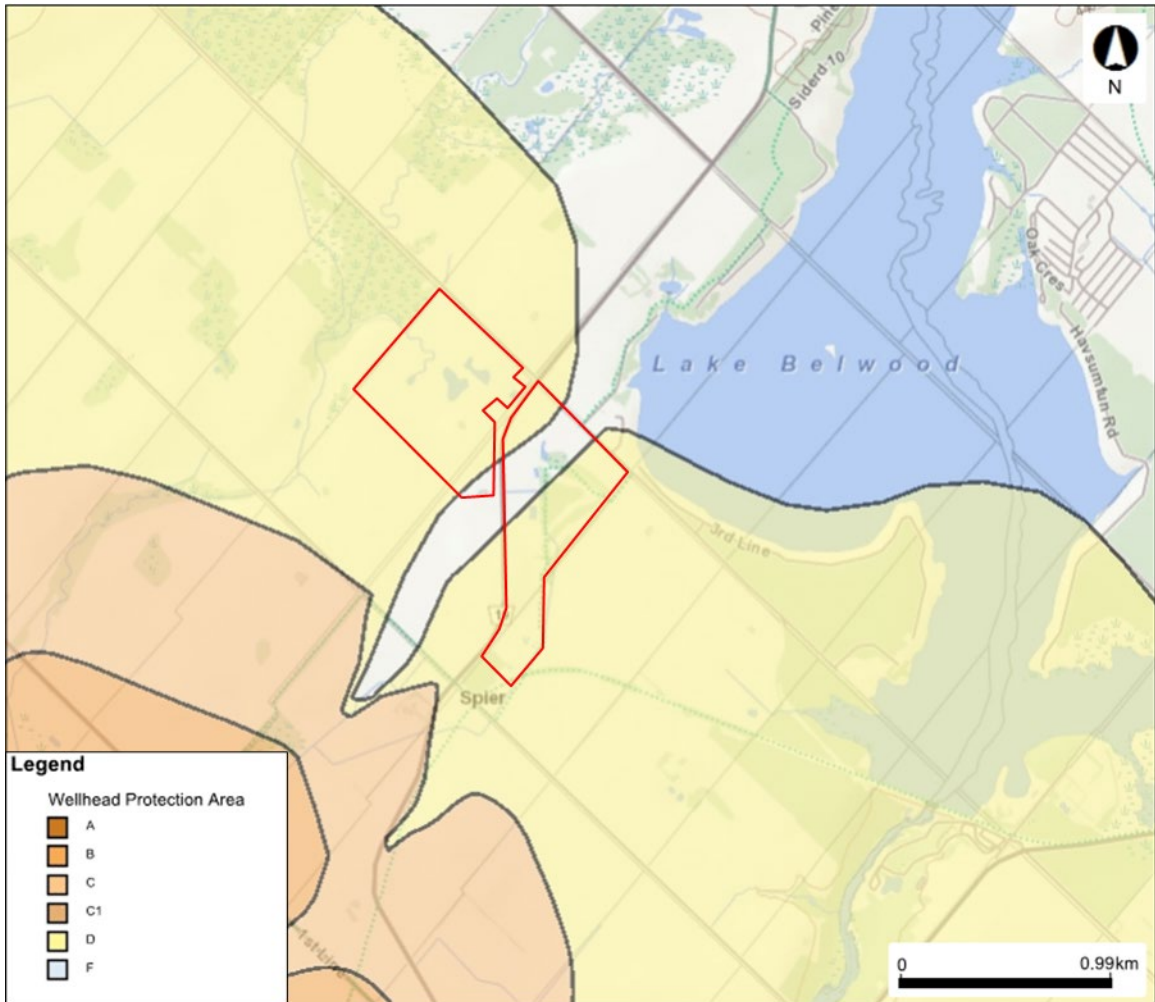
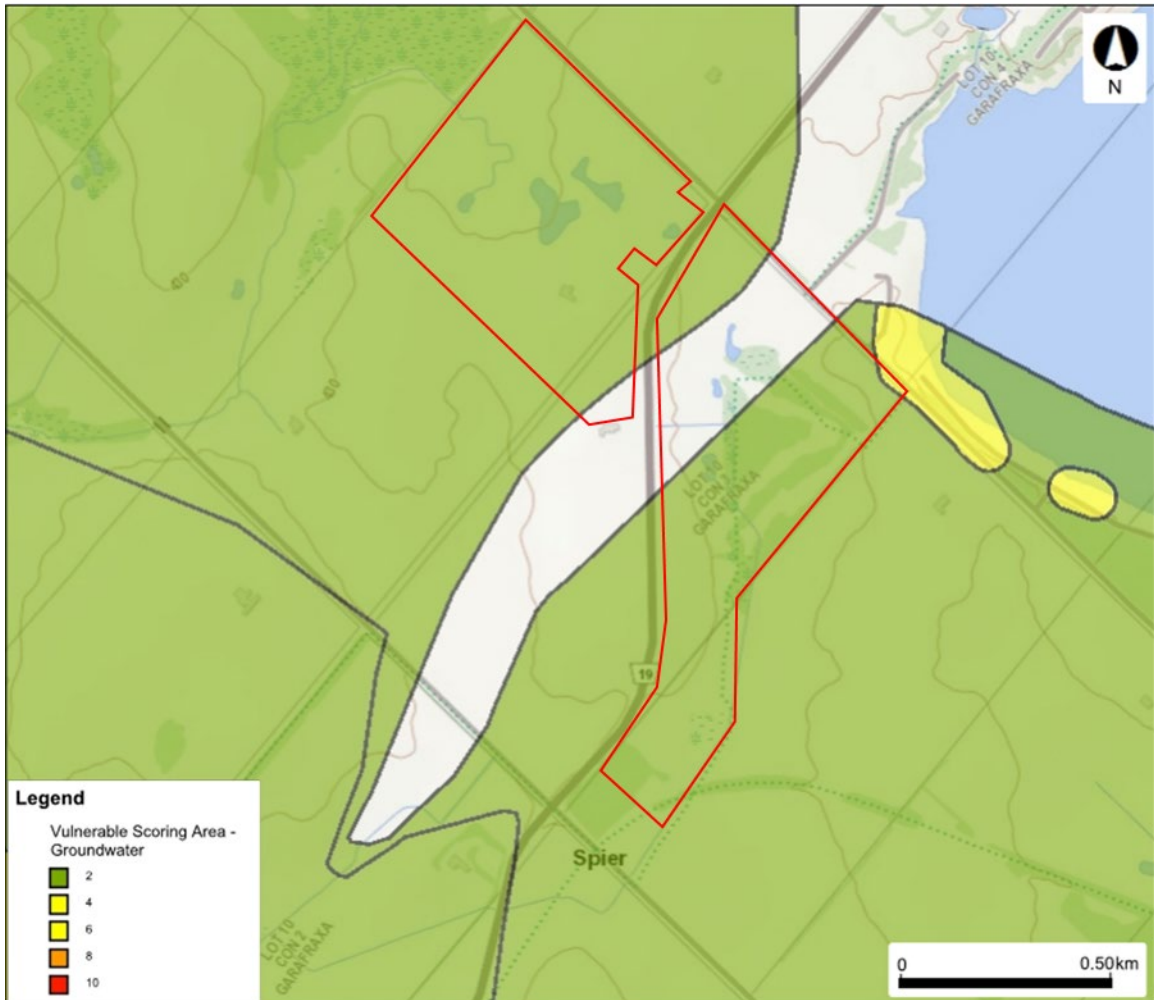


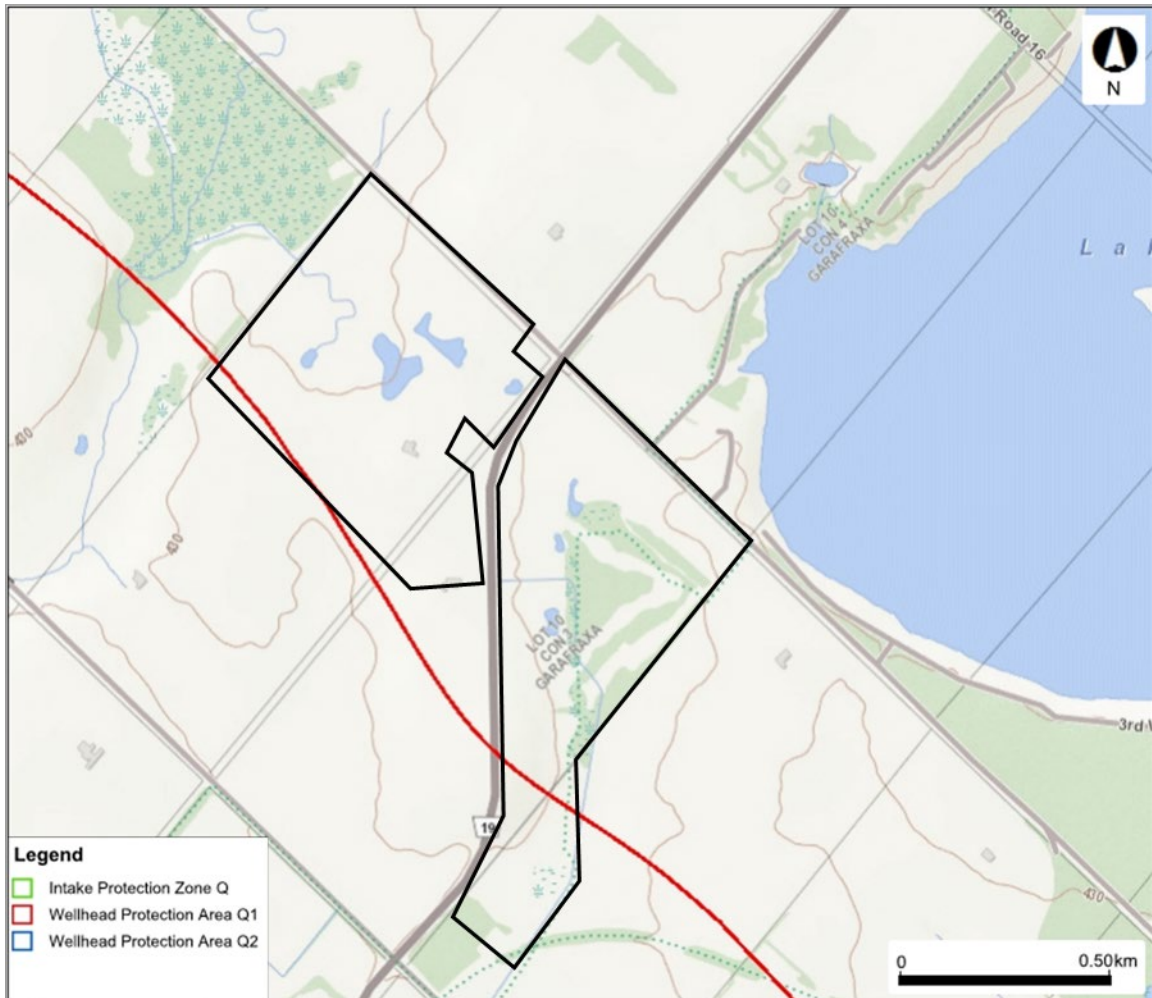
Figure 4-2: Groundwater Vulnerable Scoring Area



Wellhead Protection Areas for Quantity (WHPA-Q)

Wellhead Protection Areas for Quantity are called WHPA-Q and significant drinking water threat activities are identified. WHPA-Q1 refers to the area where activities that take water without returning it to the same source may be a threat. WHPA-Q2 refers to the area where activities that reduce recharge may be a threat.

The Study Area is mostly located outside of the WHPA-Q1 Area. The red line marker indicates the start of the WHPA-Q1 Area and circles to the West away from the Study Area. As illustrated in Figure 4-3, a small portion of the SE Site is located within the WHPA-Q1 Area.

Figure 4-3: Wellhead Protection Areas Quantity

Intake Protection Zones

An Intake Protection Zone is an area related to surface water intake and within which it is desirable to regulate or monitor drinking water threats. These areas are either set distances, delineated based on the time it would take to respond to a spill, or based on the catchment area of the intake.

No Intake Protection Zones were identified in the Study Area.

Issue Contributing Areas

An Issue Contributing Area (ICA) is an area within a vulnerable area where presently occurring human activities or conditions resulting from past human activities have or are likely to contribute to the elevated concentration of particular substances in the drinking water source. Issues refer to pathogens and chemically specific substances which commonly include chloride, sodium, and nitrate. If an Issue is identified for a well, then

all prescribed drinking water threat activities related to that particular substance within the ICA are significant drinking water threats, regardless of vulnerability scoring.

There are no issue contributing areas located in the Study Area.

Highly Vulnerable Aquifers

A Highly Vulnerable Aquifer (HVA) is an aquifer on which external sources have or are likely to have a significant adverse effect and includes the land above the aquifer. An aquifer can be considered highly vulnerable based on several factors, including how deep it is underground, what sort of soil or rock is covering it and the characteristics of the soil or rock surrounding it. The faster water can flow through the ground to an aquifer, the more vulnerable it is to contamination.

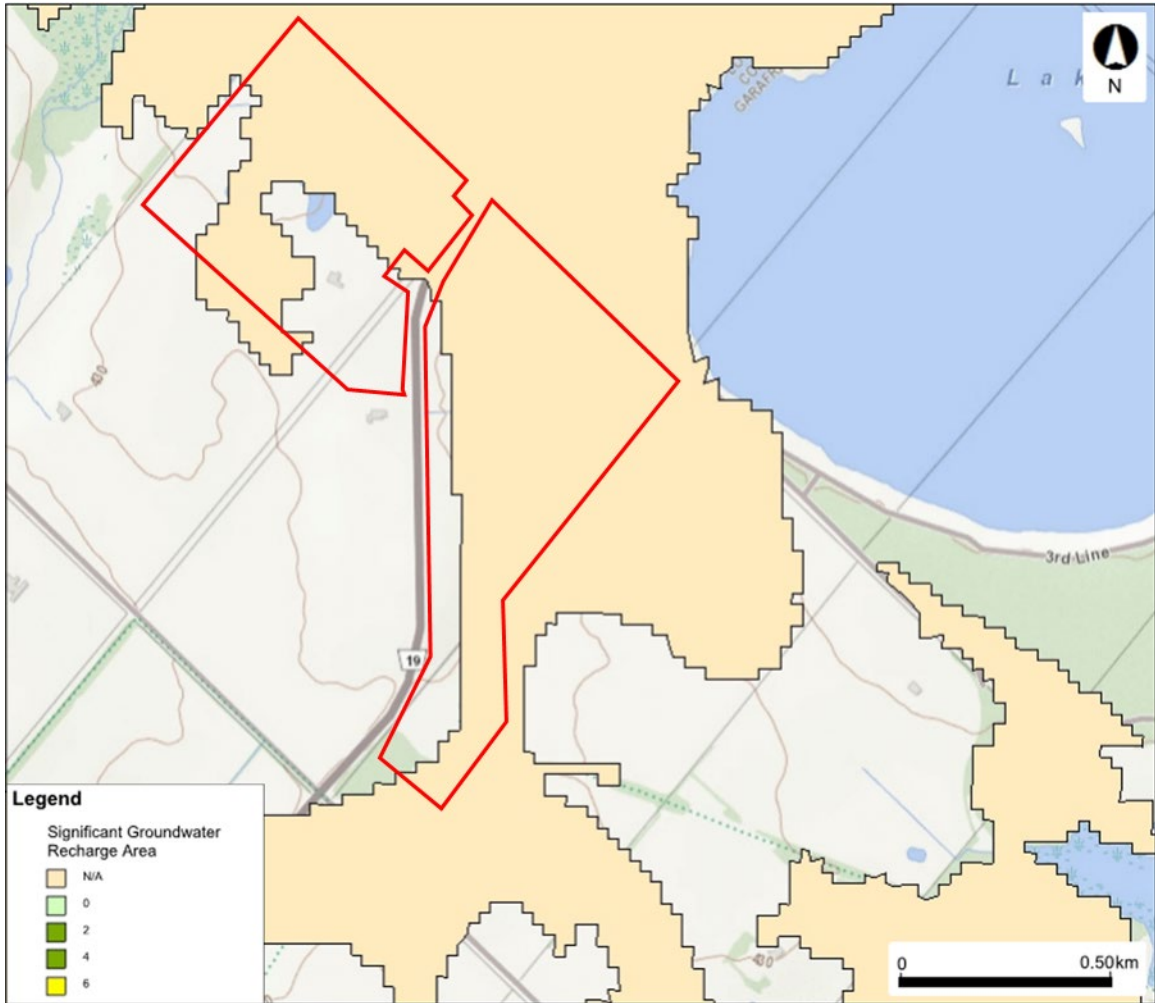
There are no Highly Vulnerable Aquifers located in the Study Area.

Significant Groundwater Recharge Areas

A Significant Groundwater Recharge Area (SGRA) is a recharge area that helps maintain the water level in an aquifer that supplies a community with drinking water. Recharge areas often have loose or permeable soil such as sand or gravel, which allows the water to seep easily into the ground. Areas with shallow fractured bedrock are also often recharge areas.

The SGRAs within the Study Area are illustrated in Figure 4-4. A large portion of the NW site and the majority of the SE site are located in a Significant Groundwater Recharge Area with a score that is not available.

Figure 4-4: Significant Groundwater Recharge Areas



4.3 Natural Environment

Beacon was retained by Fergus Development Inc. to natural heritage studies for the Study Area; this included the preparation of an Environmental Impact Study (EIS) for the proposed residential redevelopment and a Preliminary Natural Heritage Technical Memo addressing the Study Area for the proposed water and wastewater servicing. The Preliminary Natural Heritage Technical Memo primarily references the NW site, lands north of this parcel and within the Wellington Road 19 and 2nd Line rights-of-way to the Town of Fergus and Grand River, respectively. The area of study referenced in the EIS is specific to the residential redevelopment located on the SE Site. This section will summarize the existing natural heritage features for the Study Area identified in the Preliminary Natural Heritage Technical Memo due to it more succinctly representing the areas required for the proposed water and wastewater servicing. However, where applicable, references to the SE Site will be provided to represent recorded wildlife in proximity to the Study Area. A copy of the Environmental Impact Study Report and the Preliminary Natural Heritage Features Assessment Technical Memorandum can be found in Appendix C. Summaries of the existing natural heritage features are provided in following sections.

4.3.1 Vegetation and Terrestrial Habitat

Vegetation surveys and community mapping was undertaken to describe and map the existing vegetation communities on current colour ortho-photography of the lands using the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). This is the standard method used for describing vegetation communities in Southern Ontario.

The NW site is predominantly anthropogenic, as it is composed of the manicured golf course lands which are regularly mowed grassed areas. There are four irrigation ponds which have some wetland marsh associated with their perimeters and in areas categorized "rough", cultural meadows exist. Immediately north of the NW site, is the Irvine Creek valley which contains units of the Living Springs Provincially Significant Wetland (PSW) Complex. Immediately adjacent to the golf course is a large (>30 ha) poplar woodland / swamp (FOD5/SWM6-2) and cultural coniferous plantation (CUP3). There are farming operations within the woodland are adjacent to the PSW. Most of the land adjacent to the Wellington Road 19 right of way consists of agricultural fields. A small (< 4 ha) cultural mixed plantation (CUP2) exists at the southeast intersection of Wellington Road 19 and 2nd Line. A small (1 ha) woodlot exists just outside of the 2nd line right of way, approximately 1 km south of Wellington Road 19. Within the Grand River Valley, east of 2nd Line, is a woodland community which include coniferous plantation. To the west, a cultural meadow is present with planted and sporadic trees.

Avifauna

A total of 31 breeding birds were recorded on the northwest Site during the 2022 breeding season with an additional two species noted as foraging only. The breeding bird communities were typical of those found in a golf course environment with wetlands, meadows, anthropogenic areas and scattered trees. Many of the birds were common birds that are frequently found in disturbed rural and urbanized environments. Avian observations were generally distributed throughout the northwest site; however, the heavily manicured areas produced the fewest number of breeding species and territories.

The following species were recorded with more than five separate singing males or territories: Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), Chipping Sparrow (*Spizella passerine*), and American Robin (*Turdus migratorius*). Other species with multiple territories on the subject property included Tree Swallow (*Tachycineta bicolor*), Indigo Bunting (*Passerina cyanea*), Savannah Sparrow (*Passerculus sandwichensis*), Baltimore Oriole (*Icterus galbula*) and House Wren (*Troglodytes aedon*).

The wetland communities and ponds on the subject property supported several species that typically rely on or are closely associated with wetland habitats to fulfill their life cycle. Such species included Common Yellowthroat (*Geothlypis trichas*), Red-winged Black bird, Eastern Kingbird (*Tyrannus tyrannus*), Canada Goose (*Branta canadensis*) and Spotted Sandpiper (*Actitis macularia*). Non-breeding birds were noted foraging over the ponds, including Barn Swallow (*Hirundo rustica*) and Bank Swallow (*Riparia riparia*).

Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) were present on the subject property, both of which are protected under the Endangered Species Act (ESA) as threatened species. These birds occurred in a number of grassland patches within the golf course area. A total of two Bobolink territories were noted and four Eastern Meadowlark territories. Both of these birds are also area-sensitive. Area-sensitive birds are those that require larger tracts of suitable habitat in which to breed or are those that have a higher breeding success in larger areas of suitable habitat. Two such species were recorded in addition to the Bobolink and Eastern Meadowlark. Savannah Sparrows are also considered grassland specialists, and four territories were present. The American Redstart is the final area-sensitive species and is typically associated with wooded areas.

An active Osprey (*Pandion haliaetus*) nest was noted on a hydro pole platform during field investigations on the north side of County Road 19, just east of 2nd Line.

No species considered S1 through S3 (Critically Imperiled through Vulnerable) using the provincial ranks were recorded. All species are either S4 (Apparently Secure) or S5 (Secure).

Herpetofauna

The irrigation ponds on the northwest site were not investigated for use by amphibians or reptiles; however incidental amphibian use (i.e., calling Green Frog [*Lithobates clamitans*]) was noted.

Within the SE site, a total of five frog species and one toad species were recorded during the 2021 nocturnal amphibian call surveys. Species included American Toad (*Anaxyrus americanus*), Green Frog (*Rana clamitans*), Gray Tree Frog (*Hyla versicolor*), Northern Leopard Frog (*Lithobates pipiens*), Spring Peeper (*Pseudacris crucifer*), and Wood Frog (*Lithobates sylvaticus*). No threatened or endangered amphibian species were recorded within the southeast site.

While turtle basking surveys on ponds within the SE site resulted in no turtle observations, it is possible the ponds on the NW site provide habitat.

Incidental Wildlife

A number of incidental wildlife species were recorded during field investigations completed within the SE site. Observed species included White-tailed Deer (*Odocoileus virginianus*) and Grey Squirrel (*Sciurus carolinensis*). Evidence of Coyote (*Canis latrans*) was noted and other species including Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Meadow Vole (*Microtus pennsylvanicus*), and / or Red Fox (*Vulpes vulpes*) are likely to be using the habitat provided by the existing golf course in the NW site.

Terrestrial chimney crayfish (*Fallicambarus fodiens*) chimneys were observed in the areas around the irrigation ponds within the NW Site.

4.3.2 Fisheries and Aquatic Habitat

Irvine Creek is located north of the site, within a wooded valley. Irvine Creek converges with the Grand River approximately 15 km downstream of the northwest site. As per the MNRF Aquatic Resources Area, Irvine Creek has been designated as a coldwater thermal regime, based on the recorded fish species present.

There are four ponds located on the golf course lands of the NW site. The two larger ponds were constructed to provide water storage for golf course irrigation. The ponds are considered off-line storage, as there is no outlet or overflow from the ponds to any surface water features on the NW site. Standing water was present in disconnected drainage areas between the more northern ponds, however, the inlets and outlets of each pond were all dry at the time of the investigation. The smallest pond located most westerly, appeared to have a discontinuous connection to the Irvine Creek valleylands.

Country Road 19 and 2nd Line cross a constructed municipal drain known as Black Drain. Black Drain drains southwest to Irvine Creek approximately 3.5 km downstream of the Country Road 19. The feature is contained within a straight, dug channel with limited riparian buffer. This fish community sampling was completed within the reach of the feature that is contained on the SE site. The sampling yielded no fish; however, downstream conditions may provide fish habitat.

A second small watercourse crossing was noted along Wellington Road 19. This feature appeared to convey drainage (west to east) through agricultural fields to its confluence with the Grand River approximately 1.5 km downstream of the road crossing.

The 2nd Line crosses a small drainage feature approximately 1.6 km southeast of its intersection with Wellington Road 19. This feature appears to convey runoff from an agricultural field west of the road and through an agricultural ditch east of the road until its confluence with the Grand River approximately less than a kilometre downstream of the road crossing.

At the terminus of the Study Area along 2nd Line, lies the Grand River valley. Fisheries and Oceans Canada (DFO) Aquatic Species at Risk mapping indicates that Grand River in this location supports Silver Shiner (*Notropis photogenis*), a federally and provincially endangered minnow species.

4.3.3 Key Natural Heritage Features

Woodlands

Lands north of the NW Site contain significant woodlands associated with the Irvine Creek Valley. At the terminus of the Study Area along 2nd Line, there are significant woodlands associated with the Grand River Valley.

Wetlands

The Living Springs Wetland Complex is north of the NW site, this is a PSW. There are four irrigation ponds which have some wetland marsh associated with their perimeters; these wetlands have no formal designation and would require further study to assess if they are key features.

Significant Wildlife Habitat

The NHIC provides a report of potential Colonial Waterbird Nesting Area in the location north of the golf course. There is also the potential for bat maternity colonies, amphibian breeding habitat, and area-sensitive bird breeding habitat within the woodland / swamp to the north. The presence of terrestrial crayfish may potentially provide SWH for the species within the northwest site.

4.3.4 Endangered of Threatened Species

Eastern Meadowlark and Bobolink, both subject to the ESA, were present on the NW site within the cultural meadow areas of the golf course lands. Breeding bird surveys of the NW site also recorded flyovers of Bank Swallow. While specific wildlife surveys were not conducted, it is possible that threatened grassland avian species may be using any suitable habitat within and adjacent to the Wellington Road 19 right of way.

Bat habitat assessments and acoustic monitoring on the SE parcel revealed the presence of Little Brown Myotis and Northern Myotis, using portions of the woodlands for foraging or flyover habitat. Other wooded areas within the Study Area, including swamp, forest and cultural plantations may support endangered bats.

As noted above, the Grand River in this location provides habitat for Silver Shiner, which is provincially and federally threatened, and regulated under the ESA and *Species at Risk Act*.

No other threatened or endangered species were recorded in the Study Area.

4.4 Socio-Cultural Environment

4.4.1 Archaeological Resources

4.4.2 Registered Sites

Currently no archaeological sites are registered within 1 km of the Study Area. The closest registered archaeological site, AkHb-1, is located approximately 3.7 km east of the Study Area. According to the Ontario Archaeological Site Database (OASD) this site consists of a collection of artifacts reported in 1969. The artifacts include 53 projectile points, 28 implement fragments (assumed to be biface fragments), six chert knives, four ground stone axes, one quartzite knife, one iron axe, one gorget, and one hammerstone. The description from the site record form suggests the tools were informally collected from local fields and does not suggest they were recovered through controlled survey. No report is associated with this site in the OASD. Regardless, the presence of these artifacts in the local area speaks to its use by pre-contact Indigenous peoples. The iron axe in the collection could be indicative of Indigenous trade with Europeans, or it could be an isolated find associated with Euro-Canadian settlement.

4.4.3 Stage 1-2 Archaeological Assessment

A review of previous archaeological assessments undertaken within the limits of the Study Area or within 50 m of the Study Area was completed. The review determined that no archaeological assessments have previously been undertaken within 50 m of the Study Area.

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In 2021, Golder Associates Ltd., a member of WSP, conducted a Stage 1 Archaeological Assessment for the Fergus Golf Club property, which included the current Study Area. This Stage 1 Archaeological Assessment included a property inspection and concluded that the current use of the Study Area as a golf course indicates the property has been subjected to some level of subsurface disturbance, though it is not possible through visual assessment to determine to what extent the development of the golf course impacted subsurface cultural remains that may be present.

As a result, Stage 2 Archaeological Assessment was recommended for the Study Area, including test pit survey at 10 m intervals for portions of the Study Area identified during the Stage 1 property inspection as likely disturbed due to the construction of the golf courses, but the level of disturbance was not able to be visually confirmed, and test pit survey at 5 m intervals for portions of the Study Area that appeared relatively undisturbed. A copy of the Stage 1 Archaeological Assessment Report is provided in Appendix D.

A Stage 2 Archaeological Assessment was conducted over the course of 33 days between April 25, 2022, and December 8, 2022, under archaeological consulting license P457, issued to Lafe Meicenheimer by the Ministry of Citizenship and Multiculturalism (MCM) (PIF# P457-0129-2022). The Stage 2 Archaeological Assessment followed the recommendations of the previous Stage 1 Archaeological Assessment and consisted of test pit survey at 5 m and 10 m intervals.

Test pit survey was conducted in both the SE Site and NW Site portions of the Study Area, which resulted in the identification of two archaeological locations in the SE Site portion of the Study Area (Locations 1 and 2). Despite intensified survey at each location, no additional archaeological material was recovered.

Given the isolated and non-diagnostic nature of the finds, Locations 1 and 2 are concluded to have no further cultural heritage value or interest as the sites do not meet the criteria identified in Section 2.2, Standard 1a of the Standards and Guidelines for Consultant Archaeologists (Government of Ontario 2011) for determining the need for Stage 3 site-specific assessment. A copy of the Stage 2 Archaeological Assessment Report is provided in Appendix E.

4.4.4 Cultural Heritage Resources

A Cultural Heritage Report was undertaken by WSP Canada Inc. on behalf of Fergus Development Inc. Field investigations were conducted on August 10, 2023, and included recording a photographing properties and roadscares within and adjacent to the Study Area from vantage points within the project Study Area as well as from public rights-of-way. A copy of the Cultural Heritage Report can be found in Appendix F.

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During the review potential Built Heritage Resources (BHRs) and Cultural Heritage Landscapes (CHLs) were identified by employing a high-level and cursory evaluation based on an understanding of the criteria identified in the MCM's *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes*.

The background research determined that the cultural heritage Study Area consists of lands shaped by agricultural and residential development and railway expansion dating from the mid-to-late 19th century, the abandonment of the railway in the mid-20th century to allow for the construction of the Shand Dam and subsequent creation of Belwood Lake, and the introduction of recreational land uses in the late 20th and early 21st century.

A total of one BHR and seven CHLs were identified within or adjacent to the Study Area. Two CHLs are non-designated property listed on the Township of Centre Wellington Heritage Register, two CHLs were identified as significant landscapes in the *Cultural Heritage Landscape Study & Inventory for the Township of Centre Wellington – Volume 3* (ASI et al. 2021), and the remaining CHLs and BHR were identified during field review.

The identified BHRs and CHLs primarily represent mid-to-late 19th century agricultural farmsteads, a former railway corridor, and remnants of the Belwood Historical Village Core. Following an assessment of potential impacts resulting from the project, it was determined that there will be potential direct impacts to one BHR identified as BHR-1 (282 Wellington Road 19). Due to the potential for direct impacts to the BHRs and CHLs the report makes the following recommendations:

1. A Heritage Impact Assessment (HIA) must be completed for BHR-1 (8282 Wellington Road 19). The HIA must contain a full heritage evaluation of 8282 Wellington Road 19 against the criteria contained in Ontario Regulation (O.Reg.) 9/06 of the *Ontario Heritage Act*. If the property is found to have cultural heritage value or interest (CHVI) then a description of the property, statement of CHVI, and a list of heritage attributes should be prepared. A property-specific impact assessment must also be completed. The HIA must be undertaken by a qualified person(s) at the onset of the detail design phase of the project and submitted to MCM for review and comment.
2. Design the Project to avoid direct and indirect impacts to the CHLs.
3. In contract documentation for the Project, direct the contractor to avoid and protect the identified BHR and CHLs.
4. Plan and locate storage and construction staging areas to avoid impacts to the identified BHR and CHLs.

5. Should the study area be expanded, retain a qualified heritage consultant to identify the impacts of the proposed new work on known or potential BHRs and CHLs and recommend appropriate mitigation or conservation measures.

4.4.5 Heritage Impact Assessment

A Heritage Impact Assessment was completed for 8282 Wellington Road 19 by undertaken by WSP Canada Inc. on behalf of Fergus Development Inc. A field investigation was completed on December 6, 2023, to confirm existing conditions and identify heritage attributes, if present, and included photographic documentation. A copy of the Heritage Impact Assessment can be found in Appendix F.

The assessment collected information through data collection requests to the Township of Centre Wellington, Ontario Heritage Trust, Ministry of Citizenship and Multiculturalism, and the Wellington County Museum and Archives.

The Study Area was evaluated using O.Reg. 9/06 of the Ontario Heritage Act to determine if it has Cultural Heritage Value. The report concluded that the Study Area does not have cultural heritage value or interest (CHVI). In addition, the report determined no direct or indirect impacts are anticipated to the adjacent listed heritage property at 6670 Second Line as the proposed work is located approximately 565 metres from the historical structure on the property.

The Heritage Impact Assessment made the following recommendations:

6. No further cultural heritage work is required for the Study Area
7. The HIA must be submitted to heritage planning staff and the Township of Centre Wellington

4.4.6 Indigenous Treaties, Rights and Land Claims

Existing Aboriginal and Treaty Rights are recognized and affirmed by Section 35 of the Constitution Act, 1982. Aboriginal Rights are associated with practices, customs or traditions that are integral to the distinctive culture of the Indigenous community claiming the right. Treaty Rights are those specified in historic treaties signed between Indigenous people and the Crown.

There are several Indigenous communities that may have constitutionally protected Aboriginal or Treaty Rights associated with the Study Area, or a portion of it, including:

- Mississaugas of the Credit First Nation (MCFN)
- Huron Wendat Nation (HWN)
- Six Nations of the Grand River (SNGR)

- Haudenosaunee Confederacy Chiefs Council [represented by the Haudenosaunee Development Institute (HDI)]

The above communities were identified by the Ministry of Environment, Conservation and Parks.

The Study Area is within several treaty areas. Treaty information between the Crown and Indigenous communities in this area is documented in the Stage 2 and Stage 1 Archeological Assessments which are provided in Appendix D and Appendix E respectively. Portions of those descriptions are copied below from the Stage 1 and 2 Archaeological Assessments.

Albany Deed/Nanfan Treaty (1701)

The Study Area is within the area of the Albany Deed of 1701, also known as the Nanfan Treaty.

The Six Nations of Grand River List of Treaties, Proclamations, Instructions and Public Notices notes that the Nanfan treaty is a “Deed from the Five Nations to the King on their Beaver Hunting Ground formally placing them under the protection of Britain. (800 mi. X 400 mi. under protection of British Crown) Iroq. Ind.: A Doc. Hist., Reel 6”.

The Albany Deed of 1701 was signed by John Nanfan, the Lieutenant Governor of New York (the Governor, the Earl of Bellmont having died), and by Robert Livingston, Secretary for Indian Affairs and other officials on behalf of the British. All Five Nations of the Iroquois Confederacy, including the Oneidas, were parties and approximately twenty sachims (chiefs) affixed their signs and seals.

The Albany Deed describes the lands which are "in length about eight hundred miles in breadth four hundred miles," spanning the Great Lakes and into the Ohio River Valley, grants title of the lands to the British Crown describes its importance for hunting and reserves the right of the Six Nations to hunt on the lands.

Haldimand Proclamation (1784)

The Study Area is within the area referenced in the Haldimand Proclamation of 1784, six miles on either side of the Grand River. A brief history of the Proclamation follows.

In 1701, representatives of several groups within the Anishinaabeg and the Haudenosaunee, collectively known as the First Nations, assembled in Montreal to participate in the Great Peace negotiations, sponsored by the French (Johnston 2004, p.10; Trigger 2004, p. h8). The Mississaugas were granted possession of the territory along and extending northward of Lake Ontario and Lake Erie (Hathaway 1930, p.433). From 1701 to the fall of New France in 1759, the Anishinaabeg experiences a “golden age” of trade, holding no conclusive alliance with either the British or the French while

maintaining their middle-man position between Indigenous groups to the north and in southwestern Ontario (Schmalz 1991, p.35). Mississauga subsistence patterns include a primary focus on hunting, fishing and gathering with little emphasis on agriculture (McMillian and Yellowhorn 2004, p.11). Temporary and moveable house structures were utilized which were easy to construct and disassemble, allowing swift travel throughout their territory (McMillian and Yellowhorn 2004, p.111). Consequently, little archaeological material was left behind.

During the American Revolution, the Haudenosaunee was divided in their support of the British and their support of the Americans. The Mohawk, Onondaga, Cayuga and Seneca supported the British and many fled from their territorial homelands south of Lake Ontario to the Niagara Peninsula and remained there until the Treaty of Paris was signed in 1784 (Tooker 1978, p.435). However, the Treaty made no provisions for the Indigenous, and “consequently, the [divided Iroquois] has to treat each government separately. This meant that as individuals the [Haudenosaunee] had to decide where they should go live and with which country they wished to enter into a treaty agreement with” (Tooker 1978, p.435). Fort Niagara remained in the control of the British, under the command of John Butler from 1777 to 1784. The Haudenosaunee who had sought refuge at Fort Niagara places enormous strain on the fort’s resources and these individuals were ultimately relocated to the Grand River Valley (Surtees 1994, pp.97-101).

On October 2, 1784, Sir Frederick Haldimand, Governor of the Province of Quebec signed a decree that granted a tract of land to the Haudenosaunee in compensation for their alliance with the British forces. The Haldimand Proclamation of 1784 granted to Six Nations and their descendants six miles on either side of the Grand River from its source to Lake Erie, known as the Haldimand Tract, or Haldimand Grant. Since the signing, the British and the Haudenosaunee disagreed about the meaning of the Haldimand Grant and the meaning of the Haldimand Grant, and negotiations between the Haudenosaunee and Canada about title to the Haldimand Tract are on-going.

Treaty Number 19 - The “Ajetance Purchase (1818)

The Study Area is within lands that first enter the historical Euro-Canadian record as part of Treaty Number 19, or the “Ajetance Purchase”, between Anishinaabe peoples and the Crown in 1818:

“[Treaty 19] was made by the Honourable William Claus, Deput-Superintendent-General of Indian Affairs on behalf of His Majesty, and the Principal Men of the Mississauga Nation of Indians, inhabiting the River Credit, Twelve and Sixteen Mile Creeks on the north shore of Lake Ontario, within the Home District, whereas the said Indians were to receive 522 pounds and ten shillings, yearly for the said tract, described as follows: ‘A tract of land in the Home District called the Mississauga Tract, bounded southerly by the purchase made in 1806; on the east by the Townships of Etobicoke, Vaughn and King;

on the south west by the Indian Purchase, extending from the outlet of Burlington Bay, north forty-five degrees west, fifty miles; and from thence north seventy-four degrees east or thereabouts, to.”

4.5 Preliminary Environmental Noise Report

A Preliminary Environmental Noise Report has been undertaken by Jade Acoustics on behalf of Fergus Development Inc. Jade Acoustics used the road traffic data obtained from the County of Wellington and the traffic consultant (BA Group) to determine the sound levels for various locations within the proposed residential redevelopment. The environmental noise guidelines of the community of Fergus, Township of Centre Wellington, County of Wellington, and the Ministry of Environment, Conservation and Parks set out the sound levels limits for indoor and outdoor spaces. Sounds levels due to adjacent roads were determined using the Ministry of Environment, Conservation and Parks’ noise prediction model (ORNAMENT).

An acoustic report will be provided for the treatment area during the detailed design phase, once the specific pumps and equipment are known.

5.0 Alternative Solutions

Phase 2 of the MCEA process requires that a proponent identify and evaluate alternative solutions to the Project Opportunity Statement, assessing the impact of the solutions on the general condition of the natural, social / cultural and economic environment including possible mitigating measures. At the conclusion of Phase 2, the appropriate MCEA planning Schedule is confirmed. It is also in this phase that the first mandatory consultation with review agencies and the public is initiated. Details of the consultation activities for this project are provided in Section 11.0.

5.1 Identification of Alternative Solutions

5.1.1 Alternative Solutions for Water Servicing

The following alternative solutions for water servicing were identified to address the Project Opportunity Statement:

- Alternative 1 – Do Nothing
- Alternative 2 – Connect to an Existing Municipal Water Supply System
- Alternative 3 – New Onsite Communal Water Supply and Treatment System

5.1.1.1 Alternative 1 – Do Nothing

Alternative 1 – Do Nothing is a mandatory consideration within the MCEA process and serves as a reference point for comparing other alternative solutions. It would involve no improvements or changes to address the Project Opportunity Statement.

5.1.1.2 Alternative 2 – Connect to an Existing Municipal Water Supply System

Alternative 2 is illustrated in Figure 5-1 and would involve the following:

- Installation of a new watermain from the existing water distribution system in Fergus along Wellington Road 19 to the development site.
- Installation of a reservoir, booster pumping station, re-chlorination and backup power on the NW Site.

5.1.1.3 Alternative 3 – New Onsite Communal Water Supply and Treatment System

Alternative 3 is illustrated in Figure 5-2 and would involve the following:

- Commissioning of new onsite wells.
- Installation of raw water supply main.
- Installation of a new onsite water treatment plant (WTP), reservoir and backup power.
- Connection to a water distribution system on the SE Site via feedermain from WTP.

Figure 5-1: Alternative Solution 2 – Water Servicing

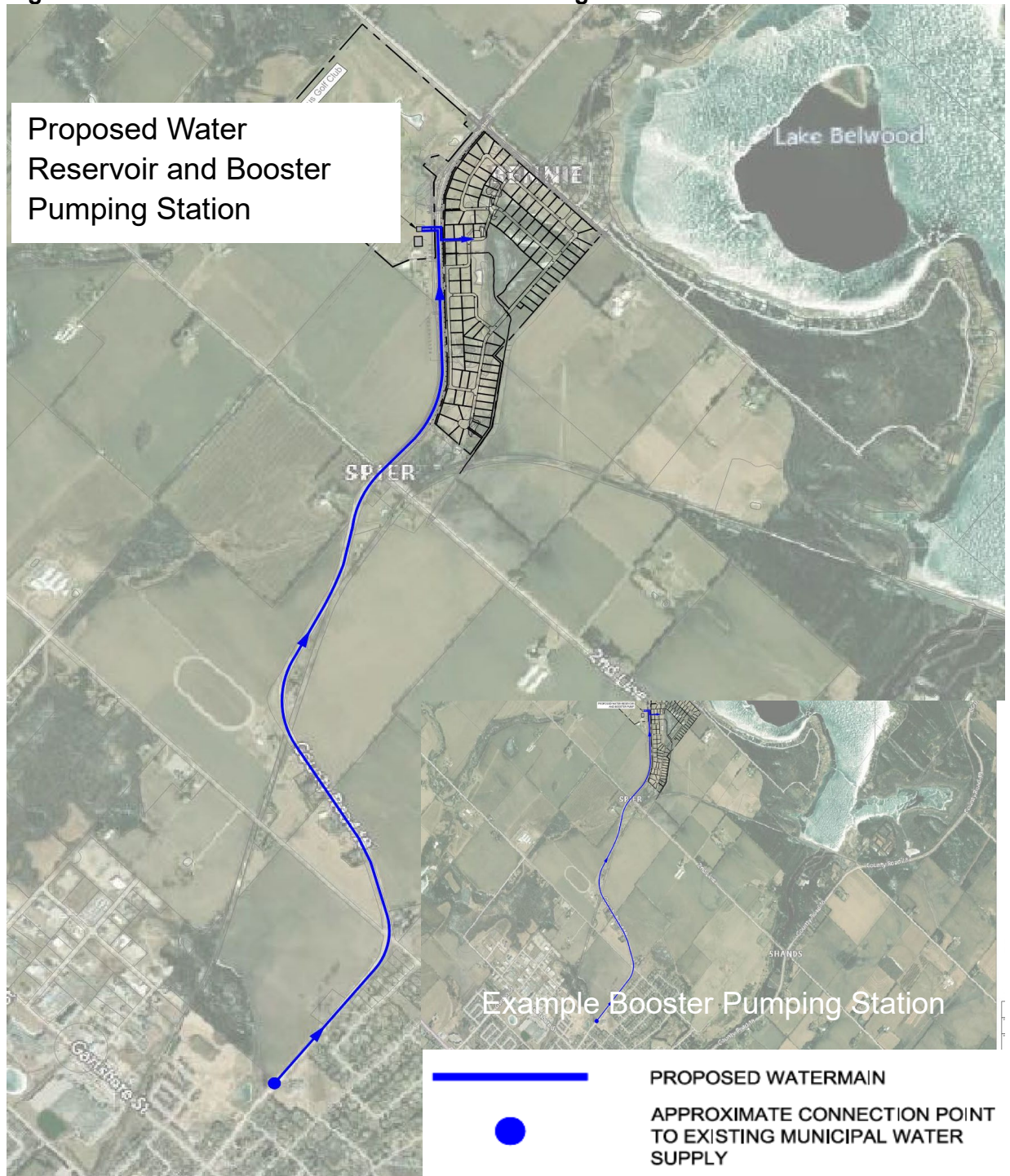


Figure 5-2: Alternative Solution 3 – Water Servicing



5.1.2 Alternative Solutions for Wastewater Servicing

The following alternative solutions for wastewater servicing were identified to address the Project Opportunity Statement:

- Alternative 1 – Do Nothing
- Alternative 2 – Connect to an Existing Municipal Wastewater System
- Alternative 3 – New Onsite Communal Wastewater Treatment Plant and Subsurface Discharge
- Alternative 4 – New Onsite Communal Wastewater Treatment Plant and Discharge Treated Sewage Effluent to a surface receiving waterbody
- Alternative 5 – New Onsite Communal Wastewater Treatment Plant and Discharge to Existing Irrigation Ponds followed by Beneficial Reuse for Golf Course Irrigation

5.1.2.1 Alternative 1 – Do Nothing

Alternative 1 – Do Nothing is a mandatory consideration within the MCEA process and serves as a reference point for comparing other alternative solutions. It would involve no improvements or changes to address the Project Opportunity Statement.

5.1.2.2 Alternative 2 – Connect to an Existing Municipal Wastewater System

Alternative 2 is illustrated in Figure 5-3 and would involve the following:

- Conveyance of untreated wastewater via sewage pumping station.
- Installation of a new forcemain from development within Wellington Road 19 right-of-way (ROW) and within local road ROWs to the existing wastewater treatment plant (WWTP) in Fergus.

5.1.2.3 Alternative 3 – New Onsite Communal Wastewater Treatment Plant and Subsurface Discharge

Alternative 3 is illustrated in Figure 5-4 and would involve the following:

- Treatment of wastewater onsite
- Discharge of treated effluent to dispersal beds located within the NW Site
- No off-site works

5.1.2.4 Alternative 4 – New Onsite Communal Wastewater Treatment Plant and Discharge Treated Sewage Effluent to a surface receiving waterbody

Alternative 4 is illustrated in Figure 5-5 and would involve the following:

- Treatment of wastewater onsite.
- Conveyance of treated effluent by piping within existing municipal ROWs (Wellington County Rd 19, 2nd Line) to discharge outfall.

- Discharge outfall location is Grand River.

5.1.2.5 Alternative 5 – New Onsite Communal Wastewater Treatment Plant and Discharge to Existing Irrigation Ponds followed by Beneficial Reuse for Golf Course Irrigation

Alternative 5 is illustrated in Figure 5-6 and would involve the following:

- Treatment of wastewater onsite.
- Discharge of treated effluent to existing irrigation ponds within the NW Site.
- No off-site works.

Figure 5-3: Alternative Solution 2 – Wastewater Servicing

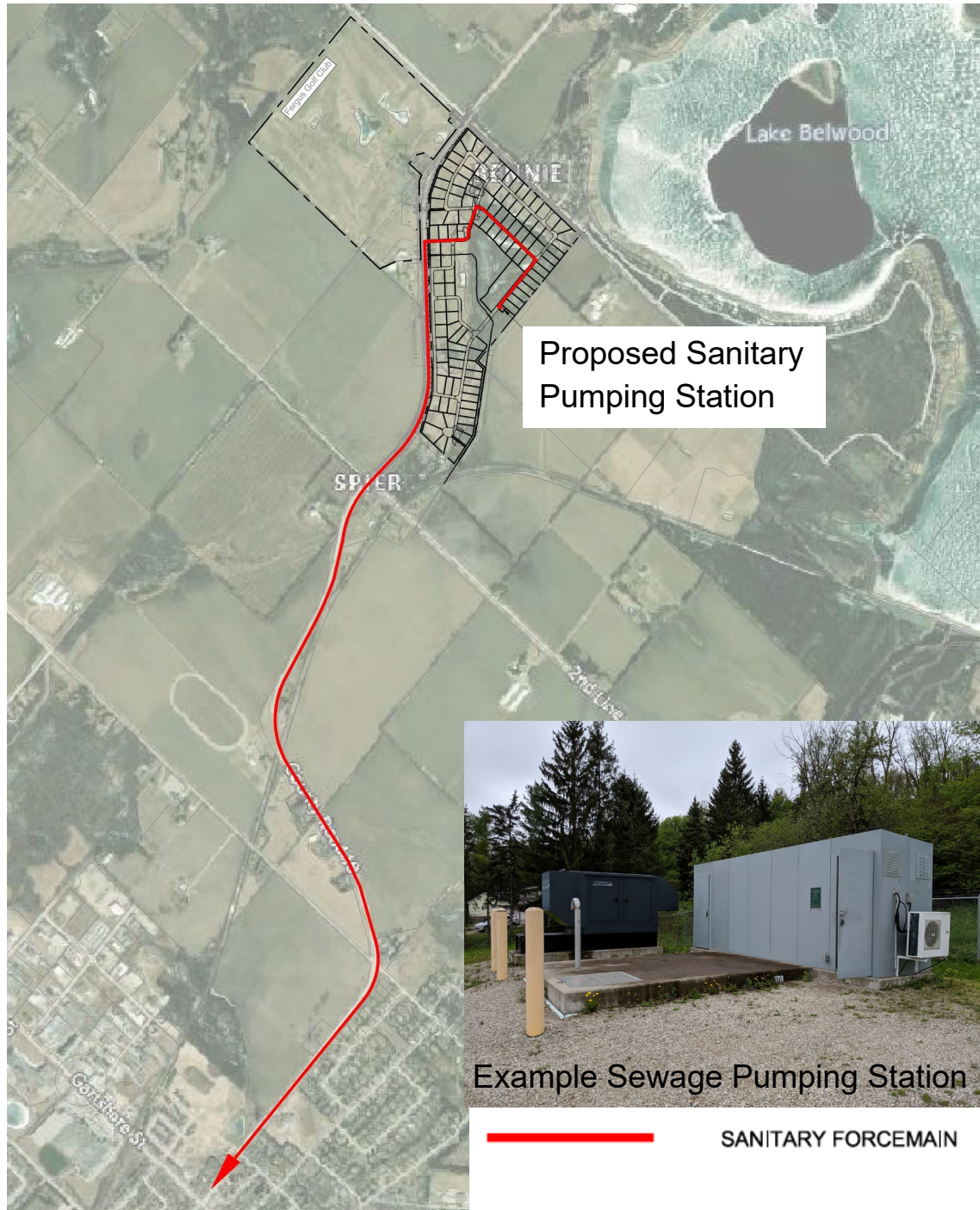


Figure 5-4: Alternative Solution 3 – Wastewater Servicing

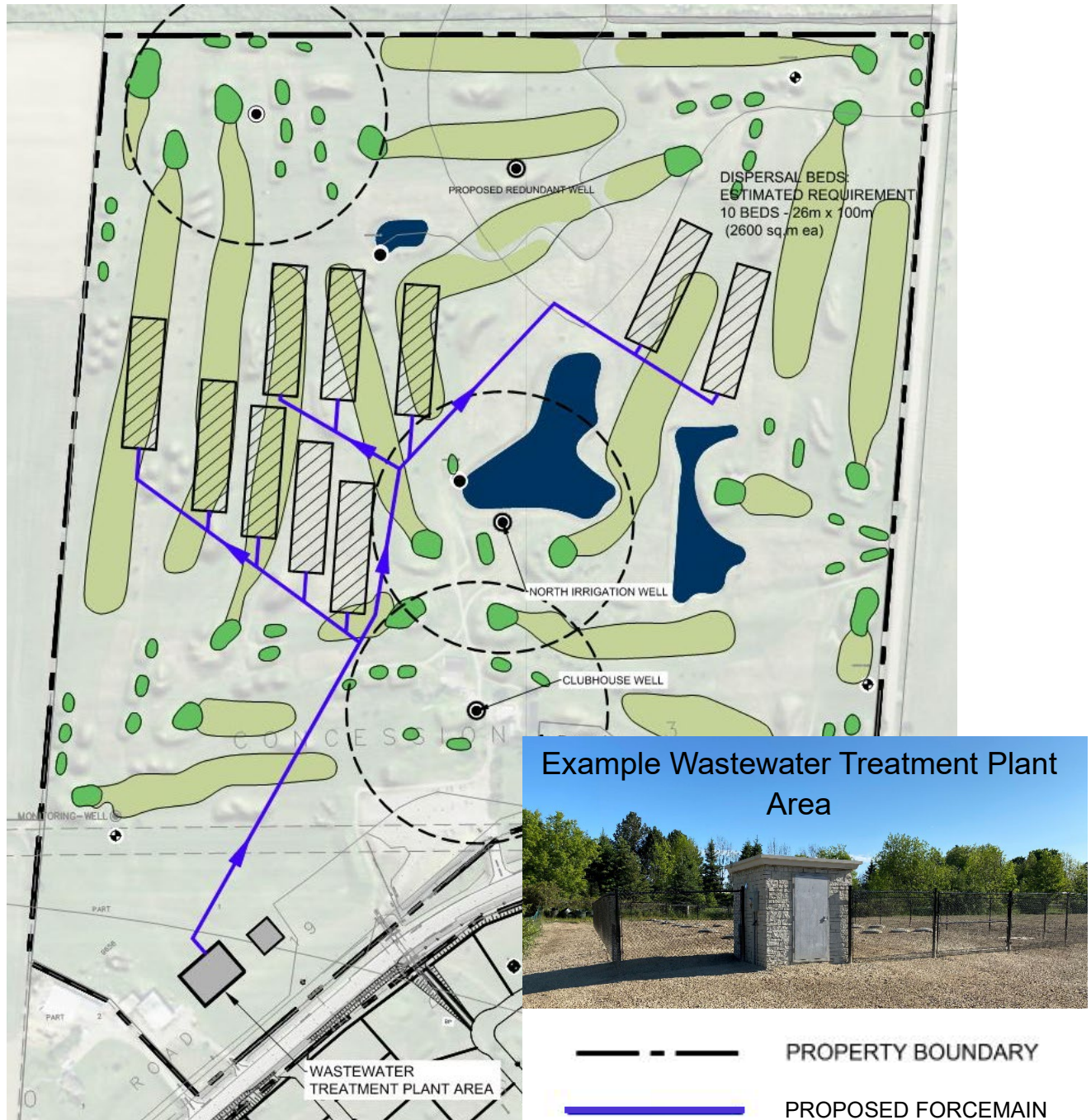


Figure 5-5: Alternative Solution 4 – Wastewater Servicing

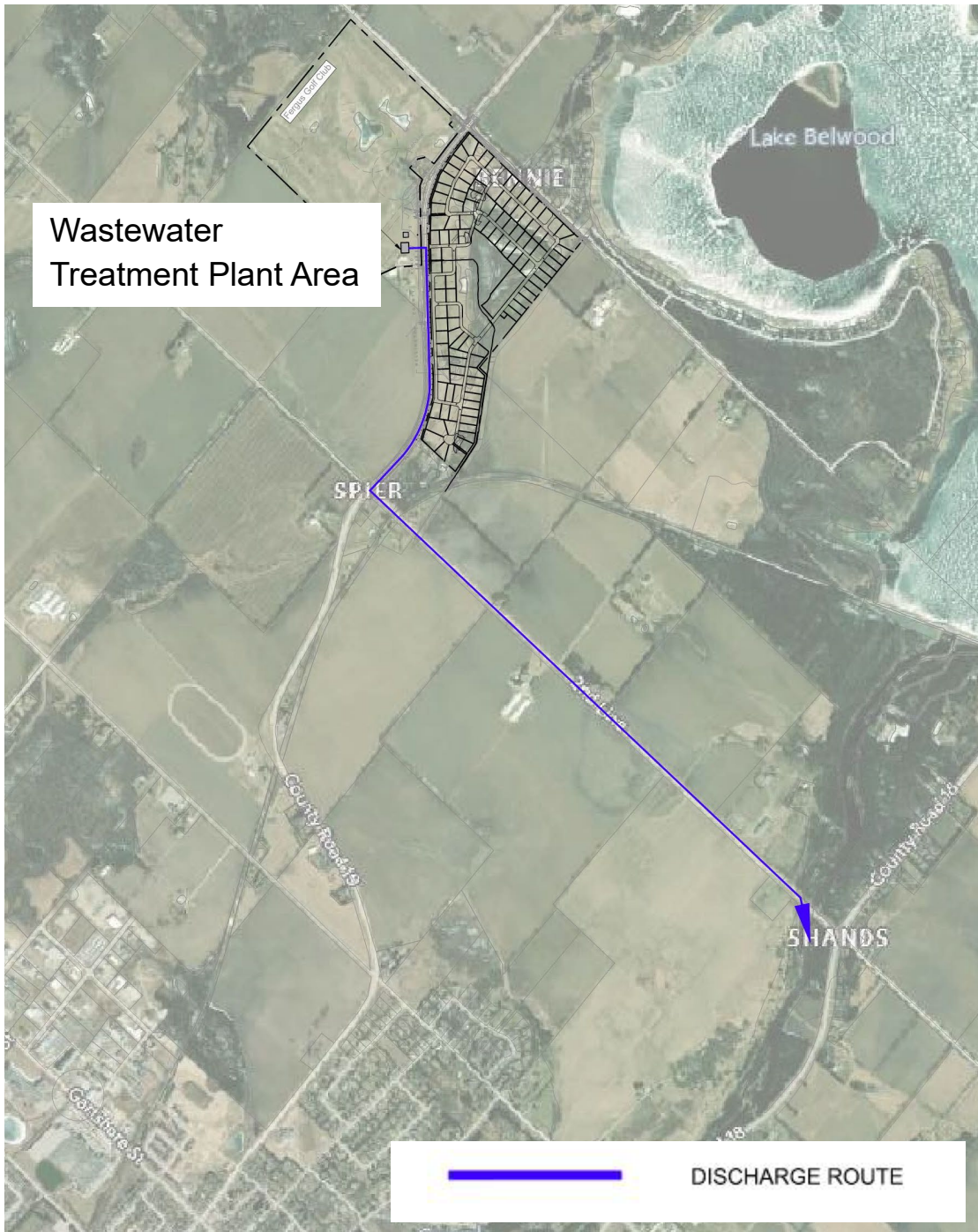


Figure 5-6: Alternative Solution 5 – Wastewater Servicing



-  PROPERTY BOUNDARY
-  PROPOSED FORCEMAIN

5.2 Evaluation of Alternative Solutions

5.2.1 Evaluation Criteria

The overall objective of the evaluation was to identify a Preferred Solution among the alternatives identified for both water and wastewater servicing that would provide the most favorable solution to the Project Opportunity Statement.

To this end, a set of Evaluation Criteria were grouped under four key areas established as part of the MCEA process to comparatively evaluate the Alternative Solutions identified above. The Evaluation Criteria for water and wastewater servicing were as follows:

Water Servicing Evaluation Criteria

Natural Environment

- Impacts to Designated Site / Species
- Impacts to Surface Water Quality
- Impacts to Groundwater Quality and Quantity
- Impacts to Hazard Lands
- Impacts to Vegetation and Terrestrial Habitat
- Impacts to Aquatic Habitat
- Source Water Protection

Socio-Cultural Environment

- Compatibility with Official Plan and Provincial Growth Plans
- Heritage Resources (archaeological features, built heritage, and cultural landscapes)
- Noise impacts
- Nuisance impacts
- Impact to existing private wells

Technical Environment

- Ability to service proposed development
- Approvals / permitting requirements
- Site considerations and construction requirements
- Operation and maintenance requirements and complexity
- Conformity with applicable guidelines and standards

Financial

- Capital costs
- Operation and Maintenance costs

Wastewater Servicing Evaluation Criteria

Natural Environment

- Impacts to Designated Site / Species
- Impacts to Surface Water Quality
- Impacts to Groundwater Quality and Quantity
- Impacts to Hazard Lands
- Impacts to Vegetation and Terrestrial Habitat
- Impacts to Aquatic Habitat
- Source Water Protection

Socio-Cultural Environment

- Compatibility with Official Plan and Provincial Growth Plans
- Heritage Resources (archaeological features, built heritage, and cultural landscapes)
- Noise impacts
- Nuisance impacts

Technical Environment

- Ability to service proposed development
- Approvals / permitting requirements
- Construction complexity
- Operation and maintenance requirements and complexity
- Conformity with applicable guidelines and standards

Financial

- Capital costs
- Operation and Maintenance costs

5.2.2 Evaluation of Alternative Solutions for Water Servicing

The evaluation of the Alternative Solutions for water servicing was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during the MCEA process. Table 5.1 provides a summary of the evaluation of Alternative Solutions for water servicing. A detailed evaluation matrix is provided in Appendix G.

5.2.3 Evaluation of Alternative Solutions for Wastewater Servicing

The evaluation of the Alternative Solutions for wastewater servicing was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during the MCEA process. Table 5.2 provides a summary of the

evaluation of Alternative Solutions for wastewater servicing. A detailed evaluation matrix is provided in Appendix G.

5.2.4 Preferred Solutions and Confirmation of Class EA Project Schedule

The preferred solution for water servicing is a New Onsite Communal Water Supply and Treatment System and the preferred solution for wastewater servicing is a New Onsite Communal Wastewater Treatment Plant and Discharge to Existing Irrigation Ponds followed by Beneficial Reuse for Golf Course Irrigation.

Based on the preferred solutions, the proposed water and wastewater servicing are identified as a Schedule C Water and Wastewater Project under Appendix 1 – Table B of the 2023 Municipal Class EA Document. Specifically, the proposed water servicing meets the definitions of water projects #10a and 15c:

- Project 10a: Construct new water system including a new well.
- Project 15c: Construction new water treatment plant or expand existing water treatment plant beyond existing rated capacity.

The proposed wastewater servicing most closely aligns with the definition of wastewater project #36:

- Project 36: Provide for land application of sewage effluent through spray irrigation system or overland flow.

Table 5.1: Evaluation of Alternative Solutions for Water Servicing

Criteria	1: Do Nothing	2: Connect to Existing Municipal Water Supply System	3: New Onsite Communal Water Supply System
Natural Environment	No impact over existing conditions.	Higher impact due to length of watermain / impact footprint.	Lower impact associated with Water Treatment Plant (WTP) footprint.
<i>Ranking</i>	<i>Most Preferred</i>	<i>Least Preferred</i>	<i>Less Preferred</i>
Socio-Cultural Environment	Not consistent with Official Plan (OP). Does not contribute to housing per Bill 23. Continuation of golf course operations on SE Site may have potential impacts to shallow groundwater.	Consistent with OP. Contributes to housing per Bill 23. Potential for impact to archaeological resources. Construction noise and traffic impacts greater due to length of watermain.	Compatible with OP. Contributes to housing per Bill 23. No known archaeological impacts. Noise from onsite WWTP operation can be mitigated. No traffic impacts anticipated. Visual impacts can be screened.
<i>Ranking</i>	<i>Less Preferred</i>	<i>Least Preferred</i>	<i>Most Preferred</i>
Technical Criteria	No services to lands designated for development. No construction or operations and maintenance (O&M) requirements. Does not necessarily mean that no further development in the community would occur.	Requires an increase in water taking from existing municipal water supply – capacity to be confirmed. Requires approvals. Moderate complexity in O&M.	Can adequately service development. Requires approvals. Moderate complexity in O&M.
<i>Ranking</i>	<i>Least Preferred</i>	<i>Less Preferred</i>	<i>Most Preferred</i>
Financial Criteria	No capital or O&M costs.	Capital Costs ~ \$10M (Developer responsibility). Moderate O&M costs (Developer responsibility). Capital costs for upgrades to existing water supply system unknown (Developer responsibility).	Capital Costs ~ \$10M (Developer responsibility). Moderate O&M costs (Developer responsibility).
<i>Ranking</i>	<i>Most Preferred</i>	<i>Least Preferred</i>	<i>Less Preferred</i>
Overall Ranking	<i>Less Preferred</i>	<i>Least Preferred</i>	<i>Most Preferred</i>
Meets Project Opportunity (PO) Statement	No. Does not meet Project Opportunity Statement. Not a viable alternative.	Yes. Meets Project Opportunity Statement.	Yes. Meets Project Opportunity Statement.
Recommendation	Not Carried Forward	Not Carried Forward	Carried Forward

Evaluation Order of Preference

Least → Less → Most

Table 5.2: Evaluation of Alternative Solutions for Wastewater Servicing

Criteria	1: Do Nothing	2: Connect to Existing Municipal Wastewater System	3: New Onsite Wastewater System with Subsurface Discharge	4: New Onsite Wastewater System with Discharge to Waterbody	5: New Onsite Wastewater System with Discharge to Irrigation Pond
Natural Environment	No impact over existing conditions.	Higher impact due to length of forcemain / impact footprint.	Moderate impact associated with dispersal beds footprint.	Higher impact due to discharge within Grand River floodplain.	Lower impact associated with only onsite discharge piping to the pond.
<i>Ranking</i>	<i>Most Preferred</i>	<i>Least Preferred</i>	<i>Somewhat Preferred</i>	<i>Least Preferred</i>	<i>More Preferred</i>
Socio-Cultural Environment	Not consistent with Official Plan (OP). Does not contribute to housing per Bill 23.	Consistent with OP. Contributes to housing per Bill 23. Potential for impact to archaeological resources. Construction noise and traffic impacts greater due to work in urban area.	Consistent with OP. Contributes to housing per Bill 23. Potential for archaeological resources in dispersal bed areas. Noise from onsite WWTP operation can be mitigated. No traffic impacts anticipated. Visual impacts can be screened.	Consistent with OP. Contributes to housing per Bill 23. Potential for archaeological resources along discharge route and outfall. Noise associated discharge route construction. Noise from onsite WWTP operation can be mitigated. Traffic impacts associated with discharge route. Visual impacts can be screened.	Consistent with OP. Contributes to housing per Bill 23. No known archaeological impacts. Noise from onsite WWTP operation can be mitigated. No traffic impacts anticipated. Visual impacts can be screened.
<i>Ranking</i>	<i>Somewhat Preferred</i>	<i>Least Preferred</i>	<i>Somewhat Preferred</i>	<i>Less Preferred</i>	<i>Most Preferred</i>
Technical Criteria	No services to lands designated for development. No construction or O&M requirements. Does not necessarily mean that no further development in the community would occur.	Insufficient treatment capacity at existing WWTP to accommodate development. Would require upgrades to existing WWTP. Requires long forcemain. Less O&M.	Can adequately service development. Requires approvals.	Can adequately service development. Requires more complex approvals due to outfall. More complex equipment compared to Alternatives 3 and 5. More operator attention.	Can adequately service development. Requires approvals.
<i>Ranking</i>	<i>Least Preferred</i>	<i>Less Preferred</i>	<i>More Preferred</i>	<i>Somewhat Preferred</i>	<i>Most Preferred</i>
Financial Criteria	No capital or O&M costs.	Capital Cost for forcemain ~ \$5M (Developer responsibility). Capital costs for existing WWTP upgrades unknown. Lowest O&M costs (Developer responsibility).	Capital Costs ~ \$5M (Developer responsibility). Moderate O&M costs (Developer responsibility).	Capital Costs ~ \$7.5M (Developer responsibility). Highest O&M costs (Developer responsibility).	Capital Costs ~ \$2.5M (Developer responsibility). Additional O&M costs associated with management of irrigation of effluent (Developer responsibility).
<i>Ranking</i>	<i>Most Preferred</i>	<i>Somewhat Preferred</i>	<i>Less Preferred</i>	<i>Least Preferred</i>	<i>Somewhat Preferred</i>
Overall Ranking	<i>More Preferred</i>	<i>Less Preferred</i>	<i>Somewhat Preferred</i>	<i>Least Preferred</i>	<i>Most Preferred</i>
Meets PO Statement	No. Does not meet Project Opportunity Statement. Not a viable alternative.	Yes. Meets Project Opportunity Statement.	Yes. Meets Project Opportunity Statement.	Yes. Meets Project Opportunity Statement.	Yes. Meets Project Opportunity Statement.
Recommendation	Not Carried Forward	Not Carried Forward	Not Carried Forward	Not Carried Forward	Carried Forward

Evaluation Order of Preference

Least → Less → Somewhat → More → Most

6.0 Alternative Design Concepts

Phase 3 of the MCEA process requires that a proponent identify and evaluate alternative design concepts for the preferred solution, assessing the impact of the alternative design concepts on the general condition of the natural, social / cultural and economic environment including possible mitigating measures. The identification of alternative design concepts for water and wastewater servicing focused on treatment technologies.

6.1 Identification of Alternative Design Concepts

6.1.1 Alternative Design Concepts for Water Servicing

The following alternative design concepts for water servicing were identified for the preferred solution:

Primary Disinfection Treatment

- Alternative 1a – Ultraviolet Primary Disinfection
- Alternative 1b – Chlorine Primary Disinfection

Aesthetic Treatment for Hardness

- Alternative 2a – Ion Exchange
- Alternative 2b – Softening Membranes
- Alternative 2c – Crystallization Technology

Water Storage

- Alternative 3a – Above Ground
- Alternative 3b – Below Ground

6.1.1.1 Alternative 1a Ultraviolet Primary Disinfection

Alternative 1a uses ultraviolet light to inactivate pathogens in the water i.e., Cryptosporidium and Giardia. Cryptosporidium and Giardia have not been detected in the groundwater source. This alternative has minimal to no impact to taste and odour of the water and is effective as part of a multi-barrier approach when providing chlorination as a second form of primary disinfection treatment.

6.1.1.2 Alternative 1b Chlorine Primary Disinfection

Alternative 1b uses chlorine to inactivate pathogens in the water i.e., bacteria and viruses. Chlorine is ineffective against Cryptosporidium. This treatment technology results in potential odour and taste in treated water.

6.1.1.3 Alternative 2a Ion Exchange

Alternative 2a uses a salt-based water softener to replace calcium and magnesium with sodium in the water. The treatment process produces a salt (sodium) wastewater product that requires removal.

6.1.1.4 Alternative 2b Softening Membranes

Alternative 2b uses differential pressure to remove calcium and magnesium using semi-permeable membranes for the water distribution system. The treatment process produces a wastewater stream containing a concentrated solution of calcium and magnesium ions without any chemical additions and would be recombined with softened water at the wastewater treatment plant.

6.1.1.5 Alternative 2c Crystallization Technology

Alternative 2c is typically used as a decentralized system in households for reducing water hardness. This alternative uses crystallization technology to change the state of minerals from ionic to crystal form. The crystals stay suspended in water as they flow through the system in crystalline form.

6.1.1.6 Alternative 3a Above Ground

Alternative 3a stores treated water in a standpipe. This option maintains gravity pressure in the system. Safety and security measures would be implemented to prevent unauthorized access and vandalism.

6.1.1.7 Alternative 3b Below Ground

Alternative 3b stores treated water in an inground reservoir. Safety and security measures would be implemented to prevent unauthorized access and vandalism.

6.1.2 Alternative Design Concepts for Wastewater Servicing

The following alternative design concepts for wastewater servicing were identified for the preferred solution:

- Membrane Bioreactor (MBR)
- Sequencing Batch Reactor (SBR)
- Aerobic Foam Media Trickling Filter
- Moving Bed Biofilm Reactor (MBBR)

For all alternatives, the treated effluent is filtered and disinfected.

6.1.2.1 Alternative 1 – Membrane Bioreactor (MBR)

Alternative 1 is a Membrane Bioreactor (MBR), which is based on conventional activated sludge technology that relies on both biological aeration processes as well as physical filtration through a microfiltration membrane. The membrane acts as a very fine filter that precludes the need for a secondary clarifier or final filtration stage in the treatment process, which results in a relatively compact footprint. In order to achieve the total nitrogen removal required for this facility, the process would require additional anoxic treatment process equipment as part of the treatment train.

Since MBRs combine biological treatment with microfiltration through a membrane, this results in a very high quality effluent with very low levels of turbidity, coliforms, solids, and organics (measured as BOD). MBRs typically have higher capital and operating costs related to regular membrane replacement and power usage required to provide sufficient oxygen to the system, as well as large pumps required to move the liquid effluent through the microfiltration membranes.

Membranes can be contained within a treatment plant building, or they can be inserted into the aeration tanks. They are typically provided in smaller modules which can be combined to provide the necessary capacity, making them modular and flexible to accommodate phased implementation or system expansion.

An MBR treatment plant requires regular management of sludge concentrations in the reactor tanks, as well as regular removal of accumulated sludge for disposal off site. Regular cleaning and replacement of the membranes is required.

6.1.2.2 Alternative 2 – Sequencing Batch Reactor (SBR)

Alternative 2 is a Sequencing Batch Reactor (SBR) which is based on conventional activated sludge biological treatment processes but carries out each step of the process sequentially in a single reactor tank, as opposed to simultaneous processes in separate tanks. By completing the treatment steps sequentially in the same tank, the SBR footprint is relatively compact.

The SBR operates by treating one batch of wastewater at a time through sequential treatment process. This requires a larger additional tank to provide storage and flow equalization at the front of the treatment train, in order to allow the process to operate in batch mode and prevent any new influent sewage flow from entering the reactor while it is processing a batch. The reactor is filled with a certain volume of wastewater (i.e. a batch), then processes through a series of treatment steps including aeration to promote aerobic biological processes, settling of solids, and decanting of the treated liquid.

The final effluent would be subjected to an additional final filtration step to remove any fine particulate solids, followed by UV disinfection. The SBR can be modified to include

an anoxic treatment step to promote nitrogen removal, but data for existing installations suggests that meeting the proposed nitrogen target for this facility may be challenging to consistently meet without significant operator attention. This alternative may require the addition of a separate tank to function as a dedicated anoxic reactor for removal of nitrogen, including the ongoing addition of a liquid carbon source to stimulate the growth of the anoxic microorganisms required to denitrify.

The SBR can be divided into several smaller parallel treatment trains to provide flexibility and modularity. The SBR system requires a sophisticated control system in order to automate the various stages of the process. An SBR treatment plant requires regular management of sludge concentrations in the reactor tanks, as well as regular removal of accumulated sludge for disposal off site.

6.1.2.3 Alternative 3 – Aerobic Foam Media Trickling Filter

Alternative 3 is an Aerobic Trickling Filter system, specifically a foam media trickling filter. An aerobic trickling filter is a relatively passive system that intermittently sprays the wastewater over the surface of a treatment media. Microorganisms grow on the surface of the media and provide treatment as the liquid is allowed to trickle down through the treatment media by gravity. Examples of the different types of media that are used could include natural or synthetic materials such as sand, gravel, peat moss, plastic, textile, or foam. A foam media trickling filter (such as the proprietary Waterloo Biofilter System) uses cubes of synthetic foam as a trickling filter media, which because of the porous nature of the foam, provides a warm, moist environment with a significant amount of available surface area to promote microbial growth for treatment of the wastewater.

A trickling filter is a passive technology that does not require mechanical air blowers to provide oxygen to the treatment process, as air movement occurs naturally through the filter between doses of the wastewater. Trickling filters do not require management of aerobic sludge levels in the reactor tanks and do not generate aerobic biological sludge.

Treated effluent is collected and pumped from the bottom of the trickling filter tank for further treatment. To achieve the necessary nitrogen removal, an additional anoxic media filter would be required, followed by final filtration and UV disinfection.

This system can be installed in parallel treatment trains to provide flexibility and modularity. The foam media can be contained in buried concrete or fiberglass tanks, or above-ground shipping containers, which provides additional flexibility in the design and layout of the system.

6.1.2.4 Alternative 4 – Moving Bed Biofilm Reactor (MBBR)

Alternative 4 is a Moving Bed Bioreactor (MBBR) which relies on conventional activated sludge technology but enhances the treatment with a media in the bioreactor, typically consisting of a floating plastic biocarrier media. The media provides additional surface area to enhance microbial growth and treatment in the bioreactor which reduces the overall plant footprint as compared to other conventional treatment processes. The media is typically kept in suspension in the liquid using air blowers, which also provide oxygen for aerobic treatment of the wastewater.

In order to achieve the total nitrogen removal required for this facility, the process would require additional anoxic treatment process equipment as part of the treatment train. Effluent would be further filtered and disinfected prior to discharge.

The MBBR process requires sludge management of the aerobic biological sludge produced in the bioreactors, including periodic hauling away for disposal.

This system can be installed in parallel treatment trains to provide flexibility and modularity and is typically contained in buried concrete tanks.

6.2 Evaluation of Alternative Design Concepts

6.2.1 Evaluation Criteria

The overall objective of the evaluation was to identify a Preferred Design Concept among the alternatives identified for both water and wastewater servicing that would provide the most favorable treatment for the preferred solution.

To this end, a set of Evaluation Criteria were grouped under four key areas established as part of the MCEA process to comparatively evaluate the Alternative Design Concepts identified above. The Evaluation Criteria for water and wastewater servicing were as follows:

Water Servicing Evaluation Criteria

Natural Environment

- Impacts to natural environment (general)

Socio-Cultural Environment

- Operational nuisance impacts (noise, odour)
- Operational traffic impacts
- Visual impacts

Technical Environment

- Ability to meet water treatment / storage criteria
- Land area requirements
- Modularity
- Operation and maintenance requirements and complexity

Financial

- Comparative capital costs
- Estimated operations and maintenance costs
- Estimated 20-year life cycle costs

Wastewater Servicing Evaluation Criteria**Socio-Cultural Environment**

- Operational nuisance impacts (noise, odour)
- Operational traffic impacts

Technical Environment

- Ability to meet effluent criteria
- Land area requirements
- Modularity
- Operation and maintenance requirements and complexity

Financial

- Comparative capital costs
- Estimated operations and maintenance costs
- Estimated 20-year life cycle costs

6.2.2 Evaluation of Alternative Design Concepts for Water Servicing

The evaluation of the Alternative Design Concepts for water servicing was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during the MCEA process. Table 6.1, Table 6.2 and Table 6.3 provide a summary of the evaluation of Alternative Design Concepts for water servicing based on the three areas of evaluation, primary disinfection, aesthetic treatment for hardness and water storage respectively. Detailed evaluation matrices are provided in Appendix H.

6.2.3 Evaluation of Alternative Design Concepts for Wastewater Servicing

The evaluation of the Alternative Design Concepts for wastewater servicing was based on an assessment of potential impacts and a review of input received from the public

and regulatory agencies during the MCEA process. Table 6.4 provides a summary of the evaluation of Alternative Design Concepts for wastewater servicing. A detailed evaluation matrix is provided in Appendix H.

6.2.4 Preferred Design Concepts

The preferred design concept for water servicing based on the combination of the three areas of evaluation involves: primary disinfection by UV, aesthetic treatment for hardness via softening membranes and above ground water storage.

The preferred design concept for wastewater servicing is the Aerobic Foam Media Trickling Filter.

The details of the preferred design concepts for water and wastewater servicing are discussed further in Section 7.1 and Section 7.2 respectively.

Table 6.1: Evaluation of Alternative Design Concepts for Water Servicing (Primary Disinfection)

Criteria	1a: Primary Disinfection – Ultraviolet Disinfection	1b: Primary Disinfection - Chlorine
Natural Environment	None.	Negative impact on natural environmental in the event of a spill.
<i>Ranking</i>	<i>Most Preferred</i>	<i>Least Preferred</i>
Socio-Cultural Environment	Minimal traffic impact due to regular inspection and maintenance. Minimal operational nuisance.	Minimal noise related to pump operation. Minimal chlorine odour. Ventilation system required to ensure cycling of air for chemical room. Moderate operational nuisance.
<i>Ranking</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Technical Criteria	Requires regular cleaning by mechanical wipers, ultrasonics, or chemicals. Inspection of UV chamber interior required every six months. Safe for operators (no chemical handling, transportation, or storage). Requires less contact time than Alternative 1b.	Cleaning and maintenance of components is required every six months and equipment and chlorine storage tank to be inspected and cleaned annually. Chemical delivery every 3 to 4 weeks. Regular inspection of the equipment, chlorine solution and free chlorine residual levels, adjustment of equipment and dosage rates as required. All forms of chlorine are highly corrosive and toxic as such, pose a risk to operators and require increased training and safety procedures than Alternative 1a.
<i>Ranking</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Financial Criteria	High estimated capital costs (Developer responsibility). Moderate estimated O&M costs (Developer responsibility).	Moderate estimated capital costs (Developer responsibility). High estimated O&M costs (Developer responsibility).
<i>Ranking</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Overall Ranking	<i>Most Preferred</i>	<i>More Preferred</i>
Recommendation	Recommended	Not Carried Forward

Evaluation Order of Preference

Least ———> More ———> Most

Table 6.2: Evaluation of Alternative Design Concepts for Water Servicing (Aesthetic Treatment for Hardness)

Criteria	2a: Aesthetic (Hardness) – Ion Exchange	2b: Aesthetic (Hardness) – Softening Membranes	2c: Aesthetic (Hardness) – Crystallization Technology
Natural Environment	Potential impact to soils as result of spray irrigation to golf course.	Minimal to no impact.	Minimal to no impact.
<i>Ranking</i>	<i>Least Preferred</i>	<i>Most Preferred</i>	<i>Most Preferred</i>
Socio-Cultural Environment	Minimal noise related to pump operation. Moderate noise for short duration during operation/cleaning. Higher operational nuisance. Minimal traffic impact due to salt deliveries (3 to 4 weeks) and regular inspection and maintenance.	Minimal noise related to pump operation. Higher operational nuisance. Minimal traffic impact due to regular inspection and maintenance.	Minimal noise and operational nuisance. Maintenance for each residential unit within the development would be required. Minimal to no traffic.
<i>Ranking</i>	<i>More Preferred</i>	<i>More Preferred</i>	<i>More Preferred</i>
Technical Criteria	Ion exchange resin needs to be replaced every 8-12 years. Chemical delivery (dry salt) required every 3 to 4 weeks. Regular regeneration of resin is required. Periodic inspection and maintenance of brine tank.	Membranes replacement (approx. every 10 years). Regular cleaning of membranes is required. Periodic inspection and maintenance.	Media or cartridge replacement range is from 1 to 3 years. No drainage required. Pre-filter to be replaced every 3 to 6 months. Periodic inspection and maintenance. Residents would be responsible for operation.
<i>Ranking</i>	<i>More Preferred</i>	<i>Most Preferred</i>	<i>Least Preferred</i>
Financial Criteria	Moderate estimated capital and O&M costs (Developer responsibility). O&M costs include: - Regular regeneration and maintenance of resin. - Re-supply of dry salt. - Moderate energy consumption.	Moderate estimated capital and O&M costs (Developer responsibility). O&M costs include: - Cleaning of membranes. - Membrane replacement (every 10 years). - Higher energy consumption than Alternative 2a.	High estimated capital and O&M costs (Developer responsibility). Installation is required at all residential units when compared to a single system at the water treatment plant. O&M costs include: - Media or cartridge to be replaced every 1 to 3 years. - Low energy consumption.
<i>Ranking</i>	<i>Most Preferred</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Overall Ranking	<i>More Preferred</i>	<i>Most Preferred</i>	<i>Least Preferred</i>
Recommendation	Not Carried Forward	Recommended	Not Carried Forward

Evaluation Order of Preference

Least → More → Most

Table 6.3: Evaluation of Alternative Design Concepts for Water Servicing (Storage)

Criteria	3a: Storage - Above Ground	3b: Storage - Below Ground
Natural Environment	Minimal to no impact.	Minimal to no impact.
<i>Ranking</i>	<i>Most Preferred</i>	<i>Most Preferred</i>
Socio-Cultural Environment	Minimal noise and no odour. Minimal operational nuisance. Can be observed at grade. Less architectural options compared to Alternative 3b. Susceptible to vandalism.	Minimal noise and no odour. Moderate operational nuisance (difficult to service and inspect). Cannot be observed at grade.
<i>Ranking</i>	<i>More Preferred</i>	<i>More Preferred</i>
Technical Criteria	Larger building footprint as a result of two separate structures. Can be expanded vertically, if required. Second tank can be provided for additional capacity with similar foundation design, if required. Manways provided for easy access. Defects/leaks are easily identified and repaired. More prone to freezing during the winter.	Minimal increase in footprint. Reservoir can be integrated into the below ground foundation design of the WTP. Additional water reservoir cells can be constructed. Complexity to expand a subgrade reservoir is higher than expanding an above ground tank due to excavation, existing foundation constraints, and shoring. Increased confined space training and safety procedures. Difficult identifying and repairing cracks and leaks. Natural protection against the extreme cold and heat, easier to maintain temperate.
<i>Ranking</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Financial Criteria	Moderate estimated capital costs (Developer responsibility) due to: - Less excavation and shoring systems - Dependent on soils and groundwater - Insulation and mixing required	High estimated capital costs (Developer responsibility) due to: - Deeper and larger excavation and shoring systems - Dependent on soils and groundwater - Insulation and waterproofing required
<i>Ranking</i>	<i>Most Preferred</i>	<i>More Preferred</i>
Overall Ranking	<i>Most Preferred</i>	<i>More Preferred</i>
Recommendation	Recommended	Not Carried Forward

Evaluation Order of Preference

Least —————> More —————> Most

Table 6.4: Evaluation of Alternative Design Concepts for Wastewater Servicing

Criteria	1: Membrane Bioreactor (MBR)	2: Sequencing Batch Reactor (SBR)	3:Aerobic Foam Media Trickling Filter	4: Moving Bed Biofilm Reactor (MBBR)
Socio-Cultural Environment	Noise associated with the operation of the MBR system can be mitigated to ensure applicable noise guidelines are met at the proposed and existing noise sensitive receptors.	Noise associated with the operation of the SBR system can be mitigated to ensure applicable noise guidelines are met at the proposed and existing noise sensitive receptors.	Limited mechanical equipment with this technology, no air blowers or large equipment, so minimal noise generation.	Noise associated with the operation of the MBBR system can be mitigated to ensure applicable noise guidelines are met at the proposed and existing noise sensitive receptors.
<i>Ranking</i>	<i>Less Preferred</i>	<i>Less Preferred</i>	<i>Most Preferred</i>	<i>Less Preferred</i>
Technical Criteria	Best available technology for phosphorus removal. Can meet objectives for other parameters (BOD, TSS, pathogens) Somewhat inconsistent nitrate removal performance; may require supplemental equipment/ processes. System can be modular. Less resilient to low flows and loadings during initial phase as dwellings gradually become occupied. Plant may struggle to meet effluent objectives during initial phases of development due to low incoming sewage volumes. Operator on site 3x per week for system checks. Highest level of mechanical parts and complex equipment. Requires air blowers.	Above ground building to house UV disinfection equipment, chemical dosing, controls, air blowers, tertiary filters. Below ground concrete tanks to contain SBR aerobic and anoxic processes. Similar to Alternative 4. Operator on site 3x per week for system checks. Moderate level of mechanical parts and complex equipment. Requires air blowers. System is somewhat modular. Can be constructed as multiple parallel treatment trains but may require more initial capital outlay than other options. Less resilient to low flows and loadings during initial phase as dwellings gradually become occupied. Plant may struggle to meet effluent objectives during initial phases of development due to low incoming sewage volumes.	Above ground building to house UV disinfection equipment, chemical dosing, controls, tertiary filters. Below ground tanks would contain most of treatment equipment and processes or could be entirely housed in above ground containers. Similar overall footprint to Alternatives 2 and 4. Smallest building footprint. Operator on site 1x per week for system checks. Minimal mechanical parts and no complex equipment. No air blowers required. High degree of flexibility to accommodate multiple treatment trains and modular installation. More resilient to low flows and loadings during initial phase as dwellings gradually become occupied.	Above ground Control Building to house UV disinfection equipment, chemical dosing, controls, air blowers, tertiary filters. Below ground tanks to contain most of the treatment equipment and processes including bioreactors, clarifiers, anoxic tanks. Similar to Alternative 2. Operator on site 1x per week for system checks. Moderate level of mechanical parts and complex equipment. Requires air blowers. System is somewhat modular. Can be constructed as multiple parallel treatment trains. Less resilient to low flows and loadings during initial phase as dwellings gradually become occupied. Plant may struggle to consistently meet effluent objectives during initial phases of development due to low incoming sewage volumes.
<i>Ranking</i>	<i>Less Preferred</i>	<i>Less Preferred</i>	<i>Most Preferred</i>	<i>Somewhat Preferred</i>
Financial Criteria	\$3.4M capital costs. \$160K to \$180K O&M costs. \$6.2M life cycle cost. (Developer responsibility)	\$3.1M capital costs. \$160K to \$180K O&M costs. \$5.9M life cycle cost. (Developer responsibility)	\$2.5M capital costs. \$60K to \$80K O&M costs. \$3.6M life cycle cost. (Developer responsibility)	\$2.8M capital costs. \$80K to \$100K O&M costs. \$4.2M life cycle cost. (Developer responsibility)
<i>Ranking</i>	<i>Least Preferred</i>	<i>Least Preferred</i>	<i>Most Preferred</i>	<i>Somewhat Preferred</i>
Overall Ranking	Less Preferred	Less Preferred	Most Preferred	Somewhat Preferred
Recommendation	Not Carried Forward	Not Carried Forward	Recommended	Not Carried Forward

Evaluation Order of Preference

Least → Less → Somewhat → More → Most

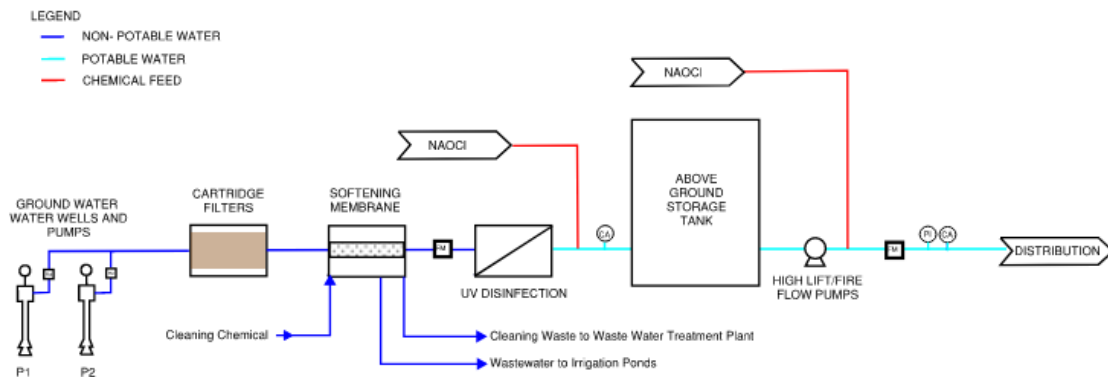
7.0 Description of the Preferred Design Concepts

7.1 Description of the Preferred Water Servicing Design Concept

The preferred water servicing design concept is based on utilizing UV light and chlorination for primary disinfection, softening membranes to reduce water hardness, chlorination for secondary disinfection (required) and treated water to be stored within an above ground reservoir.

The preferred design process flow diagram is illustrated in Figure 7-1.

Figure 7-1: Proposed Process Flow Diagram



The design of the water treatment plant would be based on the water demand and the target treatment criteria that must be met. The water demand was based on the number of dwelling units (new single detached homes) and associated population to be serviced by the facility and proposed Clubhouse and Maintenance Building. The development population was estimated using an average density of 3.094 people per unit based on the Township of Centre Wellington Development Charges Background Study (Watson & Associates, 2010). Preliminary flows were estimated based on the Township of Centre Wellington Draft Engineering Guidelines (2018), which require a per capita flow rate of 350L/day. The Ontario Building Code Section 8 Water Demands were used to project the maximum day demands for the Clubhouse and Maintenance Building. The design criteria and preliminary water demands are summarized in Table 7.1.

The water treatment plant design will include softening membranes to reduce water hardness. The softening membranes typically have a 70% to 75% recovery rate, requiring a higher maximum day water taking. As such, the water treatment plant will be sized to provide maximum day demands.

Table 7.1: Water Treatment Design Criteria and Flows

Criterion	Design Criteria	Source
Density	3.094 people per unit	Township of Centre Wellington Development Charges Background Study (Watson & Associates, 2010)
Total Units	118	Draft Plan of Subdivision (GSP Group, 2022)
Population ¹	365	Calculated
Per Capita Flow	350L/capita/day	Township of Centre Wellington Draft Engineering Guidelines (Township, 2018)
Average Day Demand ²	1.48 L/s	Calculated
Maximum Day Factor	3.4	Design Guidelines for Drinking Water Systems (MECP, 2008)
Maximum Day Demand (Residential) ³	5.03 L/s	Calculated
Maximum Day Demand (Clubhouse) ⁴	0.41 L/s	Calculated
Maximum Day Demand (Maintenance Building) ⁵	0.016 L/s	Calculated
Maximum Day Demand (Total)	5.46 L/s	Calculated
Maximum Day Water Taking ⁶	7.08 L/s	Calculated

1. The redevelopment population was estimated by multiplying the total units in the redevelopment by the average density.
2. Average Day Demand was calculated by multiplying the per capita flow by the redevelopment population.
3. Maximum Day Demand was calculated by multiplying the Average Day Demand by the Maximum Day Factor.
4. Based on Ontario Building Code 8.2.1.3.(1).6.c – Maximum Wastewater Flow (food services operation) and Ontario Building Code 8.2.1.3.(1) 12.a – Maximum Wastewater Flow (Clubhouse excluding food services operation). A conversion factor of 0.90 from wastewater to water was applied, as well as a 30% safety factor.
5. Based on Ontario Building Code 8.2.1.3.(1).26.a – Wastewater Flow (water closet) for warehouse). A conversion factor of 0.90 from wastewater to water was applied, as well as a 30% a safety factor.
6. Maximum Day Demand (Total) divided by a system recovery rate of 70%.

The design flows will be refined and confirmed during the design and approval process.

As per the Ministry of Environment, Conservation and Parks (MECP) Drinking Water regulations for non-GUDI (Groundwater Under Direction influence of Surface Water)

sources, the treatment process must achieve a minimum of 2-log (99%) removal and/or inactivation of viruses. It should be noted that MECP is in the process of transitioning from the 2-log disinfection requirement to the 4-log disinfection requirement, although the official amendment has yet to be finalized.

For GUDI sources the treatment process must achieve:

- 2-log removal or inactivation of *Cryptosporidium* oocysts
- 3-log removal or inactivation of *Giardia* cysts
- 4-log removal or inactivation of viruses

It is required that at least 0.5-log inactivation of *Giardia* cysts and a 2-log reduction or inactivation of viruses must be achieved through disinfection.

The two groundwater wells identified as the primary water source as classified as non-GUDI as per the criteria set out in O.Reg. 170/03 as discussed in Water Supply Investigation (WSP, 2024) attached as Appendix B. However, the water treatment plant would be designed to provide disinfection to the requirements of GUDI wells with insitu filtration. This design allows for improved water safety by providing a multi-treatment approach that would address any potential changes to the water quality in the future. Table 7.2 summarizes the target disinfection levels the water treatment plant would be designed to, in accordance with the MECP guidelines.

Table 7.2: Water Treatment Targets

Pathogen	Log Removal / Inactivation
<i>Cryptosporidium</i> oocysts ¹	4
<i>Giardia</i> cysts ¹	4
Viruses	4

1. *Cryptosporidium* and *Giardia* have not been detected in the groundwater source.

The water treatment facility would generally consist of the following components.

Building

The building would house process mechanical, electrical, and HVAC equipment, chemical feed systems, electrical control room, and chemical room. Dimensions of the building would be confirmed during the preliminary design stages.

Cartridge Filters

Two cartridge filters (duty / standby) would be installed to capture and remove any suspended solids and sediment from the water to protect the softening membranes from fouling. The filters would be placed in parallel to ensure continuous treatment is provided.

Softening Membranes

A pressure pump would be provided to feed water through softening membranes (duty). The membranes would be housed within pressure vessels, and multiple vessels would be arranged in series. The waste stream containing the hardness minerals would be discharged to the wastewater treatment plant.

A bypass would be installed to redirect a portion of the feed water around the unit when needed for emergency or maintenance requirements. A chemical cleaning feed would circulate a cleaning solution through the membrane system components to remove fouling, scaling, and other deposit accumulation. The wastewater from the cleaning system would be discharged to the pond via the wastewater treatment plant.

Primary Disinfection Using UV Light and Chlorination

The disinfection system would be built around a multi-barrier approach which would meet the disinfection levels required by the MECP prior to the water leaving the water treatment plant. The UV disinfection system serves as a multi barrier approach since chlorination will be used for primary and secondary disinfection.

The softened water would flow through two UV reactors (duty / standby). Flow control valves and sensors would be installed to regulate and monitor the flow of the water through the UV reactors.

Secondary Disinfection and Residual Management Through Chlorination

Sodium hypochlorite dosing pumps (duty / standby) would be provided for secondary disinfection and top-up disinfection. The disinfection system would include a liquid chlorine (sodium hypochlorite) storage tank and feed system with sufficient chlorine contact time to provide 4-log inactivation of viruses. The sodium hypochlorite injection system would also be designed to maintain a residual of 1.0 mg/L within the distribution system. It should be noted that distribution piping to the first consumer would also provide additional contact time but will only be used as a further buffer and would not be included in the design of the disinfection system.

The disinfection achieved through the proposed water treatment plant is summarized in Table 7.3.

Table 7.3: Total Disinfection Achieved

Treatment Process	Cryptosporidium Oocysts	Giardia Cysts	Viruses
UV (Primary Disinfection)	4-log	2.5-log	2-log
Primary Chlorination (Secondary Disinfection)	-	1.5-log	4-log
Total Disinfection	4-log	4-log	6-log
Required Disinfection Before First Consumer	4-log	4-log	4-log

Treated Water Storage

An above ground water storage tank would be provided with a capacity to meet the water storage requirement for equalization, fire, and emergency volumes under the maximum day demand and fire flow condition.

Booster Pumping Station

A booster pumping station would be required to supply maximum day demands and fire flows to the Fergus Golf Club Redevelopment. The booster pumping station would provide and maintain the pressure range between 275 kPa to 670 kPa (40 psi to 100 psi) throughout the servicing area. One jockey and two high lift pumps (duty / standby) would be provided to convey treated water from the reservoir to the distribution. The pumps would be designed such that the firm capacity of the station can be satisfied with the largest pump out of service. The station will also house two fire flow pumps (duty/standby) sized to provide fire flows to maintain a minimum pressure of 140 kPa (20 psi) within the servicing area in the event of a fire.

Control Instrumentation and Emergency Procedures

Sensors and instrumentation would be installed to continuously monitor parameters such as pressure, flow, and water quality. Safety features such as pressure sustaining valves and emergency shutdown systems would be implemented to protect the equipment and operating personnel.

The facility will be equipped with an emergency power generator to sustain the entire operation.

Ownership

The drinking water system will be owned and operated (via a licensed operator) by the condominium corporation.

7.2 Description of the Preferred Wastewater Servicing Design Concept

The preferred wastewater servicing design concept is based on an aerobic foam media trickling filter system.

The design of the wastewater treatment plant equipment would be based on the quantity of wastewater to be treated, as well as the target effluent criteria that must be met. The quantity of wastewater is based on the number of dwelling units (single detached homes) and associated population to be serviced by the treatment facility. Preliminary design flows have been estimated at 175 m³/day based on the Township of Centre Wellington Draft Engineering Guidelines (2018) which require a per capita flow rate of 350 L/day. The development population was estimated using the Township of Centre Wellington Development Charges Background Study (Watson & Associates 2020) which suggests an average density of 3.094 people per unit. The design flow estimates also include an allowance for inflow and infiltration into the sewer collection system based on MECP guidelines of 90 L/person per day. The design flows also consider an allowance to accommodate sewage flows from the golf course clubhouse. Preliminary wastewater design flows are summarized in Table 7.4.

Table 7.4: Preliminary Wastewater Design Flows

	No. of Units	PPU	Total Population	Flow per Person (L/day)	Total Flow (L/day)
Single Family Units	118	3.094	365	350	127,782
Golf Clubhouse					10,000
Allowance for I&I			365	90	32,850
Total Flow					170,632
Total ADF (rounded) (m³/day)					175

The design flow will be refined and confirmed during the design and approval process.

The preliminary effluent targets for the wastewater treatment facility have been developed in consultation with the MECP and are based on discharge to the irrigation pond for beneficial reuse as irrigation water. A copy of pre-consultation records with MECP are provided in Appendix I. Preliminary effluent targets for typical wastewater parameters are summarized in Table 7.5.

Table 7.5: Proposed Effluent Objectives

Design Parameter	Units	Effluent Objective	Effluent Limit	Compliance Based On
Total Biochemical Oxygen Demand – 5 Day (BOD5)	mg/L	5.0	10	Monthly Average
Total Suspended Solids (TSS)	mg/L	5.0	10	Monthly Average
Total Phosphorus (TP)	mg/L	< 0.3	< 0.5	Monthly Average
Total Ammonia (TAN)	mg/L	< 1.0	< 2.0 (summer) < 3.0 (winter)	Monthly Average
Total Inorganic Nitrogen	mg/L	< 5.0	< 10	Monthly Average
pH		6.5 to 9.5	6.5 to 9.5	Single Sample Result
E. Coli	CFU/ 100 mL	< 100	< 200	Monthly Geometric Mean Density

The foregoing effluent criteria are preliminary and will be confirmed with MECP through the ECA process.

The wastewater treatment facility would generally consist of the following components:

Screening and flow equalization tank

Raw sewage is collected from the dwelling units and pumped to the wastewater treatment facility where it is collected in an initial tank. This tank provides screening of large debris, as well as equalization of peak flows.

Settling and pre-treatment tanks

The wastewater would flow through the initial settling and pre-treatment tanks which provide separation of solids from the liquid (primary settling) and anaerobic digestion. Liquid effluent flows from these tanks into the biofilter tanks for further treatment.

Aerobic foam media biofilter tanks for aerobic treatment (Biofilters)

The liquid effluent is conveyed to a series of biofilter tanks which are filled with foam trickling filter media. The effluent from the pump tanks is evenly distributed through spray nozzles over the surface of the biofilter medium and treated as it trickles through the interior of the medium. Aerobic conditions are maintained in the treatment tanks using passive venting and small air fans. The aerobic biofilters provide treatment of the wastewater by removing organic carbon, solids, ammonia-nitrogen, and pathogens. The

biofilters are typically contained in buried concrete or fiberglass tanks with hatches to provide access for operation and maintenance.

Anoxic reactor tanks for nitrogen removal

Following the aerobic biofilters, the effluent is further treated in anoxic reactor tanks. The anoxic reactor provides anoxic conditions (i.e., lacking in dissolved oxygen), which promotes the further treatment of the wastewater, specifically related to the removal of nitrate. The anoxic reactors are typically contained in buried concrete or fiberglass tanks with hatches to provide access for operation and maintenance.

Phosphorus coagulant system

The treatment system would remove phosphorus from the wastewater using a coagulant system whereby an aluminum-based product is injected into the liquid effluent to precipitate the phosphorus. The phosphorus coagulant system would typically be housed in the wastewater treatment plant control building.

Filtration

A final filtration step removes any fine solids or turbidity from the final effluent, typically using sand filters. The filters are typically housed within the wastewater treatment plant control building.

UV Disinfection

The final treatment step is a UV disinfection system in which the final treated liquid is passed through a series of UV lamps to eliminate the remaining pathogens (bacteria, viruses). The UV system is typically housed within the wastewater treatment plant control building. The final treated and disinfected effluent would be discharged to the irrigation ponds for reuse as irrigation water.

The above components are preliminary at this time and will be refined as the design and approvals process progresses. A preliminary process schematic is illustrated in Figure 7-2 and Figure 7-3 which shows the areas of spray irrigation.

The treatment facility will consist of a series of buried tanks, as well as a control building to house certain equipment and components, control panels, etc. The treatment plant is expected to be equipped with monitoring equipment, remote alarm notifications, and a backup power supply. Regular monitoring and oversight would be stipulated by MECP as part of the conditions of approval.

Ownership

The wastewater works will be owned and operated (via a licensed operator) by the condominium corporation.

Figure 7-2: Preliminary Process Schematic for Wastewater Treatment Plant

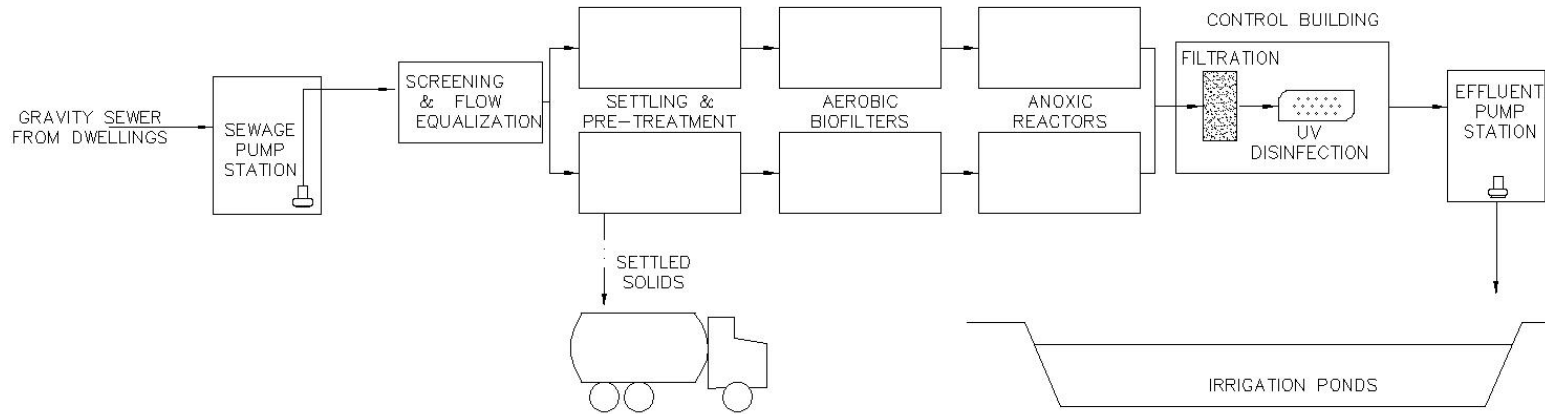


Figure 7-3: Areas of Spray Irrigation



7.3 Proposed Site Layout

The water and wastewater treatment facilities would be located on a shared block of land located on the NW site. Based on the preferred design alternatives in the preceding sections, a preliminary site layout depicts the potential layout for the water treatment and wastewater treatment facilities.

The proposed water and wastewater treatment plants would be located on the northwest parcel of the site as shown in Figure 7-4.

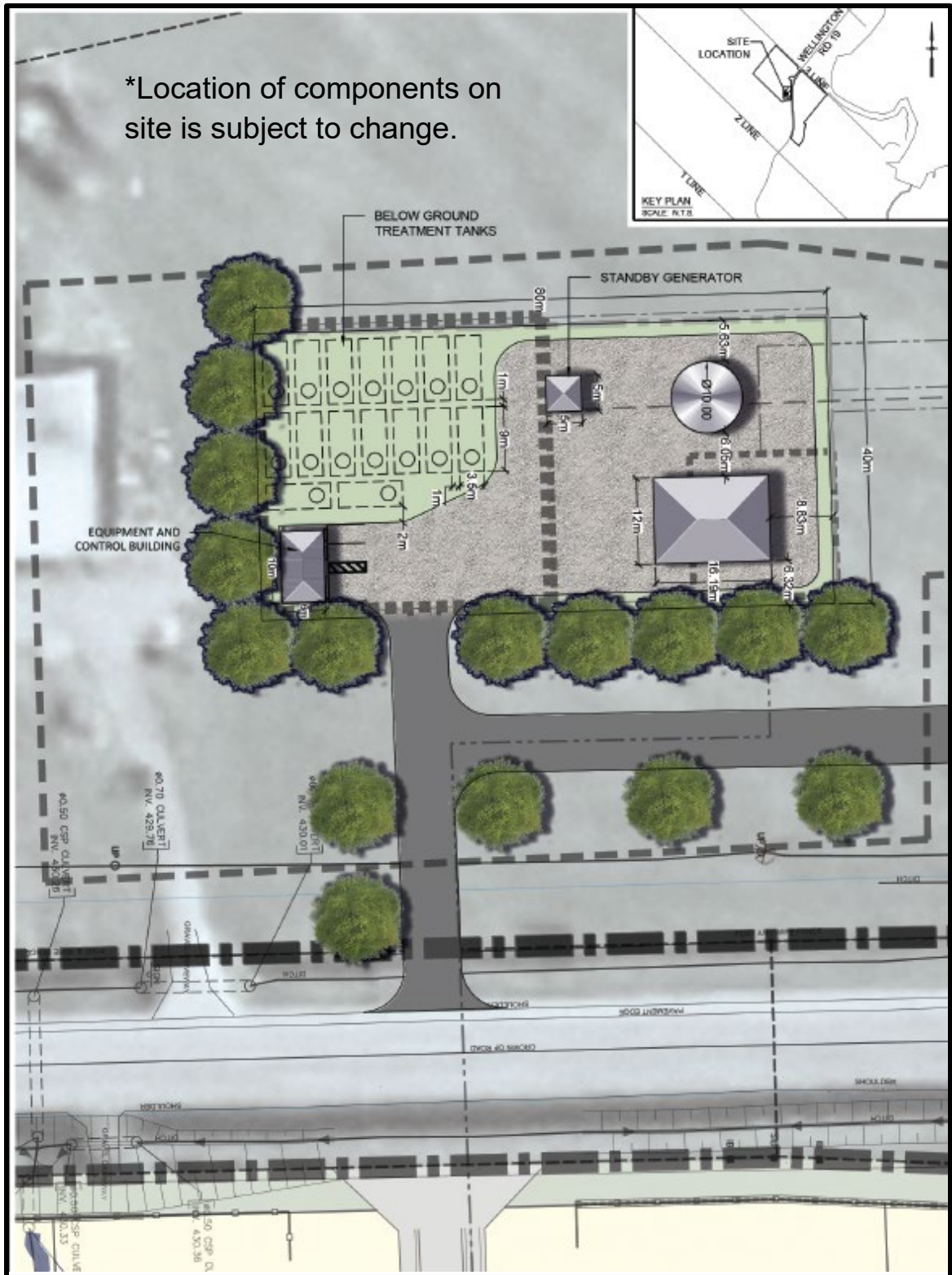
The proposed site would be accessed via a site access road from Wellington County Road No. 19. The site would be designed to permit service trucks and vehicles to service the reservoir, water treatment plant, install equipment, and provide regular chemical supply to the facility.

Parking would be provided adjacent to the entrance at the south side of the property. The facility would include bollards at all access doors and around emergency standby generation. The water treatment plant building would also include lighting above the access door and additional lighting around the standby generator would be provided. Adequate lighting will also be present to facilitate ease of access and required maintenance at times where outside light is minimal.

Yard piping would include raw water feed line, reservoir feed drain lines, treated effluent line, and process wastewater piping to the wastewater treatment plant. Coordination with utilities such as hydro and gas would be conducted during the preliminary design stage.

The wastewater treatment components described above are depicted on the preliminary site layout illustrated in Figure 7-4, including the wastewater treatment plant building, as well as a series of buried tanks. The backup power supply is also shown on the preliminary site plan and would consist of an emergency generator of sufficient size to operate both the water treatment plant and the wastewater treatment plant, in the event of a power outage.

Figure 7-4: Proposed Site Plan Concept



8.0 Potential Environmental Impacts, Mitigation and Future Commitments

The potential environmental effects associated with construction of the proposed water and wastewater treatment facilities within the Study Area have been identified and are summarized in Table 8.1 below. Proposed measures to mitigate these effects are also provided in the table. All mitigation measures, which include commitments to be satisfied during the detailed design or construction phases of the project will be reviewed and confirmed during the detailed design phase of the project.

Table 8.1: Potential Environmental Effects, Mitigation Measures and Future Commitments

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Proposed Mitigation Measures and Future Commitments
Natural Environment	Trees and Vegetation	<p>Loss of trees and vegetation.</p> <p>Trees adjacent to the work areas may be subject to impacts within the rootzone from grading and other construction activities.</p>	<ul style="list-style-type: none"> 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 (Township of Wellington and GRCA, as applicable). Erosion and Sediment Control (ESC) measures shall be developed during the detailed design phase of the project and installed prior to commencement of any grading or vegetation disturbance. An Arborist Report and associated tree inventory and tree protection plan, including removals, will be developed during the detailed design phase of the project once the final grading limits and vegetation removals are known. 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 the adjacent vegetation communities. 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.
Natural Environment	Wildlife and Wildlife Habitat	<p>Temporary displacement of and disturbance to wildlife and wildlife habitat during the construction phase (e.g., vegetation removals, noise disturbance).</p>	<ul style="list-style-type: none"> The footprint of the proposed disturbed area shall be minimized as much as possible. Site buildings outside of suitable habitat for threatened avian species to the extent possible. Approvals under the Endangered Species Act will be required should any threatened avian species habitat be impacted. To prevent Bank Swallows from establishing nests in stockpiles of soil, ensure that all slopes created by stockpiling soil, overburden or similar materials in the project limits are maintained at 70° or less by contouring faces or piling material on the face. If Bank Swallows establish nests in the stockpiles, stop any Project Activities that would harm or harass Bank Swallows until the end of the Breeding Season. Any necessary vegetation removal should be undertaken between September 1 and March 30 for compliance with the Migratory Birds Convention Act, otherwise nest surveys by a qualified avian biologist should be undertaken prior to vegetation removal. A fish and wildlife salvage plan will be completed prior to any works within the irrigation ponds. All fish and wildlife shall be salvaged under license/authorization obtained from MNR. Temporary silt fence barriers are recommended to exclude wildlife (i.e., amphibians and reptiles) from the earthwork and construction activities in areas adjacent to low-lying areas. 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

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Proposed Mitigation Measures and Future Commitments
			<p>searched immediately following fencing installation for any wildlife that may have become trapped. Any wildlife shall be permitted to escape, to a suitable habitat.</p> <ul style="list-style-type: none"> • 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 Region. • 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.
Physical Environment	Soil and Groundwater	Potential for localized groundwater quality impacts as a result of spills during construction.	<ul style="list-style-type: none"> • Refueling of equipment and fuel storage shall be conducted in designated areas at least 30 m away from any existing wells. • The Contractor shall be required to develop Spill Prevention and Contingency Plans for construction and operational phases of the project.
Physical Environment	Soil and Groundwater	Potential dewatering of the work area may be required.	<ul style="list-style-type: none"> • Geotechnical conditions should be reviewed when design details are known, including final grading and when service inverts are available. • The geotechnical report shall fully assess groundwater conditions and dewatering requirements and the need for application for a PTTW or EASR, additional investigation and / or analysis in order to finalize the geotechnical and hydrogeological recommendations. • 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. • 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 GRCA.
Physical Environment	Soil and Groundwater	Potential for impacts to shallow groundwater wells during construction.	<ul style="list-style-type: none"> • Locations of the wells should be confirmed in a well survey conducted within the Study Area to identify any shallow wells in close proximity to the site 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: <ul style="list-style-type: none"> – Notification of residents of construction with contact information.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Proposed Mitigation Measures and Future Commitments
			<ul style="list-style-type: none"> - A reporting and investigation protocol to address complaints. • Supply of alternate water source in case of confirmed impact.
Physical Environment	Soil and Groundwater	Potential for excess soil as a result of road reconstruction and replacement of underground utilities.	<ul style="list-style-type: none"> • 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.
Socio-Economic Environment	Air Quality	Temporary increase in dust in air, emissions from construction activities.	<ul style="list-style-type: none"> • 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. • During construction, the following mitigation measures shall be used: <ul style="list-style-type: none"> - The access road shall be continuously maintained and graded as required to remove potholes, ruts and ripples in the road surface. Efforts to prevent contamination of the road surface, such as spilling sands, silts and clays, will also help to minimize dust. - If appropriate equipment is available, the roadway should be sprayed with water or other dust control measures as required to minimize dust generation prior to paving. - 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.
Socio-Economic Environment	Noise	Temporary nuisance noise during construction activities.	<ul style="list-style-type: none"> • 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. • All construction activities shall conform to the criteria set out in NPC115 of 83 dB. • The construction contractor will be required to develop a Construction Management Plan that specifically addresses noise controls, mitigation to be implemented and frequency of equipment inspection.
Cultural Environment	Cultural Heritage	Potential impact to cultural heritage resources.	<ul style="list-style-type: none"> • The following recommendations are excerpted from the Cultural Heritage Report completed by WSP (September 2023) and provided in Appendix F of this report: • A Heritage Impact Assessment (HIA) must be completed for BHR-1 (8282 Wellington Road 19). The HIA must contain a full heritage evaluation of 8282 Wellington Road 19 against the criteria contained in Ontario Regulation (O.Reg.) 9/06 of the <i>Ontario Heritage Act</i>. If the property is found to have cultural heritage value or interest (CHVI) then a description of the property, statement of CHVI, and a list of heritage attributes should be prepared. A property-specific impact assessment must also be completed. The HIA must be undertaken by a qualified person(s) at the onset of the detail design phase of the project and submitted to MCM for review and comment. • Design the Project to avoid direct and indirect impacts to the CHLs.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Proposed Mitigation Measures and Future Commitments
			<ul style="list-style-type: none"> • In contract documentation for the Project, direct the contractor to avoid and protect the identified BHR and CHLs. • Plan and locate storage and construction staging areas to avoid impacts to the identified BHR and CHLs. • Should the Study Area be expanded, retain a qualified heritage consultant to identify the impacts of the proposed new work on known or potential BHRs and CHLs and recommend appropriate mitigation or conservation measures.
Transportation and Built Environment	Human Health and Safety	Potential safety hazard to humans from construction activities, heavy equipment and increased construction traffic.	<ul style="list-style-type: none"> • The Health and Safety Plan shall be developed in accordance with the Occupational Health and Safety Act, 1990 and regulatory requirements.
Transportation and Built Environment	Transportation Infrastructure	Potential safety hazards on roadways from construction activities, heavy equipment and increased construction traffic.	<ul style="list-style-type: none"> • Operation of construction related vehicles will be done in accordance with all appropriate safety policies and procedures and based on Canadian Standards (Transport Canada, etc.). • All contractors will be required to complete and follow appropriate construction site training and adhere to appropriate road safety regulations during construction. Work shall be done in such a manner as to minimize disruption to the adjacent neighbourhoods. Noise and dust emissions shall be controlled. Contract specifications shall ensure that all equipment and vehicles are compliant with noise and air emission standards for applicable equipment.
Transportation and Built Environment	Transportation Infrastructure	Temporary traffic flow / access disruptions.	<ul style="list-style-type: none"> • Consult with public agency and/or adjacent landowners / tenants regarding temporary access routes. Contractor shall develop and implement a Traffic Management Plan in coordination with County. Adequate signage to give advance notice of disruptions and detours shall be provided by the contractor.

9.0 Climate Change Considerations

Climate change is defined as any significant change in long-term weather patterns. The term can apply to any major variation in temperature, wind patterns or precipitation that occurs over time. Global warming describes the recent rise in the average global temperature caused by increased concentrations of greenhouse gases (GHGs) trapped in the atmosphere.

Scientists have concluded that human activity is largely responsible for recently observed changes to our climate since GHGs are mainly caused by burning fossil fuels to produce energy.

The MECP finalized a document entitled “Considering Climate Change in the Environmental Assessment Process” in 2017 that provides guidance relating to the ministry’s expectations for considering climate change during the MCEA process. It is suggested that this guide be consulted if an approved MCEA has no climate consideration method.

There are two types of climate change effects that can be considered. The first is the effect that a project can have on climate change. In this case, the degree to which the project can provide some climate change mitigation measures is to be assessed. The second is the effect climate change has on the project. In this case, the degree to which the project can demonstrate adaptation to climate change impacts is assessed. Climate Change was considered during this MCEA and is discussed in this Section.

9.1 Effects of the Project on Climate Change

At the detailed design stage, Low Impact Development (LID) features will be considered to promote climate resiliency. Water impacts may be reduced through the consideration of Greyter Water Systems to reuse greywater and thereby reduce water demands. Greywater in the Greyter Water Systems includes wastewater from bath, lavatory, laundry, and sink (not including kitchen sink), which is reused for non-potable uses (i.e. toilet flushing). The centralized wastewater treatment approach provides a high level of treatment at greater efficiency than individual onsite systems.

Landscape changes associated with a project can also impact climate change. A carbon sink is described as a land or ocean mass that can take in carbon, in particular carbon dioxide, from the atmosphere. Vegetation can assist in removing carbon dioxide from the atmosphere.

The proposed undertaking will result in some vegetation removal during grading activities. Vegetation loss (and related carbon sink removal) is anticipated to be minimized as much as possible by reducing the footprint of grading activities where feasible.

9.2 Effects of Climate Change on the Project

Infrastructure is susceptible to deterioration from freeze-thaw events and drainage features may be impacted by increased precipitation events that are becoming more prevalent in Southern Ontario due to climate change effects which can result in potential flooding and erosion.

The Detailed Design and associated drainage infrastructure will consider peak flows and capacity.

10.0 General Approval and Permit Requirements

The following list is based on the Detailed Design and Construction phases and provides a preliminary set of approval and permit requirements. A final list shall be determined during the detailed design phase of the project.

- When all matters relating to archaeological sites within the project area of the project have been addressed to the satisfaction of the MCM, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development. No grading or other activities that may result in the destruction or disturbance of any archaeological sites are permitted until notice of approval has been received.
- Approvals under the *Fish and Wildlife Conservation Act* for the temporary relocation of fish and wildlife for any proposed works within the irrigation ponds.
- An ESC Plan will be developed in consultation with GRCA. Implementation of the erosion and sediment control measures will conform to recognized standard specifications such as OPSS and the requirements of the GRCA. The ESC Plan will also consider the TRCA Erosion and Sediment Control Guide for Urban Construction (2019).
- A permit approval will be required from GRCA in accordance with O. Reg. 150/06 Grand River Conservation Authority: Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses for construction works in GRCA regulated areas.
- A Permit to Take Water (PTTW) will be obtained from MECP for the new water supply well.
- An Engineer Evaluation Report (EER) will be completed and submitted to MECP within thirty (30) days of commissioning of the new water supply well.
- A Drinking Water License (DWL) will be obtained from MECP for the operation of the water treatment system.
- An Environmental Compliance Approval (ECA) will be obtained from MECP for the wastewater treatment facility.
- A Municipal Responsibility Agreement (MRA) will need to be signed with the Township of Centre Wellington relating to the operation of the water and wastewater treatment plants.

- A building permit will need to be obtained with the Township of Centre Wellington for the water treatment plant.
- The contractor will need to obtain an Occupancy Permit from the County for any works within Wellington Road 19 ROW.

11.0 Study Consultation

Comprehensive consultation was a key component of this MCEA Study. An effective consultation process was followed. The process was highly visible and maximized opportunities for the public, government agencies, and Indigenous communities to participate, in a constructive manner with a process that was open, traceable, rational, and highly defensible.

The key features of the consultation process included:

- The **identification** of Indigenous communities, agencies, key stakeholders, local residents and other interested or potentially affected parties that would need to be consulted during the MCEA Study. These contacts comprised the Project Contact List, which was used to maintain contact information for interested parties throughout the process and summarize comments received about the project and responses.
- Indigenous communities, agencies, key landowners / developers, local residents and other interested or potentially affected parties of the study were **Notified** results at key points of the MCEA process.
- **Engaging** Indigenous communities, agencies, key landowners / developers, local residents and other interested or potentially affected parties at key points of the MCEA process to gather input and help inform key decision making.
- **Responding** to inquiries or comments in an efficient and timely manner.

11.1 Notification

Notifications were mailed or emailed to all contacts on the Project Contact List created for the Study. Contacts were notified with a Notice of Commencement ('NOCm') and Public Information Centre #1, Notice of Public Information Centre #2 and the Notice of Completion ('NOCp'). The Project Contact List and all project notices are provided in Appendix I. All notices were placed in two consecutive publications of the Wellington Observer.

11.2 Consultation Activities

11.3 Indigenous Communities

Notices were sent by email to Indigenous communities. MECP has developed guidance on the steps to rights-based consultation with Indigenous communities (*"Acknowledgement of Notice of Commencement"* and *"A Proponent's Introduction to the Procedural Aspects of Consultation with Aboriginal Communities"*). MECP was contacted on May 8, 2023, to confirm the list of Indigenous communities to engage as

part of the MCEA Study. Several follow up emails were made with MECP to confirm the list. A copy of correspondence is provided in Appendix I. As confirmation of the list was not provided by MECP, the study team proceeded to engage with Indigenous communities based on prior engagement as part of the *Planning Act* application.

Follow-up calls were made to the identified Indigenous communities following the issuance of the Notice of PIC #2 to confirm receipt of the notice. Follow up engagement activities are described below including capacity funding agreements, report review and responses, representatives at site during archaeology work, additional site visits and meetings. A summary of communication with identified Indigenous communities was maintained by Burnside on the Project Contact List and summarized in Table 11.1. Copies of all correspondence with Indigenous communities are provided in Appendix I.

Table 11.1: Summary of Indigenous Community Consultation

Indigenous Community	Follow-up Call	Comment Received	Study Team Response
<p>Haudenosaunee Development Institute (HDI)</p>	<p>October 4, 2023, Burnside sent a follow up email to Raechelle Williams to ask how HDI’s review of environmental reports was proceeding and ask if there were any initiation questions. Noted timing for filing the EA and that study team would like to incorporate comments from HDI prior to filing.</p> <p>Follow up emails were sent on October 5, 2023, and November 1, 2023, to confirm if HDI had comments.</p>	<p>Raechelle Williams requested a call to gain a better understanding of the project.</p> <p>HDI signed an agreement for EA review.</p> <p>HDI indicated they would provide a response to the Environmental Impact Study the week of November 6, 2023.</p> <p>HDI provided comments on January 19, 2024.</p> <p>February 9, 2024, HDI reaffirmed their request for a financial mitigation and accommodation model for impact on established treaty rights which they state say include the right to free and undisturbed use of the land for ourselves and for our coming faces (future generations). HDI asked Geranium to provide any evidence that rights have been surrendered on the subject property and noted UNDRIP free, prior and informed consent. HDI noted that a third party proponent is not capable of determining, assessing or coming to conclusions in terms of the nature and scope of s.35 treaty rights - this obligation rests solely with the Crown.</p>	<p>A virtual meeting with HDI was held on August 8, 2023.</p> <p>An agreement for EA review was signed.</p> <p>A copy of the EIS and Environmental Review memo prepared by Beacon Environmental was shared with Raechelle Williams and Matt Turner on September 22, 2023.</p> <p>The Study Team provided a response to comments on February 8, 2024, along with ESC plans, the Arborist Report, and held a meeting on February 9, 2024, to discuss the comments.</p> <p>February 9, 2024, Geranium responded to HDI thanking them for their comments and call. Geranium noted they will review HDI comments and will set up another meeting Geranium provided a link to the environmental impact study previously circulated.</p> <p>March 19, 2024, Geranium responding to HDI requesting they provide notice visiting the site in the future for any site visits for safety reasons. Geranium clarified that the site alteration program had not commenced; however,</p>

Indigenous Community	Follow-up Call	Comment Received	Study Team Response
		<p>March 18, 2024, HDI clarified they did not need an updated agreement and would move forward with the original signed agreement. HDI noted they had conducted a Technical Level 1 on the proposed project property to analyze the land and determine whether Geranium has proceeded with any soil stripping, and tree removal.</p> <p>March 21, 2024, HDI responded that they would be present to monitor fence placement and tree removals.</p> <p>April 15, 2024, HDI responded to Geranium’s notification of fence placement and tree removal noting that they would be present to monitor and inspect the fence, noting they would continue this once a week until any ground breaking activities occur and would begin monitoring more.</p> <p>April 23, 2024, HDI replied to Geranium’s email indicating they did not agree to Geranium’s terms to be compensated for HDI monitors to be present onsite at the beginning of tree clearing and earthworks program when the erosion control measures are being installed, twice during the project and at the end when the erosion control measures are being removed. HDI noted they wish to be present for the duration of this project to ensure the erosion control measures are maintained and functioning,</p>	<p>there would be some fieldwork next week and would notify HDI when a schedule is confirmed.</p> <p>March 21, 2014, Geranium notified HDI that the contractor will be mobilizing the next morning to commence with fence placement and tree removals.</p> <p>April 19, 2024, Geranium thanked HDI for notification in advance of site visit and acknowledged HDI’s interest in participating in the site works program. Geranium noted they have agreed to compensate HDI monitors to be present onsite at the beginning of the tree clearing and earthworks program when the erosion control measures are being installed, twice during the project (with adequate notice to Geranium) and at the end when the erosion control measures are being removed. Geranium noted they will also invite HDI to periodic meetings, either remote or onsite, similar to the GRCA and the Municipality at various milestones of the project during earthworks and site servicing. Geranium reaffirmed, as discussed at the February 9, 2024, meeting, that they are interested in receiving any information about how the project impacts treaty rights.</p> <p>April 25, 2024, Geranium offered meeting dates and asked for weekly rated to finalize weekly monitoring program.</p>

Indigenous Community	Follow-up Call	Comment Received	Study Team Response
		<p>observe any dewatering activity, monitor any earth movement activity and to ensure the potential species at risk are being observed during the project. HDI would like to meet to further discuss monitoring schedule/visits, financial mitigation and accommodation model in terms of impacts on established treaty rights and referenced their email from February 9, 2024.</p>	
<p>Mississaugas of Credit First Nation</p>	<p>September 1, 2023, Burnside could not reach the DOCA phone number. Burnside left a message with the front desk of MCFN with contact information for Mark LaForme and Abby Lee.</p> <p>October 2, 2023, Burnside sent a follow up email to Mark and Abby to confirm receipt of the Notice of PIC #2 and advise of timing for filing the EA.</p>		
<p>Huron Wendat Nation</p>	<p>September 1, 2023, Burnside left voicemails for Dominic Ste-Marie and Theifaine Terrier.</p>		

Indigenous Community	Follow-up Call	Comment Received	Study Team Response
	<p>October 2, 2023, Burnside sent follow up emails to Dominic Ste-Marie, Theifaine Terrier and Mario Gros-Louis to confirm receipt of the Notice of PIC #2 and advise of timing for filing the EA.</p> <p>October 3, 2023, Burnside sent a follow up email to the consultation email account in response to Dominic Ste-Marie's out of office. Theifaine Terrier and Mario Gros-Louis were cc'd.</p>		
<p>Six Nations of Grand River First Nation</p>	<p>October 4, 2023, Burnside sent a follow up email to Peter Graham to advise of the timing for filing the EA and request if he has any comments on the evaluation matrices or the EA study in general.</p>	<p>Peter Graham indicated Six Nations charges for document review and meetings.</p> <p>Six Nations of Grand River signed an agreement for EA review.</p> <p>Peter Graham requested a copy of the ranking of alternative solutions on August 3, 2023.</p>	<p>An agreement for EA review was signed.</p> <p>A copy of the evaluation matrices for alternatives solutions for water and wastewater servicing was provided to Peter Graham on September 1, 2023.</p> <p>A follow up email was sent October 4, 2023.</p>

11.3.1 Engagement with Haudenosaunee Development Institute

Based on requests from Haudenosaunee Development Institute ('HDI') to be involved in the study, the study team completed the following engagement activities with HDI during the MCEA Study. These activities are beyond the Study Notices that were circulated to HDI.

- A representative from HDI attended Stage 2 Archaeological Assessment fieldwork.
- Study team met virtually with representatives from HDI on August 8, 2023, to provide overview of the project.
- A copy of the Environmental Impact Study and Memorandum by Beacon Environmental summarizing natural heritage features associated with the water and wastewater systems to service the planned redevelopment were provided to HDI in response to a request by Raechelle Williams on September 22, 2023.
- HDI provided comments on the project on January 19, 2024.
- The Study team provided a response to HDI's comments on February 8, 2024.
- The Study team had a meeting with HDI representatives on February 9, 2024, to discuss the response to HDI's comments.
- The Study team has emailed back and forth with HDI to coordinate site visits / monitoring.
- HDI monitors visited the site on April 18, 2024, and March 22, 2024

11.3.2 Engagement with Mississaugas of Credit First Nation

Based on requests from Mississaugas of the Credit First Nation ('MCFN') to be involved in the study, the study team completed the following engagement activities with MCFN during the MCEA Study. These activities are beyond the Study Notices that were circulated to MCFN.

- A representative from MCFN attended Stage 2 Archaeological Assessment fieldwork.

11.3.3 Engagement with Huron Wendat Nation

Based on requests from Huron Wendat Nation ('HW') to be involved in the study, the study team completed the following engagement activities with HW during the MCEA Study. These activities are beyond the Study Notices that were circulated to HW.

- A representative from HW attended Stage 2 Archaeological Assessment fieldwork

11.3.4 Engagement with Six Nations of Grand River First Nation

Based on requests from Six Nations of Grand River First Nation ('SNGR') to be involved in the study, the study team completed the following engagement activities with SNGR during the MCEA Study. These activities are beyond the Study Notices that were circulated to SNGR.

- A representative from SNGR attended Stage 2 Archaeological Assessment fieldwork

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- Burnside provided the Alternative Solutions Detailed Evaluation Matrices on September 1, 2023, in response to Peter Graham's request.
- Burnside followed up to request comments on the Alternative Solutions Detailed Evaluation Matrices.

11.4 Public Information Centre #1

PIC #1 was held on June 2, 2023, from 6:00 PM to 8:00 PM. PIC #1 was arranged as an open house style session with a presentation at 6:30 PM followed by a question-and-answer period.

A copy of the display boards for PIC#1 is provided in Appendix I.

A total of 15 people signed in at PIC #1 excluding the study team. A total of three comments were received in the comment period following PIC #1. Comments were provided through paper comment sheets supplied at the PIC or via email. A copy of the PIC #1 Summary Report including copies of comment sheets and public correspondence received during the PIC #1 comment period is provided in Appendix I.

The comments received during the PIC #1 comment period included the following themes:

- Water usage and impact to aquifer and wells
- Management of the wastewater system and water supply
- Wastewater treatment system
- Impact to wildlife habitat and wildlife species
- Light and traffic noise pollution

11.5 Public Information Centre #2

PIC #2 was held on September 11, 2023, from 6:00 PM to 8:00 PM. PIC #2 was arranged as an open house style session with a presentation at 6:30 PM followed by a question-and-answer period.

A copy of the display boards for PIC#2 is provided in Appendix I.

A total of 18 people signed in at PIC #2 excluding the study team. A total of two comments were received in the comment period following PIC #2. Comments were provided through paper comment sheets supplied at the PIC or via email. A copy of the PIC #2 Summary Report including copies of comment sheets and public correspondence received during the PIC #2 comment period is provided in Appendix I.

The comments received during the PIC #2 comment period included the following themes:

- Water usage and impact to aquifer and wells
- Management of the wastewater system and water supply

- Function of the wastewater treatment system
- Project timeline and approvals process

11.6 Agencies

Pre-consultation emails were exchanged with Grand River Conservation Authority (GRCA) and the Ministry of Environment, Conservation, and Parks (MECP).

A preliminary technical memorandum was sent to MECP summarizing the project, site and subsurface conditions, wastewater characteristics, proposed wastewater treatment system, and the operation, maintenance, and management of the wastewater treatment system.

MECP provided a response with comments on the technical memorandum. Burnside provided a revised submission of the technical memorandum as well as an Irrigation Pond Contingency Plan. MECP provided an email confirming the pre-consultation requirement had been met. MECP was provided with the draft ESR. A meeting with MECP was held to discuss the comments and responses to comments were provided.

GRCA staff reviewed and provided comments on the Environmental Impact Study (EIS). GRCA staff were also provided with a submission for draft planning approval on February 18, 2022. GRCA staff were provided with the draft ESR.

Records of pre-consultation correspondence is provided in Appendix I.

Notifications were mailed or emailed to all identified agencies on the Project Contact List created for the Study. A summary of communication with identified agencies was maintained by Burnside on the Project Contact List and summarized in Table 11.2. Copies of all correspondence with agencies is provided in Appendix I.

Table 11.2: Summary of Agency Consultation

Agency	Date	Topics
MECP	December 21, 2023	Responses to MECP comments sent by email.
MECP	December 4, 2023	Meeting to discuss hydrogeology comments on draft ESR.
GRCA	December 1, 2023	GRCA provided comments on the draft ESR.
MECP	November 23, 2023	MECP provided comments on the draft ESR.
GRCA	November 13, 2023	Draft ESR was circulated to GRCA.
MECP	September 1, 2023	Confirmation that pre-consultation requirement has been met.
MECP	August 24, 2023	Environmental Compliance Approval package comments.
MECP	January 30, 2023	Comments received on Preliminary Technical Memo.
GRCA	June 16, 2023	Sewage pump station monitoring, water balance, GRCA regulation limits associated with wetlands and watercourses, rezoning application,

Agency	Date	Topics
GRCA	May 25, 2023	Response to notice, asking to be kept up to date with information pertaining to MCEA.
GRCA	June 21, 2022	Setbacks for Environmental Protection Zone and Municipal Drain and Watercourse Setbacks, Major Flows into SWM pond, Water Balance, DFO Consultation, Fish Habitat, Thermal Mitigations, Wetlands, Rezoning Application, Official Plan Amendment

11.7 Landowners

Landowner 1	Study Team members discussed a potential buffer on the shared property boundary. The landowner did not have any concerns with the EA process.
Landowner 2	Study Team members discussed water supply and clarified the proposed method of water supply demonstrated the minimal impact to neighbouring wells.
Landowner Group 3 – Renee Boulevard Residents	Study Team members discussed the existing flooding issue at Rennie Boulevard. The drainage issue is outside of the study area and outside of the development area. However, the Study Team is assisting with mitigation of the drainage issue out of good faith.
Landowner 4	Study Team members discussed a landscaped buffer on the shared property boundary between Landowner 4 and the Study Area. The landowner has no concerns with the EA process.

12.0 Conclusions

The preferred solution for water servicing is a New Onsite Communal Water Supply and Treatment System and the preferred solution for wastewater servicing is a New Onsite Communal Wastewater Treatment Plant and Discharge to Existing Irrigation Ponds followed by Beneficial Reuse for Golf Course Irrigation.

The preferred design concept for water servicing based on the combination of the three areas of evaluation involves: primary disinfection by UV, aesthetic treatment for hardness via softening membranes and above ground water storage.

The preferred design concept for wastewater servicing is the Aerobic Foam Media Trickling Filter.

The details of the preferred design concepts for water and wastewater servicing are discussed further in Section 7.1 and Section 7.2 respectively.

This meets the project opportunity statement as it provides a cost-effective and environmentally sound means of providing a potable water supply and wastewater servicing for the new housing units (single detached homes). Alternatives were examined for their impacts to the natural, socio-cultural, technical and financial environment.

Should data from the additional monitoring wells result in a change to conclusions, the evaluation and preferred solution will be reviewed to determine if an EA Addendum is required. All steps outlined by the MCEA (2023) will be followed accordingly.

Stormwater management will be addressed through the detailed design process and is not within the scope of this EA. A detailed design will be provided to the MECP approvals branch.

The anticipated timeline for the condominium is to obtain building permits in 2025 and for house construction to occur between 2025 to 2026. Details for the anticipated timeline is outlined in Table 12.1.

Table 12.1: Anticipated Project Timeline

Component	Anticipated Timeline
Earthworks	April 2024 – December 2024
Underground Servicing	August 2024 – April 2025
Water Treatment Plant and Appurtenances	May 2024 – October 2025
Wastewater Treatment Plant, Pump Station, and Force mains	May 2024 – Spring 2025
Paving	June 2025

13.0 References

Environmental Registry of Ontario (ERO), 2023. County of Wellington Official Plan Amendment 119. Accessed at: <https://ero.ontario.ca/notice/019-5635>

