



**COLE**

December 19, 2019  
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**Attention: Daniel Steinberg, LL.B.  
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**Horseshoe Craighurst Corridor Water, Wastewater and Transportation  
Master Plan  
Final Master Plan**

Cole Engineering Group Ltd., in association with Greenland International Consulting Ltd., is pleased to submit this Final Report for the Horseshoe Craighurst Corridor (HCC) Water, Wastewater and Transportation Master Plan. This Final Report will be circulated to the various review agencies.

We trust this report meets your requirements. It has been a pleasure working with the HCC Landowners Group and we look forward to providing services on future projects. As always, should you have any questions or concerns, please do not hesitate to contact me at 416-606-8762 or [chill@coleengineering.ca](mailto:chill@coleengineering.ca).

Best Regards,  
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Final Master Plan Report	December 17, 2019	Final

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## LIST OF ACRONYMS

- ANSI Area of Natural and Scientific Interest
- ATRIS Aboriginal and Treaty Rights Information System
- ASI Archaeological & Heritage Services Inc.
- AWS American Water Services
- BOD<sub>5</sub> Biochemical Oxygen Demand
- CHL Cultural Heritage Landscape
- COSEWIC Committee on the Status of Endangered Wildlife in Canada
- COSSARO Committee on the Status of Species at Risk in Ontario
- CPR Canadian Pacific Railway
- CR County Road
- CRA Commercial, Recreational and Aboriginal
- DO Dissolved Oxygen
- DFO Fisheries and Oceans Canada
- EA Environmental Assessment
- ECA Environmental Compliance Approval
- ESA Environmentally Significant Area
- ESR Environmental Study Report
- ft foot/feet
- ft<sup>2</sup> square feet
- GGH Greater Golden Horseshoe
- ha hectare(s)
- HCC Horseshoe Craighurst Corridor
- km kilometre(s)
- L/s litres per second
- m metre(s)
- m<sup>3</sup> cubic metre(s)
- mbgs metres below ground surface
- MEA Municipal Engineers Association
- MECP Ministry of the Environment, Conservation and Parks
- mm millimetre(s)
- mm/s millimetre(s) per second
- MNRF Ministry of Natural Resources and Forestry
- MOI Ministry of Infrastructure
- MTO Ministry of Transportation Ontario
- NH<sub>3</sub>-N Ammonia Nitrogen
- NVCA Nottawasaga Valley Conservation Authority
- OPA Official Plan Amendment
- O.Reg. Ontario Regulation
- PPS Provincial Policy Statement
- PPTW Permit to Take Water
- SAR Species at Risk
- TDH Total Dynamic Head
- TSS Total Suspended Solid
- TP Total Phosphorus
- TN Total Nitrogen
- WWTP Wastewater Treatment Plant

## Executive Summary

The Horseshoe Craighurst Corridor (HCC) Landowners Group Inc. (the “Landowners”) and the Township of Oro-Medonte have completed this Water, Wastewater and Transportation Master Plan to identify long term servicing plans for future development within the Horseshoe Valley and Craighurst Settlement Areas. These two settlement areas are located approximately 2 kilometers (km) apart along Horseshoe Valley Road (as known as County Road 22) in the Township of Oro-Medonte, Simcoe County. **Figure ES-1** presents the location of the settlement areas as well as the Primary Study Area. The Primary Study Area includes both settlement areas and was used as a general geographical basis for all of the technical supporting studies completed as part of this Master Plan. In some cases, the Study Area was modified depending on the specific technical analyses completed to better understand and capture potential effects. The Primary Study Area includes a corridor along County Road 22 and along Line 6 North from County Road 22 to Coldwater River.

This Master Plan has followed the Municipal Engineers Association (MEA) Master Planning process Approach #2, includes completion of Phases 1 and 2 of the Class EA Process and carried out the requirements for Schedule A, A” and B projects to move forward to implementation. This Master Plan also sets the stage for future Schedule C projects that will proceed as separate studies to allow for greater detail in the evaluation of alternative design concepts. As planning principles have been integrated into the EA process, this Master Plan also meets the requirements of Ontario’s Planning Act in addition to meeting the requirements of the Environmental Assessment Act. The development of this Master Plan has considered a number of policies and legislation from various levels of government including the Federal Government (Fisheries Act, Species at Risk and Migratory Birds Convention Act), the Province of Ontario (Provincial Policy Statement, Places to Grow – Growth Plan for Greater Golden Horseshoe, Endangered Species Act, Conservation Authorities Act and Clean Water Act), Simcoe County (Simcoe County Official Plan and Simcoe County Transportation Master Plan Update) and the Township of Oro-Medonte (Official Plan and amendments and Natural Heritage Plan).

Water and wastewater servicing is currently provided to Horseshoe Valley through a combination of private sector, municipal and individual systems. In Craighurst, water servicing is currently provided through a combination of individually owned wells and a municipal system while wastewater servicing is provided by individually owned septic systems. As it is the Township of Oro-Medonte’s, policy that settlement areas be developed primarily on full water and wastewater services, a number of planned developments in the settlement areas will require municipal servicing. The Growth Plan for the Greater Golden Horseshoe has identified growth within Oro-Medonte. Based on a review of the above information, the problem statement for this Master Plan is as follows:

*“How to provide water, wastewater and transportation infrastructure to service future development within the Craighurst and Horseshoe Valley Settlement Areas, meeting the guidelines, requirements and approval of Regulatory Agencies and the Township of Oro-Medone while minimizing impacts to the natural, cultural and social features of the study area.”*

As part of this Master Plan, a comprehensive review of existing conditions has been completed with all technical information gathered and analysis documented in this Master Plan. Natural environment assessments were completed to assess landforms, soils, groundwater (aquifer characteristics and source water protection areas), terrestrial vegetation, wetlands, wildlife (amphibian surveys and species at risk), habitat, surface water, fisheries and the connections between these resources. Existing cultural heritage assessments include the completion of a Stage 1 Archaeology Assessment and a Cultural Heritage Resources Assessment in addition to assessments of current land use. Detailed assessments of existing

water, wastewater and transportation infrastructure in the study area were also completed. In addition to the above, an assimilative capacity assessment and reasonable use assessment were completed to support this Master Plan.

Future water, wastewater and transportation needs were identified following a detailed assessment of future land use in the settlement areas. The Greater Golden Horseshoe Growth Plan estimated a residential population for Oro-Medonte of 27,000 persons by 2031, which the majority of growth occurring within the Horseshoe Valley and Craighurst Settlement Areas. With existing and future development, the Horseshoe Valley Settlement Area future population has been estimated at 10,367 persons while the Craighurst Settlement Area future residential population has been estimated at 1,822 persons. In addition, commercial development of 355,800ft<sup>2</sup> or 32,500m<sup>2</sup> was also identified for the Horseshoe Valley Settlement Area. Analyses of future water, wastewater and transportation needs were developed to service identified growth. For water and wastewater, future needs were identified. For transportation, it was concluded that no further transportation improvements would be necessary, beyond those already recommended as part of the County Road 22 Class EA.

Based on the analysis of water and wastewater needs, a series of alternative solutions were developed and evaluated. These alternative solutions included limit growth, do nothing, implement water use and wastewater reduction measures and expand and enhance existing systems. These alternative solutions were used to develop servicing alternatives. Servicing alternatives were developed and screened to meet water and wastewater. Servicing alternatives that were demonstrated to be reasonably cost effective to construct and operate and reasonably capable of being approved were identified and carried forward into detailed evaluation. Six water servicing alternatives and four wastewater servicing alternatives were carried forward into detailed evaluation. Detailed evaluation considered a set of specific evaluation criteria that were broadly grouped into four areas including natural environment, social/ cultural environment, technical and economic/ financial. Each servicing alternatives was evaluated against each evaluation criteria with the results considered to identify the recommended preferred alternative. For water servicing, the recommended preferred alternative consists of additional water supply and in-ground storage in Craighurst and interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley. The recommended preferred servicing alternative for wastewater includes a new subsurface discharge wastewater treatment plant in Craighurst, a new surface water discharge wastewater treatment plant in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP. The recommended preferred alternatives were presented to the public for review at a Public Information Centre, held on January 23, 2019. Following receipt of comments from the public, preferred alternatives for water and wastewater were identified. **Table ES.1** presents information on recommended projects, including estimated capital costs, Class EA schedule and project trigger.

**Table ES.1 Recommended Projects**

ID	Description	Estimated Capital Cost	Class EA Schedule	Implementation Trigger
W1	Craighurst Well improvements to provide an additional capacity of 15L/s (Township to be proponent)	\$0.7M	C	Will be required to support development
W2	Construction of new in-ground storage facility in the vicinity of the Craighurst well	\$2.7M	B	Will be required to support development

**Table ES.1 Recommended Projects**

ID	Description	Estimated Capital Cost	Class EA Schedule	Implementation Trigger
W3	Horseshoe Valley Interconnection works, Construct 30m of 1,000m watermain to provide chlorine contact chamber	\$0.3M	B	Can proceed immediately.
W4	Expansion of storage at Horseshoe Highlands Storage Facility to extend tanks to a height of 18.6m and construct a third tank with a height of 18.6m.	\$5.5M	B	Current combined zone was excess storage capacity of 1,368m <sup>3</sup> . With interconnection of Zones, current storage could support a population up to 6,000 persons.
WW1	Expansion of the Skyline WWTP up to the site capacity. (Skyline Investments to be proponents)	\$9.6M	C	Project will be required to support future development.
WW2	New Horseshoe Valley WWTP with a surface discharge to Coldwater Creek (Township to be proponent)	\$11M	C	Project will be required when excess capacity at expanded Skyline WWTP has been used.
WW3	New Craighurst WWTP with a sub-surface discharge (Township to be proponent)	\$8M	C	Project will be required to allow growth in Craighurst
WW4	New pumping stations, forcemain, outfall sewer and outfall from new Horseshoe WWTP to Coldwater Creek	\$16M	A+	Project will be required when excess capacity at Skyline WWTP has been used.

Mitigation measures were also developed to address identified or potential impacts associated with the preferred alternative. These measures are intended to be considered through further studies or detailed design as implementation proceeds.

Consultation and communications were critical over the course of this study. A variety of tools were used to communicate with interested stakeholders, agencies, local residents, First Nations and the general public. A project mailing list was developed, maintained and updated over the course of the study. Notice of Study Commencement and a Notice of Public Information Centre (PIC) were provided to individuals and groups on the study mailing list and published on the Township's website and local newspapers. During the PIC, copies of display boards were available for handout and were posted on the Township's website following the PIC. Comments were received and were incorporated into this Master Plan. Review and Agency consultation and Indigenous Community engagement also occurred throughout the study. Finally, presentations to Oro-Medonte Council were completed throughout this study.

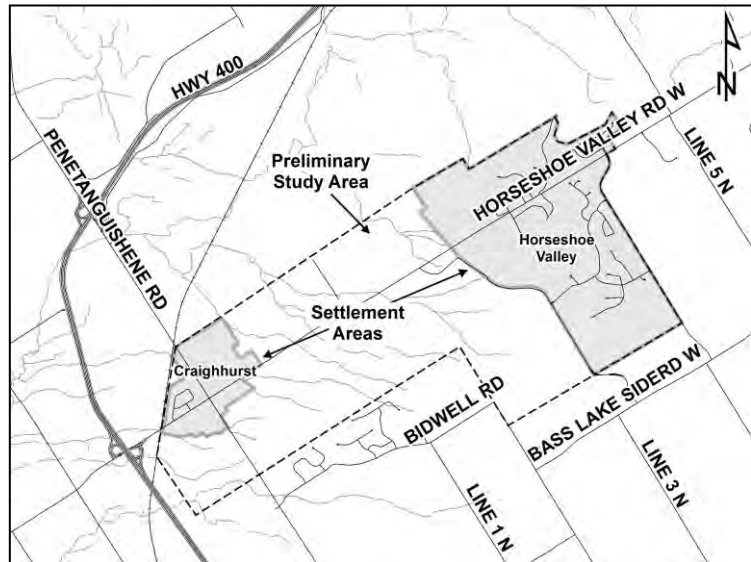
Based on the results of this study, the following recommendations are made:

- Water
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for an expansion to the Craighurst water supply;
  - The Township should move forward into preliminary design of an in-ground storage facility in Craighurst and an expansion to the Horseshoe Highlands Water Storage Facility;
  - The Township should move forward with interconnection of Zones 1 and 2 in Horseshoe Valley; and,
  - The Township should consider implementation of water use reduction measures and programs to encourage residents to reduce their water use within both Horseshoe Valley and Craighurst.
- Wastewater
  - Skyline Investments should initiate additional studies including a Schedule 'C' Class EA to select a preferred design concept for expansion of the Skyline Wastewater Treatment Facility up to its site capacity.
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for the construction of a new treatment facility in Horseshoe Valley. It is recommended that the Township include evaluation of alternative design concepts for pumping stations, forcemain, outfall sewer and outfall structure within the overall scope of the Schedule 'C' EA;
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for a new wastewater treatment facility in Craighurst; and,
- Transportation:
  - The County should continue to implement the recommendations of the County Road 22 Class Environmental Assessment.



# 1 Introduction

The Horseshoe Craighurst Corridor (HCC) Landowners Group Inc. (the “Landowners”) and the Township of Oro-Medonte have completed this Water, Wastewater and Transportation Master Plan to identify a long-term servicing plan for future development of the two settlement areas known as Horseshoe Valley and Craighurst. The Horseshoe Valley Development Node and the Craighurst Settlement area are located approximately two kilometres (km) apart along Horseshoe Valley Road (County Road 22) in the Township of Oro-Medonte, County of Simcoe.



**Figure 1-1 Settlement Areas**

**Figure 1-1** presents the locations of the settlement areas.

To accommodate approved and planned growth within the two settlement areas only, new water and wastewater servicing infrastructure is proposed, along with transportation network improvements. The new infrastructure for which this Master Plan seeks approval includes improvements for municipal water and wastewater systems and transportation improvements. *Schedule B projects for which this Master Plan seeks approval, include an in-ground water storage facility in Craighurst, water system interconnections works in Horseshoe Valley, expansion of the Horseshoe Highlands Water Storage Facility and new pumping stations / sewer/ and forcemain along Horseshoe Valley Road and 6 Line North.* It is anticipated that separate Schedule C Municipal Class Environmental Assessment (EA) studies will be completed for the future construction of a new Horseshoe Valley Wastewater Treatment Plant, an expansion to the Skyline Wastewater Treatment Plant, a new Craighurst Wastewater Treatment Plant and improvements to the Craighurst water supply. The Landowners (lead proponent) propose to construct the identified water and wastewater infrastructure at their expense, while the Township will ultimately own, operate and maintain the infrastructure. Similarly, the Landowners will be responsible for all expenses related to design and construction of the intersection improvements, in accordance with requirements of both the County of Simcoe and the Township of Oro-Medonte, as applicable. Water, wastewater and transportation servicing located outside of the two settlement areas and required to service lands outside of the settlement areas is not part of this Master Planning process.

## 1.1 Background

Horseshoe Valley is a year-round vacation destination, best known for the Horseshoe Resort which covers an area of approximately 650 hectares (ha) within the Settlement Area (Development Node) boundary. The Resort includes alpine and Nordic skiing, golf courses and an adventure park, an inn, spa, restaurants, banquet facilities and timeshare units, and over 40km of recreational trails connected to the nearby Copeland Forest. The community itself comprises approximately 2,000 residents, a fire hall, police detachment, and annual visitors of about 200,000 during the winter months and 20,000 during the summer months.

Craighurst is a Rural Settlement area comprised of approximately 94 existing single-detached residences. There is a community hall, gas station, grocery store, liquor store and chocolate factory, and two restaurants, churches and vehicle repair shops. The remainder of the land is predominantly vacant, with some being used for field crops. The current population is estimated at approximately 282 people.

Currently, water and wastewater servicing within Horseshoe Valley is provided through a combination of private sector, municipal and individual systems. Water is supplied via municipal water services and municipal services sourced from the private sector. Wastewater servicing is provided by either the private sector for private development or existing residential homes, municipal communal septic systems, or by individual septic systems. In Craighurst, wastewater servicing is provided through private on-lot wastewater systems (septic systems) while water servicing is provided through a combination of a municipal water system and privately-owned wells.

There are a number of planned future developments within these areas that will require municipal servicing. **Section 6.1** provides details on these future developments. It is the Township's policy that these areas be developed primarily on full water and wastewater services.

Four major landowners, Skyline Horseshoe Valley Inc., Horseshoe Valley Lands Inc., Kellwatt Lands and Craighurst Land Corp., collectively own a large portion of the lands within the two development areas. These landowners intend to address the Township's policy of providing water and wastewater servicing via a combination of existing infrastructure and the new infrastructure proposed through this Master Plan.

## 1.2 Master Plan Objectives

The purpose of this Master Plan study is to identify water, wastewater and transportation solutions for future growth in the HCC Development Area, and to do so in a comprehensive, environmentally sound planning process with public participation to facilitate dialogue between parties with a number of competing interests. Further, this Master Plan documents the development, evaluation and selection of the preferred solutions to efficiently and effectively service the existing and anticipated growth. Key objectives include:

- Protection of the environment, as defined in the *Environmental Assessment Act*, through the wise management of resources. This goal will be met through background studies, consultation with the general and affected public and relevant government review agencies, and mitigation and monitoring;
- Recommendation of projects which can meet the HCC water and wastewater servicing and transportation needs with minimal disruption to existing residents, business owners and the natural environment, while at the same time meeting Regulatory Agency requirements and Township of Oro-Medonte Planning and Engineering Standards;
- Involvement of a broad range of stakeholders in the study process to allow for sharing of ideas, education, testing of creative solutions and developing alternatives; and,
- Comprehensive documentation of the study process in compliance with Phases 1 and 2 of the Municipal Class EA process.

## 1.3 Study Area

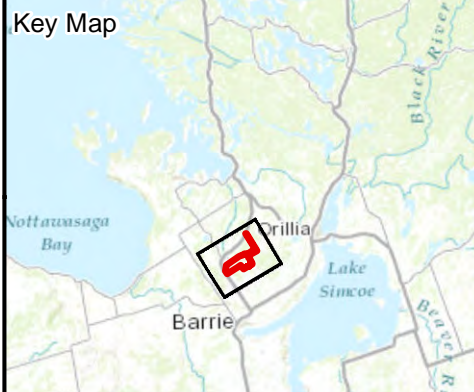
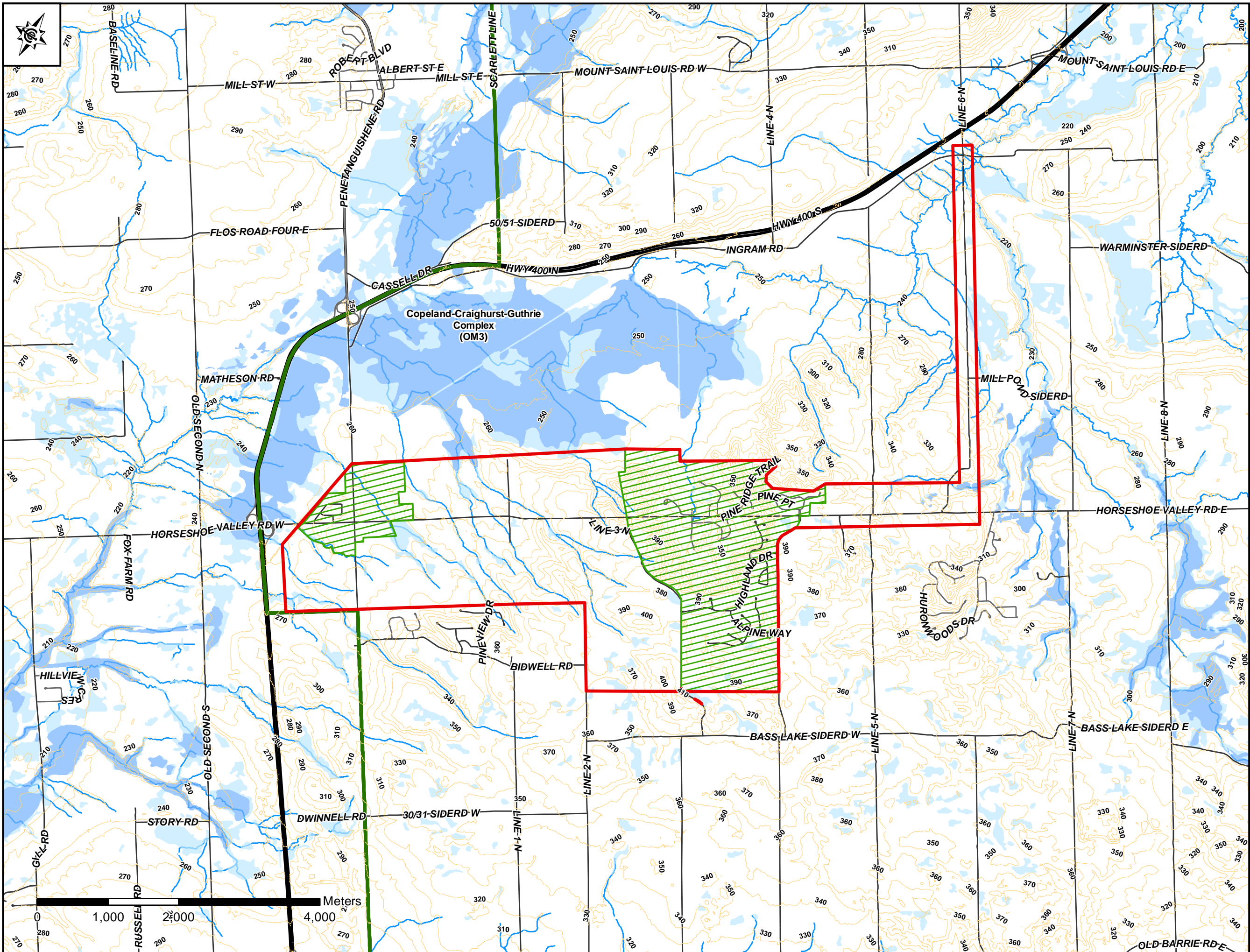
The Study Area is located within the west central part of the Township of Oro-Medonte in the County of Simcoe. As shown in **Figure 1-2**, the Primary Study Area contains the settlement areas of Craighurst and Horseshoe Valley and the surrounding lands connecting the two areas. It is generally centered along

Horseshoe Valley Road (County Road 22) just south and east of Highway 400. The Canadian Pacific Railway (CPR) borders its western boundary near Craighurst. In addition to the nearby Highway 400 and CPR, major transportation corridors include Horseshoe Valley Road and Penetanguishene Road (County Road 93). Administratively the Study Area includes portions of the Township of Oro-Medonte Wards 1 and 3.

The Primary Study Area was used as the general geographic base for all technical supporting studies completed as part of this Master Plan. However, depending on the specific technical discipline assessed, the Study Area may have been modified to better capture potential impacts specific to that discipline. Further details are provided as applicable in each technical support study in the Appendices.

The study area was further expanded as the Master Plan process proceeded. The Study Area shown in **Figure 1-2**, includes a corridor along County Road 22 and along Line 6 North extending from County Road 22 to Coldwater River. This corridor was added to allow for assessment of a new outfall sewer within this corridor.





**Legend**

- Watercourse
- 10m Contour
- Existing Road
- Highway
- Study Area
- Municipal Boundary
- Settlement Areas
- Unevaluated Wetlands
- Evaluated Wetlands

**Figure 1-2  
Regional Topography**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.:	Date:
EM14-0424	April 2019

## 2 Master Planning Process

This study followed the Municipal Engineers Association (MEA) Master Planning process Approach #2. This Master Plan completed Phases 1 and 2 of the Class EA process and carried out the requirements for Schedule A, A+ and B projects (refer to **Section 2.2.1** for an explanation of the Schedules) to move forward to implementation. This Master Plan also sets the stage for future Schedule C projects that will proceed with separate studies to allow for greater detail in the evaluation of alternatives and design concepts. Background information including governing legislation, details regarding this process and the different project classifications are provided in the sub-sections below.

### 2.1 Legislation

By integrating EA planning principles with the planning of infrastructure for existing and future land use, master plans meet the requirements of both Ontario's *Planning Act* and the *Environmental Assessment Act*.

#### 2.1.1 Planning Act

The Ontario *Planning Act* (2006) is the principal law governing land use planning in Ontario. It describes how land uses are controlled and who may control them. Led by provincial policy, it serves to establish a land use planning system that promotes sustainable economic development in a healthy natural environment. The Act guides municipal councils, land use planners and other parties in the preparation of Official Plans, zoning by-laws, minor variances, site plan controls and plans of subdivision. It also ensures the planning process is open, accessible, timely and efficient. It encourages co-operation and coordination among various interests and recognizes that decision-making authority and accountability rests in planning. As such, the Act plays a crucial role in shaping Ontario's communities due to the broad powers over land use planning it provides to provincial and municipal decision-makers.

#### 2.1.2 Environmental Assessment Act

The *Environmental Assessment Act*, passed by the Ontario government in 1975, requires proponents (owners) to review and document the potential environmental impact of any major project or activity prior to construction. The purpose of the Act is to "provide for the protection, conservation, and wise management of Ontario's environment". The Act broadly defines the environment as:

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

The Act applies to any major public sector project and designated private sector projects that have the potential for significant environmental effects. All municipalities in Ontario, including the Township of



Oro-Medonte, are subject to the provisions of the Act and its requirements to conduct an EA for applicable projects.

## 2.2 Municipal Class Environmental Assessment

The MEA “Municipal Class Environmental Assessment” document (October 2000, as amended in 2007, 2011 & 2015) outlines a planning process, approved under the *Environmental Assessment Act*, for municipal projects having a predictable range of environmental impacts and applicable mitigation measures. **Figure 2-1** presents a broad overview of the Municipal Class Environmental Assessment process and shows the details of Phases 1 and 2 of the EA process, which is the focus on this study.

This planning process includes the following five phases:

- **Phase 1: Problem or opportunity identification**, including the issue to be addressed and the rationale behind the problem or opportunity;
- **Phase 2: Identification of alternative solutions** and in turn the preferred solution to the problem or opportunity, taking into consideration the existing environment and public and review agency input;
- **Phase 3: Identification of alternative design concepts** for the preferred solution, taking into consideration the anticipated environmental effects, methods of minimizing negative effects and maximizing positive effects, and public and review agency input;
- **Phase 4: Documentation** of the planning and consultation process through Class EA Phases 1 through 3 in an Environmental Study Report (ESR) which is then made available for scrutiny by the public and review agencies; and,
- **Phase 5: Implementation** as documented in the ESR, including completion of detailed design, construction contract drawings and documentation, construction and monitoring for adherence to the environmental provisions and commitments made in the ESR and contract documents.

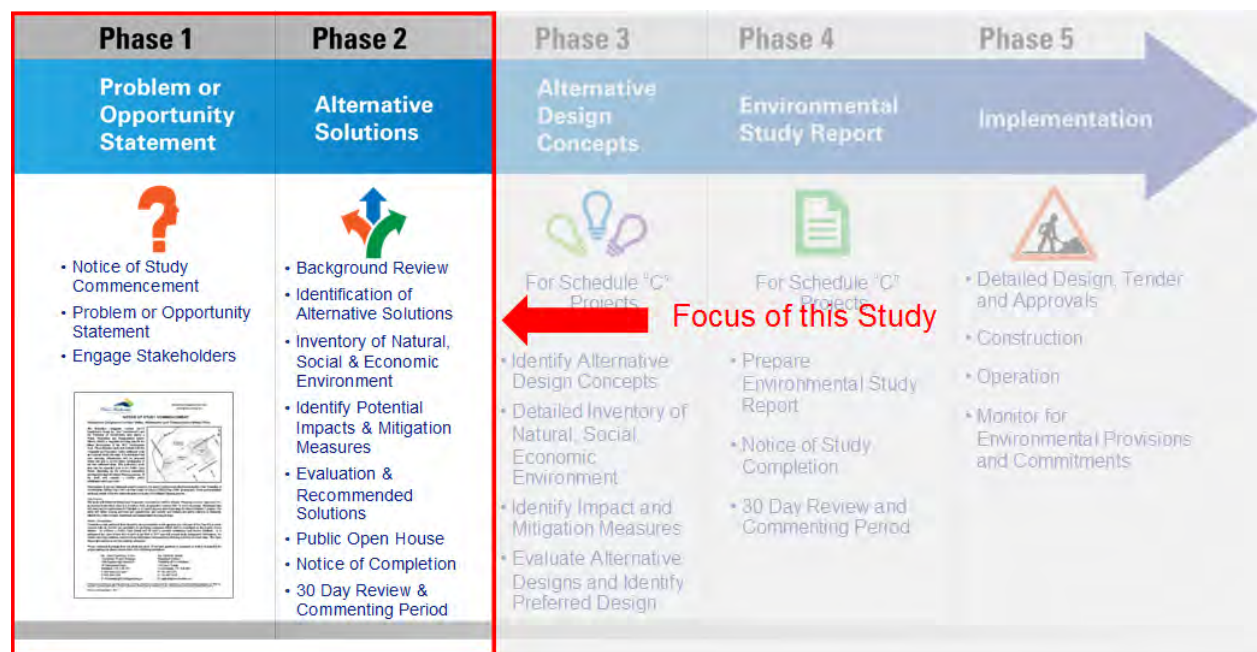


Figure 2-1 MEA Process Overview

### 2.2.1 Class EA Project Classification

Projects subject to the Class EA process are classified into one of four types or “schedules” depending on the anticipated level of environmental impact and for some projects, the anticipated construction costs. The four schedules include:

- **Schedule A:** These projects are limited in scale, have minimal adverse environmental effects and include normal or emergency maintenance and operations procedures. For example, watermain repairs or installation of new service connections are classified as Schedule A projects. All Schedule A projects are pre-approved and do not require any planning or public consultation under the Class EA process;
- **Schedule A+:** These projects are also pre-approved and do not require any planning under the Class EA process. However, the proponent is required to inform the public via some type of public notification (typically a letter, newspaper notice or website posting) prior to construction or implementation. For example, watermain or sewer extensions within an existing road right-of-way or utility corridor are classified as Schedule A+ projects;
- **Schedule B:** These projects have the potential for some adverse environmental effects. As such, the proponent is required to proceed through Phases 1 and 2 of the Municipal Class EA process, including consultation with those who may be affected. Schedule B projects generally include minor expansions or improvements to existing facilities. At the completion of Class EA Phase 2, a Project File is prepared to document the planning process and made available for public and agency review for a period of 30-calendar days. If a concern is raised that cannot be resolved, an individual or agency may request a Part II Order (see **Section 2.6** below). Alternatively, the proponent may elect to voluntarily plan the project as a Schedule C undertaking; and,
- **Schedule C:** These projects have the potential for significant adverse environmental effects and must proceed through Class EA Phases 1 to 4, including consultation. Schedule C projects typically include siting and construction of new facilities such as water or wastewater treatment plants, and major expansions to existing facilities. At the completion of Class EA Phase 3, an Environmental Study Report (ESR) is prepared to document the planning process, including the evaluation of alternatives and alternative design concepts. Similar to Schedule B projects, the ESR must be made available for public and agency review and a Part II Order may be requested.

The projects described in this report involve new sewers / forcemains within existing road right-of-ways (Schedule A+), new water storage and a water storage facility expansion (Schedule B). As such, Phases 1 and 2 of the Class EA planning process apply to this study. It is anticipated that future Schedule C Class EA will be initiated for two new wastewater treatment facilities to be located within the Horseshoe Valley Settlement Area and in Craighurst, expansion of the existing Skyline WWTP and improvements to the Craighurst water supply. It is anticipated that the Schedule C Class EA for a new Horseshoe Valley Wastewater Treatment Facility will also meet EA requirements for a new outfall system, including any required pumping stations, forcemain or outfall sewers. A list of the specific Schedule A+, B and C projects associated with the Master Plan is outlined in **Section 10** for the preferred servicing strategies for water, wastewater and transportation.

### 2.2.2 Class EA Principles

The planning process followed adheres to the guidelines outlined by the MEA Class EA document and reflects the following five key principles of environmental planning made under the *Environmental Assessment Act*:

- **Consultation with affected parties.** Consultation with a range of potentially affected stakeholders, including the public, government review agencies and First Nations and Métis, is an integral part of the planning process and should begin early. Its purpose is to identify concerns and allow them to be addressed cooperatively before final decisions are made;
- **Consideration of a reasonable range of alternatives.** Different “alternatives to” the undertaking and “alternative methods” of implementing the preferred solution must be considered, including the “do nothing” alternative;
- **Identification and consideration of the impacts of each alternative on all aspects of the environment.** The potential impacts of each alternative must be considered, including both adverse effects and benefits on the natural, social, cultural, technical and economic environments;
- **Systematic evaluation of alternatives in terms of their advantages and disadvantages to determine the net environmental effects.** As the evaluation moves from “alternatives to” to “alternative methods”, the level of detail evaluated increases against each aspect of the environment. Net environmental effects are the effects that remain after mitigating measures have been applied; and,
- **Provision of clear and complete documentation of the planning process to allow traceability of decision-making with respect to the project.** The documentation is then made available for public review and scrutiny.

By following these planning principals, possible environmental impacts are taken into account before project implementation. This allows the prevention of environmental damage through good planning and decision-making.

### 2.2.3 Master Planning Within the Class EA Framework

This Water, Wastewater and Transportation Master Plan study followed the master planning process as set out in the MEA Municipal Class EA document. **Figure 2-2** demonstrates the Master Planning process. The Class EA specifies that master plans must at least satisfy the requirements of Class EA Phases 1 and 2 and incorporate the five key principles of environmental planning. The Class EA defines master plans as:

“Long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments.”

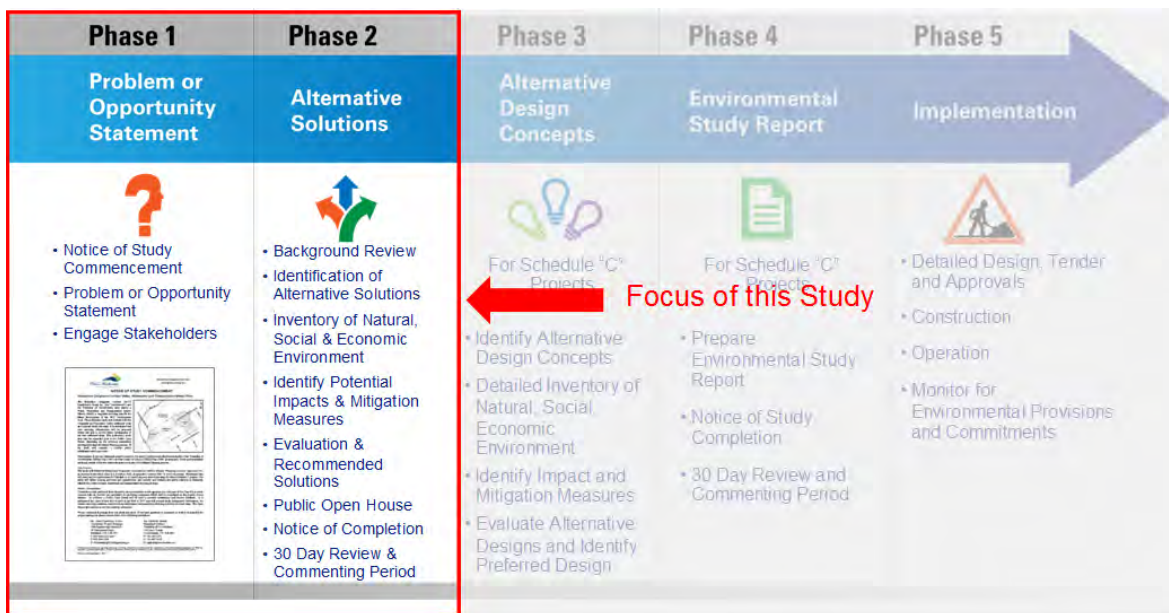
The master planning process involved six main steps:

1. To establish a baseline, the process began with identifying both the existing population and existing infrastructure within the Horseshoe Valley and Craighurst development areas. Inventories of the existing environment were also completed to assist in determining potential effects.
2. Population growth forecasts and development type (e.g. private sector or municipal) within both Horseshoe Valley and Craighurst were used to determine future water demands, wastewater flows and traffic conditions. Future growth projections were verified with the Landowners, the Township of Oro-Medonte and County of Simcoe.



3. Future servicing requirements were then identified through comparison of future predicted demands, flows and traffic controls with existing servicing infrastructure capabilities and regulatory requirements.
4. Different approaches or “alternatives” to meet future servicing needs were developed and then evaluated against a set of criteria that considered the potential effects on the natural, social, cultural, technical and economic environments.
5. The preferred water, wastewater and transportation servicing alternatives were identified and used as the basis for developing more detailed servicing strategies.
6. For those recommended projects which are classified as Schedule B projects, further planning was completed and mitigation measures were developed to fully address Class EA Phases 1 and 2. For those recommended projects which are classified as Schedule C projects, it is anticipated that additional Class EA studies will be completed in the future.

Consultation with a range of stakeholders was undertaken throughout the master planning process. A variety of communication strategies were used, including newspaper notices, written correspondence, website postings, a Public Open House, Council presentations, and discussions with the Nottawasaga Valley Conservation Authority (NVCA). Liaison with Indigenous Communities (First Nations and Métis groups) was also maintained at key contact points throughout the study to ensure their interest and historical connections in the area were understood and respected. The issues identified via the consultation and communications program were used to guide the master planning process. All comments received were considered in the selection of the preferred alternatives and are included in this report. **Section 10** provides the details of the consultation and communications program.



**Figure 2-2 Master Planning Process**

### 2.3 Other EA Planning Considerations

Project requirements sometimes trigger the need for compliance with other EA planning processes, including the Ministry of Infrastructure (MOI) Public Work Class EA process and/or a federal EA as per the *Canadian Environmental Assessment Act*. Further details are provided in the sub-sections below.

### **2.3.1 Ministry of Infrastructure Class EA**

The requirement for real estate activities related to provincial owned lands, such as land or easement acquisitions transacted by Infrastructure Ontario, triggers the MOI Public Work Class EA process. Through this Class EA planning process however, no MOI Public Work Class EA triggers were identified.

### **2.3.2 Canadian Environmental Assessment**

The *Canadian Environmental Assessment Act* (2012) focuses federal environmental reviews on projects which have the potential to cause significant adverse environmental effects in areas of federal jurisdiction. For the Act to apply, the proposed physical activity (project) must be designated under the “Regulations Designating Physical Activities” and specifically, be listed in the “Schedule for Physical Activities”.

Review of the Schedule for Physical Activities shows there is no physical activity that matches the work proposed in this Master Plan for construction of *watermains, sanitary sewers, or pumping stations*. This means that these activities are not a “designated project”, so meeting the requirements of the *Canadian Environmental Assessment Act* will not be necessary for the projects in the Master Plan.

Section 14 (2) of the *Canadian Environmental Assessment Act* does provide the Minister with the power, by order, to designate a physical activity that is not prescribed by regulations if, in the Minister’s opinion, either carrying out that physical activity may cause adverse environmental effects, or public concerns related to those effects, may warrant the designation. However, this is not the case for this project so meeting the CEAA will not be required.

### 3 Policy and Legislative Considerations

As with all municipalities in Ontario, the Township of Oro-Medonte must operate according to the planning frameworks established by senior levels of government. Among other administrative, legislative and financial frameworks, this includes policies and legislation established by the Federal Government, the Province of Ontario and the County of Simcoe. In addition, the *Planning Act* requires that lower tier municipalities, including the Township of Oro-Medonte, prepare their own Official Plans to govern land use. The following sections discuss the relevant planning policies, applicable legislation and growth forecasts considered as part of this Master Plan study. These are considered to confirm that projected growth within the area can be accommodated with the required water, wastewater and transportation services while at the same time protecting the natural environment and public health.

#### 3.1 Federal Legislation

In addition to the *Canadian Environmental Assessment Act*, the following sub-sections provide further details regarding other legislation relevant to this Master Plan, including the Federal:

- Fisheries Act;
- Species at Risk Act; and,
- Migratory Birds Convention Act.

##### 3.1.1 Fisheries Act

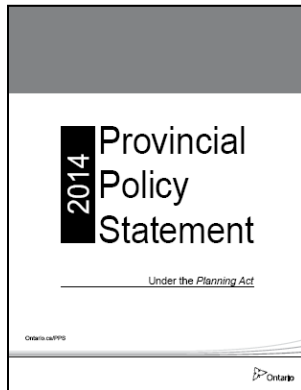
The purpose of the Federal *Fisheries Act* is to maintain healthy, sustainable and productive fisheries through the prevention of pollution and the protection of fish and their habitat. In 2012, changes were made to the *Fisheries Act* to enhance the ability of DFO to manage threats to Canada's Commercial, Recreational and Aboriginal (CRA) fisheries. CRA fisheries include those fish that fall within the scope of applicable federal or provincial fisheries regulations as well as those that can be fished by aboriginal organizations or their members for food, social or ceremonial purposes or for purposes set out in a land claims agreement. Fish that support these fisheries are those that contribute to the productivity of a fishery and may reside in bodies of water that contain fisheries or in water bodies that are connected by a watercourse to such water bodies (DFO, 2013).

Proponents, in this case the Landowners Group, are responsible for determining if the project is likely to cause impacts or serious harm to CRA fish and if these impacts can be avoided or mitigated. Serious harm to fish is defined as “the death of fish or any permanent alteration to, or destruction of, fish habitat”. If it is determined the impacts cannot be avoided or mitigated and will result in serious harm to fish, an application for authorization must be submitted to DFO. Projects having the potential to obstruct fish passage or affect flows needed by fish also require authorization outside of CRA fishery areas.

##### 3.1.2 Species at Risk

At the federal level, Species at Risk (SAR) designations for species occurring in Canada are initially determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). If approved by the federal Minister of the Environment, species are added to the federal “List of Wildlife Species at Risk” in the *Species at Risk Act* through designation as one of the following risk categories:

- Extirpated – lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario;



- Endangered – the species lives in the wild in Ontario but is facing imminent extinction or extirpation;
- Threatened – the species lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it; or,
- Special Concern – the species lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

Species included in Schedule 1 as endangered or threatened are afforded protection of critical habitat on federal lands. On private or provincially-owned lands and waters, endangered, threatened or extirpated species are protected under the Act, unless ordered by the Governor in Council.

### 3.1.3 Migratory Birds Convention Act

Canada seasonally hosts approximately 450 species of native birds, the majority of which are protected under the *Migratory Birds Convention Act* (1994) and are collectively referred to as “migratory birds”. It is the responsibility of Environment Canada to develop and implement policies and regulations to ensure the protection of migratory birds, their eggs and their nests. The Act provides for the protection of migratory birds through the Migratory Birds Regulations and the Migratory Birds Sanctuary Regulations. The *Species at Risk Act* also protects migratory birds on private or provincially-owned lands and waters. The hunting of migrating game birds is managed through the amendments of the Migratory Game Bird Hunting Regulations and established according to national objectives and guidelines.

## 3.2 Provincial Policies and Legislation

In addition to the *Planning Act* and the *Environmental Assessment Act*, a number of provincial policies and legislation apply to this master planning study, including the:

- Provincial Policy Statement (PPS);
- Growth Plan for the Greater Golden Horseshoe (GGH);
- *Endangered Species Act*;
- *Conservation Authorities Act*; and,
- *Clean Water Act*.

The sub-sections below provide further information regarding the applicability of each of these policies and legislation. The Greenbelt Plan, Oak Ridges Moraine Plan and Niagara Escarpment Plan do not apply to this study.

### 3.2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS, 2014) provides direction to municipalities on matters related to land use planning and development. Specifically, the PPS (under the *Planning Act*) sets the policy foundation for regulating the development and use of land within the Province. The PPS focuses growth and development within urban and rural settlement areas while supporting the viability of rural areas. Settlement areas in the Township of Oro-Medonte include Craighurst and Horseshoe Valley as the focus of growth and development while promoting vitality and regeneration.

The PPS states that land use patterns within settlement areas will be based on an appropriate range and mix of housing types and densities to meet projected requirements of current and future residents and must be provided by planning authorities. This includes a range of uses and opportunities for intensification and redevelopment, where this can be accommodated, and implementation of phasing policies. In addition, there are numerous provincial plans, such as the Greenbelt Plan and the Growth Plan for the GGH, that are to be read in conjunction with the PPS. The County of Simcoe is located outside of the Greenbelt area and thus the Greenbelt Plan is not applicable. The Township of Oro-Medonte has reviewed recent Official Plan Amendments (OPA) and Draft Plan approvals to ensure that the PPS is being met within the settlement areas of the Township.

Applicable policies of the PPS are provided in **Appendix A**. Policy 1.6 of the PPS provides direction to municipalities regarding water and wastewater services. Key policies state that infrastructure “shall be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate change while accommodating projected needs”. It further notes that planning for infrastructure shall be coordinated and integrated with land use planning so that they are financially viable over their life cycle and available to meet current and projected needs. Policies 1.6.3 and 1.6.4 state that the use of existing infrastructure should be optimized before consideration is given to developing new infrastructure, and infrastructure should be strategically located to support effective and efficient delivery of emergency management services. With respect to water and wastewater specifically, key sections of Policy 1.6.6 state that:

- Planning for water and wastewater services shall:
  - Direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing i) municipal water and wastewater services, and ii) private communal water and wastewater services, where municipal services are not available;
  - Ensure that these systems are provided in a manner that: i) can be sustained by the water resources upon which such services rely, ii) is feasible, financially viable and complies with all regulatory requirements, and iii) protects human health and the natural environment;
  - Promote water conservation and water use efficiency; and,
  - Integrate servicing and land use considerations at all stages of the planning process.
- Municipal water and wastewater services are the preferred form of servicing for settlement areas. Intensification and redevelopment within settlement areas on existing municipal sewage services and municipal water services should be promoted, wherever feasible;
- Where either municipal or private water and wastewater services are not provided, individual on-site services may be used provided that site conditions are suitable for the long-term provision of such services with no negative impacts. In settlement areas, these services may only be used for infilling and minor rounding out of existing development; and,
- Partial services shall only be permitted i) where they are necessary to address failed individual on-site water and wastewater services in existing development; or ii) within settlement areas, to allow for infilling and minor rounding out of existing development on partial services provided that site conditions are suitable for the long-term provision of such services with no negative impacts.

With respect to transportation, key sections of Policy 1.6.7 state that safe, energy efficient transportation systems should be provided which are appropriate to address projected needs, transportation demand management strategies should be used where feasible, and transportation considerations shall be integrated at all stages of the planning process.

Policy 2.0 provides direction regarding the protection and management of natural heritage features and resources. The PPS defines the following natural heritage features and provides planning policies for each, including:

- Significant wetlands and coastal wetlands – designated by the Ministry of Natural Resources and Forestry (MNRF) and/or the municipality;
- Significant woodlands – identified using criteria established by the MNRF. The existing MNRF guidelines found in the 2010 Natural Heritage Reference Manual are expected to be replaced with new, more explicit guidelines;
- Significant valleylands – the responsibility of the municipality or other planning authority, in this case the Nottawasaga Valley Conservation Authority (NVCA);
- Significant wildlife habitat of endangered or threatened species – determined in accordance with provincial and federal requirements;
- Areas of Natural and Scientific Interest (ANSIs) – the responsibility of the municipality or other planning authority, in this case the NVCA; and,
- Fish habitat – governed by Fisheries and Oceans Canada (DFO).

Each of these features is afforded varying levels of protection subject to guidelines, and in some cases, regulations, further discussed below.

### 3.2.2 Places to Grow – Growth Plan for Greater Golden Horseshoe

The Growth Plan for the GGH (2017) is a provincial plan that builds upon the policy foundation provided by the PPS. The purpose is to provide land use planning policies to address issues facing specific geographic areas in Ontario. Key policies related to managing growth in the GGH are as follows:

Forecasted growth to the horizon of this Plan will be allocated based on the following:

- The vast majority of growth will be directed to *settlement areas* that;
  - have a delineated built boundary;
  - have existing or planned municipal water and wastewater systems; and,
  - can support the achievement of complete communities.





- Growth will be limited in *settlement areas* that;
  - are undelineated built-up areas;
  - are not serviced by existing or planned municipal water and wastewater systems; or,
  - are in the Greenbelt Area.
- Within settlement areas, growth will be focused in;
  - delineated built-up areas;
  - strategic growth areas;
  - locations with existing or planned transit, with a priority on high order transit where it exists or is planned; and,
  - areas with existing or planned public service facilities.
- Development will be directed to *settlement areas*, except where the policies of this Plan permit otherwise;
- Development will be generally directed away from hazardous lands; and,
- The establishment of new *settlement areas* is prohibited.

The updated Growth Plan (2017) came into effect in July 2017 with forecasts to 2041, however Schedule 7 for the County of Simcoe remains the same as the 2013 version with forecasts to 2031. Schedule 7 of the Growth Plan provides a distribution of population and employment to 2031 for the Simcoe Sub-area which comprises the City of Barrie, City of Orillia and County of Simcoe. The population and employment forecasts contained in Schedule 7 are to be used for planning and managing growth in the Simcoe Sub-area to 2031. In Schedule 7, the Township of Oro-Medonte has a projected population of 27,000 and employment of 6,000 to 2031. This means that based on its 2011 census population of 20,078, the population is projected to grow by approximately 6,922 residents by 2031.

All municipalities play an important role in ensuring that future growth is planned for and managed in an effective and sustainable manner that conforms to the Plan. The intent is that by 2031, development in all municipalities within Simcoe County will not exceed the overall population and employment forecasts contained in Schedule 7.

However, for the purposes of the HCC Water, Wastewater and Transportation Master Plan, it is important to note that:

- Projected population growth does not include the seasonal population; and,
- Section 6.1 of the Growth Plan states that the intent is that by 2031 development for all the municipalities within Simcoe County will not exceed the overall population and employment forecasts contained in Schedule 7.

Therefore, development within the settlement areas beyond the Schedule 7 forecast is possible.

The Growth Plan addresses *municipal water and wastewater systems* by indicating that they will be planned, designed, constructed or expanded in accordance with the following:

- Opportunities for optimization and improved efficiency within existing systems will be prioritized and supported by strategies for energy and water conservation and water demand management;
- The system will serve growth in a manner that supports achievement of the minimum intensification and density targets in the Plan; and,

- A comprehensive water or wastewater master plan or equivalent, informed by watershed planning has been prepared to;
  - Demonstrate that the effluent discharges and water takings associated with the system will not negatively impact the quality and quantity of water;
  - Identify the preferred option for servicing growth and development, which must not exceed the assimilative capacity of the effluent receivers and sustainable water servicing, ecological, and other needs; and,
  - Identify the full life cycle costs of the system and develop options to pay for these costs over the long-term.

### **3.2.3 Endangered Species Act**

The provincial *Endangered Species Act* was put in place to protect and recover plants and animals and their habitat that are at risk of disappearing from Ontario. SAR in Ontario are initially determined by the Committee on the Status of Species at Risk in Ontario (COSSARO). Species are added under the Act if approved by the MNRF. The Act prohibits the killing or harming of endangered or threatened species and also provides general habitat protection. Species classified as special concern are not included in this protection. Species-specific habitat protection is only afforded to those species for which a habitat regulation has been prepared and passed into law under the Act. Alterations to protected species or their habitats may be considered under the MNRF through the *Endangered Species Act* permitting or authorizations process.

### **3.2.4 Conservation Authorities Act**

The purpose of the *Conservation Authorities Act* is to ensure the conservation, restoration and responsible management of water, land and natural habitat through programs that balance human, environmental and economic needs. The Act authorizes the formation of Conservation Authorities, including the NVCA. The NVCA regulates hazard lands within its jurisdiction, including creeks, valleylands, shorelines, and wetlands under Ontario Regulation (O.Reg.) 172/06. It also regulates areas within 120m of all provincially significant wetlands, wetlands greater than 2ha in area, and areas within 30m of wetlands less than 2ha in size where development could interfere with the hydrologic function of the feature. Development *may* be permitted within regulated areas subject to conformity with Official Plans, completion of appropriate studies and NVCA permits, as applicable. The NVCA generally requires that all watercourses be protected from adjacent development, typically through the use of a vegetative buffer.

### **3.2.5 Clean Water Act**

The *Clean Water Act* (2006) mandates the protection of drinking water resources, particularly through the formation of Source Protection Committees. These Source Protection Committees were tasked with completing assessment reports to delineate wellheads and intake protection zones around municipal water sources. From this, source protection policies have been developed and are being incorporated into municipal plans. Horseshoe Valley and Craighurst fall within the South Georgian Bay Lake Simcoe Source Protection Region, as well as the Severn Sound Environmental Association.

## **3.3 County of Simcoe Policies**

Relevant County of Simcoe policies include the County's Official Plan, Water and Wastewater Visioning Strategy and the Transportation Master Plan Update. The sub-sections below summarize the relevant policies of each.



### 3.3.1 County of Simcoe Official Plan

The County of Simcoe Official Plan (Modified December 2012, partially approved and Issued August 2015) provides a policy context for land use planning and provides the basis for exercising the approval authorities for local municipal Official Plans and amendments and applications for subdivision of land (such as the Township of Oro-Medonte). The County's Official Plan notes that within Oro-Medonte, the population is projected to be approximately 27,000 by 2031, plus an additional employment force of 6,000.

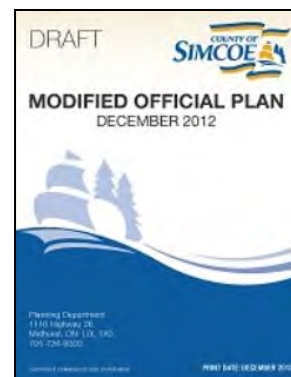
The following relevant policies related to settlement areas and their developments are provided in the Modified County of Simcoe Official Plan:

#### Objectives:

- 3.5.1 *To focus population and employment growth and development within settlements, with particular emphasis on primary settlement areas, in accordance with the policies of this Plan.*
- 3.5.2 *To develop a compact urban form that promotes the efficient use of land and provision of water, sewer, transportation, and other services.*
- 3.5.3 *To develop mixed use settlements as strong and vibrant central places and to create healthy settlements and communities that are sustainable.*
- 3.5.4 *To promote development forms and patterns which minimize land consumption and servicing costs.*

#### Policies:

- 3.5.5 *... Only those settlements listed on Schedule 5.1 are recognized as designated settlement areas. The establishment and/or recognition of new settlement areas is prohibited.*
- 3.5.7 *Settlement areas shall be the focus of population and employment growth and their vitality and regeneration shall be promoted.*
- 3.5.8 *Local municipalities with more than one settlement area shall undertake growth management studies or similar strategic planning to identify the hierarchy of settlements within the municipality and the distribution of population and employment among the identified settlements and rural areas based on criteria including but not limited to type of sewage and water servicing available and capacity of that servicing, density and intensification targets, range and mix of uses within each settlement area and the settlement area role in providing services to a broader area.... Only where appropriate based on the hierarchy, settlement areas are encouraged to develop as complete communities with a diverse mix of land uses, a range and mix of employment and housing types, high quality public open space and easy access to local stores and services. Settlement identification, and the allocations, shall be incorporated into local municipal official plans. The planning horizon to determine requirements for urban development is a maximum of twenty years notwithstanding section 3.5.10 below.*
- 3.5.9 *Development may be approved in settlement areas in excess of what is needed to accommodate the forecasts in Table 1, provided the development:*



- a) *Contributes to the achievement of the density targets or intensification targets as applicable, in accordance with sections 3.5.23 and 3.5.24 of this Plan;*
  - b) *Is on lands for urban uses as of January 19, 2012;*
  - c) *Can be serviced in accordance with applicable provincial plans, provincial policies and section 4.7 of this Plan; and*
  - d) *Is in accordance with the requirements of the Lake Simcoe Protection Plan, 2009, if applicable.*
- 3.5.10 *The County may approve adopted official plans or adopted official plan amendments regarding lands within a settlement area that re-designate lands not for urban uses to lands for urban uses that are in excess of what is needed for a time horizon of up to 20 years or to accommodate the forecasts in Table 1, whichever is sooner, until January 19, 2017 or such date as is specified in the Growth Plan, for an amount of land to accommodate a total population not to exceed 20,000 for the County of Simcoe in total, provided the growth satisfies the following criteria....*
- 3.5.20 *The preferred form of servicing for major long-term expansion of settlement areas is full municipal sewage services and municipal water services, in accordance with Section 4.7 of this Plan.*
- 3.5.22 *Local municipalities will work with the County to manage the land inventory within settlements across the County to include sufficient land for residential, commercial, industrial, institutional, and recreational growth for a period of up to 20 years, including opportunities for intensification, redevelopment, and future growth areas including those urban areas listed in 3.5.23. The timing and availability of municipal water services and sanitary sewage treatment capacity to service up to the 20 year growth projection shall be considered and may require phasing of the development in accordance with service availability.*
- 3.5.24 *Intensification, or directing of development to the built-up area and serviced areas within settlement areas, contributes to a compact development form. Accordingly, it is a policy of this Plan that local municipalities will plan to achieve the following minimum percentages of all new residential units occurring annually to be developed within the built boundaries of settlement areas by the year 2015 and for each year thereafter: Township of Oro-Medonte Intensification Target, 20%.*
- 3.5.29 *Development within the built-up areas and designated Greenfield area of settlement areas may be of higher density to achieve the policy directives of this Plan but should be compatible with adjacent residential areas.*
- 3.5.30 *It is a policy of this Plan that in the development of settlements that a range of types of housing, including detached, semi-detached, townhouse, and apartment units, be provided, along with a mix of affordable housing, to meet a variety of housing needs.*

In addition, the Official Plan's key objectives and policies on water and sewer services are as follows:

Objectives:

- 4.7.1 *To promote the development of sewage and water service systems that facilitate the conservation and protection of ground and surface water quality and quantity and natural heritage features and ecological functions.*

4.7.2 *To promote the development of sewage and water service systems which are financially supported by their users to enable their maintenance and effective operation.*

4.7.3 *To protect drinking water sources from contamination.*

Policies:

4.7.4 *The preferred method of servicing settlement areas and other multi-lot developments is full municipal sewage services and full municipal water services. A local municipality may direct growth towards a particular settlement area to achieve this policy. Intensification and redevelopment within settlement areas on existing municipal sewage services and municipal water services should be promoted, wherever feasible.*

4.7.5 *Where full municipal sewage services and municipal water services are not provided, municipalities may allow the use of private communal water services and private communal sewage services.*

4.7.6 *Where municipal sewage services and municipal water services or private communal sewage services and private communal water services are not provided and where a study concludes that the provision of full municipal sewage services and municipal water services or private communal sewage services and private communal water services cannot be implemented, individual on-site sewage services and individual on-site water services may be used provided that site conditions are suitable for the long-term provision of such services with no negative impacts. In settlement areas, these services may only be used for infilling or minor rounding out of existing development.*

4.7.8 *The County encourages local municipalities to undertake comprehensive master servicing plans for development within settlement areas. As referenced in Sections 3.2 and 3.5, local municipal growth management strategies shall consider the ability to provide full municipal or private communal services where not already provided, as a key element in directing and/or focusing development to particular settlements for long-term growth and development.*

4.7.9 *Planning for sewage and water services shall:*

- a) *direct and accommodate expected growth or development in a manner that promotes the efficient use and optimization of existing services;*
- b) *ensure that the systems are provided in a manner that can be sustained by the water resources upon which such services rely; is feasible, financially viable and complies with all regulatory requirements; and protects human health and the natural environment;*
- c) *promote water conservation and water use efficiency;*
- d) *integrate servicing and land use consideration at all stages of the planning process; and*
- e) *be in accordance with the servicing hierarchy outlined in the policies above.*

4.7.11 *Municipalities should only consider construction of new, or expansion of existing, municipal sewage services and municipal water services or private communal water services and private communal sewage services where:*

- i. *strategies for water conservation and other water demand management initiatives are being implemented in the existing servicing area*
- ii. *plans for expansion or for new services are to serve growth in a manner that supports achievement of the intensification target and density targets as set out in this Plan, and*
- iii. *plans have been considered in the context of applicable inter-provincial, national, binational, or state-provincial Great Lakes Basin agreements.*

- 4.7.12 *Municipal sewage services and municipal water services or private communal water services and private communal sewage services should be developed together. The development of new or expansion of existing partial services is not permitted, except...*
- 4.7.14 *Planning for infrastructure and public service facilities may go beyond a 20-year time horizon.*
- 4.7.17 *Designated Greenfield area development, redevelopment, intensification, and greyfield and brownfield development for settlement area uses should generally be directed to locations with full municipal sewage services and municipal water services or private communal sewage services and private communal water services or to adjacent locations where the services can be efficiently extended to those forms of development through an approved EA. Similarly, such services should be extended to the areas of such development in co-ordination with the staging of development and in accordance with planned and targeted population and employment allocations. Nevertheless, the service systems of nearby settlements, municipalities or other development nodes may be linked where it is economically advantageous.*
- 4.7.18 *Any servicing capability study, servicing feasibility study, or hydrological study must be prepared to the satisfaction of the County and local municipality in consultation with relevant agencies.*
- 4.7.21 *Water and sewage systems shall be established in accordance with provincial standards for drinking water and effluent quality.*

Relevant transportation policies include:

- 4.8.7 *Land use planning and development decisions within the County shall be integrated with transportation considerations. The County and local municipalities will plan for and protect corridors and rights-of-way for infrastructure, including major goods movement facilities and corridors, transportation, transit, active transportation and electricity generation and utility facilities and transmission systems to meet current and projected needs.*
- 4.8.28 *Where a subdivision by plan or consent is proposed and abuts a County Road, the County will require the dedication of land to the County Road system from the original and newly created lots in order to achieve the right-of-way widths identified in Table Schedule 5.4. All land dedications, necessary Traffic Impact Studies, and necessary infrastructure improvements shall be provided at the expense of the developer.*
- 4.8.31 *County Roads policies and standards with regard to entrances, widening, reserves, setbacks, tree removal and other matters along County Road corridors are set out in bylaws, policies, reports and guidelines adopted from time to time by County Council.*
- 4.8.36 *Notwithstanding Plan policies and bylaws permitting development of uses or the creation of lots, access to a proposed subdivision or development shall be from an existing or proposed local municipal road, and not from a County Road or Provincial Highway, where feasible and where compatible with other Plan policies.*

Given the above policies, the growth is to be focused in the settlement areas with full municipal water and wastewater servicing (unless the Township allows for the use of private communal water servicing and private communal sewage services as per Policy 4.7.5) with due consideration given to transportation considerations.

### **3.3.2 County of Simcoe Water and Wastewater Visioning Statement**

The County completed a Visioning Strategy in response to the need to use an integrated, ecosystem planning approach to ensure sustainable development. The Strategy assessed the existing water and wastewater system requirements, agreements and plans for its member municipalities, including the Township of Oro-Medonte. The Strategy is a background document in final draft form (February 29, 2012) and was reviewed when developing servicing options for Craighurst and Horseshoe Valley.

### **3.3.3 County of Simcoe Transportation Master Plan Update**

The County's Transportation Master Plan Update (October 2014) provides direction for the planning, coordination and implementation of an integrated transportation network within the County. It recommends a variety of road projects for implementation in the short, medium and long term horizons. Improvements to Horseshoe Valley Road (County Road 22) between Horseshoe Valley and Craighurst were recommended in the subsequent County Road 22 Class Environmental Assessment Study (2017). Further information on the County Road 22 EA Study is provided in **Section 5**.

## **3.4 Township of Oro-Medonte Policies**

Relevant Township of Oro-Medonte policies include the Township's Official Plan and applicable Official Plan Amendments (OPAs) and the Oro Moraine Natural Heritage Plan. The sub-sections below summarize the relevant policies of each. In addition, the Township's Development Engineering Policies, Process and Design Standards (2016) is intended as guidelines for land development and should be referenced for all future infrastructure design. All infrastructure is to be approved by the Municipality.

### **3.4.1 Township of Oro-Medonte Official Plan**

According to the Township's Official Plan (Office Consolidation December 2015) Schedule A (Land Use), Craighurst is designated as rural settlement area, and Schedule F (Craighurst Secondary Plan) further designates the area as living area, core area, community use area, and environmental protection zone. Schedule D (Horseshoe Valley Development Node) designates the settlement area of Horseshoe Valley as low and medium density residential development, Horseshoe Valley Village, resort facility and recreational uses. A small section of the north portion of the area is outside of the Oro Moraine. Horseshoe Valley Road and the area that links Craighurst and Horseshoe Valley is largely designated as Oro Moraine Core / Corridor Area. On the east side of Craighurst, there is a small segment of Oro Moraine Enhancement Area. On the north side of Horseshoe Valley Road (midway between the two settlement area boundaries) is a recreational area (Settler's Ghost Golf Course).

Section A5 of the Official Plan outlines the servicing strategy for the Township (see **Appendix A**). Section A.5.2 indicates that servicing of Horseshoe Valley Resort and Craighurst is through municipally owned water and sewage treatment systems or by communal systems. For new lots in a settlement area, Council shall be satisfied that an adequate supply of potable water will be available to service the new lot. For lots that are to be serviced with a municipal or communal sewage treatment system, Council shall be satisfied that the lot can be serviced by that system before the lot can be developed. Growth in the Township of Oro-Medonte is based on the 2011 to 2031 timeline.

Official Plan Schedule B: Natural Features identifies Environmental Protection Areas within the Township, with the intention of protecting environmentally sensitive areas from incompatible land use activities and uses that would have a negative impact on significant natural features and functions. Environmental Protection One (EP1) designation includes all wetlands, provincially significant ANSIs, significant wildlife

habitat, habitat of threatened and endangered species and any other areas that have been determined to be significant as a result of a development review process. Environmental Protection Two (EP2) areas include woodlands, regionally significant ANSIs, other wildlife habitat areas and fish spawning and nursery areas. New development on these lands is discouraged. Furthermore, Section B5.1.2 of the Official Plan states that it is the intent of the plan to protect all rivers and streams from incompatible development in order to minimize impacts on their function. Therefore, no development is permitted below the top-of-bank of any river or stream or within 30m of the top-of-bank.

### **3.4.2 Applicable Official Plan Amendments**

An Official Plan Amendment (OPA) is an application process through which policies and/or land use designations in an Official Plan are changed. OPAs can be applicable to a single property or apply to an entire area or the entire Township. OPAs 27, 35 and 36 apply to Craighurst and Horseshoe Valley.

#### **3.4.2.1 Craighurst OPA 27**

The Craighurst Secondary Plan was initiated by the Township in 2003 and OPA 27 (adopted by the Township in May 2009 and minor modifications adopted April 2013) was approved by the County of Simcoe for Craighurst in June 2014. The OPA increased the settlement area (development area) boundary as shown in **Figure 3-1**.

Lands that were subject to OPA 27 have a total area of approximately 113 hectares (ha), 77ha of which were within the previous settlement area designation (shown in orange). The increased area resulted in a 700 unit expansion, broken down as follows:

- 75% single family dwellings (525 units);
- 18% townhouses (125 units); and,
- 7% non-residential (50 units).

Craighurst was selected as suitable for future growth based on the following:

- Centered on the intersection of two major County roads (County Roads 22 and 93) which can accommodate traffic;
- Located adjacent to the full Highway 400 interchange at Horseshoe Valley Road (County Road 22);
- Located at the gateway to the large recreational and residential area centered on the existing Horseshoe Resort and Sugarbush;
- Strong history as a crossroads community;
- Located on the flanks of the Oro Moraine with soil conditions such that a range of options with respect to sewage disposal were thought to be feasible; and,
- High potential for provision of adequate supply of potable water.

OPA 27 was revised to conform to the Growth Plan and 2014 PPS as these policies require densities to be higher in settlement areas where full municipal services exist or will be provided.



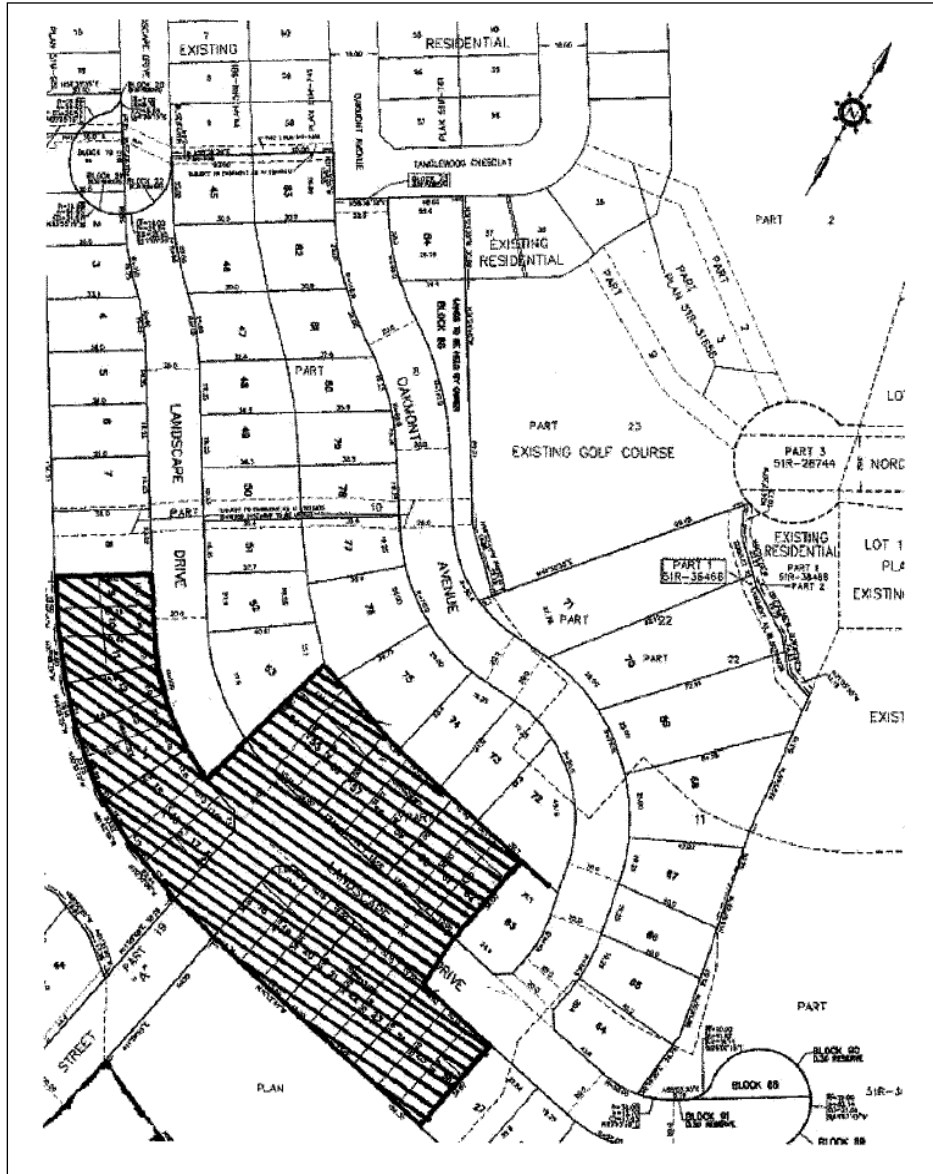


**Figure 3-1 Craighurst Revised Settlement Area as per OPA 27**

**3.4.2.2 Township of Oro-Medonte OPAs 35 and 37**

The purpose of OPA 35, approved in July 2013, was to amend Schedule D (Horseshoe Valley Land Use) by permitting townhouse dwellings and a maximum density of 15 units per hectare on Part of South Half of Lot 3 and Part of Lot 4, Concession 4 (see **Figure 3-2**). Known as Landscapes Phase 3 (Horseshoe Ridge 3A), the lands were previously draft approved for low density residential development, but the OPA re-designated them as medium density residential in order to add townhouses and thereby provide for a greater range of housing types. The area is approximately 10.206 hectares and includes 57 single detached dwelling lots within 3 blocks. As per OPA 35, 27 townhouse units were also approved for a total of 84 residential units. The OPA maintained the low density residential designation adjacent to the existing homes, creating a buffer from the proposed intensified residential use throughout the site.

In June 2015, OPA 37 was approved which re-designated nine of the single detached dwellings in Landscapes Phase 3 (i.e. lots 9-13 and 45-48 in Plan 51M-1035) to medium density, resulting in approval for an additional 19 townhouse dwellings or a total of 94 units (i.e. 48 single detached dwellings plus 46 townhouse dwellings).



**Figure 3-2 Medium Density Residential Lands as per OPA 35**

**3.4.2.3 Township of Oro-Medonte OPA 36**

Similar to OPA 35 described above, OPA 36 (approved in November 2013) affects lands located within the Horseshoe Valley Settlement Area known as the Highlands Future Lands. OPA 36 re-designated lands described as Part of South Half of Lot 3 and Part of Lot 4, Concession 4 (see **Figure 3-3**) from low density to medium density residential development, with site specific policies related to the range of housing permitted (single detached dwellings, semi-detached dwellings, townhouse dwellings and medium density multi-unit residential buildings up to 5-stories in height).

The lands were previously draft approved and designated for low density residential development. The Horseshoe Valley low density residential designation is intended to accommodate single family residences and does not permit a mix of housing types. The medium density designation will allow a range of housing



along with single family dwellings as well as commercial and institutional uses on lands identified as a growth node in the Township and County.

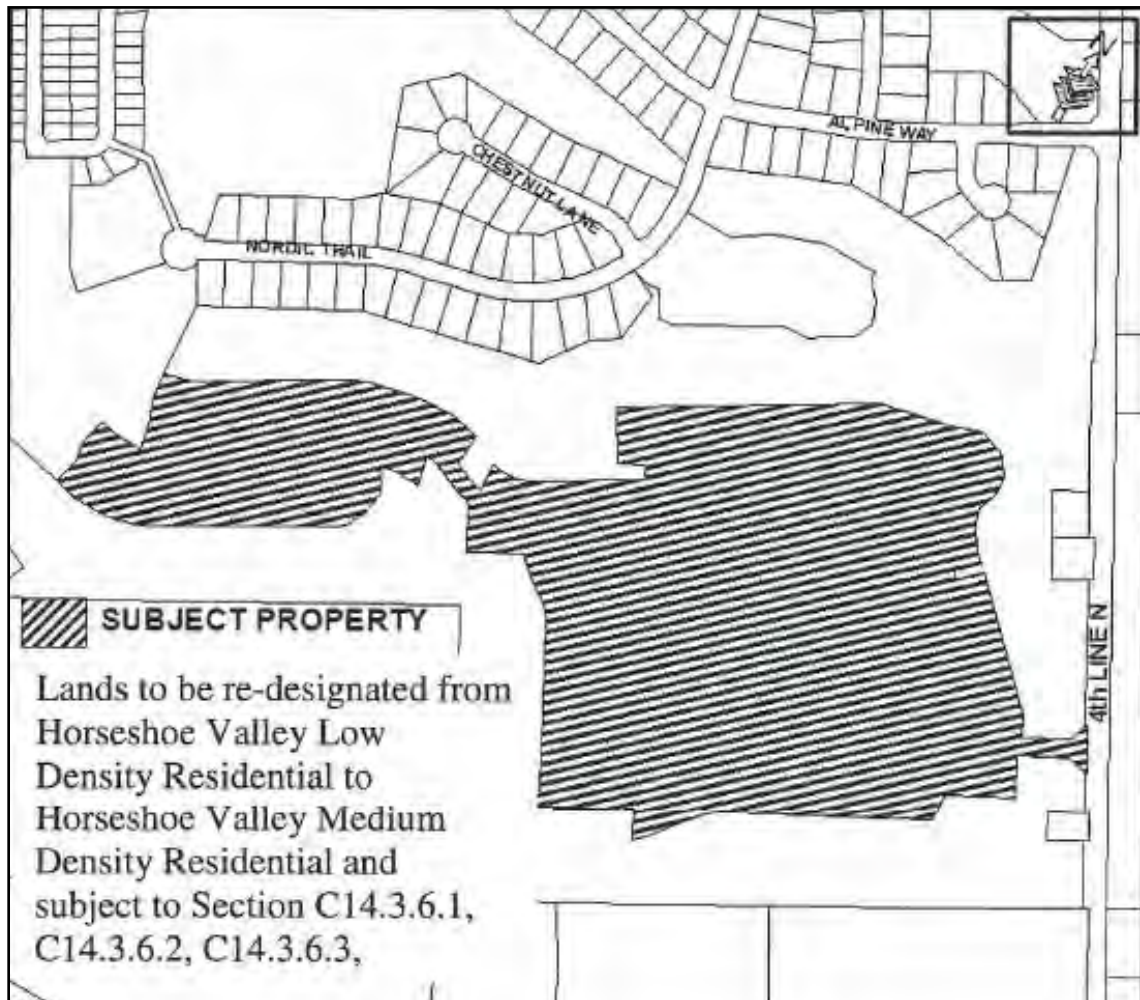


Figure 3-3 Medium Density Residential Lands as per OPA 36

### 3.4.3 Oro-Medonte Natural Heritage Plan

Horseshoe Valley and Craighurst are located within the Oro Moraine, an environmentally significant landform in the County of Simcoe. A Natural Heritage Study was undertaken in 2002 to identify natural heritage features of the Oro Moraine. The database of natural core areas and linkages from the study was used to develop the Natural Features, Schedule B in the Township of Oro-Medonte Official Plan (see **Appendix A**). The result was the preparation of a comprehensive strategy for municipal greenspace planning that ensures the long-term preservation of a sensitive natural heritage feature within the Township. There are also specific policies (B1 – Oro Moraine Planning Area) in the Township’s Official Plan for development within the Oro Moraine and the protection of the natural heritage features and functions. **Appendix A** provides the relevant policy excerpts.

## 4 Problem or Opportunity Statement

Phase 1 of the Municipal Class EA planning process defines the starting point for any Class EA as the “Problem or Opportunity Statement.” This statement assists in defining the scope of the project and serves as its central theme and integrating element. In developing the Problem or Opportunity Statement for this Master Plan, the following key points were considered:

- Water and wastewater servicing within Horseshoe Valley is currently provided through a combination of private sector, municipal, and individual systems. Water servicing in Craighurst is provided through a combination of individually owned wells and a municipal system. Wastewater servicing in Craighurst is provided by individually owned septic systems;
- It is the Township’s policy that settlement areas be developed primarily on full water and wastewater services. In areas where municipal services are not provided, the Township may allow the use of private communal water services and private communal services, as per the County’s OP policies. As per the Township’s policy, there are a number of planned developments that will require municipal servicing in the future;
- The PPS encourages municipalities to focus growth into defined settlement areas (Horseshoe Valley and Craighurst) where full water and wastewater services can reasonably be made available. Furthermore, the PPS requires that planning for infrastructure be integrated with growth planning so that services are available to meet current and projected needs;
- The “Growth Plan for the Greater Golden Horseshoe” (2017) sets out the planning framework under which municipalities are expected to manage their local growth and development. The Growth Plan sets specific population and employment forecasts for upper tier municipalities (County of Simcoe) and lower tier municipalities (Township of Oro-Medonte) are expected to review their growth plans and planning policies accordingly;
- According to the Growth Plan, the Township of Oro-Medonte has a projected 2031 population of 27,000 and an employment force of 6,000. Based on the 2011 census population of 20,078, this means that the Township’s population is expected to grow by approximately 6,992 residents by the year 2031. However, projected population growth does not include seasonal populations, which in Horseshoe Valley are approximately 200,000 per year in the winter and 20,000 per year in the summer months; and,
- The Growth Plan states that development in excess of growth forecasts may be approved in settlement areas (Horseshoe Valley and Craighurst) if development meets certain requirements, including if the proposed development is on lands designated for urban use as of January 19, 2012 and can be serviced in accordance with applicable provincial plans and policies.

Considering the above-listed points, the Problem or Opportunity Statement for the HCC Water, Wastewater and Transportation Master Plan was defined as follows:

*How to provide water, wastewater and transportation infrastructure to service future development within the Craighurst and Horseshoe Valley Development Node settlement areas, meeting the guidelines, requirements and approval of Regulatory Agencies and the Township of Oro-Medonte, while minimizing impacts on natural, cultural and social features of the study area.*

The HCC Landowners Group, together as co-proponents with the Township of Oro-Medonte, initiated this master planning process to identify and evaluate alternative solutions to address the Problem / Opportunity Statement. This Master Plan report documents the planning process and provides recommendations for how to best service future development.

## 5 Existing Conditions

Phase 2 of the Municipal Class EA process requires a general inventory of the natural, cultural and socio-economic and technical environments to be considered. It also requires that significant features and potential impacts be identified early in the Class EA planning process where possible, so that significant features can be avoided or efforts can be made to mitigate (reduce) adverse impacts. This chapter summarizes the environmental inventory completed. It also comments on the existing water, wastewater and transportation systems. Supporting studies completed as part of this process are found in the Appendices as noted throughout this chapter.

In addition, there have been many related studies completed for the Horseshoe Valley and Craighurst settlement areas dating back to the 1990's. These were also reviewed for background information where applicable. Most of the available background studies for the area were commissioned by local developers to assist in development plans and approvals. Among others, key reports include:

- Tier 2 Water Budget Analysis and Water Quantity Stress Assessment for the Oro North, Oro South and Hawkestone Creeks Subwatersheds (EarthFX, May 2013);
- Horseshoe Valley Resort Water Supply and Distribution System Assessment and Sewage Treatment Plant Capacity Assessment (Cole Engineering, June 2011);
- Horseshoe Valley Design Concepts and Development Strategy (MHBC Planning, June 2009); and,
- Horseshoe Valley Resort Comprehensive Development Plan (URS, June 2003) and associated technical / functional servicing reports.

Ongoing and previously completed Class EAs in and around the study area were also reviewed for relevant background information. These include:

- County Road 22 Environmental Assessment (Ainley Group, 2017);
- Horseshoe Highlands Water System: Water Supply, Pump House and Storage Schedule B Municipal Class EA (AECOM, March 2015);
- Horseshoe Highlands Water System – Water Pump Station and Reservoir Design Brief (AECOM, 2017); and,
- Craighurst Secondary Plan ESR (TSH, April 2008) and associated technical reports.

This information was considered when reviewing the potential environmental effects of the alternative solutions. Additional background reports are referenced as applicable in each of the appended Existing Conditions reports summarized in the sections below. A complete listing of all reports reviewed as part of this study is contained in **Section 11- References**.

### 5.1 Natural Environment

Consideration of the natural environment includes landforms and soils, groundwater (hydrogeology), terrestrial vegetation and wetlands, wildlife and habitat, surface water and fisheries, and the connections provided by or between these resources. This information is summarized as applicable in the sub-sections below based on one or more of the following technical support studies:

- Natural Environment Report, Beacon Environmental Limited, November 2015. (see **Appendix B**);
- Existing Conditions Surface Hydrology Report for Matheson Creek & Coldwater River Greenland International Consulting Ltd., November 2015 (see **Appendix C**);
- Matheson and Coldwater Creeks Geomorphological Inventory and Field Observation Report, GEO Morphix Ltd., March 2015 (see **Appendix D**); and,
- Background Review of Existing Hydrogeological Conditions, Cole Engineering Ltd., November 2015 (see **Appendix E**).

### 5.1.1 Topography

The Study Area is located in the western limits of the Simcoe Uplands physiographic region of Southern Ontario. This area is characterized by a series of rolling till plains with flat valleys and steep valley walls. The Simcoe Uplands were once part of the islands in glacial Lake Algonquin. The area is also located at the western periphery of the Oro Moraine, a glacially-formed accumulation of glacial debris. The Township of Oro-Medonte Official Plan Appendix 1: Mineral Aggregate Resources designates this area as Secondary Aggregate Resource area (see **Appendix A**). **Figure 5-1** presents the topography of the study area.

As shown in **Figure 5-1**, regional topography generally slopes in a north-westerly direction with some incised watercourse valleys. Most prominently, the Horseshoe Valley area is characterized by the horseshoe-shaped landform with a steep drop (approximately 95m), mostly used for skiing. This landform crosses Horseshoe Valley Road (County Road 22) and starts at a topographic high of approximately 395 metres above sea level (masl) in the south dropping to approximately 290masl in the northwest.

### 5.1.2 Geology and Hydrogeology

The Quaternary geology consists of thin glaciolacustrine (ice-contact) stratified deposits which vary from silts and clays to fine sand to gravel beach deposits. This is underlain by Newmarket Till which is predominantly silt to silty clay. The Craighurst area straddles two formations of glaciofluvial ice contact and glaciolacustrine deposits, while Horseshoe Valley is fully within the ice contact deposits. This composition allows precipitation to readily infiltrate the ground, resulting in frequent groundwater contributions to creek systems. Directly north of Horseshoe Valley there is a large area of organic deposits associated with the Copeland Forest Complex.

Based on regional geological mapping presented in the Tier 2 Water Budget Analysis for the Oro Moraine (EarthFX, 2013), the following units locally overlie the bedrock (with oldest layers at the bottom, and recent layers near the surface):

- Recent Deposits – sediments deposited from the glacial Lake Algonquin after the final retreat of the Pleistocene glaciers. The majority of the surficial geology is composed of glaciofluvial and glaciolacustrine deposits;
- Oro Moraine Aquifer – a glacial formation composed primarily of sand and gravel. The overall Oro Moraine is composed of alternating layers of sand and gravel aquifers and till aquitards deposited during the advancing and regression of the glaciers;

- Newmarket Till – a regionally extensive, typically massive, stony and dense silty sand diamicton deposited approximately 18,000- to 20,000-years ago, when the Laurentide ice sheet was at its maximum extent. It acts as a regional aquitard separating the Oro Moraine Aquifer from the underlying Thorncliffe Aquifer. Fractures and joints provide the majority of the permeability within the till. The thickness of Newmarket till can be up to 60 m, but generally varies between 20m to 30m;
- Old Glacial Deposits (Early and Middle Wisconsinan) – earlier glacial deposits primarily composed of alternating aquifers and aquitards composed of sand and gravel, silty sand, and silt and silty clay respectively; and,
- Bedrock (Paleozoic and Precambrian) – underlying the unconsolidated sedimentary material is the Shadow Lake Formation, consisting primarily of sedimentary rock. The Shadow Lake Formation is composed of poorly-sorted argillaceous, arkosic sandstones and conglomerates, sandy shales and siltstones, and minor argillaceous dolostone and limestone. The rocks are non-fossiliferous and colour ranges from red to maroon to green with an average thickness is about 6m (EarthFX, 2013).

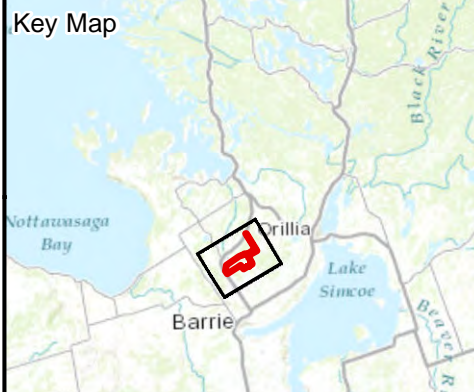
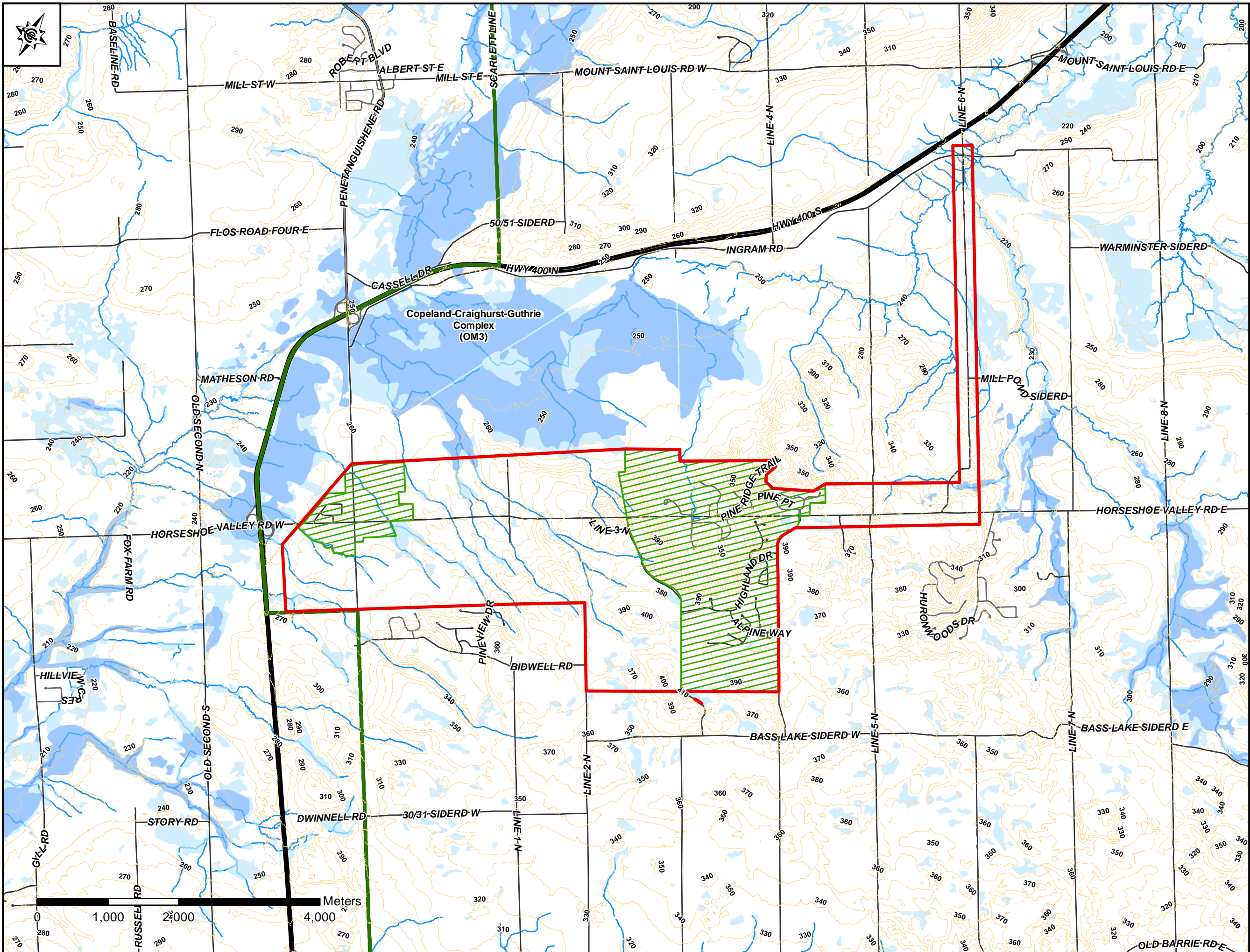
#### 5.1.2.1 Geological Cross Sections

To characterize the local geology underlying the Study Area, geological cross sections were constructed using MECP well record data (accessed April 2015) combined with topographical data points obtained from the County of Simcoe. As shown in **Figure 5-2**, a total of three geological cross sections were created: one west-east profile along Horseshoe Valley Road, one north-south profile through Craighurst, and one north-south profile through the Horseshoe Valley Resort (see **Appendix E**, Figures 7B thru 7D). In summary, the primary materials underlying the site were found to be alternating layers of sand and silt / clay combinations. It is likely that minor sand / aquifer layers are mixed in the clay layers but these were not individually identified by the well records.

#### 5.1.2.2 MECP Well Records

A search of the MECP well records database was conducted within an approximate 1km radius of the settlement areas. The search returned a total of 155 records, most of which (74%) are used for domestic water supply (see **Figure 5-2**). Well information including screened depth, static water level and pumping rate were obtained to assist in assessing the viability of various units for use as additional water supplies. In summary, it appears that the highest yields are screened in the lower regional aquifer unit, from between 71m and 83m below ground surface (mbgs) and in general have a static water level around 60mbgs. Further information regarding the MECP well records is provided in **Appendix E**.





**Legend**

- Watercourse
- 10m Contour
- Existing Road
- Highway
- Study Area
- Municipal Boundary
- Settlement Areas
- Unevaluated Wetlands
- Evaluated Wetlands

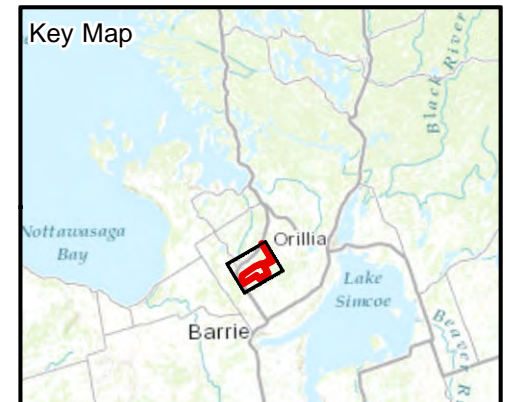
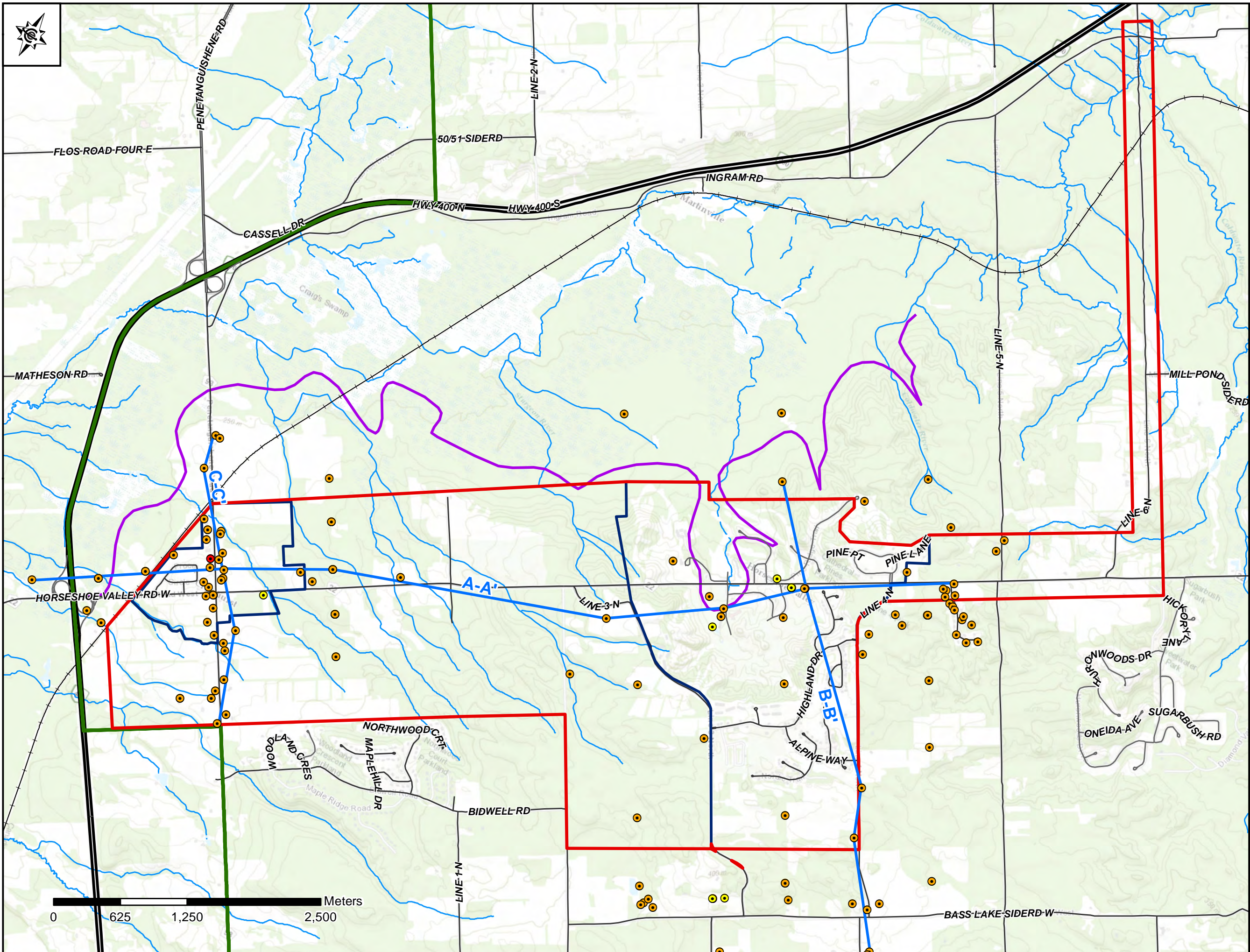
**Figure 5-1  
Regional Topography**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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- Legend**
- MOECC Well Records**
    - Observation Wells
    - Test Hole
    - Water Supply
  - Cross Section Location
  - Oro Moraine
  - Watercourse
  - +— Railroad
  - Existing Road
  - Highway
  - Study Area
  - Municipal Boundary
  - Settlement Areas

**Figure 5-2**  
**MOECC Well Records and**  
**Geological Cross Section**  
**Locations**

Horseshoe Craighurst Corridor  
 Water, Wastewater and transportation  
 Master Plan



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### 5.1.2.3    **Aquifer Characteristics**

Aquifers are areas of soil or rock under the ground where cracks and spaces allow water to pool. Aquitards on the other hand are areas of low permeability that restrict the flow of groundwater. The Oro Tier 2 Water Budget Analysis (EarthFX, 2013) and associated geological cross sections indicate several relatively shallow, alternating aquifer and aquitard units in the Study Area. Based on the cross sections completed, there are two regionally extensive aquifer units composed of gravel, sand and silty sand, located approximately 35 to 75mbgs respectively. A Water Supply Potential memo for Craighurst completed by Golder Associates (April 2013) indicated that certain areas of the local aquifer would be suitable for additional supply wells. Further detailed information on aquifers for the Craighurst Area was also presented in the Preliminary Hydrogeological Study and Site Development Assessment, completed in 2018 (Golder Associates, 2018).

### 5.1.2.4    **Source Water Protection Areas**

The Study Area is within the South Georgian Bay Lake Simcoe Source Protection Region and is thus governed by the South Georgian Bay Lake Simcoe Source Protection Plan. This plan delineates the Wellhead Protection Areas (WHPA) within this region as the Craighurst Wellfield and the Horseshoe Highlands Wellfield. **Figure 5-3** shows the extent of the wellhead protection areas associated with these wellfields. This figure also shows the location of areas of significant groundwater recharge and highly vulnerable aquifer areas. Any development within these wellfields is subject to restrictions or requirements described in the South Georgian Bay Lake Simcoe Source Protection Plan.

### 5.1.3    **Terrestrial Vegetation and Wetlands**

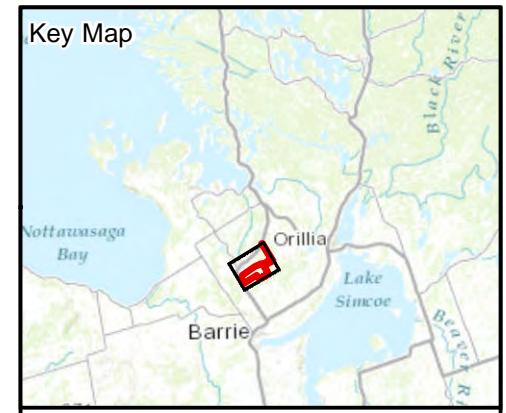
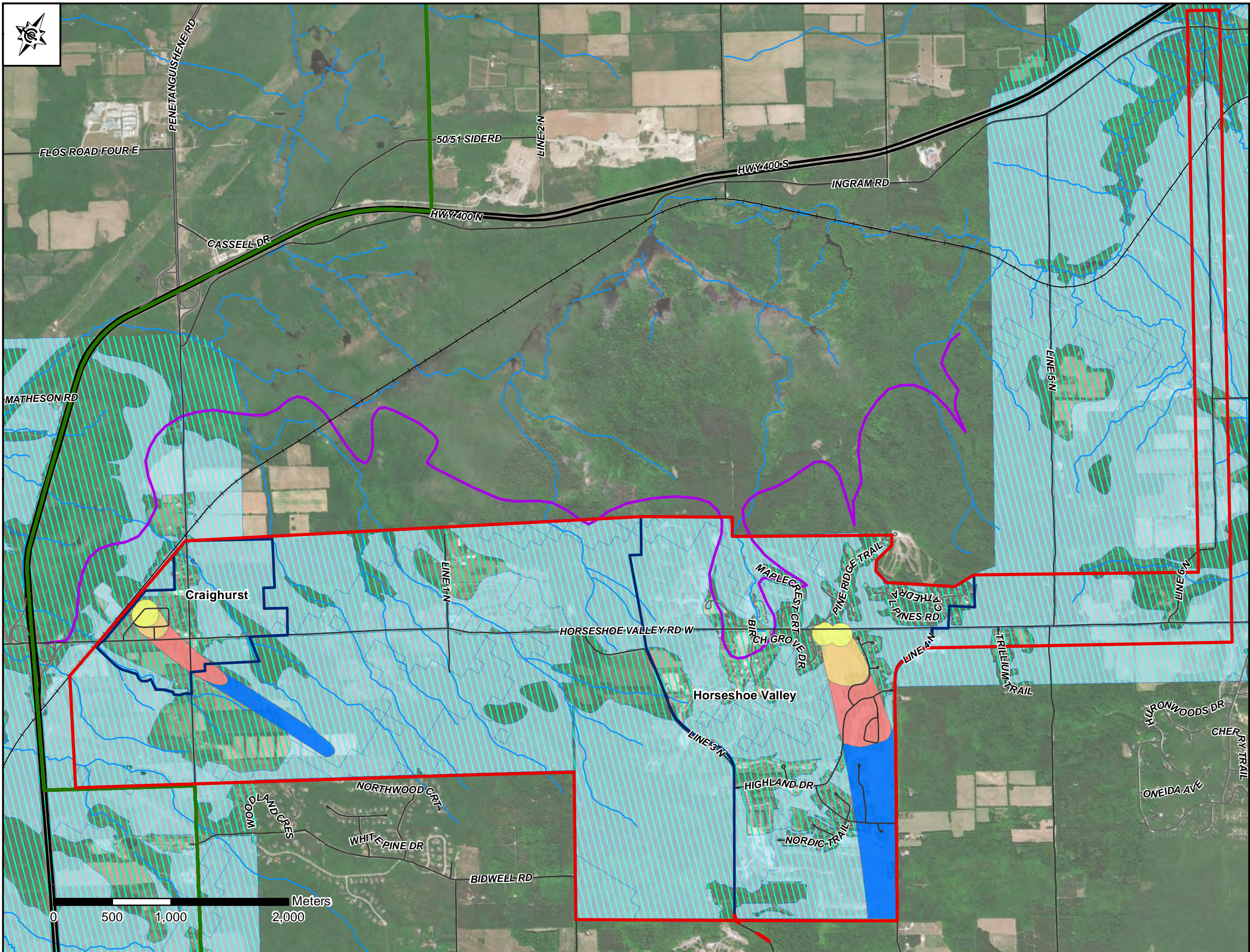
The Study Area contains many natural features including Provincially Significant Wetlands (PSWs), rivers, creeks, woodlands and habitat for SAR. Existing natural features in the Study Area are described in greater detail in the following sections based on review of desktop background information and field surveys conducted in spring 2015 by Beacon Environmental (see **Appendix B**).

#### 5.1.3.1    **Significant Wetlands**

As shown in **Figure 5-4**, there are a large number of small, unevaluated wetlands located within the Study Area. Three wetlands are designated by the MNRF as PSWs in the vicinity of the Study Area as follows:

- Copeland Craighurst Guthrie Wetland Complex – located north of Horseshoe Valley where wetland conditions were previously described in 2013 as “very good”, but the observed trend of wetland quality is declining. A small section of this PSW complex protrudes into the north side of the Primary Study Area;
- West Coulson PSW – located west of Horseshoe Valley straddling Horseshoe Valley Road (County Road 22) between Line 6 and Line 7 N. This wetland is associated with Coulson Creek, a tributary of Coldwater River; and,
- East Coulson PSW – located southeast of the West Coulson PSW, south of Horseshoe Valley Road near Line 8 N.





- Legend**
- Oro Moraine
  - Watercourse
  - Railroad
  - Existing Road
  - Highway
  - Study Area
  - Municipal Boundary
  - Settlement Areas
  - Wellhead Protection Area Zone A
  - Wellhead Protection Area Zone B
  - Wellhead Protection Area Zone C
  - Wellhead Protection Area Zone D
  - Significant Ground Water Recharge Area
  - Highly Vulnerable Aquifer Area

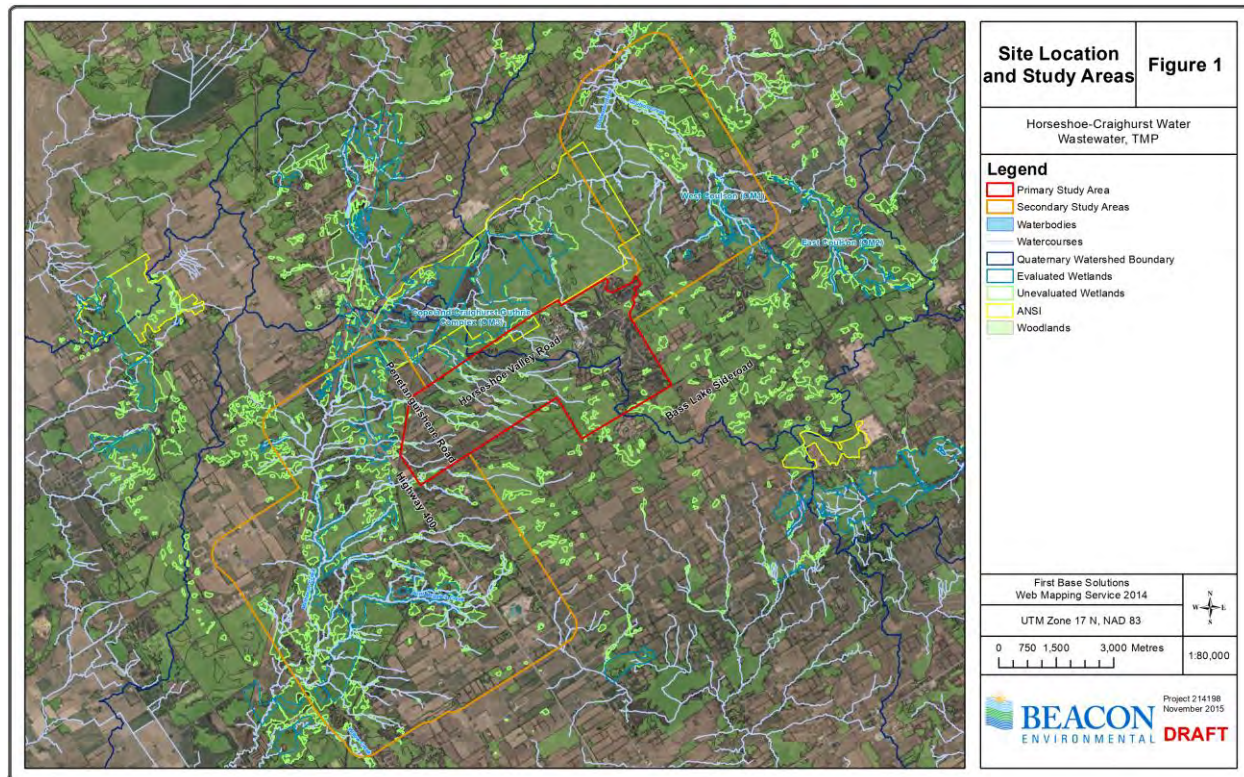
**Figure 5-3  
HVAs, SGRAs, and WHPAs**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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**Figure 5-4 Significant Wetlands and Woodlots**

### 5.1.3.2 Significant Woodlots

Significant woodlands are designated by the municipality. The Township of Oro-Medonte Official Plan Schedule B (see **Appendix A**) identifies the Copeland Forest as significant woodland (see **Figure 5-4**). Copeland Forest is located just north of the Horseshoe Valley settlement area and extends west to Penetanguishene Road (County Road 93). It is Crown Land and forms the predominant feature in the headwaters for the Coldwater River. There are no significant woodlands within the Study Area.

### 5.1.3.3 ESAs and ANSIs

There are no Environmentally Significant Areas (ESAs) within the Study Area, but the Copeland Forest is considered an Area of Natural or Scientific Interest (ANSIs). ANSIs are areas of land and water containing unique natural landscapes or features. These features have been scientifically identified by the MNRF as having life or earth science values related to protection, scientific study or education. **Figure 5-4** shows the extent of the Copeland Forest.

### 5.1.4 Surface Water

The Study Area is located at the headwaters of two watercourse systems:

- Matheson Creek – a major tributary of Willow Creek within the Nottawasaga River watershed. It originates on the Oro Moraine near Craighurst and flows in a southerly direction to its convergence with Willow Creek northwest of Midhurst. Stream health overall is good, with no observed stream health trend. Matheson Creek flows through a forested valley for much of its length and exhibits unimpaired stream health until its confluence with Willow Creek. Stream

health at this point begins to decline due to agricultural land uses and sparse riparian vegetation; and,

- Coldwater River – originates along the north slope of the Oro Moraine between Coulson and Horseshoe Valley, and outlets directly into Severn Sound at Georgian Bay. Productive trout habitat is present throughout its headwaters and springs from the Oro Moraine provide high quality, healthy source water to the system. Stream health declines as the river flows through agricultural lands to the north. The Severn Sound Environmental Association conducts monitoring and manages the systems on a watershed basis.

Surface flow is drained to the east via Coldwater Creek and to the west via Matheson Creek. Their tributaries travel northwards crossing Horseshoe Valley Road and Penetanguishene Road. The two catchments are mostly undeveloped, with forest as the predominant land cover. As shown in **Figure 5-4** Craighurst is located in the upper reach of Matheson Creek and Horseshoe Valley is primarily located in the uppermost reach of the Coldwater River. A small portion of the Matheson Creek catchment supports residential and commercial lands around Craighurst.

### 5.1.5 Fisheries

MNRF provided fish collection records and temperature classification mapping for both the Coldwater River and Matheson Creek. According to the records provided, most reaches in both subwatersheds provide the coolwater habitat required to maintain Brook Trout (*Salvelinus fontinalis*) populations. Brook Trout require high levels of groundwater input and are sensitive to perturbations. A summary of all 37 fish species identified in both systems is provided in **Appendix B**. None of the species recorded in the Study Area are listed as threatened or endangered in Ontario.

Within the Study Area, a fish habitat survey was completed on July 15, 2015. After review of aerial maps and during the field survey, eight locations were identified along Horseshoe Valley Road that could potentially provide fish habitat. Survey locations are shown on **Figure 5-5**. Two survey locations (CW-01 and CW-02) are within the Coldwater River subwatershed of the Severn Sound Watershed, while the remaining six locations (MA-01 thru MA-06) are within the Matheson Creek sub-watershed of the Nottawasaga River Watershed. Visual inspection of each watercourse crossing included the channel width and depth profile, substrate and morphology, and bank height. Fish sampling was not completed MNRF provided fish collection records for both Matheson Creek and Coldwater River. In summary, the fish habitat at seven of the eight locations likely provides intermittent warm water fish habitat. The exception is MA-02 within the Craighurst settlement area, which likely provides permanent coldwater fish habitat. At this location, cover for fish is provided by undercut banks and there are signs of groundwater contribution, including watercress growing in the channel.

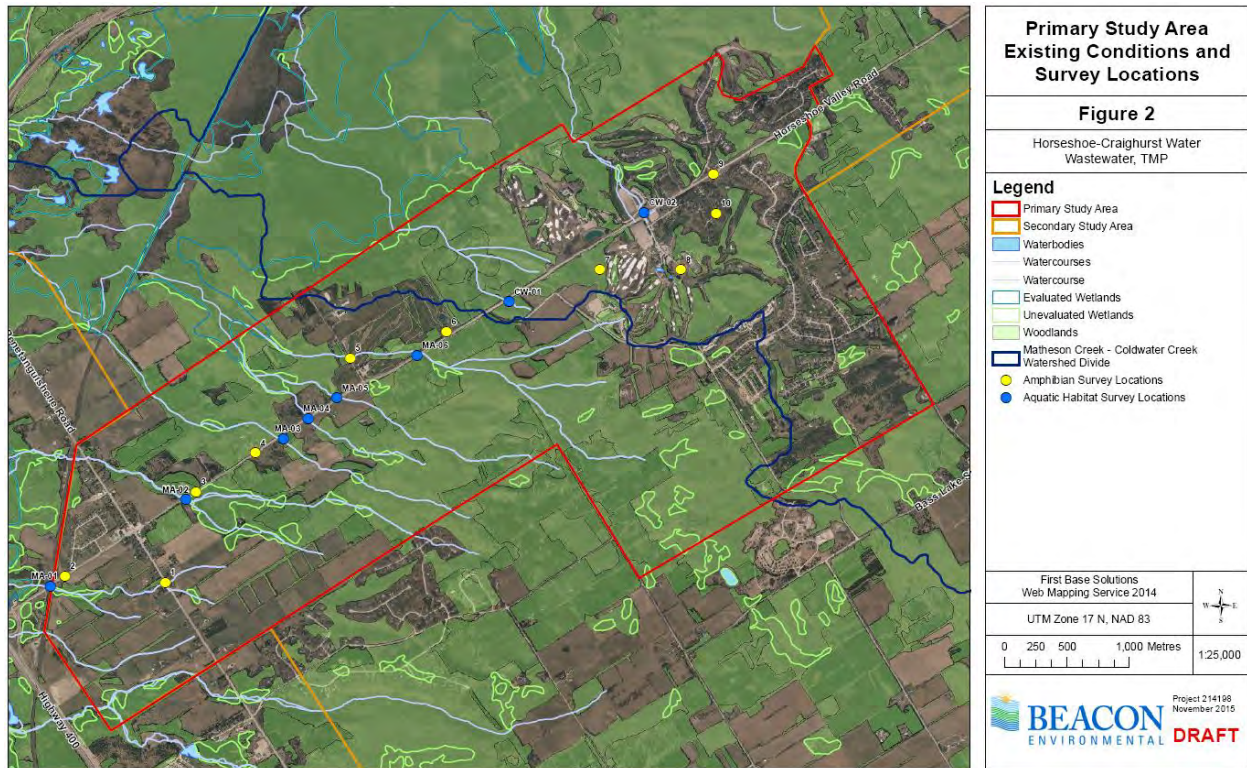
It should be noted that thermal classification of fish habitat (i.e. warm water or coldwater) is ultimately the jurisdiction of MNRF. The thermal classifications identified at each crossing will need to be validated with the MNRF before they are used to determine construction timing windows.

### 5.1.6 Wildlife and Habitat

Significant wildlife habitat is defined in the PPS as “areas where plants, animals, and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.” Considering the relatively undisturbed character of the natural features within the Study Area, significant wildlife



habitat may be present. However, further investigation is recommended to identify any significant wildlife habitat once design has proceeded to a level where impact assessment can be undertaken.



**Figure 5-5 Aquatic Habitat and Amphibian Survey Locations**

### 5.1.6.1 Amphibian Surveys

Amphibian surveys were completed in the spring of 2015 following the marsh monitoring program quality assurance project plan (Bird Studies Canada, 2000) in the Primary Study Area. Ten survey locations were selected based on preliminary review of aerial photographs (see **Figure 5-5**). After the first survey, two locations were eliminated based on observations made. Each amphibian survey station that was deemed suitable was visited on three nights, no less than 15-days apart, during the spring and early summer (April 16, May 24 and June 29, 2015). **Appendix B** (Table 3) provides the amphibian survey results, but in summary, no amphibian calls were heard at Survey Location 3 just east of Penetanguishene Road. Various other amphibians were identified at all other locations, including: American Toad (*Anaxyrus americanus*), Wood Frog (*Rana sylvatica*), Spring Peeper (*Pseudacris crucifer*), Gray (Tetraploid) Tree Frog (*Hyla versicolor*) and Green Frog (*Lithobates clamitans*).

### 5.1.6.2 Species at Risk

Review of the Natural Heritage Information Centre (NHIC) and a preliminary SAR screening provided by the MNR (June 2015) indicates there could be potentially 21 SAR within the Study Area (see **Table 5.1**). However, as noted by the MNR: “the SAR records found in the NHIC database are not exhaustive and are based on known occurrences only. As a result, although there may be no record (or confirmation) of a SAR on site, it does not mean that they are not present if appropriate habitat exists. Due diligence is therefore still required and would include an appropriate consideration of what species could be present based on



available habitat...we have considered your preliminary list and agree those species could be encountered if appropriate habitats exist.”

Within the Horseshoe Valley Road and other road right-of-ways, habitat for most of these species is very limited; however, the following species have a potential to occur within the road right-of-way:

- Butternut (endangered);
- Blanding’s turtle (threatened);
- Eastern ribbonsnake (special concern);
- Milksnake (special concern); and,
- Snapping Turtle (special concern).

As part of any detailed design project, identification of habitat will need to be completed to facilitate an impact assessment.

**Table 5.1 Potential Species at Risk**

Common Name	Scientific Name	Status
Canada warbler	<i>Cardellina canadensis</i>	special concern
Cerulean warbler	<i>Setophaga cerulea</i>	threatened
Chimney swift	<i>Chaetura pelagica</i>	threatened
Common nighthawk	<i>Chordeiles minor</i>	special concern
Golden-winged warbler	<i>Vermivora chrysoptera</i>	special concern
Hooded warbler	<i>Setophaga citrina</i>	special concern
Olive-sided flycatcher	<i>Contopus cooperi</i>	special concern
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	special concern
Short-eared owl	<i>Asio flammeus</i>	special concern
Eastern whip-poor-will	<i>Antrotomus vociferus</i>	threatened
Monarch	<i>Danaus plexippus</i>	special concern
Eastern small-footed myotis	<i>Myotis leibii</i>	endangered
Little brown myotis	<i>Myotis lucifugus</i>	endangered
Northern myotis	<i>Myotis septentrionalis</i>	endangered
American ginseng	<i>Panax quinquefolius</i>	endangered
Butternut	<i>Juglans cinerea</i>	endangered
Blanding’s turtle	<i>Emydoidea blandingii</i>	threatened
Eastern ribbonsnake	<i>Thamnophis sauritus</i>	special concern
Milksnake	<i>Lampropeltis triangulum triangulum</i>	special concern
Snapping Turtle	<i>Chelydra serpentina</i>	special concern
Bobolink	<i>Dolichonyx oryzivorus</i>	threatened

## 5.2 Cultural Environment

The cultural environment includes archaeological and cultural heritage resources. This information is summarized as applicable in the sub-sections below based on the following technical support studies:

- Existing Conditions Report, Archaeological & Cultural Heritage Services Inc. (ASI), May 2015 (see **Appendix F**); and,
- Preliminary Cultural Heritage Resource Assessment: Built Heritage Resources and Cultural Heritage Landscapes, Desktop Data Collection Results, ASI, May 2015 (see **Appendix G**).

The findings of these studies is discussed in the following sub-sections.

### 5.2.1 Archaeological Resources

An Existing Conditions Report (**see Appendix F**) was completed to characterize archaeological resources in the Study Area and an area surrounding the Study Area which was referred to as a larger area of investigation. As shown in **Figure 5-6**, desktop background research indicated that the Area of Investigation included 130 archaeological sites that may require further assessment, including 41 confirmed and 89 unconfirmed sites. These include 49 previously registered archaeological sites, 46 unconfirmed archaeological sites, and 43 unregistered Huron-Wendat village sites. As shown in **Figure 5-7**, nine historic cemeteries were also identified within the Area of Investigation and will require avoidance by any proposed infrastructure.

Given the potential for the identification of Aboriginal and Euro-Canadian archaeological resources, the report recommended that a Stage 2 Archaeological Assessment (background study and property inspection) following the selection of preferred solutions. However, for consideration in the evaluation of alternative solutions, it noted the following:

- Forty-one of the 49 previously registered archaeological sites within the Area of Investigation will require various degrees of further archaeological assessment;
- All 46 unconfirmed archaeological sites require, at a minimum, Stage 2 Archaeological Assessment to confirm their locations; and,
- All 43 unregistered Huron-Wendat village sites will require Stage 2-3 Archaeological Assessments to confirm their location and extents and Stage 4 Mitigation of Development Impacts (either through protection and avoidance or excavation).

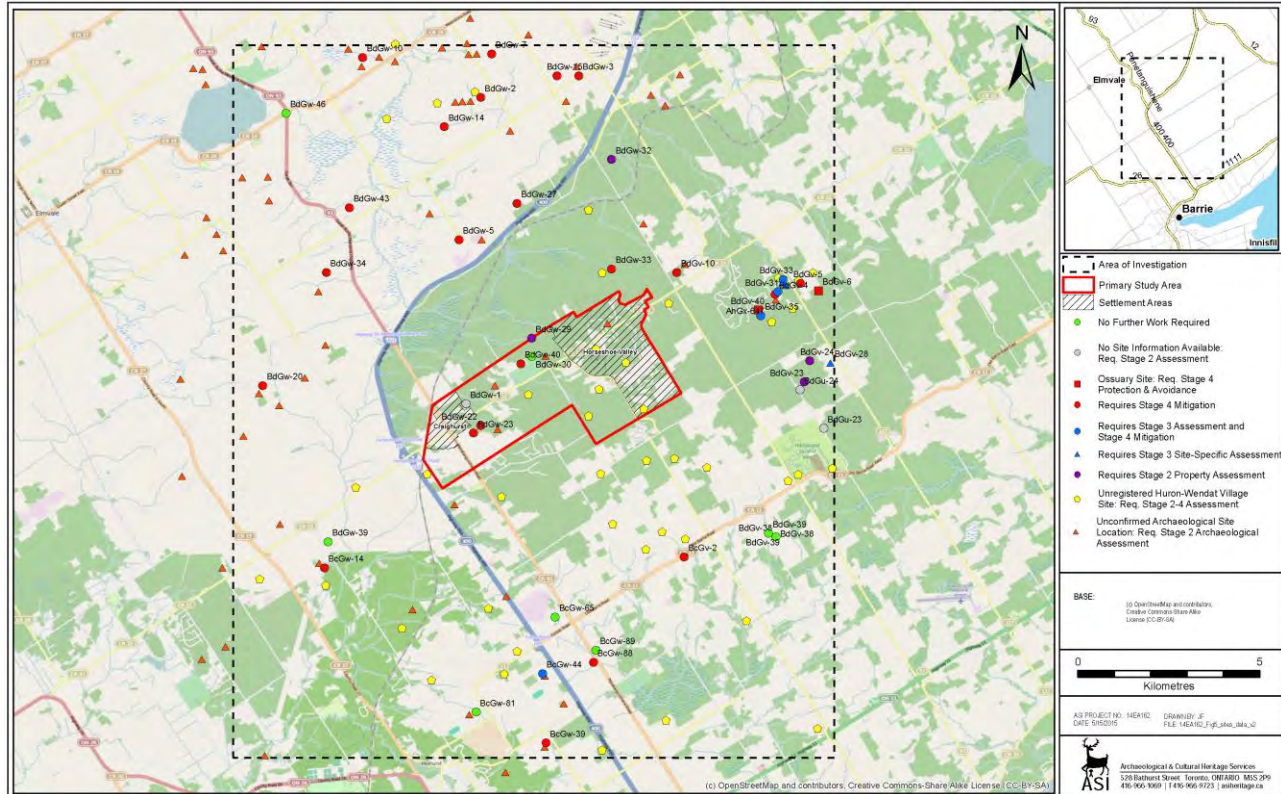


Figure 5-6 Location of Known Archaeological Sites

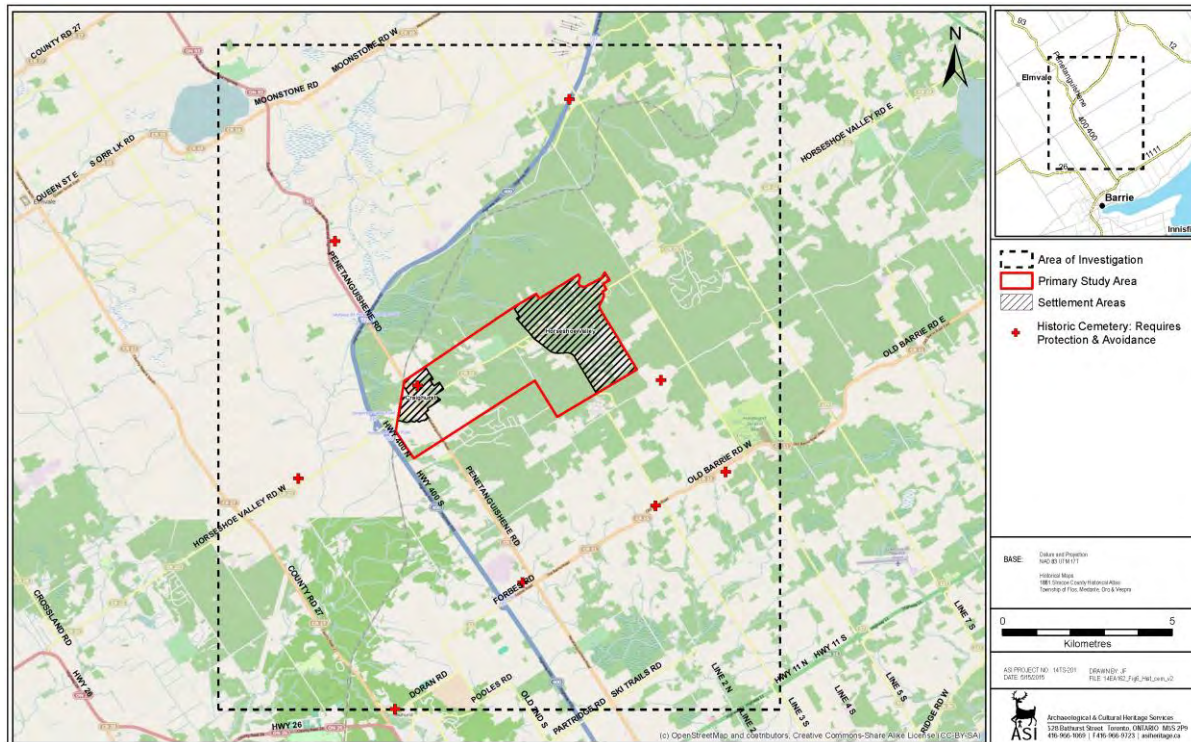


Figure 5-7 Location of Euro-Canadian Cemeteries



## 5.2.2 Cultural Heritage Resources

ASI completed a desktop inventory of cultural heritage resources within the Study Area in order to assist with identification of potential impacts (see **Appendix G**). Cultural heritage resources include both above-ground built heritage resources and cultural heritage landscapes (CHLs). Built heritage resources are typically individual buildings or structures associated with a variety of human activities such as historical settlement or patterns of architectural development. Generally, buildings or structures more than 40-years old may have heritage value. A CHL is a collection of individual built heritage resources and other related features that together form farm complexes, roadscapes and nucleated settlements.

Based on review of the federal registers and municipal and provincial heritage inventories, there is one previously identified feature of cultural heritage value within the Study Area: Penetanguishene Road (Highway 93) which is designated under Part IV of the *Ontario Heritage Act*. This designation was made through the *Ontario Heritage Act* by the Township of Springwater because Penetanguishene Road was a historically surveyed military roadway connecting Lake Simcoe to the Penetanguishene naval depot on Georgian Bay. The designation does not mean that roadway improvements or infrastructure along it are prohibited.

In addition, two additional CHLs were also noted: the Knox Presbyterian Cemetery and the St. John Anglican Church and Cemetery. It is anticipated that additional cultural heritage resources will be identified during field review, especially within the village of Craighurst as well as along historically surveyed roads. The field review will be completed once the preferred solutions are identified. It will be conducted to identify any additional heritage resources, confirm the integrity of the previously identified heritage areas, and to obtain information to accurately map the above-ground cultural heritage resources. Potential impacts will then be identified and appropriate mitigation measures recommended. In general, any proposed infrastructure should be planned to avoid impacts to cultural heritage resources.

## 5.3 Socio Economic Environment

The socio-economic environment includes existing communities and residential and recreational areas, as well as commercial and industrial land uses and activities. This information was obtained from the Township of Oro-Medonte Official Plan (see **Section 6.3.2** of the Township's Official Plan), as well as planning documents obtained from the Landowners Group. The following sub-sections provide further details.

### 5.3.1 Land Uses

General land uses within the Study Area are defined as per the Township of Oro-Medonte Official Plan Schedule A: Land Use (see **Appendix A**). As shown in **Figure 5-8**, general land uses within the Study Area include rural residential, rural settlement, recreational (e.g. golf courses, ski resorts) and Oro Moraine core / corridor areas (e.g. wooded areas, potential natural habitat enhancement areas and open space). The following sections provide information on land uses in Horseshoe Valley and Craighurst Settlement Areas.

#### 5.3.1.1 Horseshoe Valley Land Uses

Land uses within the Horseshoe Valley Development Node are designated according to the Township's Official Plan Schedule D: Horseshoe Valley (see **Appendix A**). As shown in **Figure 5-9**, these include a mix of low and medium density residential, recreational, resort facility and Horseshoe Valley Village uses.

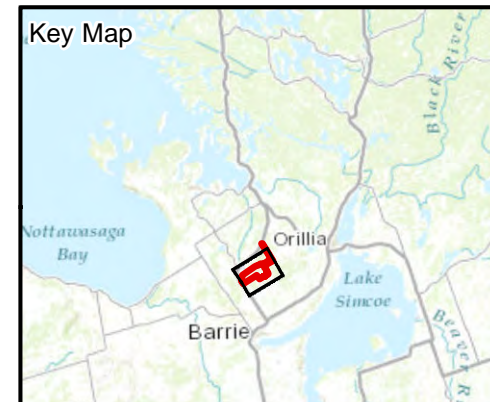
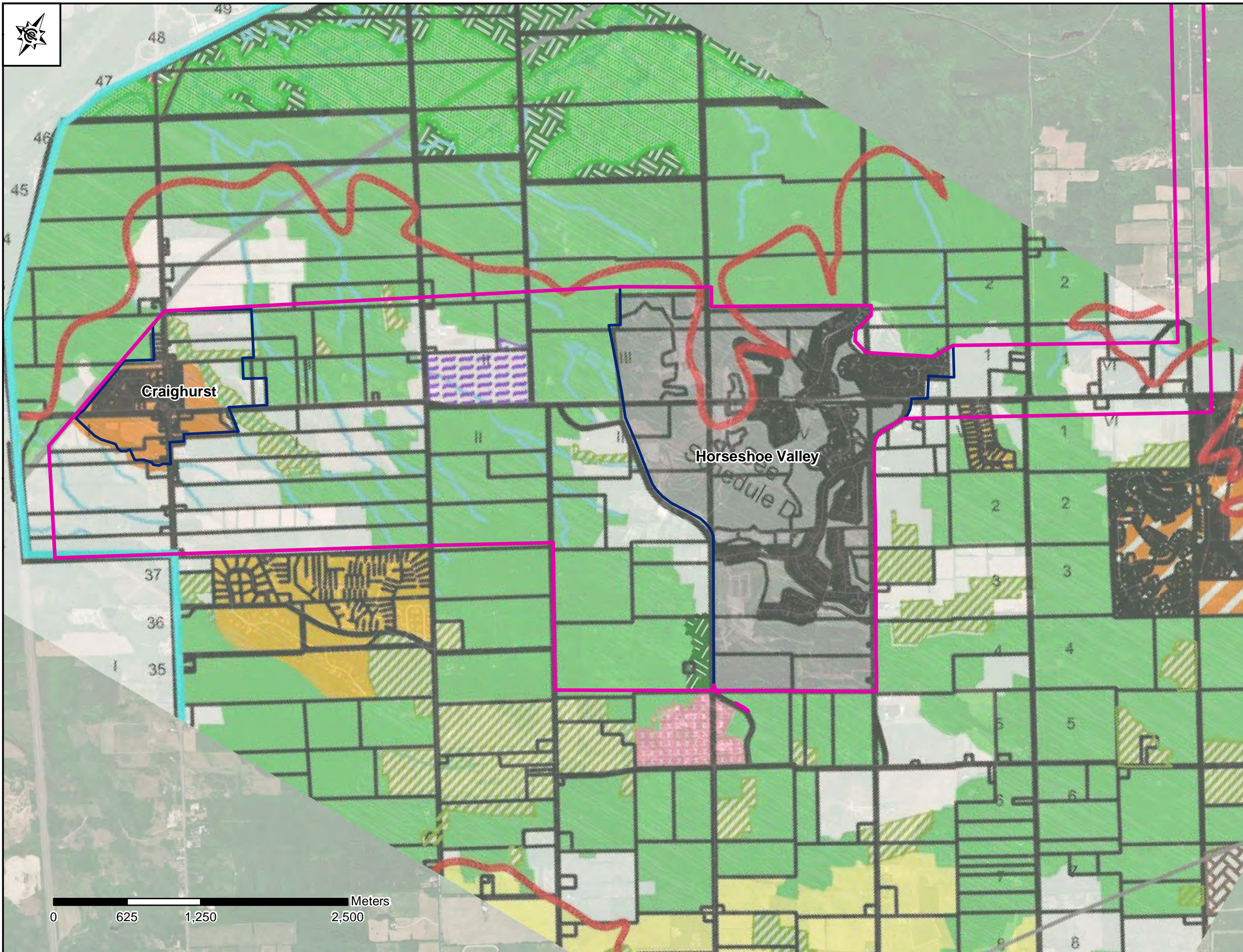
More specific land uses within Horseshoe Valley are designated according to the Township of Oro-Medonte Zoning By-Law Schedule A-15 (see **Appendix A**). Among other designations, these include:

- Agricultural / rural areas which mostly surround the settlement area;
- Environmental protection areas along stream valleys and watercourses;
- A mineral aggregate resource area just south of the settlement area which is a Primary Aggregate Resource area according to Official Plan Appendix 1: Mineral Aggregate Resources (see **Appendix A**); and,
- Future development areas.

As previously mentioned, Horseshoe Valley is best known for the Horseshoe Resort which covers an area of approximately 650 hectares (ha) (1600 acres). The Resort includes alpine and nordic skiing, golf courses and an adventure park, an inn, spa, restaurants, banquet facilities and timeshare units, and over 40km of recreational trails connected to the nearby Copeland Forest. The community itself comprises approximately 2,000 residents, a fire hall, police detachment, and annual visitors of about 200,000 during the winter and 20,000 during the summer months.

**Figure 5-10** shows existing land use and future development areas. Existing developments, their estimated populations and water and wastewater servicing also described in **Table 5.2** Populations were estimated assuming the Township's Engineering Design Criteria of 2.2 persons per unit for single family, semi-detached. Duplex, townhome and apartment dwellings. This information was compiled from various sources including the Horseshoe Valley Resort Water Supply and Distribution System Assessment (June 2011), various correspondence with the Township of Oro-Medonte and discussions with the HCC Landowners Group. **Table 5.3** presents similar information on non-residential developments within Horseshoe Valley.





**Legend**

- Oro Moraine
- Watercourse
- Railroad
- Existing Road
- Highway
- Study Area
- Municipal Boundary
- Settlement Areas
- Core/Corridor
- Rural Settlement Area
- Rural Residential
- Edge Centre SPA
- Enhancement Area
- Major Open Space
- Recreational

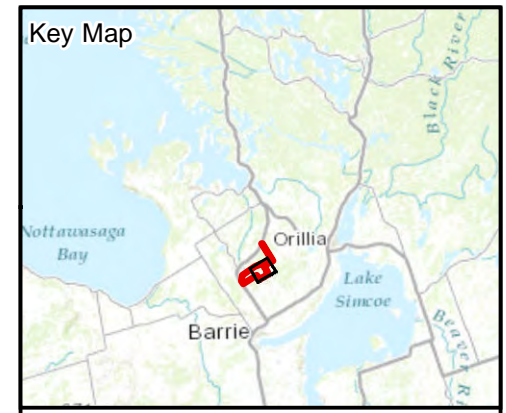
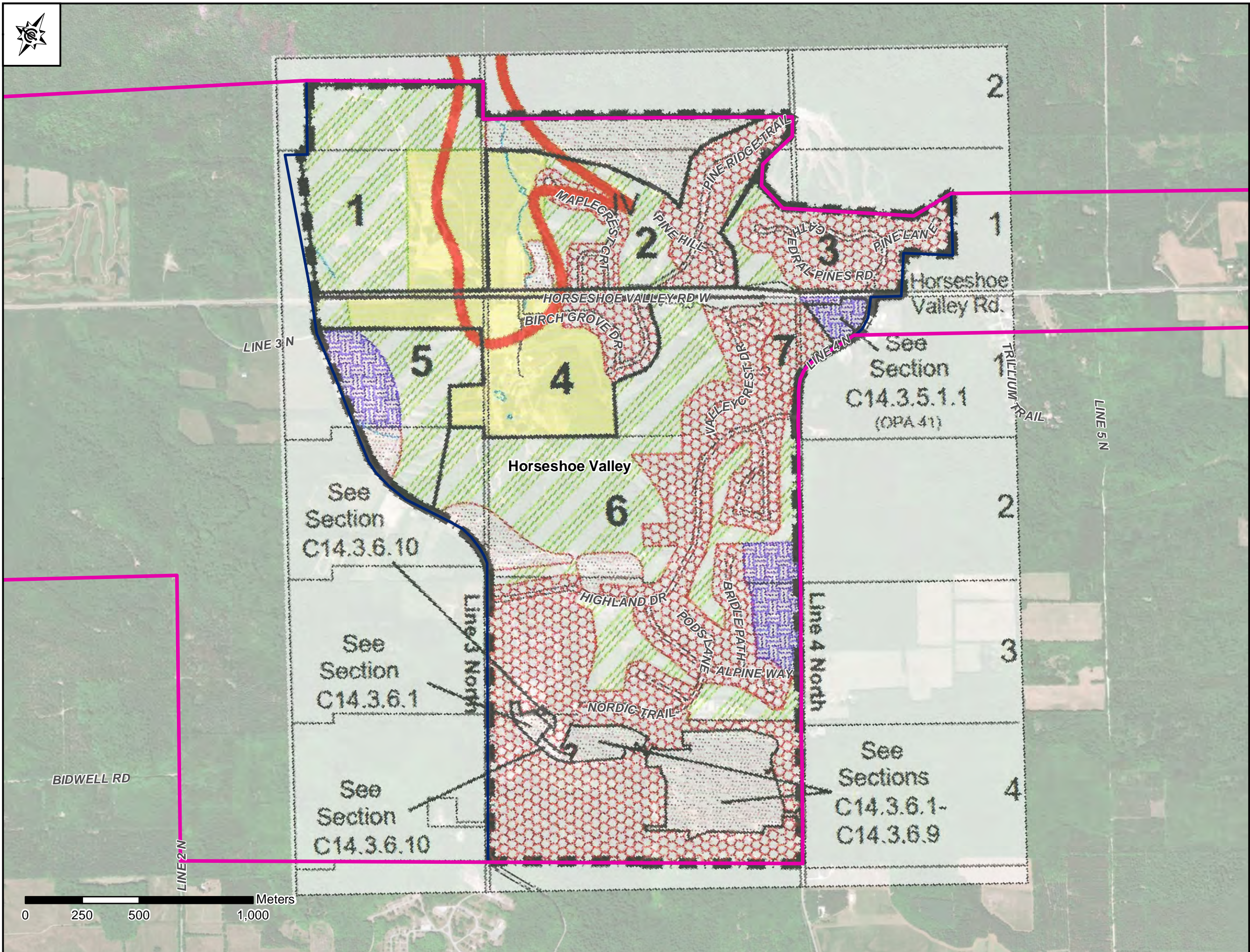
**Figure 5-8  
General Land Use**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.:	Date:
EM14-0424	April 2019





- Legend**
- Oro Moraine
  - Watercourse
  - Railroad
  - Study Area
  - Municipal Boundary
  - Settlement Areas
  - Official Plan Land Use Designations**
  - Low Density Residential
  - Medium Density Residential
  - Resort Facility
  - Horseshoe Valley Village
  - Recreational Area

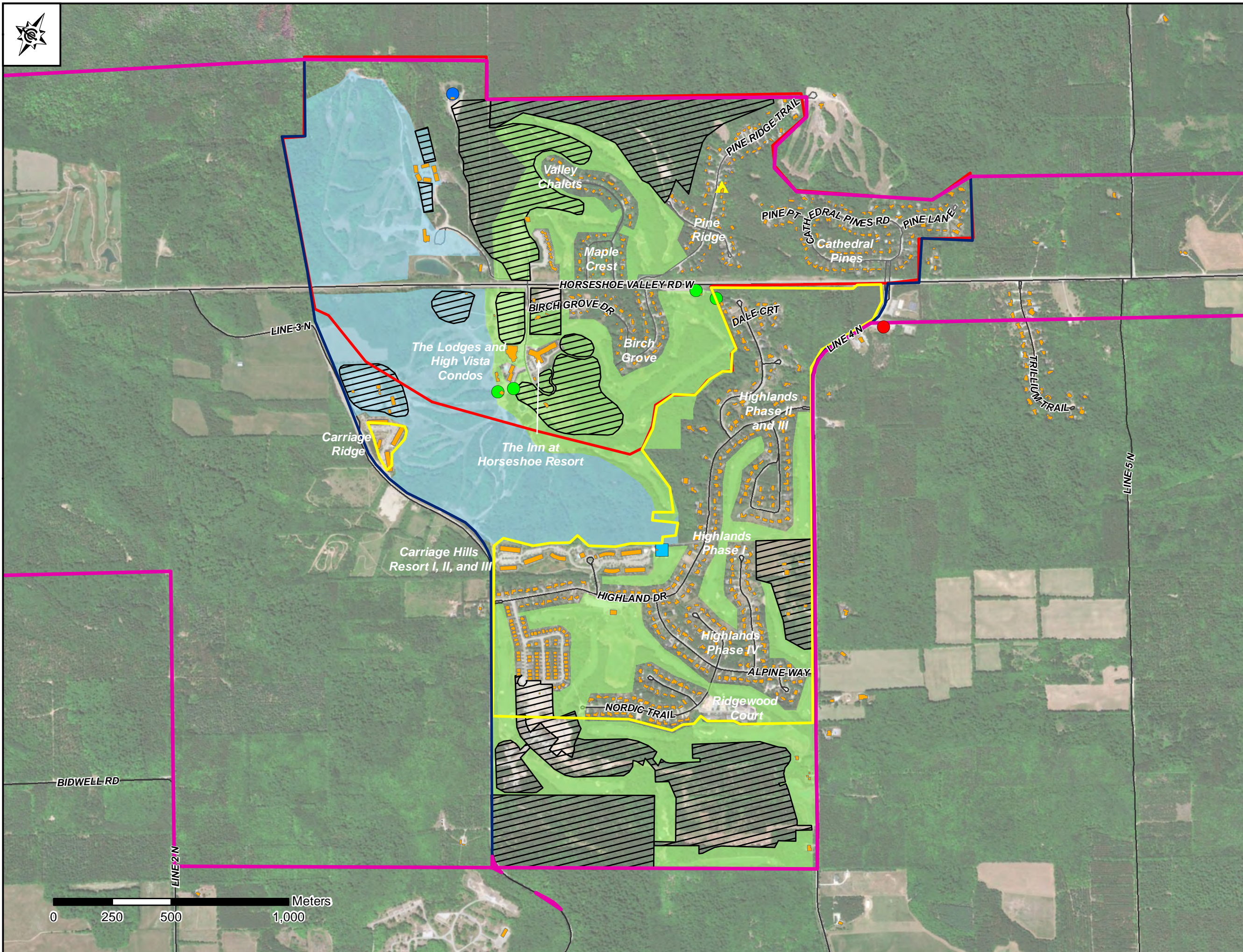
**Figure 5-9  
Land Use in Horseshoe  
Valley Settlement Area**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
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- Legend**
- Firehalls
  - Skyline WWTP
  - Storage Tank
  - Existing Well
  - ▲ Pumping Station
  - Watercourse
  - Railroad
  - Existing Road
  - Highway
  - Study Area
  - Settlement Areas
  - Existing Buildings
  - Golf Course
  - Ski Resort
  - Future Development
  - Pressure Zone 1
  - Pressure Zone 2

**Figure 5-10  
Horseshoe Valley Existing  
Developments and Servicing**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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**Table 5.2 Horseshoe Valley Existing Development**

Development Name (Developer-Type)	Existing Wastewater Servicing			Existing Water Servicing		Units	Persons/Unit	Population	Seasonal	Additional Information
	Skyline	Private	Communal Septic	Skyline (PZ1)	Municipal (PZ2)					
<b>Existing Residential Development</b>										
Carriage Hills Phase I (Wyndham – Time Share Condos)	✓				✓	52	2.2		114	Currently serviced by the Skyline WWTP as per the Amended Municipal Capital Facilities Agreement for a total of 585 residential units. Horseshoe Ridge 3A is allocated an additional three lots as per the agreement, but these are excluded here because OPA35 approved 84 units for Horseshoe Ridge 3A, not 87 as per the agreement.  Commercial units including Carriage Hills Recreation Centre, Carriage Ridge Recreation Centre and the Horseshoe Resort are allotted 12, 8 and 80 units (100 units total) as per the agreement, but are not included
Carriage Hills Phase II (Wyndham – Time Share Condos)	✓				✓	52	2.2		114	
Carriage Hills Phase III (Wyndham – Time Share Condos)	✓				✓	68	2.2		150	
Landscapes Phase 1 (Laurel View – Single Family Residential)	✓				✓	66	2.2	145		
Landscapes Phase 2A (HVL – Single Family Residential)	✓				✓	16	2.2	35		
Landscapes Phase 3 (Horseshoe Ridge 3A) (HVL – as per OPA 35)	✓				✓	84	2.2	185		
Carriage Ridge (Phase 4) Resort (Wyndham – Time Share Condos)	✓				✓	78	2.2		172	
The Inn at Horseshoe Resort (Skyline – Hotel Rooms)	✓				✓	102	2.0		204	
Slopeside Condos (Skyline – Time Share Condos)	✓				✓	44	2.2		97	

**Table 5.2 Horseshoe Valley Existing Development**

Development Name (Developer-Type)	Existing Wastewater Servicing			Existing Water Servicing		Units	Persons/Unit	Population	Seasonal	Additional Information
	Skyline	Private	Communal Septic	Skyline (PZ1)	Municipal (PZ2)					
High Vista Townhouses Phase 1 (Skyline – Heights of Horseshoe Townhouse Condos)	✓				✓	24	2.2	53		here – they are accounted for under “Commercial Developments” on a square footage basis.
Valley Chalets (Skyline – Simcoe Condominium Townhouse Condos)		✓		✓		66	2.2		145	
Birch Grove Country Club Subdivision (Skyline – Single Family Residential)			✓	✓		47	2.2	103		18 units on communal septic
Pine Ridge Subdivision (Skyline – Single Family Residential)			✓	✓		65	2.2	143		37 units on communal septic
Maple Crest Subdivision (Skyline – Single Family Residential)			✓	✓		50	2.2	110		26 units on communal septic
Cathedral Pine Subdivision (Skyline – Single Family Residential)			✓	✓		96	2.2	211		13 units on communal septic
Ridgewood Court (HVL – Single Family Residential)						15	2.2	33		
Highlands Subdivision Phase I (HVL – Single Family Residential)						68	2.2	150		Total of 319 lots in the Highlands Subdivision – all lots

**Table 5.2 Horseshoe Valley Existing Development**

Development Name (Developer-Type)	Existing Wastewater Servicing			Existing Water Servicing		Units	Persons/Unit	Population	Seasonal	Additional Information
	Skyline	Private	Communal Septic	Skyline (PZ1)	Municipal (PZ2)					
Highlands Subdivision Phase II (HVL – Single Family Residential)						38	2.2			are single family units as per the OP and review of aerial mapping. Lot numbers revised per February 3, 2016 email from the Township and confirmed with Plan 51M-391, Plan 51M-447, Plan 51M-456, Plan 51M-553 and Plan 51M-720.
Highlands Subdivision Phase IIB (HVL – Single Family Residential)						8	2.2	18		
Highlands Subdivision Phase III (HVL – Single Family Residential)						13	2.2	29		
Highlands Subdivision Phase IV (HVL – Single Family Residential)						192	2.2	422		
<b>Sub-Total Existing Development (excluding Seasonal)</b>						<b>782</b>	<b>-</b>	<b>1720</b>	<b>987</b>	
<b>Sub-Total Existing Development (including Seasonal)</b>						<b>1240</b>		<b>2,717</b>		<b>Total of 94 lots of communal septic</b>

**Table 5.3 Horseshoe Valley Existing Non-Residential Development**

Development Name (Developer)	Served By			Development	
	Skyline WWTP	Skyline Water (PZ1)	Municipal Water (PZ2)	Area (ft <sup>2</sup> )	Comment
<b>Existing Commercial Development</b>					
The Inn at Horseshoe Resort - Restaurant, Bar & Conference Centre (Skyline)	✓	✓		65,000	Includes 4,500ft <sup>2</sup> restaurant, 420ft <sup>2</sup> Gift Shop and 2,130ft <sup>2</sup> Spa

**Table 5.3 Horseshoe Valley Existing Non-Residential Development**

Development Name (Developer)	Served By			Development	
	Skyline WWTP	Skyline Water (PZ1)	Municipal Water (PZ2)	Area (ft <sup>2</sup> )	Comment
<b>Existing Commercial Development</b>					
Cross Country Chalet (Skyline)		✓		9,000	Includes 3,000ft <sup>2</sup> Cross Country Café
Heights of Horseshoe Clubhouse/Chalet (Heights of Horseshoe)		✓		13,000	
Carriage Ridge Recreational Centre (Wyndham)	✓		✓	5,000	
Carriage Hills Recreational Centre (Wyndham)	✓		✓	3,000	
Kid’s Koral and Operations Building (Skyline)	✓	✓		1,800	
Tack Shop (Skyline)	✓	✓		500	
Hitching Post Grill (Skyline)	✓	✓		500	Valley Snack Bar
Arbraska Tree Tops (Skyline)	✓	✓		500	
Accounting Building (Skyline)		✓		2,800	
Ellesmere Chapel (Skyline)		✓		1,000	
The Horseshoe Centre (Skyline)	✓	✓		5,200	
Horseshoe Maintenance (Skyline)	✓		✓	5,500	
Snow Making Plant (Skyline)	✓	✓		4,500	
Base Lodge - Restaurant, Cafeteria and Conference Centre (Skyline)	✓	✓		40,000	Includes 990ft <sup>2</sup> Golf & Ski Shop, 6,700ft <sup>2</sup> Crazy Horse Saloon and 4,050ft <sup>2</sup> Alpine Room Cafeteria
Highlands Golf Clubhouse, Restaurant and Conference Centre (Skyline)	✓		✓	6,500	Includes 550ft <sup>2</sup> Pro Golf Shop, 1,824ft <sup>2</sup> Highlands Club Room and 500ft <sup>2</sup> Highlands Café
<b>Sub-Total Existing Commercial Development</b>	-	-	-	<b>163,800</b>	

In total, there are currently 1,240 residential and seasonal units with an estimated residential population of 2,708 persons in Horseshoe Valley. Non-residential development accounts for 163,800ft<sup>2</sup>.



### 5.3.1.2 Craighurst Land Uses

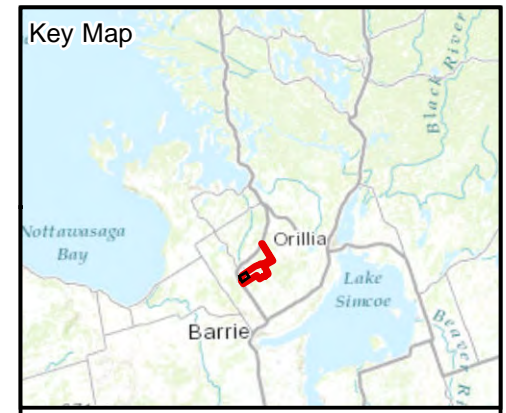
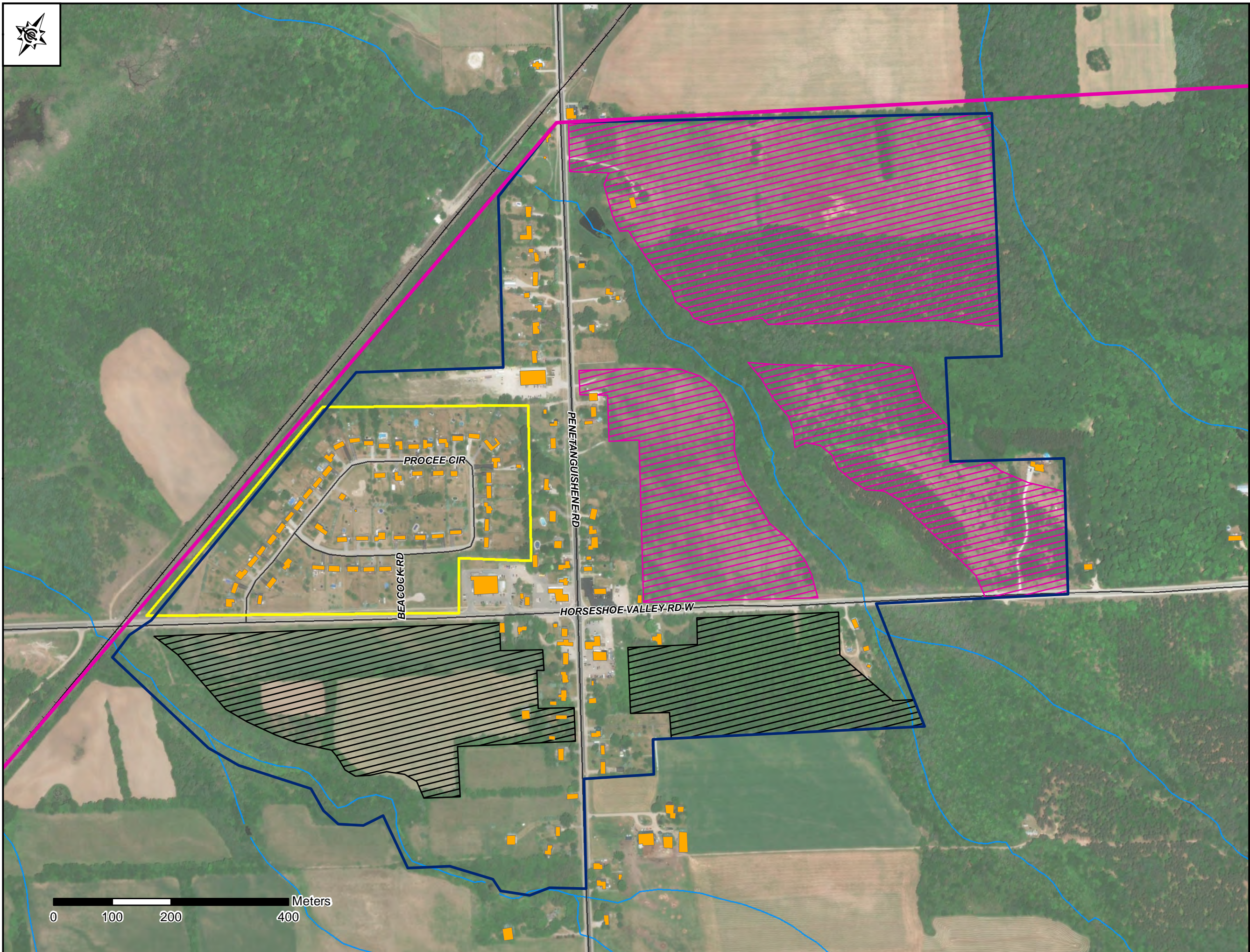
Craighurst is a Rural Settlement area comprised of approximately 94 single-detached residences. There is a community hall, gas station, grocery store, liquor store and chocolate factory, and two restaurants, churches and vehicle repair shops. The remainder of the land is predominantly vacant, with some being used for field crops. The current population is estimated at approximately 282 people.

More specific land uses within both Craighurst are designated according to the Township of Oro-Medonte Zoning By-Law Schedule A-14 (see **Appendix A**). Among other designations, these include:

- Agricultural / rural areas which mostly surround Craighurst;
- Environmental protection areas along stream valleys and watercourses;
- Two small rural industrial areas in and near Craighurst; and,
- General and local commercial areas centred around the intersection of Horseshoe Valley Road and Penetanguishene Road.

As discussed in **Section 3.4.2**, the Craighurst settlement boundary was recently amended to include an additional 36ha of agricultural / rural area just northeast of the existing village. **Figure 5-11** shows the revised settlement boundary and existing land uses.





- Legend**
- Watercourse
  - Railroad
  - Existing Road
  - Highway
  - Study Area
  - Settlement Areas
  - Existing Buildings
  - Future Development - Others
  - Future Development - Land Owners Group
  - Water Service Area

**Figure 5-11  
Craighurst Existing  
Developments and Servicing**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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### 5.3.2 Existing Water Systems

Greenland International Consulting Ltd. (Greenland) completed an Existing Conditions Report as part of the water servicing component of this Master Plan (see **Appendix H**). The report notes that the existing Horseshoe Valley water supply system consists of two pressure zones. Zone 1 is privately operated and owned by Skyline while Zone 2 is owned and operated by the Township of Oro-Medonte. Both zones are supplied by two wells, two back up wells and have storage and local distribution systems. A separate Craighurst water supply system consists of two communal systems (Craighurst Estate Water Works and Snider Well) which consist of three wells, one underground storage reservoir and a local water distribution system. Further details on the existing water supply and distribution infrastructure for Horseshoe Valley and Craighurst are provided in the following sections.

#### 5.3.2.1 Horseshoe Valley Water System

The Horseshoe Valley Resort area and the surrounding residential areas are serviced with water from two separate systems: one privately owned and operated by Skyline (Pressure Zone 1) and the other owned and operated by the Township of Oro-Medonte (Pressure Zone 2). The water distribution system in both pressure zones includes pipes ranging in size from 50mm diameter service connections to 300mm diameter trunk watermains. Zone 1 and Zone 2 are independent of each other.

As shown in **Figure 5-10**, Zone 1 serves the commercial and residential buildings at the main resort complex in the low elevations. Zone 1 is supplied with water from Skyline's private well (Well #3) which is 0.41m in diameter and 79.6m deep, and a backup well (Well #4) which is 0.18m in diameter. The well is contained in the pump house located between the Maintenance Building and the Main Lodge of the resort. As per the Permit to Take Water (PTTW) issued by the MECP, the amount of water allowed to be withdrawn from Well #3 is 64.4L/s or 5,564m<sup>3</sup>/day. The current well pump has a maximum capacity to deliver 62.5L/s or 5,400m<sup>3</sup>/d. Zone 1 also includes a 773m<sup>3</sup> storage tank and a booster pumping station located at the midpoint of Pine Ridge Trail to provide adequate pressure to the residential areas at higher elevations on Cathedral Pine Road. A groundwater supply evaluation completed by COLE, dated December 7, 2016, indicated that Well #3 is not under Groundwater under Direct Influence of Surface Water (GUDI) conditions.

Disinfection for Zone 1 occurs at the pump house and consists of one chlorine injection point, a flow meter and a backflow preventer. The treatment train consists of two chemical metering pumps with a rated capacity of 3.8L/hr and a 250L chemical solution tank. The system has continuous free chlorine residual and turbidity analyzers. The total capacity of the current disinfection system is 35.9L/s and it is less than the allowable PTTW capacity 64.4L/s and/or the maximum pumping capacity of 62.5L/s. Treatment facility and disinfection system upgrades will be required if the current maximum supply capacity of 35.9L/s is increased from Well #3.

There is also an emergency interconnection, between Horseshoe Valley (Zone 1) and Township of Oro-Medonte (Zone 2) water supply systems, located just south of Horseshoe Valley Road off of Country Club Road. This connection is normally closed but can be opened during emergency conditions (e.g. pipe break within the Horseshoe Valley water supply system) to provide water to Horseshoe Valley water supply system from the higher system head of the Zone 2 system.

The water from Zone 2 at this location has been treated with chlorine but has not had sufficient contact time and consequently, has not been properly disinfected. If this connection is used the entire Horseshoe Valley water supply system would require the completion of corrective actions in accordance with Schedule 18 of O.Reg. 170/03 should this emergency only measure be taken.

Zone 2 (municipal) serves residential subdivisions and a few commercial buildings, including Carriage Hills Phases 1-3, Carriage Ridge, Carriage Hills/Ridge Recreation Centres, Laurel View, Horseshoe Maintenance and the Highlands Golf Clubhouse complex. Zone 2 is served by Well #1 which supplies water at 39L/s at a total dynamic head (TDH) of 205m. There are two elevated storage tanks. One tank is located north of the Alpine Way / Highland Drive intersection and has a capacity of 1,280m<sup>3</sup>. Further information on this facility is presented below. The Township recently constructed the Horseshoe Highlands Water Storage Facility which has a current storage volume of 1,538m<sup>3</sup>. The second well (Well #2) is used in emergency situations only and has a supply capacity of 6.1L/s at 150 TDH. Well #2 does not have sufficient TDH required to fill the elevated storage tank. Therefore, if Well #1 is out of commission, the elevated storage tank is required to be taken offline. As the Zone 2 groundwater supply is not directly affected by surface water, only primary disinfection (i.e. chlorine contact time before the water enters the distribution system) is required.

AECOM completed a Class EA for the Horseshoe Highlands Water System: Water Supply, Pump House and Storage Schedule B Municipal Class Environmental Assessment (AECOM, 2015) for the Township of Oro-Medonte. The Class EA recommended an above grade water storage facility with high lift pumping, an extension of the existing chlorine contact pipe as a method to provide primary disinfection and provision of standby power at the existing well pump house as the preferred alternative. In 2017, AECOM prepared the Horseshoe Highlands Water System Water Pump Station and Reservoirs Design Brief (April 2017) to document the design of the preferred alternative. The design provided an initial storage volume of 1,538m<sup>3</sup>, identified that the two tanks could be extended to a height of 18.6m to provide a storage volume of a total storage capacity of 3,764m<sup>3</sup>. The Design Brief also identified that a third tank could be constructed at this site. In total, with a third tank and extension of the existing tanks to a height of 18.6m, the site could provide a total storage volume of 5,646 m<sup>3</sup>. If the other existing tank of 1,280m<sup>3</sup> is included, expansion of the Horseshoe Highlands Water Storage Facility could provide a total system storage in Zone 2 of 6,926m<sup>3</sup>.

### 5.3.2.2 Craighurst Water System

Craighurst is currently supplied with potable water by two communal water systems and individually-owned wells. The two communal systems (Craighurst Estates Water Works and the Snider Well) are comprised of three wells in total. Wells #2 and #3 are the main supply wells while Well #1 is a standby well. The PTTW for the three wells has an approved daily capacity of 433m<sup>3</sup>/d or 5.0L/s. The current well pump capacity allows for a combined supply rate of 5.86L/s. The system also includes a 112m<sup>3</sup> underground storage reservoir. Raw water enters the pumping station and is treated with sodium hypochlorite and the treated water is discharged into the storage reservoir. **Figure 5-11** shows the location of water system facilities in Craighurst.

### 5.3.3 Existing Wastewater Systems

Greenland completed an Existing Conditions Report as part of the wastewater servicing component of this Master Plan (see **Appendix I**). The report notes that a portion of the existing Horseshoe Valley settlement area is sewered and the wastewater from these areas is treated at a privately-owned Skyline Wastewater Treatment Plant (WWTP) while the remaining un-sewered area uses private septic systems. Craighurst is currently not sewered and uses lot level private septic systems for sewage disposal. Further details concerning existing sanitary conditions are provided in the following sections.

### 5.3.3.1 Horseshoe Valley Wastewater System

The Horseshoe Valley Wastewater System consists of a wastewater collection system and the Skyline WWTP. Skyline WWTP provides treatment to the majority of the existing residential population, seasonal visitors and commercial buildings in Horseshoe Valley. There are however, an estimated 324 existing units located within the Settlement Area which are currently on private septic systems. The WWTP is owned by Skyline but operated by Clearford Water Systems Inc. It is operated under an MECP Environmental Compliance Approval (ECA). The ECA sets the effluent discharge limits for various parameters including dissolved oxygen (DO), Total Suspended Solids (TSS), Total Phosphorus (TP), Ammonia-Nitrogen (NH<sub>3</sub>-N), Total Nitrogen (TN) and pH. Treatment processes at the WWTP include primary screening and grit removal, followed by secondary treatment via biologically activated sludge in sequencing batch reactors. Tertiary treatment is then provided prior to discharge to any of its three exfiltration lagoons which are used for the disposal of the treated effluent. This facility has a subsurface discharge. The sludge is stored in aerated holding tanks and hauled off-site for disposal. Currently, improvements are anticipated at the Skyline WWTP to provide additional exfiltration capacity. A study of this facility, Tetrattech (2012) estimated that the Skyline WWTP could ultimately be expanded to provide capacity to treat up to 1,230m<sup>3</sup>/d. Specific details concerning the ECA and the existing WWTP are provided in **Appendix I**.

### 5.3.3.2 Craighurst Wastewater Servicing

Craighurst does not currently have any form of communal wastewater servicing. Lot level private septic systems currently provide wastewater servicing for the community of Craighurst.

### 5.3.4 Transportation Network

Horseshoe Valley Road (Country Road 22) and Penetanguishene Road (County Road 93) are the major transportation corridors within the Study Area. Other roadways includes 3 Line North, Birch Grove Drive, and Line 4. In addition, the Canadian Pacific Railway (CPR) borders the western boundary of Craighurst at the crossing of the MacTier Subdivision. The details of the above note roads are as follows:

- Horseshoe Valley Road (CR22) is classified as primary arterial. County Road 22 is the main east-west arterial road connecting Craighurst and the Horseshoe Valley resort area with Highway 400 and other destinations to the east and west. It is a two lane major road with a rural cross section providing one travel lane in each direction and having a gravel shoulder width of 2m to 3m on both sides of the roadway. The horizontal alignment of CR22 is relatively straight and flat, however, there is variation in vertical alignment with both downgrade and upgrade sections in the Study Area. CR22 has a posted speed limit of 70km/h;
- Penetanguishene Road (CR93) is classified as primary arterial road. CR92 is a two lane major road with a rural cross section providing one travel lane in each direction and having a gravel shoulder width of 2m to 3m on both sides of the roadway. The horizontal alignment of CR93 is straight and flat, however there is variation in the vertical alignment in the Study Area. CR93 has a posted speed limit of 50km/hr;
- 3 Line North is classified as a local road in the Study Area. 3 Line North is a two lane north south road with a semi-rural cross section providing one travel lane in each direction and having a gravel shoulder with a width of 0.5m to 1.0m on both sides of the road. 3 Line North has a posted speed limit in the Study Area of 50km/hr;



- Birch Grove Road is classified as a local road in the Study Area. Birch Grove Road is a two lane north south road with a semi-rural cross section providing one travel lane in each direction and having a gravel shoulder on each side. North of CR22, this road becomes a gravel roadway;
- 4 Line North is classified as a local road in the Study Area. 4 Line North is a two lane north south road with a semi-rural cross section providing one travel lane in each direction and having a gravel shoulder with a width of 1m to 2m on both sides of the road. 4 Line North has a posted speed limit in the Study Area of 50km/hr; and,
- Other roads within the Horseshoe Valley resort include Country Club Lane, Pine Ridge Trail, Maplecrest Court and Beechwood Road. Each of these roads, with the exception of Pine Ridge Trail, will not have a potential increase in traffic as a result of future development.

In 2014, Simcoe County completed an updated Transportation Master Plan and recommended improvements to the County's roads. No specific improvements were recommended for CR22 and CR93 in the vicinity of the Study Area. In 2017, Simcoe County completed a Class EA study for County Road 22 improvements. The study recommended reconstruction of the roadway from 3 Line North to Horseshoe Boulevard, from Horseshoe Boulevard to Country Club Lane, from Country Club Lane to 4 Line North and intersection improvements at 3 Line North and Horseshoe Boulevard (single lane roundabout) and 4 Line North (multi-lane roundabout) along with right turn tapers at most intersections, a median left turn lane between Horseshoe Boulevard and Country Club Lane and closing the intersection at Beechwood Road.

In the Craighurst area there are two local roads to the east of County Road 93 that provide access into a subdivision. Both of these roads, Procee Court and Beacock Road, would not be subject to growth in traffic as a result of future development. The signalized intersection of County Road 22 and County Road 93 have left turn lanes in all approach directions. The length of the left turn lane on the west approach functions as a turn lane for access into the commercial area which includes a grocery store, LCBO, gas station and convenience store. The intersection does not have median islands to protect left turning vehicles from on-coming traffic.

#### **5.3.4.1 Existing Traffic**

Existing traffic data counts were received from the County of Simcoe for County Road 22 and County Road 93 for road sections in the Study Area. In 2014, County Road 22 had an Average Annual Daily Traffic (AADT) count of 5,300 between Horseshoe Valley and County Road 93, and 6,300 between County Road 93 and Highway 400. To assess traffic conditions in 2018, growth rates taken by the CR22 Class EA were used. **Appendix J** contains detailed analysis of 2018 traffic conditions in the Study Area.

## 6 Future Servicing Considerations

This chapter provides further details regarding future servicing considerations, including proposed developments and associated population servicing requirements, development phasing, water and wastewater design criteria, future water demand and storage requirements, future projected wastewater flows, and future traffic requirements.

### 6.1 Future Developments

The 2031 forecasted population for the Township of Oro-Medonte was estimated to be 27,000 as per Schedule 7 of the Growth Plan for the GGH, with 28,100 persons per County discussions. Discussions with the Township confirmed that the majority of the Township's population will be within the Craighurst and Horseshoe Valley settlement areas. The following sections describe the future proposed developments within each of these settlement areas.

#### 6.1.1 Horseshoe Valley

**Figure 6-1** shows the future proposed developments (approved and unapproved), colour-coded by landowner. According to the Township, five Draft Plans are approved for Horseshoe Valley:

1. Copeland House Phase 1 consisting of 67 residential condo units. The Township of Oro-Medonte notes that these 67 units have been approved.
2. Heights of Horseshoe Phase 2 consisting of 13 townhouse units. Site Plan Approval has been granted.
3. Timber Ridge consisting of 250 single residential units. The Draft Plan was approved in 1995 but approvals for reconfiguration of access through Skyline's property are required according to Skyline.
4. The Highlands Future Lands, including Horseshoe Ridge Phase 4, approved under OPA 36 within the Horseshoe Valley Settlement Area on Part of South Half of Lot 3 and Part of Lot 4, Concession 4. OPA 36 allows for higher density pockets within the development area to achieve 30 units per hectare overall:

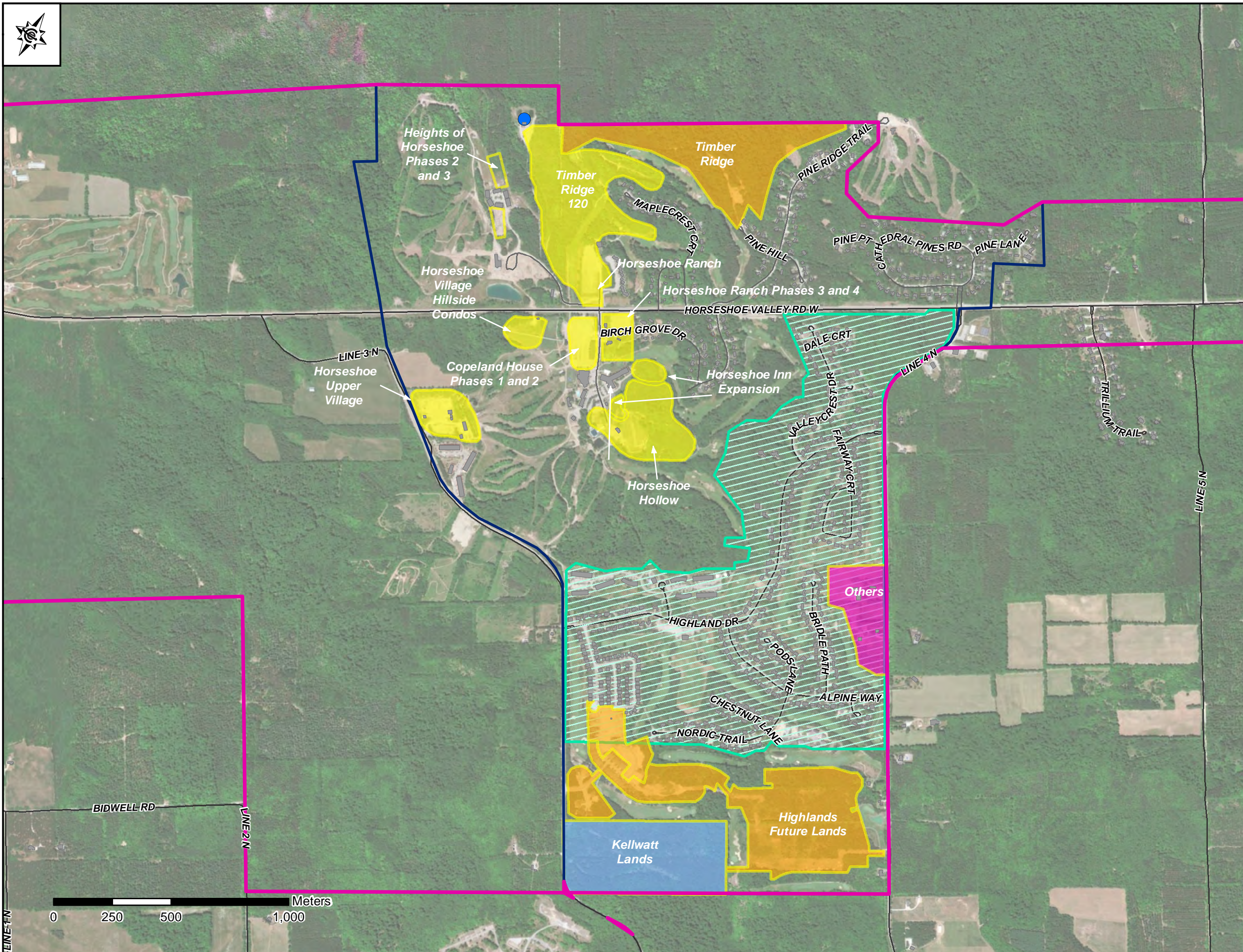
“Recognizing that a range of densities are appropriate within the development which will include densities to accommodate midrise development, with the predominant land use being for uses permitted in Section C14.3.6.1 a), the density of the overall development within lands located on Part of South Half of Lot 3 and Part of Lot 4, Concession 4 in the Township of Oro-Medonte shall not exceed 30 units per gross hectare.”

Based on OPA36, 789 units are expected. Of these, 619 units are within the approved allocation with the remaining units associated with the potential intensification of under-utilized and vacant lands.

5. Lands in the southwest corner of the settlement area are approved for 97 low density residential units (complete Application in 2006 for all singles). In 2016, there was a Pre-consultation Application for re-zoning of their lands as medium density residential (townhouses and single. This would increase the unit number to 300 based on its size of approximately 7ha.

**Table 6.1** and **Table 6.2** provide further information regarding the future development of Horseshoe Valley. This information was compiled from various sources including the Horseshoe Valley Resort Water Supply and Distribution System Assessment (June 2011), various correspondence with the Township of Oro-Medonte and discussions with the HCC Landowners Group. The future development unit / population numbers indicated below were used to determine service infrastructure sizing requirements.





**Legend**

- Existing STP
  - Watercourse
  - +— Railroad
  - Existing Road
  - Highway
  - Study Area
  - Settlement Areas
  - Existing Buildings
  - Existing Water Service Area
  - Development Areas
- Ownership**
- Kellwatt Lands
  - Horseshoe Valley Lands
  - Others
  - Skyline

**Figure 6-1  
Horseshoe Valley Future  
Developments Areas**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.:  
EM14-0424

Date:  
April 2019



**Table 6.1 Horseshoe Valley Existing and Future Residential Developments**

Development Name (Developer-Type)	Servicing and Populations						
	Skyline WWTP	Zone 1 Water System	Zone 2 Water System	Units	Persons/unit	Population	Seasonal Population
<b>Existing Residential Development</b>							
Carriage Hills Phase 1	✓		✓	52	2.2		114
Carriage Hills Phase 2	✓		✓	52	2.2		114
Carriage Hills Phase 3	✓		✓	68	2.2		150
Landscapes Phase 1	✓		✓	66	2.2	145	
Landscapes Phase 2A	✓		✓	16	2.2	35	
Landscapes Phase 3	✓		✓	84	2.2	185	
Carriage Ridge Phase 4	✓		✓	78	2.2		172
The Inn at Horseshoe Resort	✓	✓		102	2.0		204
Slopeside Condos	✓	✓		44	2.2		97
High Vista Townhomes Phase 1	✓	✓		24	2.2	53	
Valley Chalets		✓		66	2.2		145
Birch Grove Country Club Subdivision		✓		47	2.2	103	
Pine Ridge Subdivision		✓		65	2.2	143	
Maple Crest Subdivision		✓		50	2.2	110	
Cathedral Pines Subdivision		✓		96	2.2	211	
Ridgewood Court			✓	15	2.2	33	
Highlands Subdivision Phase1			✓	68	2.2	150	
Highlands Subdivision Phase 2			✓	38	2.2	84	
Highlands Subdivision Phase 2B			✓	8	2.2	18	
Highlands Subdivision Phase 3			✓	13	2.2	29	
Highlands Subdivision Phase 4			✓	192	2.2	422	
Copeland House Phase 1	✓	✓		67	2.2	148	
<b>Future Residential Developments</b>							
Copeland House Phase 2 (Skyline – Residential Condos)	✓		✓	67	2.2	147	

**Table 6.1 Horseshoe Valley Existing and Future Residential Developments**

Development Name (Developer-Type)	Servicing and Populations						
	Skyline WWTP	Zone 1 Water System	Zone 2 Water System	Units	Persons/unit	Population	Seasonal Population
Heights of Horseshoe Phase 2 (Cedarvale Cr Corp) - Townhomes	✓		✓	13	2.2	29	
Timber Ridge			✓	250	2.2	550	
Future Lands (including Landscapes Phase 4+ - Mixed Use Residential/ Commerical)			✓	619	2.2	1362	
Kellwatt Lands (mixed use residential)			✓	97	2.2	214	
<b>Sub-Total Approved Residential Development</b>				<b>1050</b>		<b>2301</b>	
<b>Proposed Future Residential Development</b>							
Future Lands (including Landscapes Phase 4+) – Mixed Use as per OPA36			✓	170	2.2	374	
Heights of Horseshoe Phase 3	✓		✓	15	2.2	33	
Kellwatt Lands (Mixed Use)			✓	43	2.2	95	
Kellwatt Lands (Townhomes)			✓	160	2.2	352	
Copeland House Phase 2	✓		✓	58	2.2	128	
Copeland House Phases 3 and 4	✓		✓	116	2.2		255
Horseshoe Inn Expansion		✓		180	2.2		396
Development of Hotel		✓		212	2.0		424
Horseshoe Village Hillside Condos			✓	180	2.2		396
Horseshoe Ranch, including Timber Ridge 120			✓	165	2.2		363
Horseshoe Hollow (residential condos)			✓	324	2.2		713
Horseshoe Hollow (Single family residential)			✓	52	2.2	114	
Horseshoe Hollow (Townhome Condos)			✓	39	2.2	86	
Horseshoe Upper Village (condos)			✓	253	2.2	557	
Horseshoe Upper Village (townhome condos)			✓	37	2.2	81	
Landscapes Phase 3 (as per OPA 37)			✓	10	2.2	22	
Others			✓	240		528	
Future Lands			✓	200		440	



**Table 6.1 Horseshoe Valley Existing and Future Residential Developments**

Development Name (Developer-Type)	Servicing and Populations						
	Skyline WWTP	Zone 1 Water System	Zone 2 Water System	Units	Persons/unit	Population	Seasonal Population
<b>Sub-total Unapproved Future Development</b>				<b>2454</b>		<b>2809</b>	<b>2547</b>
<b>Total Residential Development (existing and future)</b>				<b>4740</b>		<b>10,367</b>	

**Table 6.2 Horseshoe Existing and Future Non-Residential Developments**

Development Name	Skyline WWTP	Zone 1 Water System	Zone 2 Water System	Development Area (ft2)
<b>Existing Commercial</b>				
The Inn at Horseshoe Resort	✓	✓		65,000
Cross Country Chalet		✓		9,000
Heights of Horseshoe		✓		13,000
Carriage Ridge Recreational Centre	✓		✓	5,000
Carriage Hills Recreational Centre	✓		✓	3,000
Kids Koral and Operations Building	✓	✓		1,800
Tack Shop	✓	✓		500
Hitching Post	✓	✓		500
Arbraska Tree Tops	✓	✓		500
Accounting Building		✓		2,800
Ellesmere Chapel		✓		1,000
The Horseshoe Centre	✓	✓		5,200
Horseshoe Maintenance	✓		✓	5,500
Snow Making Plant	✓	✓		4,500
Base Lodge	✓	✓		40,000

**Table 6.2 Horseshoe Existing and Future Non-Residential Developments**

Development Name	Skyline WWTP	Zone 1 Water System	Zone 2 Water System	Development Area (ft <sup>2</sup> )
Highlands Gold Club	✓		✓	6,500
Sub-Total Existing Commercial				163,800
<b>Future Commercial</b>				
Highlands Future Lands			✓	25,000
Copeland House Phase 2	✓	✓		2,000
Copeland House Phase 2 and 4	✓	✓		16,000
Future Commercial Skyline	✓	✓		143,000
Sub-total Future Commercial				192,000
<b>Total Commercial</b>				<b>355,800</b>

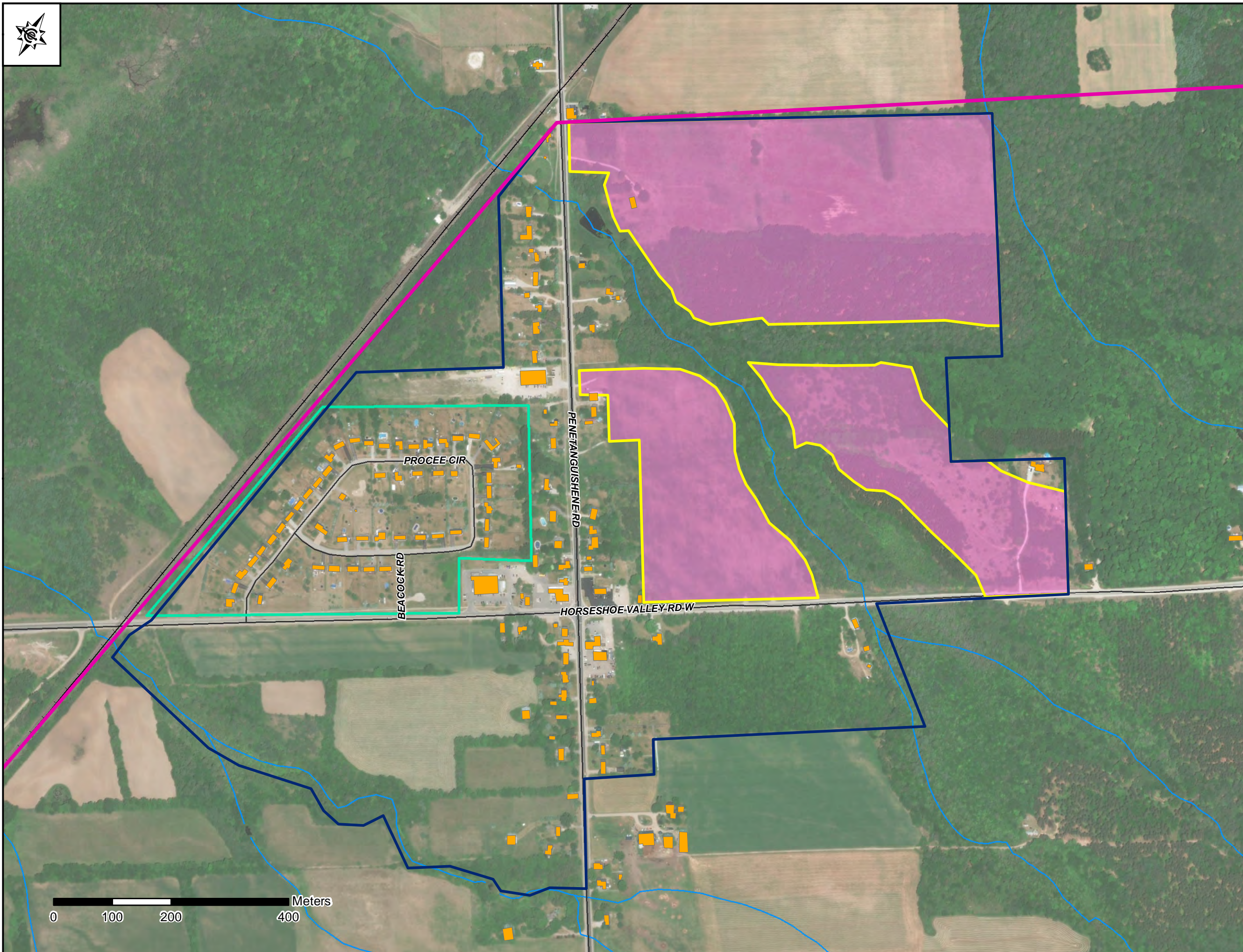
## 6.2 Additional Proposed Developments

An additional development is proposed for the lands west of 4 Line North in the south portion of the Horseshoe Valley settlement area. The subject site is comprised of #3224 Line 4 North (which was #3016) and the abutting site to the south at #3094 (was #3092). The combined area of both sites is approximately 8ha. These lands are identified as resort facility in the Township’s Official Plan. The developments that are currently being considered are low density residential (7 units per gross ha or 56 units total), and/or medium density residential (30 units per gross ha or 240 units total) and/or a combination of both.

### 6.2.1 Craighurst

As previously discussed in **Section 3.4.2**, the Craighurst settlement boundary was amended to include an additional 700 units as per OPA 27. The location of developable lands is shown in **Figure 6-2**. **Table 6.3** presents details of existing and planned developments in Craighurst.





**Legend**

- Watercourse
- Railroad
- Existing Road
- Highway
- Study Area
- Settlement Areas
- Existing Buildings
- Future Development Areas
- Ownership**
- Craighurst Land Corp.
- Existing Water Service Area

**Figure 6-2  
Craighurst Future  
Development Areas**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.:  
EM14-0424

Date:  
April 2019



**Table 6.3 Craighurst Existing and Future Developments**

Development Type	Development Planning			
	Units	Person / Unit <sup>1</sup>	Population <sup>2</sup>	Phasing
<b>Existing Development</b>				
Single Family Residential	94	-	282	n/a
<b>Sub-Total Existing Development</b>	<b>94</b>	<b>-</b>	<b>282</b>	
<b>Proposed Development (Pending Approval)</b>				
Single Family Residential <sup>3</sup>	525	2.2	1,155	50 units/yr (2018-2028)
Medium Density Residential (Townhomes)	175	2.2	385	50 units/yr (2028-2031)
<b>Sub-Total Proposed Development</b>	<b>700</b>	<b>-</b>	<b>1,540</b>	
<b>Total Residential Development (Existing + Future)</b>	<b>794</b>	<b>-</b>	<b>1,822</b>	

### 6.3 Population Servicing Requirements

Based on **Table 6.1** and **Table 6.2**, infrastructure is required to accommodate a total of 4,740 units or 10,367 people within Horseshoe Valley, and commercial developments totaling 355,800 square feet. However, since Skyline Horseshoe Valley Inc. intends to retain private water services for the Inn, golf course, irrigation and snow making (i.e. yellow highlighted developments), municipal water servicing will need to accommodate 4,246 residential units or a total population of 9,343 and commercial developments of 228,800ft<sup>2</sup>.

Based on **Table 6.3**, the infrastructure in Craighurst is required to accommodate a total of 794 units or 1,822 people. Both existing and future commercial developments within Craighurst are relatively small, centered on the main intersection, and can be accommodated through servicing of the residential population.

In summary, as shown in **Table 6.4**, the HCC Water, Wastewater and Transportation Master Plan will account for water servicing for a total of 11,165 residents and approximately 228,800ft<sup>2</sup> of commercial developments, while wastewater servicing will include 12,189 residents and commercial developments of approximately 355,800ft<sup>2</sup>.

**Table 6.4 Total Servicing Requirements**

Settlement Area	Water Servicing	Wastewater Servicing
<b>Horseshoe Valley</b>	9,343 residents and approximately 228,800ft <sup>2</sup> of commercial development	10,367 residents and approximately 355,800ft <sup>2</sup> of commercial development
<b>Craighurst</b>	1,822 residents & small commercial developments accommodated through residential servicing	1,822 residents & small commercial developments accommodated through residential servicing
<b>TOTAL</b>	<b>11,165 residents and commercial developments of approximately 228,800ft<sup>2</sup></b>	<b>12,189 residents and commercial developments of approximately 355,800ft<sup>2</sup></b>

As previously discussed, the Township's population is projected to grow by approximately 6,922 residents by 2031. It is important to note that this growth does not include seasonal populations (i.e. the 2,547 future seasonal residents), which must still be accounted for in the overall servicing design requirements. Furthermore, many of the existing developments within Horseshoe Valley, which the Master Plan will accommodate, were already included in the 2011 census population (i.e. the 1,468 were residents identified). Similarly, Craighurst's current population of 282 residents was also included in the 2011 census population. Therefore, excluding the seasonal population and 2011 census populations, the planned population is actually 7,892.

This means that the future populations will exceed Schedule 7 of the GGH by approximately 970 residents. As previously mentioned, this exceedance can be accommodated per Section 6.3.2.1 of the GGH, which permits development in settlement areas beyond the Schedule 7 forecast. Correspondence with the Township dated April 24, 2015 also confirms that the Township is supportive of considering infrastructure planning beyond the 2031 planning horizon.

## 6.4 Water Servicing Considerations

The report on existing water servicing (see **Appendix H**) summarized the existing water demands within Horseshoe Valley and Craighurst and identifies available capacity for future development needs. To identify future needs, design criteria were first developed and applied to the population servicing requirements discussed above. Permanent residential and commercial water demands were then identified, as well as day-use and seasonal demands including snowmaking and irrigation. Storage requirements were also determined for each pressure zone. The following sub-sections summarize the key results from the report on the existing water servicing in **Appendix H**.

### 6.4.1 Design Criteria

The purpose of water design criteria is to ensure that future water demands are accurately predicted and include appropriate redundancies (backup) for safety and risk management. Applicable water design criteria include Average Day Demand, Maximum Daily Demand and Peak Hourly Demand. Storage requirements including snowmaking and irrigation demands and emergency storage are also considered.

#### 6.4.1.1 Average Day Water Demand

Average Day Demand is estimated by using the population of a given service area and multiplying it by a conservative range of average day water demand. Based on the review of the existing water use data for Horseshoe Valley (2013 and 2014), the average per capita daily flows were found to be approximately 300L/capita/day (L/cap-d). Similarly for Craighurst, the average per capita daily flows were found to be approximately 177L/cap/d based on available data (2012, 2013 and 2014). However, the Township's Development Engineering Policies, Process and Design Standards (2016) require that an average day water demand of 450L/cap/d be used to estimate the average day water demand. For this study, a per capita water demand of 450L/cap/d was used to calculate average day water demand from new development while the current average per capita demand was used to calculate needs for existing residents. It is noted that the use of this higher value for per capita water demand could result in oversizing of infrastructure and consideration should be given to staging future works based on actual water use as development proceeds. We note that there are adverse conditions associated with oversized systems such as water age and excessive maintenance and operations costs that can be mitigated through careful evaluation of demands.



### 6.4.1.2 Maximum Day Demand and Peaking Factors

For communities with a population of more than 500 people, Maximum Daily Demand and Peak Hourly Demand factors can be found in the MECP’s *Design Guidelines for Drinking Water Systems* (2008). The Township’s Development Engineering Policies, Process and Design Standards (2016) recommends that a maximum day factor of 2 and a peak hour factor of 4.5 be used to calculate future maximum day and peak hour water demands. For communities with a population less than 500 people such as Craighurst, larger peaking factors are generally used to account for a greater water demand spike. **Table 6.5** shows the factors used.

**Table 6.5 Water Design Criteria**

Settlement Area	Average Day Demand	Maximum Day Factor <sup>1</sup>	Peak Hour Factor <sup>1</sup>
Horseshoe Valley	450L/cap/d	2.0	4.5
Craighurst	450L/cap/d	2.0	4.5

<sup>1</sup> Source: Township of Oro Medonte, Development Engineering Policies, Process and Design Standards (2016)

### 6.4.1.3 Snow Making and Irrigation

Snowmaking and irrigation flows were taken from the information provided by Skyline Horseshoe Valley Inc. Potable water, irrigation and snowmaking water demands are supplied through Well #3. Well #3 of the Horseshoe Valley Water System is the only well that is used for snowmaking and irrigation, for which the demands are 1,090m<sup>3</sup>/d and 378m<sup>3</sup>/d respectively. Irrigation occurs at random times during the day, generally between mid-May to mid-September. During the winter months (typically mid-November to late January), snowmaking operates 24-hours/day, 7-days a week. As Well #3 has a capacity of 23.66L/s or 2,044m<sup>3</sup>/d, a result, snowmaking accounts for approximately 53% of the pump capacity each day, leaving only 47% of the capacity to supply the remainder of the Zone 1 servicing area.

The snowmaking demand is included in the Maximum Daily Demand and Peak Hourly Demands so that if a fire occurs while snow making is in progress, there is enough total storage for the required fire flow.

Although the Oro-Medonte Municipal Water system does service some of the Horseshoe Valley, it is not used for snowmaking or irrigation. Similarly, Craighurst has no documented use or need of their well for snowmaking or commercial irrigation purposes.

## 6.4.2 Existing Demand Requirements

Based on the population and unit counts provided in **Section 6.2**, existing maximum water demands were calculated for each Pressure Zone within Horseshoe Valley and within Craighurst to identify if any residual capacity is available for future development needs. Existing water demands, as calculated based on existing conditions per capita flows and peaking factors are provided in **Table 6.6**. **Table 6.7** provides a summary of the residual capacity of the water supply system.

### 6.4.2.1 Horseshoe Valley Existing Demand Requirements

Water demands in Horseshoe Valley are more complicated than typical residential / commercial demands due to snow making activities and large fluctuations in population (specifically on weekends and holidays). In addition to permanent residents, there are a large number of day visitors to the Resort as well as a working staff. To develop a conservative water demand estimate, the highest equivalent population of day visitors was added to the “permanent demand” for Zone 1 existing permanent residential

development and permanent commercial areas (on an area or square footage basis). Since the Skyline System services the majority of the main Resort buildings, it was assumed that all day visitor water demands will contribute to the Zone 1 demands.

As shown in **Table 6.6**, the existing Average Daily Demand for Zone 1 was calculated to be approximately 6.65L/s, while the Maximum Daily Demand is approximately 12.2L/s and the Peak Hour Demand is approximately 22.8L/s. Since the Zone 1 pump has a maximum rated capacity of 62.5L/s, the current pumps are sufficient to facilitate the require peak hour demands during the expected maximum equivalent day visitors added to the permanent demand.

Pressure Zone 2 services a large residential population but commercial, day visitors and snowmaking/irrigation are not factors. As such, the existing Average Daily Demand for Zone 2 was estimated to be approximately 5L/s, while the maximum day demand is approximately 9L/s and the peak hour demand is approximately 21.7L/s. Since the Zone 2 well pumps have a combined capacity of 92L/s, the current well pumps for Zone 2 are sufficient. Based on existing conditions, this residual capacity is sufficient to service an additional 7,808 equivalent persons.

**Table 6.6 Existing Water Demands**

Usage	Equivalent Population	Historic Usage (L/cap-d)	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
<b>Horseshoe Valley Zone 1</b>					
Permanent Residents	1,250	300	4.18	7.70	15.69
Permanent Commercial	125	300	0.43	0.80	1.63
Day Visitors	584	300	2.04	3.73	7.60
<b>Total Base Demand</b>	<b>1,914</b>	-	<b>6.65</b>	<b>12.23</b>	<b>22.78</b>
<b>Horseshoe Valley Zone 2</b>					
Permanent Residential	1,650	300	5.73	10.54	21.48
Permanent Commercial	18	300	0.06	0.12	0.23
<b>Total</b>	<b>1,668</b>	-	<b>5.79</b>	<b>10.66</b>	<b>21.71</b>
<b>TOTAL ZONES 1 and 2 (WINTER)</b>	<b>3,582</b>	-	<b>12.44</b>	<b>22.89</b>	<b>46.63</b>
<b>Craighurst</b>					
<b>Residential and Commercial *</b>	<b>282</b>	<b>200</b>	<b>0.65</b>	<b>1.99</b>	<b>3.72</b>

\*Assumes that all equivalent persons are connected to the existing water system which may not be the case.

**6.4.2.2 Future Consolidation of Zones 1 and 2**

The Horseshoe Highlands Water System Schedule B Class EA (AECOM, 2015) recommended that Zones 1 and 2 be connected and that the Zone 2 well capacity be increased. The total available supply for Zones 1 and 2 will be 123.5L/s. However, 12.6L/s is required to support snowmaking activities in Zone 1. As the consolidated existing demands are 12.4L/s for average day, 22.9L/s for peak day and 46.83L/s for peak hour, the connected water system will have sufficient capacity to supply both pressure zones under existing conditions.



The Township has recently constructed additional storage in Zone 2. The Horseshoe Highlands Water Storage Facility currently provides a storage volume of 1,538m<sup>3</sup> but can be expanded to a capacity of 5,645m<sup>3</sup> through the construction of a third tank and expansion of the existing two tanks. The total storage volume is currently 2,818m<sup>3</sup>, while expansion of the Horseshoe Highlands Water Storage Facility could result in a total Zone 2 storage volume of 6,926m<sup>3</sup>. Currently, there is sufficient storage to meet current requirements for a consolidated Zone 1 and 2.

#### 6.4.2.3 Craighurst Existing Water Demands

The existing Average Daily Demand for Craighurst was calculated to be approximately 0.65L/s, while the Maximum Daily Demand is approximately 2L/s and the Peak Hour Demand is approximately 3.7L/s. Since the pump has a maximum rated capacity of 5.86L/s, the current well pump is sufficient to meet the current demand.

It should be noted that existing water demand calculations for Craighurst assume that the entire equivalent population of 282 persons is connected to the water system. The relatively low per capita demand numbers derived from the water use data could indicate this may not be the case.

#### 6.4.3 Storage Requirements

Domestic storage requirements for a given service area is determined using the following formula provided in the MECP Guidelines:

$$\begin{aligned} \text{Total Storage Required} = & \text{Fire Storage} + \\ & \text{Equalization Storage (25\% of Maximum Day Demand)} + \\ & \text{Emergency Storage (25\% of Fire Storage} + \text{Equalization Storage)} \end{aligned}$$

The required volume of stored water for firefighting is determined based on fire flow guidelines which takes into account a 2-hour firefighting interval. Equalization storage is required to be calculated if the well pump capacity of the system is less than the Maximum Daily Demand. Emergency storage is the sum of fire and equalization storage multiplied by 25%.

##### 6.4.3.1 Horseshoe Valley Storage Requirements

The Horseshoe Valley Pressure Zone 1 has one elevated storage tank, constructed in 1972, with a total storage capacity of 773m<sup>3</sup>. Using the formula above (including equalization storage), the required storage capacity was calculated as 1,503m<sup>3</sup>. This means the current water system storage in Pressure Zone 1 is under capacity to properly supply the fire flows required to support a 2-hour firefighting demand. As shown in **Table 6.7**, an additional 730m<sup>3</sup> of capacity is required.

Pressure Zone 2 has an elevated storage volume of 2,818m<sup>3</sup>. Using the formula above (excluding equalization storage), the required storage capacity was calculated as 720m<sup>3</sup>. This means the current water system storage in Pressure Zone 2 is considered acceptable, with 2,098m<sup>3</sup> available capacity remaining.

##### 6.4.3.2 Craighurst Storage Requirements

Underground storage in Craighurst currently has a capacity of 112m<sup>3</sup>. However, the required storage capacity was calculated (excluding equalization storage) as 746m<sup>3</sup> to adequately provide fire protection as well as supply the Maximum Daily Demand. An additional storage volume of 634m<sup>3</sup> will be required in Craighurst to meet the requirements of existing residents.

#### 6.4.4 Summary of Water Supply and Storage Assessment

**Table 6.7** provides a summary of the residual capacity of the water supply system to service future growth and shows the residual capacities remaining within the Zone 1, Zone 2 and Craighurst water systems. It is noted that the residual storage capacity in Zone 2 and the combined Zone 1 and 2 has included the two storage tanks in the Horseshoe Highlands Water Storage Facility.

**Table 6.7 Summary of Water System Residual Capacity**

Usage	Residual Supply Capacity	Residual Pump Capacity	Residual Storage Capacity
Horseshoe Valley Zone 1	25.7L/s	Yes	- 730m <sup>3</sup>
Horseshoe Valley Zone 2	28.34L/s	Yes	2,098m <sup>3</sup>
Future Combined Zones 1 and 2	54.04L/s	Yes	1,368m <sup>3</sup>
Craighurst	3.86L/s	Yes	-634m <sup>3</sup>

#### 6.5 Projected Water Demands

Based on the population servicing requirements identified in **Section 6.2** and the recommended design criteria identified in **Section 6.3.1**, projected water demands have been developed for Horseshoe Valley and Craighurst. **Table 6.8** presents the projected water demands.

**Table 6.8 Future Water Projections**

	Total Projected Population and Commercial Areas	Existing	Future
<b>Horseshoe Valley</b>			
<b>Zone 1 – Average Day Demand (L/s)</b>	-	6.65	11.0
<b>Zone 1 – Max Day Demand (L/s)</b>	-	12.23	21.9
<b>Zone 1 – Storage (m<sup>3</sup>)</b>	-	773	2,293
<b>Zone 2 – Average Day Demand (L/s)</b>	-	12.44	48.1
<b>Zone 2 – Max Day Demand (L/s)</b>	-	22.89	96.3
<b>Zone 2 – Storage (m<sup>3</sup>)</b>	-	1,280	4,301
<b>Craighurst</b>			
<b>Average Day Demand (L/s)</b>	1,822	0.65	9.5
<b>Max Day Demand (L/s)</b>	1,822	2	18.9
<b>Storage (m<sup>3</sup>)</b>	1,822	224	1,364

#### 6.6 Wastewater Servicing Considerations

The report on existing wastewater servicing (see **Appendix I**) summarizes the existing wastewater collection and treatment system within Horseshoe Valley and Craighurst. It also identified any residual capacity for future development needs. Craighurst is currently serviced with private septic systems and does not currently have any form of communal sanitary servicing. Therefore, there is no residual

capacity for wastewater servicing in Craighurst. The following sub-sections below only apply to Horseshoe Valley.

### 6.6.1 Design Criteria

Based on the population and unit counts provided in **Sections 6.1 and 6.2**, existing average day flows were calculated for the Horseshoe Valley wastewater system. **Table 6.9** presents a summary of average, maximum month and peak flow data collected at the Skyline WWTP between 2013 and 2015.

**Table 6.9 Skyline WWTP Flow Data (2013-2015)**

Value	2013	2014	2015	3 Year Average
<b>Average Day Flow (m<sup>3</sup>/d)</b>	285	443	401	376
<b>Maximum Month Flow (m<sup>3</sup>/d)</b>	370	753	621	581
<b>Peak Day Flow (m<sup>3</sup>/d)</b>	634	942	795	790

Based on the 2015 service population of 1,160 persons and an estimated day use average dry weather flow of 47m<sup>3</sup>/d, the average annual per capita flow is estimated to be 284/cap/d. A review of the flow data indicated that average day flows were higher during the winter months. The 3-year maximum month value of 581m<sup>3</sup>/d is indicative of these seasonal conditions and equates to an average per capita flow of 433L/cap/d, assuming an estimated maximum day use flow of 79m<sup>3</sup>/d. It is important to note that this value includes infiltration as it is calculated based on the total measured flow at the facility. These values are all within the MECP Design Guidelines for Sewage Works (2008). In addition, **Appendix I** also contains analysis of non-residential wastewater flows generated from day use.

The MECP Design Guidelines for Sewage Works recommends the following design criteria be used to assess and size wastewater systems:

- Average dry weather flow of 225-450L/cap/d;
- Average infiltration for major pumping stations and treatment plants of 90L/cap/d; and,
- Infiltration allowance for the smaller pumping stations and sewers of 0.10-0.2L/s/ha.

The Township of Oro-Medonte has identified wastewater system design criteria in the Development Engineering Policies, Process and Design Standards (2016). This document identifies the following criteria to be used in sizing wastewater system:

- Average day flow of 450L/cap/d;
- Harmon peaking factor to calculate peak flows within a range of 1.5 to 4.0; and,
- Infiltration allowance for sewers of 0.23L/s/ha.

Based on a review of existing data as well as guidelines and standards, design criteria recommended for use in this study are presented in **Table 6.10**.



**Table 6.10 Wastewater System Design Criteria (Horseshoe Valley)**

Infrastructure Type / Factor	Wastewater Treatment	Wastewater Conveyance
<b>Average Residential Day Flow</b>	374	450
<b>Average Commercial Day Flow</b>	28m <sup>3</sup> /d/ha	28m <sup>3</sup> /d/ha
<b>Peaking Factor</b>	1.74	Harmon Peaking Factor
<b>Infiltration Allowance</b>	Included in average day flow	0.23

For treatment, design criteria indicative of current flows at the Skyline WWTP have been selected. These values are within the range of those recommended for use by the MECP but are slightly lower than the Township’s Development Engineering Policies, Process and Guidelines. For the wastewater conveyance system or sewer system, criteria identified in the Township’s Development Engineering Policies, Process and Guidelines have been adopted.

For the Craighurst system, the following design criteria have been selected for use:

- For treatment, an average per capita wastewater flow of 350L/cap/d. This value is the average value recommended by the MECP (225 – 450L/cap/d). An infiltration allowance of 90L/cap/d will also be applied to determine total average flows; and,
- For the conveyance system, the Township’s criteria will be adopted including a per capita wastewater flow of 450L/cap/d, the Harmon Peaking Factor and an infiltration allowance of 0.23L/ha/s.

### 6.6.2 Existing Wastewater Flows

**Table 6.9** presents the average flow data at Skyline WWTP collected over a three year period. Skyline WWTP has a current rated capacity based on average flow of 810m<sup>3</sup>/d, a peak instantaneous capacity of 2,795m<sup>3</sup>/d. The Skyline WWTP is a subsurface discharge facility and is equipped with three exfiltration lagoons which are used for disposal of treated effluent. Currently, the effluent lagoons have an average day flow capacity of 608m<sup>3</sup>/d and a peak flow capacity of 710m<sup>3</sup>/d. It should be noted that Skyline Investments is currently proceeding with the detailed design of improvements to the lagoons that would increase their capacity to match the rated treatment capacity.

For Craighurst, current flows have been estimated based on the existing population and on the design criteria identified in **Section 6.4.1**. **Table 6.11** presents the estimated current flows calculated for Craighurst.

**Table 6.11 Estimated Existing Wastewater Flows (Craighurst)**

Item	Quantity
Estimated Current Residential Population	282
Selected Per Capita Wastewater Flow (L/cap/d)	350
Selected Per Capita Infiltration Allowance (L/cap/d)	90
Estimated Current Average Flow (m <sup>3</sup> /d)	124

As shown in **Table 6.11**, the average estimated current wastewater flow for the Craighurst community is 124m<sup>3</sup>/d. It is noted that the Craighurst community is not currently serviced by a communal wastewater system.

### 6.6.3 Summary of Current Wastewater System

**Table 6.12** provides a summary of the residual capacity of the existing WWTP system for future growth. Currently, the peak daily flow is not expected to exceed the WWTP’s peak flow capacity of 1,800m<sup>3</sup>/day. However, expansion of the WWTP or reduced loading will be required to maintain operational efficiencies within the effluent limits set by the ECA. As such, prior to the connection of any additional population, whether through connection of existing residents currently using private septic systems or through new development, further wastewater servicing capacity will be required for Horseshoe Valley and altogether new capacity will be required for Craighurst.

**Table 6.12 Summary of WWTP Residual Flow Capacity for Future Growth**

	Existing Flows	WWTP Design Capacity	Residual Capacity
<b>Horseshoe Valley Community</b>			
Average Day Flow (m <sup>3</sup> /d)	376	810	434
High Seasonal Average Flow (m <sup>3</sup> /d)	581	810	229
<b>Craighurst Community</b>			
Average Day Flow (m <sup>3</sup> /d)	124	-	-124

The Skyline WWTP does have residual capacity (based on rated capacity), based on the high seasonal average day flow of 581m<sup>3</sup>/d of 224m<sup>3</sup>/d. It is also noted that the current effluent lagoons are planned to be upgraded from the current capacity of 608m<sup>3</sup>/d to match the rated capacity of the facility or 810m<sup>3</sup>/d. At Craighurst, average flow from the current population is estimated to be 124m<sup>3</sup>/d. As there is no communal wastewater facilities in Craighurst, this is a current capacity shortfall.

### 6.7 Projected Wastewater Flows

Based on the population servicing requirements identified in **Section 6.2** and the recommended design criteria identified in **Section 6.6.1**, projected wastewater flows have been developed for Horseshoe Valley and Craighurst. **Table 6.13** presents the projected wastewater flows.

**Table 6.13 Future Wastewater Projections**

	Total Projected Population and Commercial Areas	Existing Flow (m <sup>3</sup> /d)	Future Estimated Flow (m <sup>3</sup> /d)
<b>Horseshoe Valley Community</b>			
Average Day Flow (m <sup>3</sup> /d)	10,366 persons, 33,501m <sup>2</sup>	581	3,971
Peak Day Flow (m <sup>3</sup> /d)	10,366 persons, 33,501m <sup>2</sup>	790	6,909
<b>Craighurst Community</b>			
Average Day Flow (m <sup>3</sup> /d)	282	124	216
Peak Day Flow (m <sup>3</sup> /d)	1,822	802	1,395

### 6.8 Transportation Servicing Needs

Transportation servicing considerations were developed based on the future development identified in **Section 6.1**. In addition, consideration of annual traffic growth rates for study area intersections were

also applied. An annual traffic growth rates of 1% for County Road 22 and County Road 93, 0.5% for 3 Line North and 4 Line North and no growth for Birch Grove Drive were applied to the turning movement counts data to forecast the future traffic volumes. These applied rates are consistent with those used in the County Road 22 Class Environmental Assessment Study.

Trip generation from the two settlement areas were estimated based on the information provided in the Trip Generation Manual, 10<sup>th</sup> Edition from the Institute of Transportation Engineers (ITE). **Table 6.14** presents estimated future trips for the Horseshoe Valley Area while **Table 6.16** presents the estimated future trips for Craighurst.

**Table 6.14 Trip Generation for Horseshoe Valley Study Area**

Use Category	Units / Rooms	GFA (Sq. ft.)	LUC	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Single Family Units	52		210	12	35	47	37	21	58
Townhouses / Condo Units	2271		230	172	839	1011	798	394	1192
Recreational Units	965		260	103	51	154	103	148	251
Hotel	212		330	48	18	66	38	51	89
Retail		25,000	820	42	25	67	114	123	237
<b>Total</b>				<b>377</b>	<b>968</b>	<b>1345</b>	<b>1090</b>	<b>737</b>	<b>1827</b>

Based on the trip generation analysis for the Horseshoe Valley Settlement Area, a total of 1,345 trips will be generated during the AM peak hour (377 trips in / 968 trips out) and 1827 total new trips during the PM peak hour (1090 trips in / 737 trips out).

For developments listed in **Table 6.14**, it was assumed that 100% of site trip roads intersecting north-south to County 22 within the Horseshoe Valley Settlement Area and each road site trip distribution is presented in **Table 6.15**.

**Table 6.15 Trip Distribution in Horseshoe Valley Study Area**

Direction	Roads	AM Peak		PM Peak	
		In	Out	In	Out
North	High Vista Drive	16%	84%	67%	33%
North	Birch Grove Drive	65%	35%	42%	58%
North	Pine Ridge Trail	17%	83%	67%	33%
South	3 Line North	17%	83%	67%	33%
South	4 Line North	22%	78%	62%	38%
South	Horseshoe Boulevard	50%	50%	49%	51%

**Table 6.16 Trip Generation from Craighurst Study Area**

Roads	Year	Use Category	Units	LUC	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
<b>COUNTY ROAD 93 and COUNTY ROAD 22</b>	<b>2018</b>	<b>Single Family Residential</b>	<b>32</b>	<b>210</b>	<b>53</b>	<b>158</b>	<b>211</b>	<b>177</b>	<b>104</b>	<b>281</b>



<b>COUNTY ROAD 22</b>	<b>2018</b>	<b>Single Family Residential</b>	<b>281</b>	<b>210</b>	<b>8</b>	<b>24</b>	<b>32</b>	<b>24</b>	<b>14</b>	<b>38</b>
<b>Total</b>					<b>61</b>	<b>182</b>	<b>243</b>	<b>201</b>	<b>118</b>	<b>319</b>

Based on trip generation analysis of the Craighurst Settlement area, a total of 243 new trips will be generated during the AM peak hour (61 trips in / 182 trips out) and 319 new trips during the PM peak hour (201 trips in / 118 trips out).

The distribution of these trips has been assumed on the basis of existing travel patterns and the location of existing developments. Details of these distributions is as follows:

- For the 32 units in Craighurst; and,
  - 50% of site trips will use the access on County Road 93 and the remainder will use the access to County Road 22;
  - Distribution on County Road 93: north 50% and south 50% both the AM and PM peak hours; and,
  - Distribution on County Road 22: west 60% and east 40% in both AM and PM peak hour.
- For the 281 units in Craighurst;
  - 100% of site trips will use the access on County Road 22; and,
  - Distribution on County Road 22, west 60% and east 40% in the AM peak hour, reverse in the PM peak hour.

Future total traffic volumes for the 2035 horizon year were calculated by applying annual growth rates on existing estimated traffic volumes (2018) and subsequent addition of traffic volumes from study area specific site developments. Synchro 9.0 software was used to analyze study intersections for the 2035 horizon year, which employs the 2000 Highway Capacity Methodology for the intersection analysis. The results of the future (2035) total traffic analysis are summarized in **Table 6.17**. Further details are contained in **Appendix J**.

**Table 6.17 Intersection Capacity Analysis – Future (2035) Total Traffic Conditions**

Intersection	Key Movement	AM Peak			PM Peak		
		LOS (v/c)	Control Delay (s)	Queue Length 95th (m)	LOS (v/c)	Control Delay (s)	Queue Length 95th (m)
Penetanguishene Road (COUNTY ROAD 93) and Horseshoe Valley Road West (COUNTY ROAD 22) (signalized)	Overall	B (0.72)	12.4	-	B (0.87)	19.9	-
	EB left	A (0.14)	5.7	5.2	B (0.47)	10.8	27.7
	EB through + right	A (0.48)	6.9	59.5	C (0.93)	23.3	#316.1
	WB left	A (0.10)	4.2	6.2	A (0.45)	8.6	#20.2
	WB through + right	B (0.79)	11.4	#178.1	A (0.72)	9.0	158.4
	NB left	C (0.23)	24.1	13.0	D (0.56)	38.1	28.4
	NB through + right	C (0.22)	23.8	17.5	C (0.53)	35.0	41.2
	SB left	C (0.32)	24.6	18.2	C (0.45)	34.6	25.1
	SB through + right	C (0.46)	25.5	30.9	C (0.52)	35.0	40.5

Intersection	Key Movement	AM Peak			PM Peak		
		LOS (v/c)	Control Delay (s)	Queue Length 95th (m)	LOS (v/c)	Control Delay (s)	Queue Length 95th (m)
3 Line North and Horseshoe Valley Road West (COUNTY ROAD 22) (unsignalized)	EB through + right	- (0.34)	0.0	0.0	- (0.76)	0.0	0.0
	WB left + through	A (0.04)	1.0	1.0	A (0.12)	3.9	3.3
	NB left + right	<b>F (1.29)</b>	<b>203</b>	<b>122.6</b>	<b>F (3.96)</b>	-	-
Birch Grove Drive and Horseshoe Valley Road West (COUNTY ROAD 22) (unsignalized)	EB left + through	A (0.03)	0.9	0.7	A (0.04)	1.0	1.0
	EB right	- (0.10)	0.0	0.0	- (0.15)	0.0	0.0
	WB left + through + right	A (0.10)	2.5	2.6	A (0.16)	4.2	4.7
	NB left + through + right	<b>F (0.85)</b>	<b>70.3</b>	54.5	<b>F (3.53)</b>	-	-
	SB left + through + right	B (0.10)	14.9	2.6	<b>F (0.59)</b>	<b>95.4</b>	21.3
4 Line North/Cathedral Pine Road and Horseshoe Valley Road West (COUNTY ROAD 22) (unsignalized)	EB left + through + right	A (0.01)	0.2	0.2	A (0.03)	0.7	0.7
	WB left + through + right	A (0.13)	3.8	3.6	B (0.50)	12	23.1
	NB left + through + right	<b>F (1.71)</b>	<b>358.9</b>	<b>290.3</b>	<b>F (11.4)</b>	-	-
	SB left + through + right	D (0.21)	25.6	6.1	<b>F (1.79)</b>	<b>851.2</b>	34.3
Penetanguishene Road (COUNTY ROAD 93) and Access 1 (unsignalized)	WB left + right	B (0.17)	10.7	4.8	B (0.16)	13.2	4.6
	NB through + right	- (0.08)	0.0	0.0	- (0.21)	0.0	0.0
	SB left + through	A (0.02)	0.9	0.4	A (0.06)	2.5	1.5
Horseshoe Valley Road West (COUNTY ROAD 22) and Access 2 (unsignalized)	EB left + through	A (0.01)	0.2	0.2	A (0.02)	0.7	0.4
	WB through + right	- (0.58)	0.0	0.0	- (0.57)	0.0	0.0
	SB left + right	D (0.16)	31.2	4.4	<b>F (6.98)</b>	-	-
Horseshoe Valley Road West (COUNTY ROAD 22) and Access 3 (unsignalized)	EB left + through	A (0.01)	0.3	0.3	A (0.04)	1.7	1.0
	WB through + right	- (0.57)	0.0	0.0	- (0.57)	0.0	0.0
	SB left + right	D (0.22)	28.7	6.5	<b>F (0.31)</b>	61.6	9.3

According to the future total traffic analysis, a poor level of service (LOS) 'F' resulted in the

- Northbound approach, both for AM and PM peak hours, at the 3<sup>rd</sup> Line North and County Road 22 intersection;
- Northbound approach, both AM and PM peak hours, and southbound approach, for PM peak hour, at the Birch Grove Drive and County Road 22 intersection;
- Northbound approach, both for AM and PM peak hours, and southbound approach, for PM peak hour, at the 4<sup>th</sup> Line North and County Road 22 intersection;
- Southbound approach, for PM peak hour, at Penetanguishene Road (COUNTY ROAD 93) and Access 2; and,

- Southbound approach, for PM peak hour, at Penetanguishene Road (COUNTY ROAD 93) and Access 3.

In order to alleviate the traffic impact observed in the future (2035) total traffic conditions in the base case (i.e. without improvements), the following mitigation measures are required:

- Single lane roundabouts for County Road 22 and 3rd Line North, and County Road 22 and Birch Grove Drive intersections;
- Multilane roundabout for County Road 22 and 4th Line North intersection;
- Provide a left-turn lane for the eastbound left turn lane with 30-meter storage length and signalization at the intersection of County Road 22 and Access #2 (Craighurst Development);
- Provide a left-turn lane for the eastbound left turn lane with 50-meter storage length and signalization at the intersection of County Road 22 and Access #3 (Craighurst Development);
- Reduction of posted speed limit from 70 km/hr to 50 km/hr within study area roadways;
- Addition of right turn tapers at all study area intersections;
- Addition of eastbound climbing lane from Country Club Lane to just east of County Road 22 and 4th Line North intersection;
- Addition of westbound climbing lane between Horseshoe Boulevard and 3rd Line North; and,
- Addition of median left turn lane between Horseshoe Resort and Country Club Lane.

The results of the future (2035) total traffic analysis – with improvements are summarized in **Table 6.18** and capacity analysis calculations are provided in **Appendix J**.

**Table 6.18 Intersection Capacity Analysis – Future (2035) Total Traffic Conditions with Improvements**

Intersection	Key Movement	AM Peak			PM Peak		
		LOS (v/c)	Control Delay (s)	Queue Length 95th (m)	LOS (v/c)	Control Delay (s)	Queue Length 95th (m)
Horseshoe Valley Road West (COUNTY ROAD 22) and Access 2 (signalized)	Overall	A (0.61)	3.2	-	A (0.72)	3.2	-
	EB left	A (0.01)	0.8	0.6	A (0.02)	0.5	0.8
	EB through	A (0.38)	1.3	26.9	A (0.73)	3.1	109.8
	WB through + right	A (0.62)	3.5	66.8	A (0.57)	2.4	54.3
	SB left + right	D (0.21)	35.2	8.8	E (0.25)	62.7	9.8
Horseshoe Valley Road West (COUNTY ROAD 22) and Access 3 (signalized)	Overall	A (0.61)	3.5	-	A (0.71)	3.9	-
	EB left	A (0.02)	0.9	0.9	A (0.06)	0.7	2.0
	EB through	A (0.39)	1.4	28.1	A (0.73)	3.6	130.9
	WB through + right	A (0.62)	3.6	66.7	A (0.59)	2.9	69.8
	SB left + right	C (0.29)	33.3	10.7	E (0.19)	57.0	12.3

Roundabout analysis has been performed at three study area intersections i.e. County Road 22 and 3 Line North, County Road 22 and Birch Grove Drive, and County Road 22 and 4 Line North. In the analysis, the



single-lane roundabout was used for County Road 22 and 3 Line North, County Road 22 and Birch Grove Drive intersections and the multilane roundabout was used for County Road 22 and 4 Line North intersection. ARCADY software was used to analyze the traffic operations under future (2035) total traffic conditions with roundabout options for these study area intersections. The performance indicators by approach arm are presented in **Table 6.19**.

**Table 6.19 Roundabout Operations – Future (2035) Total Traffic Conditions**

Intersection	Level of Service	
	AM Peak Hour	PM Peak Hour
County Road 22 and 3 <sup>rd</sup> Line North	A	B
County Road 22 and Birch Grove Drive	B	B
County Road 22 and 4 <sup>th</sup> Line North	A	A

Based on the analysis completed, no additional transportation-related improvements, beyond those already recommended in the County Road 22 Class EA, will be needed to support future development in the Study Area. Therefore, no alternatives have been developed or evaluated to address transportation issues.

## 7 Alternative Solutions to the Problem

Based on the water and wastewater servicing considerations discussed in **Chapter 6**, new servicing solutions will be required prior to future development within the Craighurst and Horseshoe Valley settlement areas. To service future development while minimizing environmental impacts, a number of alternative solutions were developed and comparatively evaluated. This chapter provides a description of the long-list and short-list of alternatives and how they were considered and evaluated in order to arrive at the recommended solutions. As analysis identified that implementation of the recommendations of the County Road 22 Class EA will be sufficient to meet future transportation requirements, future transportation improvements identified in County Road 22 Class EA were included in all alternatives and servicing alternatives.

### 7.1 Alternative Solutions

The Municipal Class EA process recognizes that there are different ways of solving a particular problem and requires that various alternative solutions be considered. As such, the initial long-list of alternatives considered was:

- Do Nothing;
- Limit Community Growth;
- Implement Water Use Efficiency and Wastewater Reduction Measures; and,
- Enhance / Expand Existing Systems.

The following sections describe each alternative solution, evaluates how the alternative solution will address the problem statements and provides the rationale for the development of servicing alternatives.

#### 7.1.1 Do Nothing

The Municipal Class EA process requires that the “Do Nothing” alternative be considered as a baseline for comparison. “Do Nothing” means just that: no improvements or enhancements would be made to either the existing water, wastewater or transportation systems. Specifically, the water supply and wastewater treatment capacity of the existing Skyline WWTP and the existing private wastewater serviced areas within Craighurst would remain the same, as would current transportation corridors. This alternative would not allow future development to occur without providing servicing, which is contrary to the County and Township’s Official Plans as well as the Provincial Policy Statement. Furthermore, this alternative does not address the Problem Statement. As such, “Do Nothing” was not carried forward as a feasible alternative.

#### 7.1.2 Limit Community Growth

This alternative involves limiting the proposed growth in the community to match the residual water supply and wastewater treatment capacities identified in the previous sections. As such, the Township of Oro-Medonte would have to limit the extent and locations of future development. For the same reasons as the “Do Nothing” alternative, limiting growth was not carried forward as a feasible alternative. It does not address the Problem Statement, nor does it adhere to the Provincial Policy Statement, provincial growth projections or Official Plans. Furthermore, OPAs would be required to implement this alternative since future growth has already been approved in some areas subject to the provision of water and wastewater servicing.

### **7.1.3 Implement Water Use Efficiency and Wastewater Reduction Measures**

This alternative involves relying on reductions in water demand and wastewater production to increase the capacity of the existing water and wastewater systems to support growth. Water demand can be reduced through a series of measures including low water use fixtures and eliminating water loss and unaccounted for water. To achieve these reductions in an existing community often requires intensive public education. In Horseshoe Valley Zone 1, water supply is also used for snowmaking and irrigation which can account for as much as 40% of the Zone 1 water system. The volume of water required for snowmaking and irrigation is largely weather dependent and outside of the Township’s control. Typically, water efficiency and conservation measures can be expected to achieve water use reductions of 10% to 20%. Reductions in wastewater can be achieved if water demands are reduced and if infiltration is reduced. Infiltration reduction measures such as sewer system rehabilitation, removal of any indirect and direct connections which allow stormwater to enter the sanitary sewer system and good maintenance practices, can be expected to reduce infiltration. Some municipalities have launched comprehensive programs to reduce wastewater volumes through a range of maintenance and capital improvements.

A review of the future servicing requirements in Horseshoe Valley and Craighurst identified that significant increases in water demands and wastewater generation are anticipated. These increases are many times the available capacity and cannot be provided by increased water use efficiency and wastewater reduction measures alone. Consequently, “Implement Water Use Efficiency and Wastewater Reduction Measures” in and of itself is not feasible and was not carried forward as a stand-alone alternative. However, it could contribute to the overall water and wastewater servicing solutions and should be carried forward as an implementation measure. Its implementation can be monitored over time and its impact on the final capacity requirements of future service expansions can be recognized then.

#### **7.1.4 Enhance / Expand Existing Systems**

This alternative involves identifying appropriate enhancements and/or expansions to existing systems that will support the projected growth. The “Enhance / Expand Existing Systems” alternative provides the most appropriate solution to accommodate future long-term growth in the Horseshoe Valley and Craighurst settlement areas. As such, this alternative was carried forward for investigation.

## **7.2 List of Servicing Alternatives**

Given the “Enhance / Expand Existing Systems” alternative was carried forward for investigation, servicing alternatives were developed for each component including water, wastewater and transportation. The sub-sections below provide a description of the servicing alternatives identified.

### **7.2.1 Water Servicing Alternatives**

The development of water servicing alternatives considered both surface and groundwater supply options. The nearest surface water supplies are Matheson Creek and Coldwater River. In addition to the exceptionally long transmission watermain to reach these watercourses, the environmental impact of construction, together with the high capital and operating costs of a surface-based system, precludes further consideration of such an alternative. A background hydrogeological investigation was completed to assess the capacity of underground aquifers to provide sufficient water supply. **Appendix E** contains the detailed results. The analysis concluded that an aquifer of Regional extent with good water supply capacity is present approximately 70m below the study area and that this unit is anticipated to have the highest capacity. As such, all water servicing alternatives developed include groundwater sources as opposed to surface water sources. Key system needs include:



1. Zone 1 Well#3 pump has a capacity of 62.5L/s. This is sufficient to meet future demands. Zone 1 storage is 773m<sup>3</sup> which is not sufficient.
2. Zone 2 well#3 can supply 39L/s. Zone 2 currently has available storage of 2,818m<sup>3</sup>.

The list of water supply alternatives is as follows:

- W1) Expansion of the existing water system in Horseshoe Valley to provide additional capacity for both Horseshoe Valley and Craighurst, providing all necessary storage and pumping at Horseshoe Valley and a trunk feedermain to Craighurst capable of supplying all domestic and fire flows.
- W2) Construction of a new Craighurst water system to provide additional capacity for both Horseshoe Valley and Craighurst, providing all necessary storage and pumping at Craighurst and a trunk feedermain to Horseshoe Valley capable of conveying all additionally required domestic and fire flows.
- W3) Expansion of the Craighurst water system to provide additional capacity for Craighurst only and expansion of the existing water system in Horseshoe Valley to include all necessary infrastructure to service Horseshoe Valley (as two separated zones).
- W4) Expansion of the Craighurst water system to provide additional capacity for Craighurst only and expansion and interconnection of the existing water system in Horseshoe Valley to include all necessary infrastructure to service Horseshoe Valley (as a combined zone).

### 7.2.2 Wastewater Servicing Alternatives

A long-list of ten potential wastewater servicing alternatives was identified, including the use of existing Skyline WWTP, expansion of the Skyline WWTP, construction of a new WWTPs or some combination of these methods. Sub-options for the use of the existing Skyline WWTP in Horseshoe Valley were also identified, including eventual decommissioning, maintenance or expansion beyond its rated capacity. Upgrade of the Skyline WWTP to achieve its current rated capacity is included in all alternatives as this project is currently proceeding. As part of the servicing alternatives development process, an Assimilative Capacity Assessment Study for a surface discharge and a Reasonable Use Assessment for a subsurface discharge were completed. The Assimilative Capacity Assessment considered the assimilative capacity of nearby watercourses to accept treated effluent. The assessment considered Matheson Creek and Coldwater River as two potential discharge locations and concluded that both watercourses are Policy 2 with respect to phosphorus. A mass balance and cumulative effects analysis identified that Matheson Creek does not have adequate assimilative capacity to receive the treated effluent from the entire Study Area but could receive up to 40% of treated effluent. The report identified that discharge of treated effluent to Coldwater Creek is feasible. Discharge of 60% of the treated effluent to Coldwater River and 40% of the treated effluent to Matheson Creek was also identified as feasible. **Appendix K** contains the completed Assimilative Capacity Assessment. **Appendix L** contains the Reasonable Use Assessment.

Based on consideration of the above, the following wastewater servicing alternatives were developed:

- WW1) All flows treated at a new Craighurst WWTP with a surface discharge with the existing Skyline WWTP either decommissioned, maintained or expanded.
- WW2) All flows treated in Horseshoe Valley at a new Horseshoe Valley WWTP with a surface discharge, with the Skyline WWTP either decommissioned, maintained or expanded.

- WW3) All flows treated in their community of origin, with two new WWTPs, both with surface discharges, one in Horseshoe Valley to treat flows from Horseshoe Valley only and the other in Craighurst to treat flows from Craighurst only, with the Skyline WWTP either decommissioned, maintained or expanded.
- WW4) All flows treated in their community of origin with new WWTPs, one in Craighurst with a subsurface discharge to treat flows from Craighurst and multiple new package WWTPs in Horseshoe Valley with subsurface discharges to treat flows from Horseshoe Valley, with the Skyline WWTP either decommissioned, maintained or expanded.
- WW5) All flows treated in their community of origin with two new WWTPs, one in Craighurst with a subsurface discharge to treat flows from Craighurst and one new WWTP in Horseshoe Valley with a subsurface discharge to treat flows from Horseshoe Valley, with the Skyline WWTP either decommissioned, maintained or expanded.
- WW6) All flows treated in their community of origin with two new WWTPs, one in Craighurst with a subsurface discharge to treat flows from Craighurst and one new WWTP in Horseshoe Valley with a surface water discharge to treat flows from Horseshoe Valley with the upgraded Skyline WWTP either decommissioned, maintained or expanded.
- WW7) All flows treated in Craighurst at a new Craighurst WWTP, with a subsurface discharge and with the upgraded Skyline WWTP either decommissioned, maintained or expanded.
- WW8) All flows treated at an upgraded and expanded Skyline WWTP.
- WW9) All flows treated in Horseshoe Valley at a new Horseshoe Valley WWTP and decommissioning of the existing Skyline WWTP.
- WW10) All flows treated in Craighurst at a new Craighurst WWTP and decommissioning of the existing Skyline WWTP.

### 7.3 Screening of Long List of Servicing Alternatives

It is widely accepted that only reasonably feasible alternatives should be considered for detailed comparative evaluation in a Municipal Class EA. Screening was completed for both water and wastewater servicing alternatives. To complete the screening process, the following two questions were considered:

- Is this servicing alternative reasonably capable of being approved and is technical feasible? and,
- Is this servicing alternative reasonably cost effective to construct and operate?

For the screening assessment, technical feasibility was considered first. If an alternative was identified as not being technically feasible, it was not considered further. The following sections present the screening of water and wastewater servicing alternatives.

#### 7.3.1 Screening of Water Servicing Alternatives

A screening analysis was completed of water servicing alternatives to arrive at a “short list” of those alternatives considered reasonably feasible. **Table 7.1** presents the screening of water servicing alternatives.

**Table 7.1 Screening of Long-Listed Water Servicing Alternatives**

Water Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
W1) Expansion of the existing water system in Horseshoe Valley to provide additional capacity for both Horseshoe Valley and Craighurst.	✗	✗	No	Significant additional supply would be required in Horseshoe Valley along with a new watermain along County Road 22, and decommissioning of existing wells and storage in Craighurst. Significant approvals and additional studies would be needed. Expansion of capacity at Horseshoe Valley, construction of a new watermain and decommissioning of Craighurst wells and storage is a significant cost.
W2) Construction of a new Craighurst water system to provide additional capacity for both Horseshoe Valley and Craighurst.	✗	✗	No	Significant additional supply would be required in Craighurst along with a new watermain along County Road 22, decommissioning of the existing wells and storage in Horseshoe Valley. Additional storage has recently been constructed in Horseshoe Valley. Alternative would require significant studies for permitting and approvals. Construction of new capacity at Craighurst, a new watermain and decommissioning of Horseshoe Valley wells and storage is a significant cost.
W3) Expansion of the Craighurst water system to provide additional capacity for Craighurst only and expansion of the existing water system in Horseshoe Valley to	✓	✓	Yes	This alternative involves incremental expansion of water supply and storage facilities in both Craighurst and Horseshoe Valley and can be completed with maintenance of all existing facilities.



**Table 7.1 Screening of Long-Listed Water Servicing Alternatives**

Water Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
include all necessary infrastructure to service Horseshoe Valley (as two separated zones).				
W4) Expansion of the Craighurst water system to provide additional capacity for Craighurst only and expansion and interconnection of the existing water system in Horseshoe Valley to include all necessary infrastructure to service Horseshoe Valley (as a combined zone).	✓	✓	Yes	This alternative involves incremental expansion of water supply and storage facilities in both Craighurst and Horseshoe Valley and can be completed with maintenance of all existing facilities. Interconnection of Zones 1 and 2 in Horseshoe Valley would maximize the use of existing facilities.

Based on the above screening analysis comparing capital and operational costs, and approval feasibility, the alternatives W3 and W4 were identified as feasible and carried forward. Further consideration of these alternatives was completed and sub-alternatives were identified. The following is the list of servicing alternatives carried forward into detailed evaluation:

- W3A – Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2;
- W3B – Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2;
- W3C - Additional water supply and in-ground storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2;
- W4A – additional water supply and elevated storage in Craighurst, interconnection of Horseshoe Valley Zones 1 and 2, a new booster pumping station and additional elevated storage in Horseshoe Valley;
- W4B – additional water supply and in-ground storage in Craighurst, interconnection of Horseshoe Valley Zones 1 and 2, a new booster pumping station and additional in-ground storage in Horseshoe Valley; and,
- W4C – additional water supply and in-ground water in Craighurst, interconnection of Horseshoe Valley Zones 1 and 2, a new booster pumping station and additional elevated storage in Horseshoe Valley.

**Table 7.2** presents additional details for each short-listed water servicing alternatives while **Figures 7-1 to 7-6** show the location of facilities in each short listed water servicing alternative.

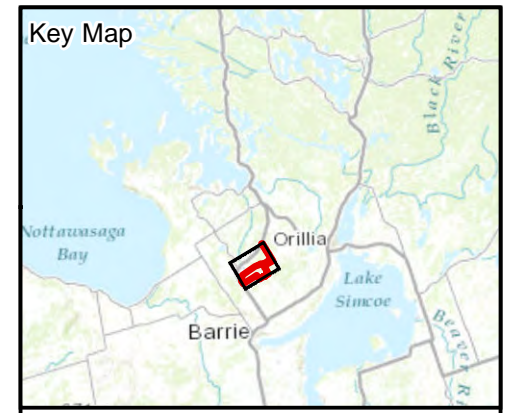
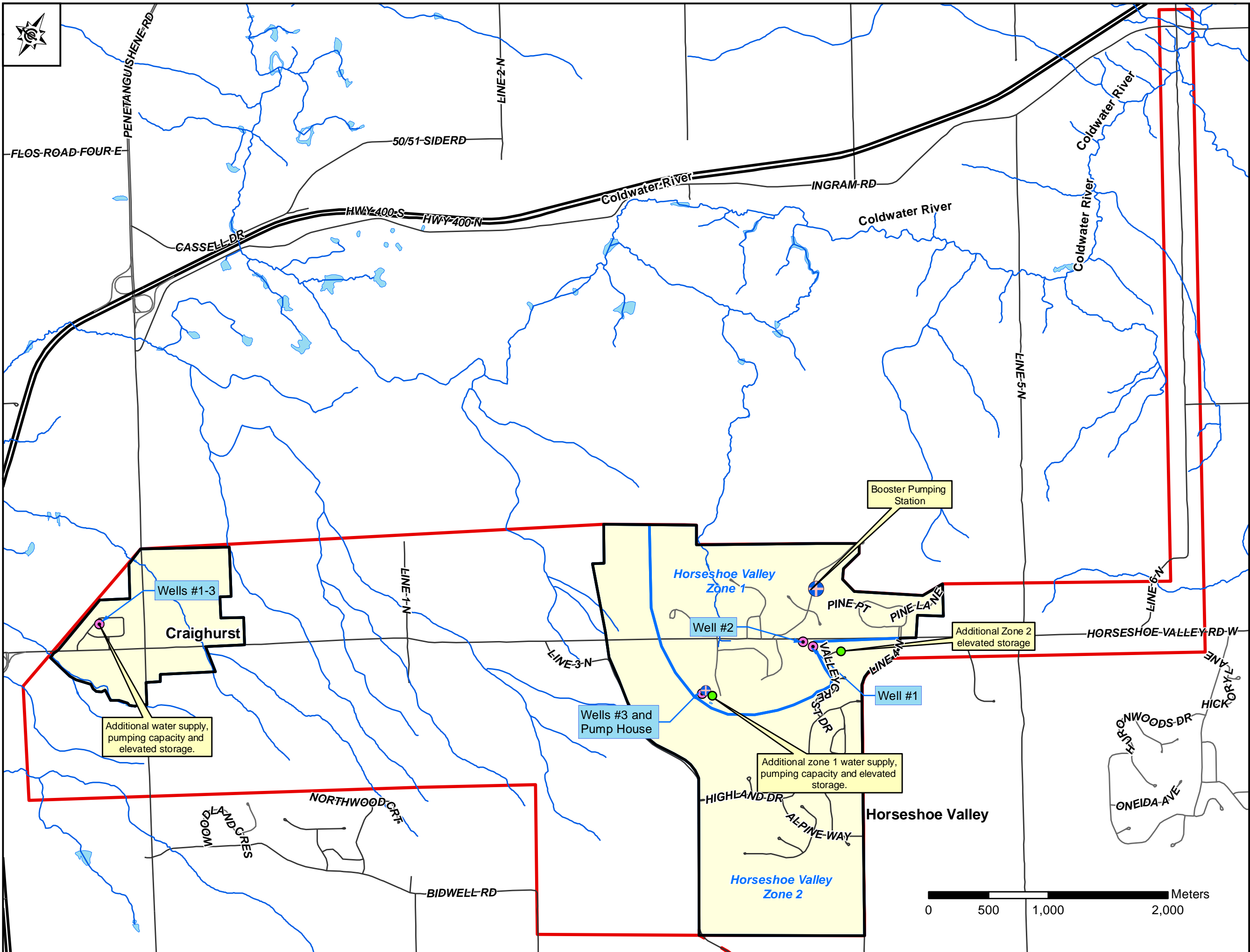
**Table 7.2 Short Listed Water Servicing Alternative Descriptions**

Servicing Alternative	Description of Works Included in Water Servicing Alternative
<p><b>W3A</b> Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2.</p>	<ul style="list-style-type: none"> <li>• Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new elevated storage tank with a volume of 1,252m<sup>3</sup>.</li> <li>• Horseshoe Valley Zone 1 –Additional 1,520m<sup>3</sup> of elevated storage</li> <li>• Horseshoe Valley Zone 2 – Additional 1,483m<sup>3</sup> of elevated storage which can be provided through an expansion to the planned elevated storage tank.</li> </ul>
<p><b>W3B</b> Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2.</p>	<ul style="list-style-type: none"> <li>• Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new in-ground storage tank with a volume of 1,252m<sup>3</sup>.</li> <li>• Horseshoe Valley Zone 1 –Additional 1,520m<sup>3</sup> of in-ground storage</li> <li>• Horseshoe Valley Zone 2 – Additional 1,483m<sup>3</sup> of in-elevated storage which can be provided through an expansion to the planned elevated storage tank.</li> </ul>
<p><b>W3C</b> Additional water supply and in-ground storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2.</p>	<ul style="list-style-type: none"> <li>• Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new in-ground storage tank with a volume of 1,252m<sup>3</sup>.</li> <li>• Horseshoe Valley Zone 1 –Additional 1,520m<sup>3</sup> of elevated storage</li> <li>• Horseshoe Valley Zone 2 – Additional 1,483m<sup>3</sup> of in-elevated storage which can be provided through an expansion to the planned elevated storage tank.</li> </ul>
<p><b>W4A</b> Additional water supply and elevated storage in Craighurst, interconnection of Horseshoe Valley Zones 1 and 2, a new booster pumping station and additional elevated storage in Horseshoe Valley.</p>	<ul style="list-style-type: none"> <li>• Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new elevated storage tank with a volume of 1,252m<sup>3</sup>.</li> <li>• Horseshoe Valley – Interconnection of Zones 1 and 2 and upgrade disinfection with new 30m of 1,000mm diameter watermain for chlorine contact, additional elevated storage volume of 3,003m<sup>3</sup> through expansion of existing facility and new booster pumping station.</li> </ul>
<p><b>W4B</b> additional water supply and in-ground storage in Craighurst, interconnection of Horseshoe Valley</p>	<ul style="list-style-type: none"> <li>• Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new in-ground storage tank with a volume of 1,252m<sup>3</sup>.</li> </ul>

**Table 7.2 Short Listed Water Servicing Alternative Descriptions**

Servicing Alternative	Description of Works Included in Water Servicing Alternative
Zones 1 and 2, a new booster pumping station and additional in-ground storage in Horseshoe Valley.	<ul style="list-style-type: none"> <li>Horseshoe Valley – Interconnection of Zones 1 and 2 and upgrade disinfection with new 30m of 1,000mm diameter watermain for chlorine contact, additional elevated storage volume of 3,003m<sup>3</sup> through new in-ground storage facility and booster pumping station.</li> </ul>
<p><b>W4C</b>                      additional water supply and in-ground water in Craighurst, interconnection of Horseshoe Valley Zones 1 and 2, a new booster pumping station and additional elevated storage in Horseshoe Valley</p>	<ul style="list-style-type: none"> <li>Craighurst – New well and pumping station with a capacity of 14L/s (will require a new PTTW) and new in-ground storage tank with a volume of 1,252m<sup>3</sup>.</li> <li>Horseshoe Valley – Interconnection of Zones 1 and 2 and upgrade disinfection with new 30m of 1,000mm diameter watermain for chlorine contact, additional elevated storage volume of 3,003m<sup>3</sup> through expansion of existing facility and new booster pumping station.</li> </ul>





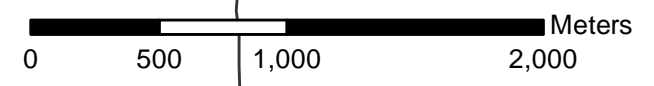
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- Monitoring Well
  - ⊕ Pumping Station
  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - Study Area
  - WaterZones

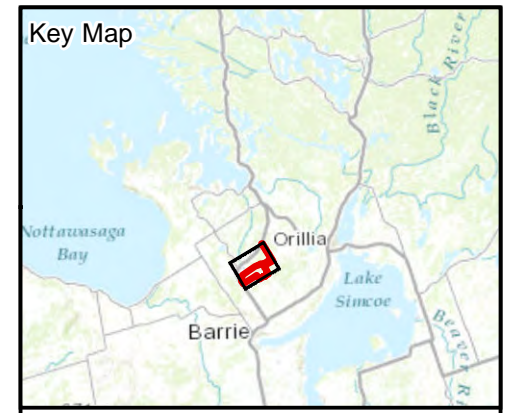
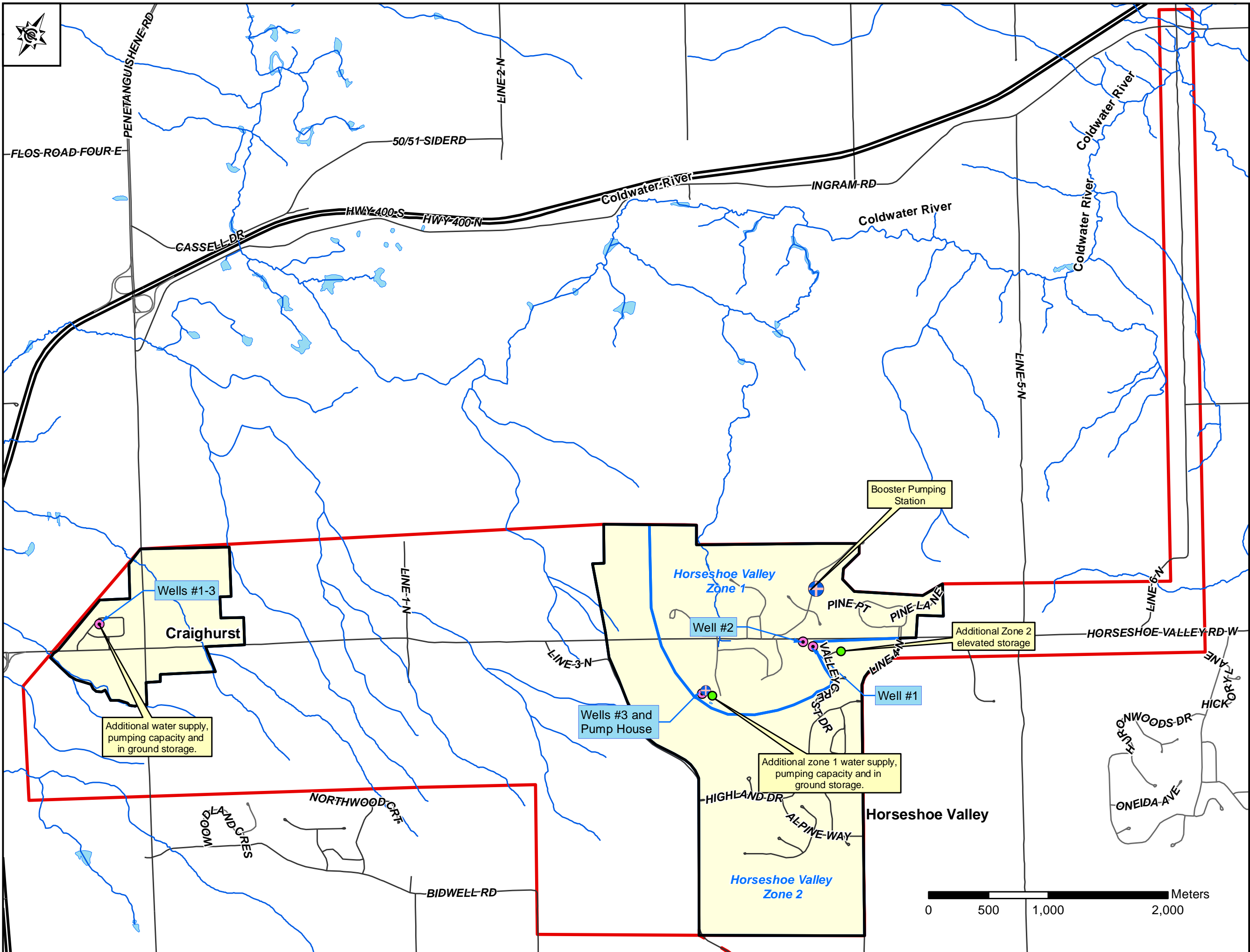
**Figure 7-1  
Alternative W3A**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
Date: April 2019





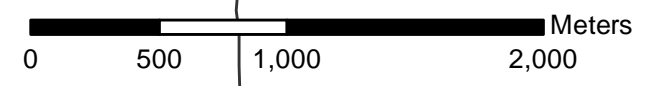
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  - ⊕ Pumping Station
  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - Study Area
  - WaterZones

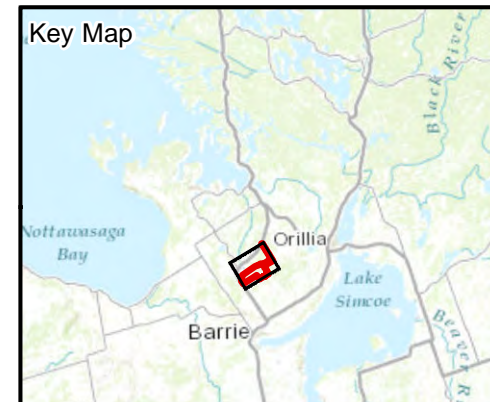
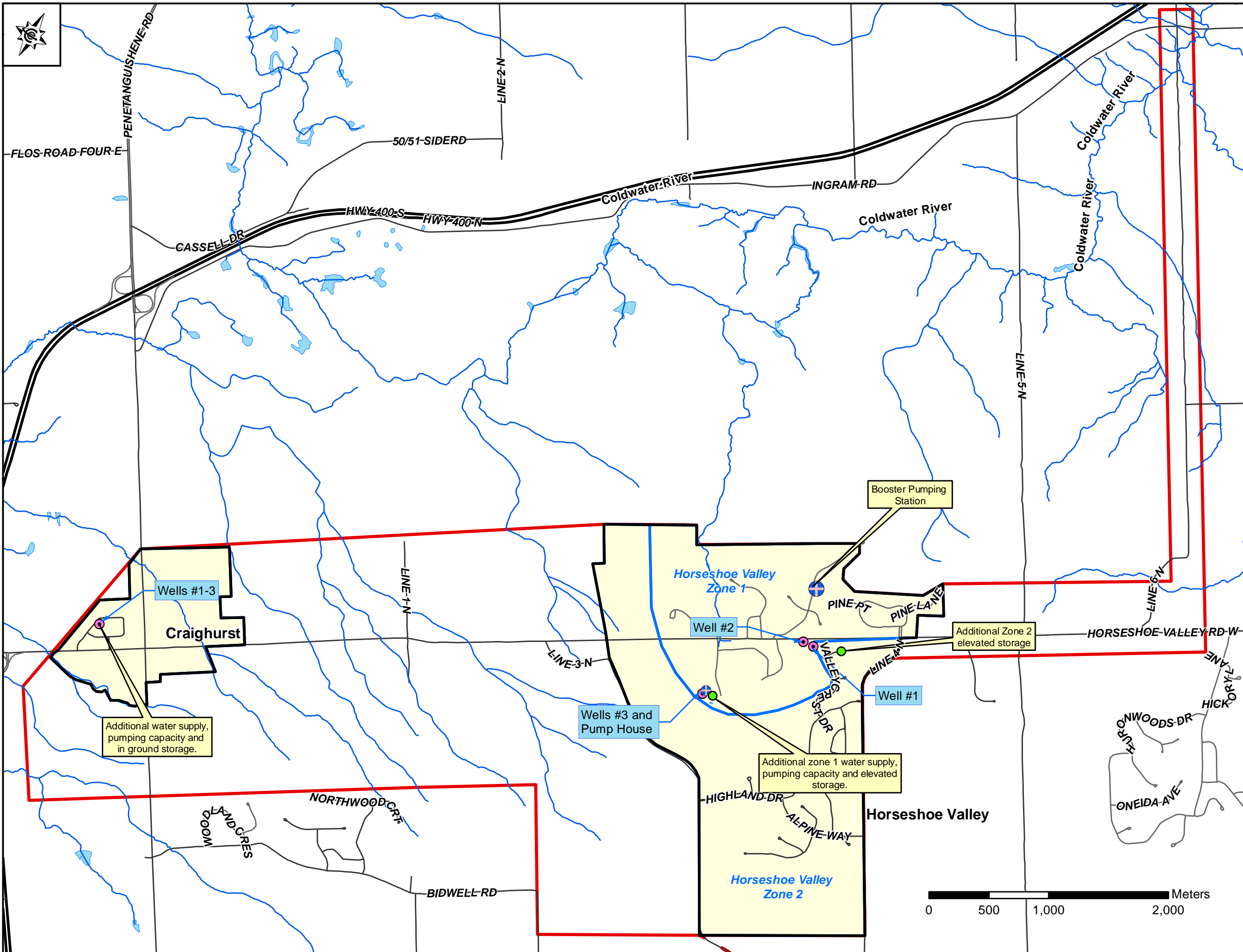
**Figure 7-2  
Alternative W3B**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
Date: April 2019





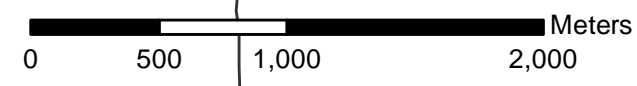
- Legend**
- Monitoring Well
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  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - Study Area
  - WaterZones

**Figure 7-3  
Alternative W3C**

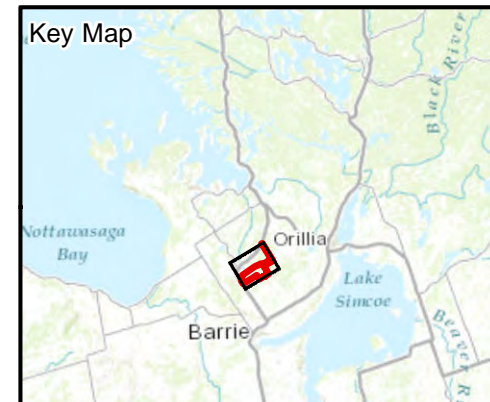
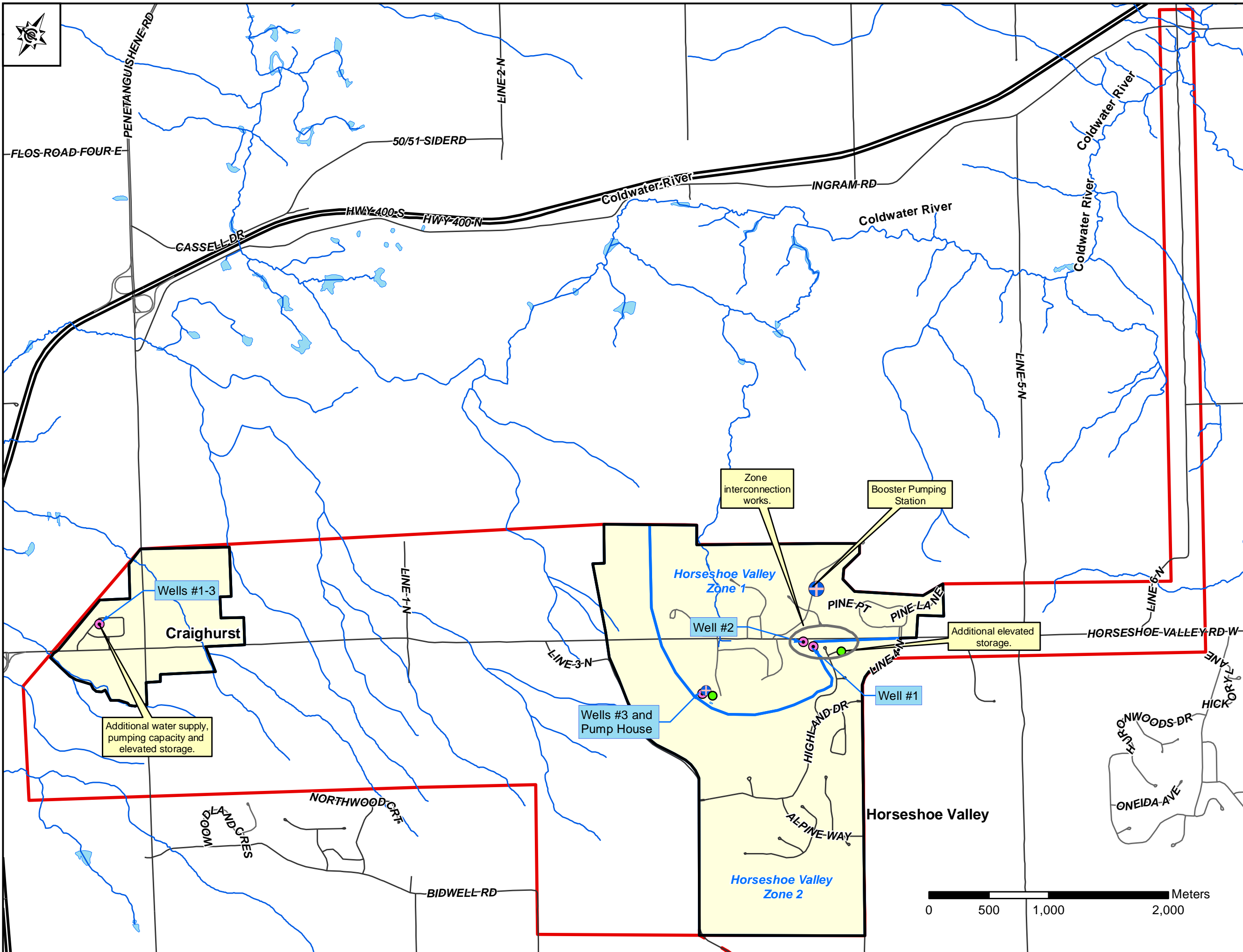
Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
Date: April 2019







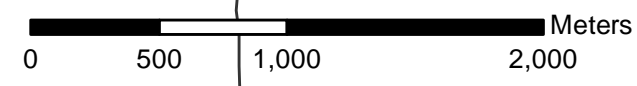
- Legend**
- Monitoring Well
  - Pumping Station
  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - Study Area
  - WaterZones

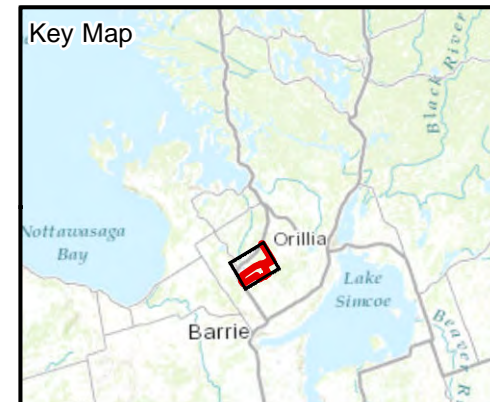
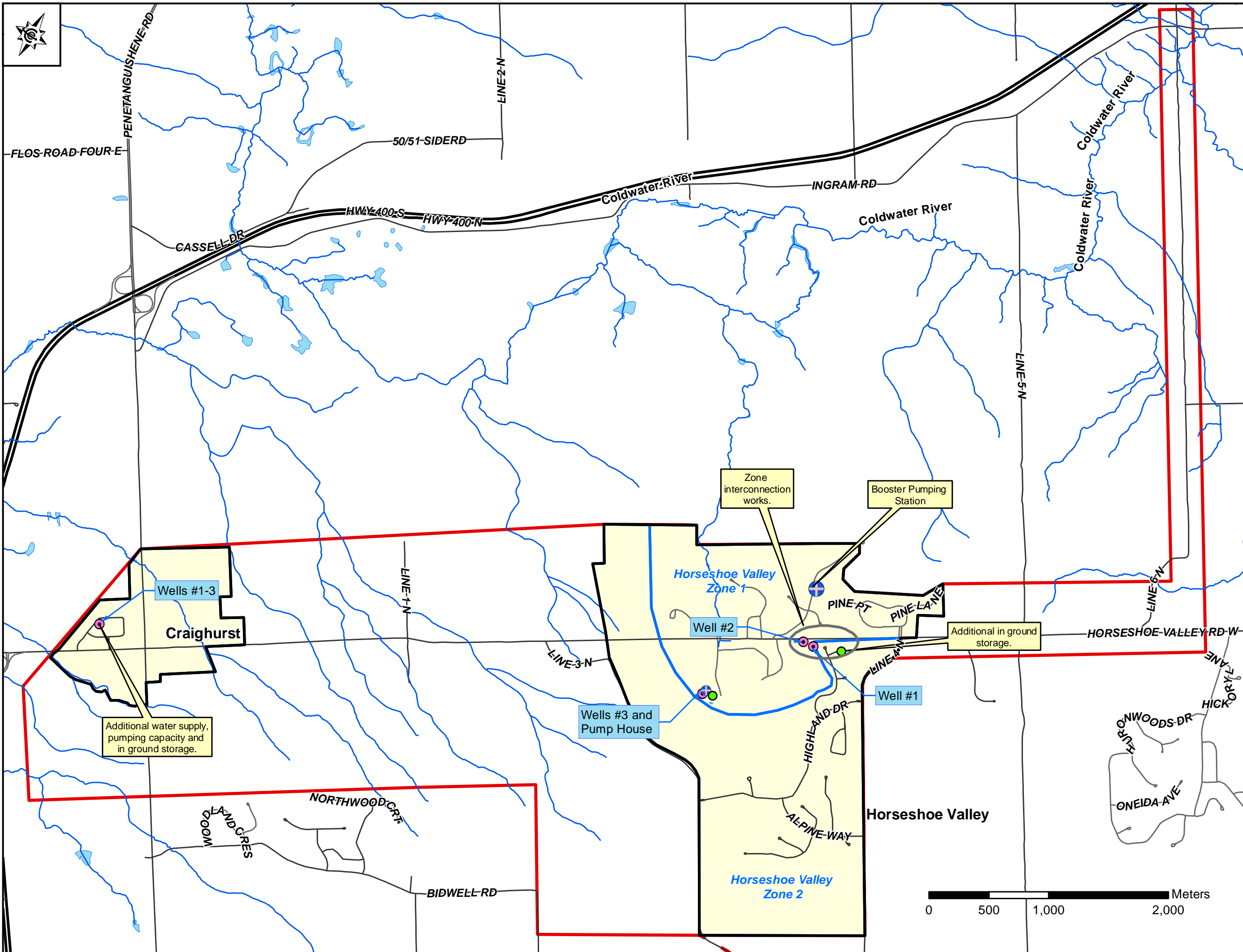
**Figure 7-4  
Alternative W4A**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
Date: April 2019





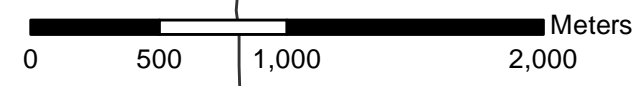
- Legend**
- Monitoring Well
  - ⊕ Pumping Station
  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - ▭ Study Area
  - ▭ WaterZones

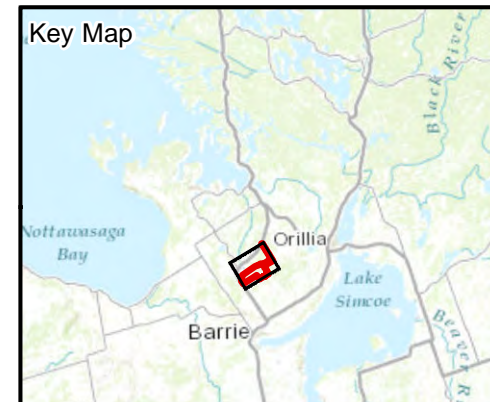
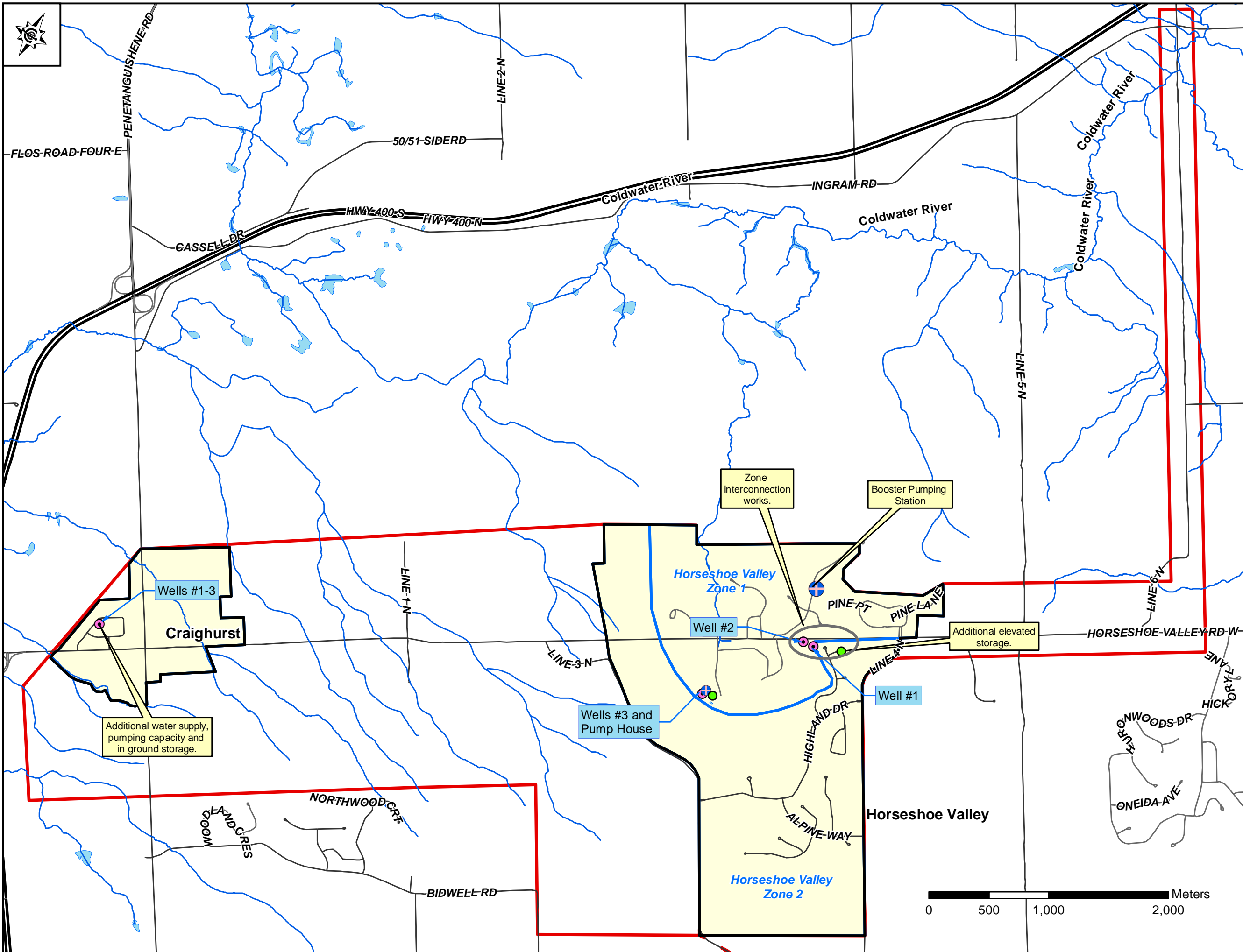
**Figure 7-5  
Alternative W4B**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



Project No.: EM14-0424  
Date: April 2019





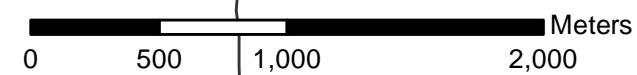
- Legend**
- Monitoring Well
  - Pumping Station
  - Watercourse
  - Waterbody Segment
  - Settlement Area
  - Study Area
  - WaterZones

**Figure 7-6  
Alternative W4C**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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### 7.3.2 Screening of Wastewater Servicing Alternatives

A screening analysis was completed of wastewater servicing alternatives to arrive at a “short list” of those alternatives considered reasonably feasible.

A key consideration in many of the servicing alternatives is the level of treatment required and the effluent discharge option. The Assimilative Capacity Assessment (see **Appendix K**) identified Coldwater Creek as a feasible watercourse for a surface discharge of treated effluent. It also identified that only 40% of treated effluent from the study area could be discharged to Matheson Creek, which is geographically closer to the Study Area. The Assimilative Capacity Assessment also recommended that a phosphorus offsetting program be investigated to minimize the potential environmental impact caused by the introduction of a new WWTP discharging to Coldwater Creek. Effluent limits for a WWTP discharging to Coldwater Creek would have to meet an effluent limit for phosphorus of 0.05mg/L. To achieve this effluent limit would require advanced treatment. Secondary treatment would reliably reduce phosphorous levels to approximately 1mg/L. Tertiary treatment (typically secondary treatment followed by sand filtration) reliably reduces the phosphorous concentration to 0.1mg/L. Membrane treatment reliably reduces phosphorous to 0.05mg/L.

The feasibility of a subsurface discharge was also assessed in a Reasonable Use Assessment (see **Appendix L**). This memorandum assessed the potential impact of a subsurface discharge of treated wastewater effluent within the Horseshoe Valley and Craighurst Settlement Areas and considered Ontario’s Reasonable Use Guideline as well as the Clean Water Act and Source Water Protection Plan conformance. The assessment concluded the following:

- Nitrate mixing and attenuation zones for Horseshoe Valley and/or Craighurst will potentially be extensive horizontally, equating to a substantial portion of each settlement area’s land area and potentially extending beyond the settlement area boundaries;
- It is uncertain whether subsurface effluent disposal in Horseshoe Valley and/or Craighurst could affect water quality in the aquifer layers in which existing municipal water well and private wells are developed. Based on the available information, the most reasonable and precautionary assumption is that this could occur in the long term;
- Nitrate levels could increase in drinking water supplies and there may be concerns about other contaminants;
- Better definition of the expected horizontal and vertical extent of the nitrate attenuation zone and risk of contamination of the water production layers would require additional technical analyses of groundwater movement at the local scale. It would also require definition of facility siting for the effluent disposal facilities within each settlement area; and,
- It was noted that if the nitrate attenuation zone extended out onto adjacent lands outside of the settlement areas, land acquisition by the owner of the treatment facility of rights to restrict water use and land use on the adjacent lands would be required.

Based on the above information, a detailed screening assessment of the long list of wastewater servicing alternatives was completed. **Table 7.3** presents the results of the screening assessment.

**Table 7.3 Screening of Long-Listed Wastewater Servicing Alternatives**

Wastewater Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
<b>WW1)</b> All flows treated in Craighurst at a new Craighurst WWTP with a surface discharge with Skyline WWTP either decommissioned, maintained or expanded.	✗	✗	No	<ul style="list-style-type: none"> <li>The new Craighurst WWTP would have a surface water discharge to Matheson Creek as this watercourse is the closest available discharge location. Matheson Creek is Policy 2 with respect to total phosphorus and does not have sufficient assimilative capacity to accept treated wastewater from both Craighurst and Horseshoe Valley. Maintenance of the current rated capacity of the Skyline WWTP will not improve the feasibility of this alternative.</li> </ul>
<b>WW2)</b> All flows treated in Horseshoe Valley at a new Horseshoe Valley WWTP with a surface discharge with Skyline WWTP either decommissioned, maintained or expanded.	✓	✓	Yes	<ul style="list-style-type: none"> <li>This alternative is technically feasible as Coldwater Creek has sufficient assimilative capacity to received treated effluent from new WWTP.</li> </ul>
<b>WW3)</b> All flows treated in their community or origin with two new WWTPs with surface discharges. Skyline WWTP would be either decommissioned, maintained or expanded.	✗	✓	No	<ul style="list-style-type: none"> <li>Matheson Creek and Coldwater River have sufficient assimilative capacity to receive treated effluent. This alternative would require the operation of two surface water treatment facilities. Fixed operational costs at both facilities result in this alternative having a</li> </ul>

**Table 7.3 Screening of Long-Listed Wastewater Servicing Alternatives**

Wastewater Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
				significantly higher life cycle cost than other alternatives.
<b>WW4)</b> All flows treated in their community of origin with one new WWTP in Craighurst with a sub-surface discharge and multiple new WWTP in Horseshoe Valley with a subsurface discharges. Skyline WWTP could be decommissioned, maintained or expanded.	✗	✗	No	<ul style="list-style-type: none"> <li>For the new Craighurst WWTP with a subsurface discharge, reasonable use calculations identified that a land area of 126ha would be required to achieve the required nitrate dilution for the Craighurst area. The effluent disposal mixing zone would be equivalent to the Craighurst Service Area boundary itself.</li> <li>Multiple subsurface discharge facilities in Horseshoe Valley would, in total, require a effluent dilution area greater than the land area of the settlement area.</li> </ul>
<b>WW5)</b> All flows treated in their community of origin with two new WWTPs with subsurface discharges	✗	✗	No	<ul style="list-style-type: none"> <li>Based on reasonable use calculations, a land area of 126ha would be required to achieve the required nitrate dilution for the Craighurst area.</li> <li>A single subsurface discharge facility in Horseshoe Valley would, in total, require a effluent dilution area greater than the land area of the settlement area.</li> </ul>
<b>WW6)</b> All flows treated in their community of origin with two new WWTPs. New Craighurst	✓	✓	Yes	<ul style="list-style-type: none"> <li>This alternative is technically feasible as the effluent mixing zone in Craighurst would not extend</li> </ul>



**Table 7.3 Screening of Long-Listed Wastewater Servicing Alternatives**

Wastewater Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
WWTP would have a subsurface discharge while Horseshoe Valley WWTP would have a surface discharge.				beyond the settlement boundary and Coldwater Creek has sufficient assimilative capacity to accept treated effluent from a new Horseshoe Valley WWTP.
<b>WW7)</b> All flows treated in Craighurst at a new Craighurst WWTP with a subsurface discharge.	✓	✗	No	<ul style="list-style-type: none"> <li>Based on reasonable use calculations, a land area greater than the Craighurst settlement area would be required to achieve the required nitrate dilution for a new Craighurst WWTP with a sub-surface discharge.</li> <li>60% increase in rated capacity at Skyline WWTP is the maximum increase possible due to site capacity.</li> </ul>
<b>WW8)</b> All flows treated at an expanded Skyline WWTP.	✓	✗	No	<ul style="list-style-type: none"> <li>Expansion of the Skyline WWTP is limited by site capacity. Maximum expansion size is estimated to be 60% increase in rated capacity. This expansion will not be sufficient to meet wastewater treatment needs. .</li> </ul>
<b>WW9)</b> All flows treated in Horseshoe Valley with decommissioning of the Skyline WWTP	✓	✗	No	<ul style="list-style-type: none"> <li>The assimilative capacity assessment identified that Coldwater Creek is Policy 2 with respect to total phosphorus, un-ionized ammonia and dissolved oxygen. Therefore, a new surface discharge WWTP in</li> </ul>

**Table 7.3 Screening of Long-Listed Wastewater Servicing Alternatives**

Wastewater Alternatives	Screening Question “Is the alternative...”		Carried Forward	Explanation for Screening Out
	Reasonably cost effective to construct and operate?	Reasonably capable of being approved?		
				<p>Horseshoe Valley serving both Horseshoe Valley and Craighurst is feasible.</p> <ul style="list-style-type: none"> <li>Alternative would require decommissioning of existing Skyline WWTP. This facility is currently being upgraded to its current rated capacity and is planned to remain in operation, therefore decommissioning will incur additional costs.</li> </ul>
<b>WW10)</b> All flows treated in Horseshoe Valley with decommissioning of the Skyline WWTP.	✓	✗	No	<ul style="list-style-type: none"> <li>Based on reasonable use calculations, a land area greater than the Craighurst settlement area would be required to achieve the required nitrate dilution for a new Craighurst WWTP with a sub-surface discharge.</li> </ul>

Based on the above screening analysis comparing capital and operational costs, and approval feasibility, the alternatives WW2 and WW6 were identified as feasible and carried forward. Further consideration of these alternatives was completed and sub-alternatives were identified. The following is the list of servicing alternatives carried forward into detailed evaluation:

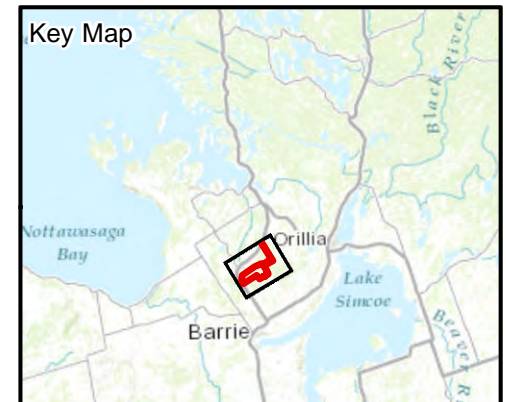
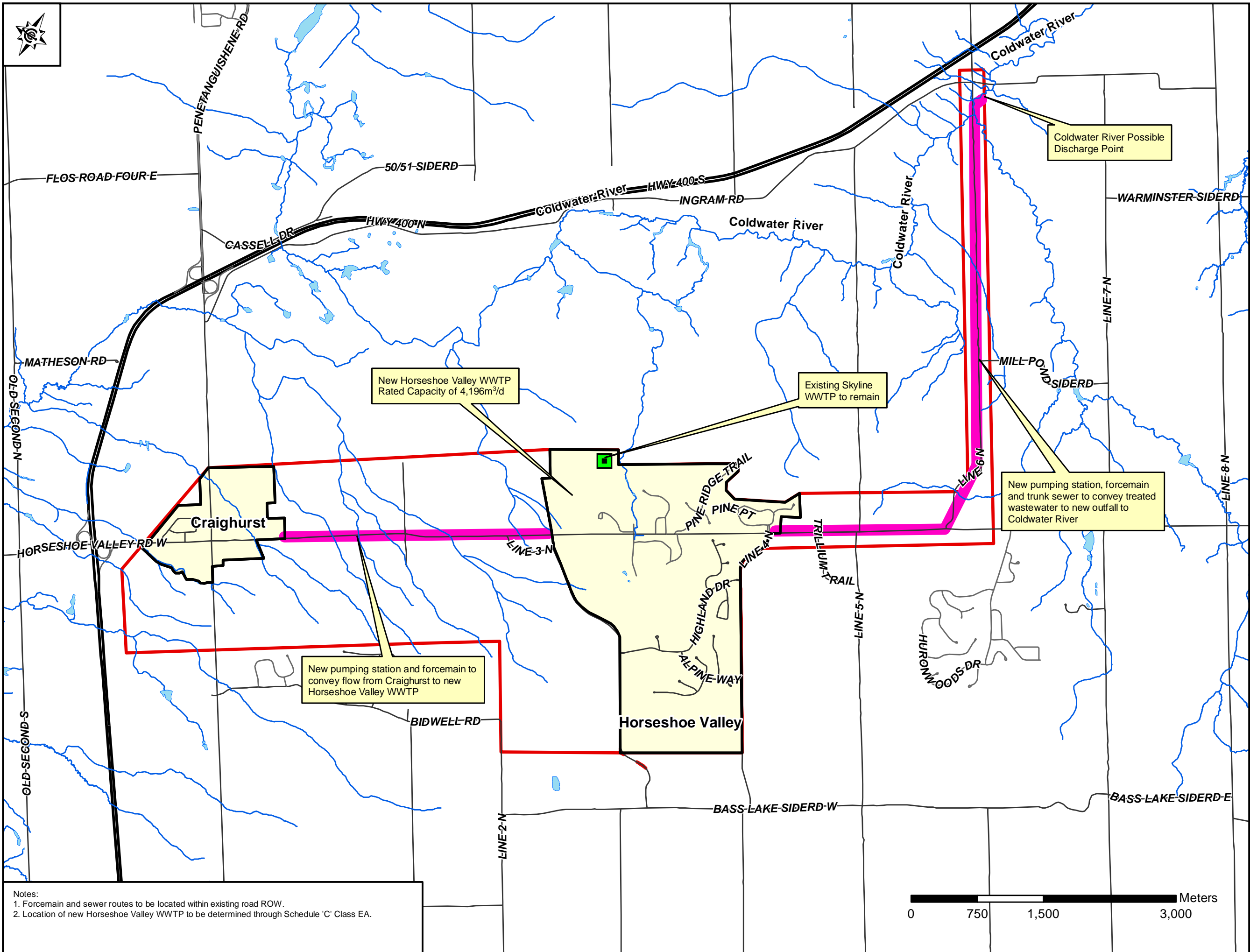
- WW2A – All flows treated at a new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek. This alternative includes the maintenance of the current rated capacity at the Skyline WWTP;
- WW2B – All flows treated at a new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek. This alternative includes an expansion of the Skyline WWTP to site capacity;
- WW6A – New Craighurst WWTP with a subsurface discharge, new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek and maintenance of the existing rated capacity of the Skyline WWTP; and,
- WW6B – New Craighurst WWTP with a subsurface discharge, new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek and expansion of the Skyline WWTP to site capacity.

**Table 7.4** presents additional details for each short listed wastewater servicing alternatives while **Figures 7-7 to 7-10** show the location of facilities in each short listed wastewater servicing alternative.

**Table 7.4 Short Listed Wastewater Servicing Alternative Descriptions**

Alternative	Description of Works Included in Alternative
<p><b>WW2A</b> All flows treated at a new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek. This alternative includes the maintenance of the current rated capacity at the Skyline WWTP.</p>	<ul style="list-style-type: none"> <li>• Maintain existing Skyline WWTP at current rated capacity of 810m<sup>3</sup>/d.</li> <li>• New Craighurst Pumping Station.</li> <li>• New 6.5km long forcemain and pumping stations from Craighurst to new Horseshoe Valley WWTP along County Road 22.</li> <li>• New Horseshoe Valley WWTP.</li> <li>• New 10km long sewer, pumping stations and forcemain to discharge outfall at Coldwater River and new outfall structure at Coldwater Creek.</li> </ul>
<p><b>WW2B</b> All flows treated at a new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek. This alternative includes an expansion of the Skyline WWTP to site capacity.</p>	<ul style="list-style-type: none"> <li>• Expand rated capacity of Skyline WWTP to site capacity.</li> <li>• New Craighurst Pumping Station.</li> <li>• New 6.5m long forcemain and pumping stations from Craighurst to new Horseshoe Valley WWTP along County Road 22.</li> <li>• New Horseshoe Valley WWTP.</li> <li>• New 10km long sewer, pumping stations and forcemain to discharge outfall at Coldwater Creek and new outfall structure.</li> </ul>
<p><b>WW6A</b> New Craighurst WWTP with a subsurface discharge, new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek and maintenance of the existing rated capacity of the Skyline WWTP</p>	<ul style="list-style-type: none"> <li>• Maintain existing Skyline WWTP at current rated capacity.</li> <li>• New Craighurst WWTP with subsurface discharge.</li> <li>• New Horseshoe Valley WWTP.</li> <li>• New 10km long sewer, pumping stations and forcemain to discharge outfall at Coldwater River and new outfall structure.</li> </ul>
<p><b>WW6B</b> New Craighurst WWTP with a subsurface discharge, new Horseshoe Valley WWTP with a surface discharge to Coldwater Creek and expansion of the Skyline WWTP to site capacity.</p>	<ul style="list-style-type: none"> <li>• Expand rated capacity of Skyline WWTP to site capacity.</li> <li>• New Craighurst WWTP with a subsurface discharge.</li> <li>• New Horseshoe Valley WWTP.</li> <li>• New 10km long sewer, pumping stations and forcemain to discharge outfall at Coldwater River and new outfall structure.</li> </ul>





- Legend**
- Existing WWTP
  - Watercourse
  - Conceptual Forcemain and Sewer Alignments
  - Waterbody Segment
  - Settlement Area
  - Study Area

New Horseshoe Valley WWTP  
Rated Capacity of 4,196m<sup>3</sup>/d

Existing Skyline  
WWTP to remain

New pumping station, forcemain  
and trunk sewer to convey treated  
wastewater to new outfall to  
Coldwater River

New pumping station and forcemain to  
convey flow from Craighurst to new  
Horseshoe Valley WWTP

Coldwater River Possible  
Discharge Point

Notes:  
1. Forcemain and sewer routes to be located within existing road ROW.  
2. Location of new Horseshoe Valley WWTP to be determined through Schedule 'C' Class EA.

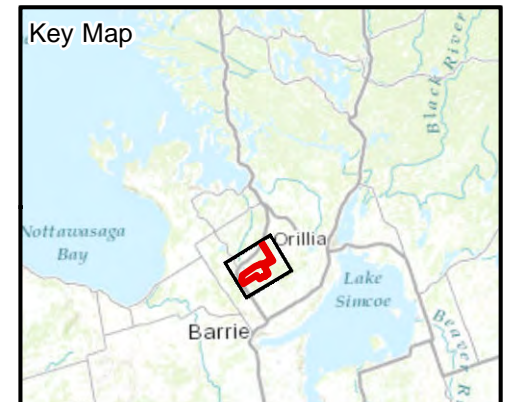
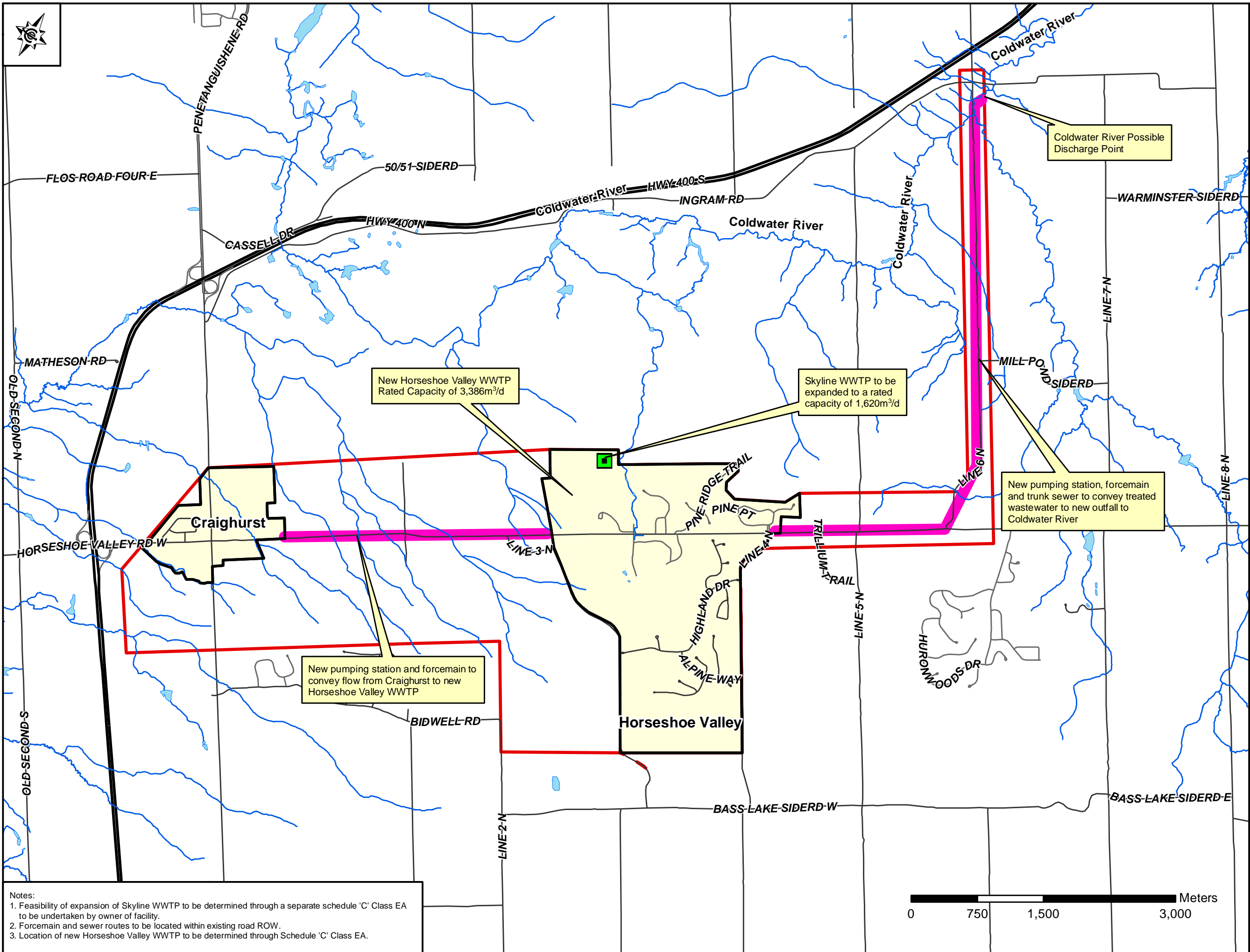


**Figure 7-7  
Alternative WW2A**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
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- Legend**
- Existing WWTP
  - Watercourse
  - Conceptual Forcemain and Sewer Alignments
  - Waterbody Segment
  - Settlement Area
  - Study Area

New Horseshoe Valley WWTP  
Rated Capacity of 3,386m<sup>3</sup>/d

Skyline WWTP to be expanded to a rated capacity of 1,620m<sup>3</sup>/d

Coldwater River Possible Discharge Point

New pumping station, forcemain and trunk sewer to convey treated wastewater to new outfall to Coldwater River

New pumping station and forcemain to convey flow from Craighurst to new Horseshoe Valley WWTP

- Notes:
1. Feasibility of expansion of Skyline WWTP to be determined through a separate schedule 'C' Class EA to be undertaken by owner of facility.
  2. Forcemain and sewer routes to be located within existing road ROW.
  3. Location of new Horseshoe Valley WWTP to be determined through Schedule 'C' Class EA.



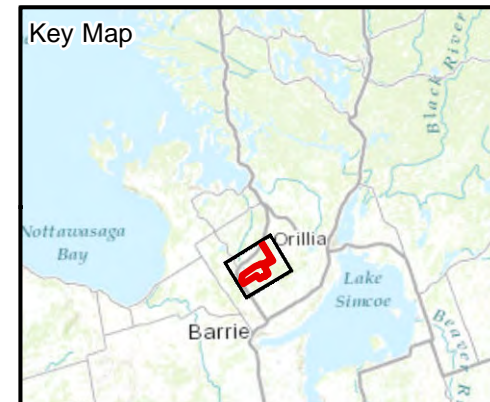
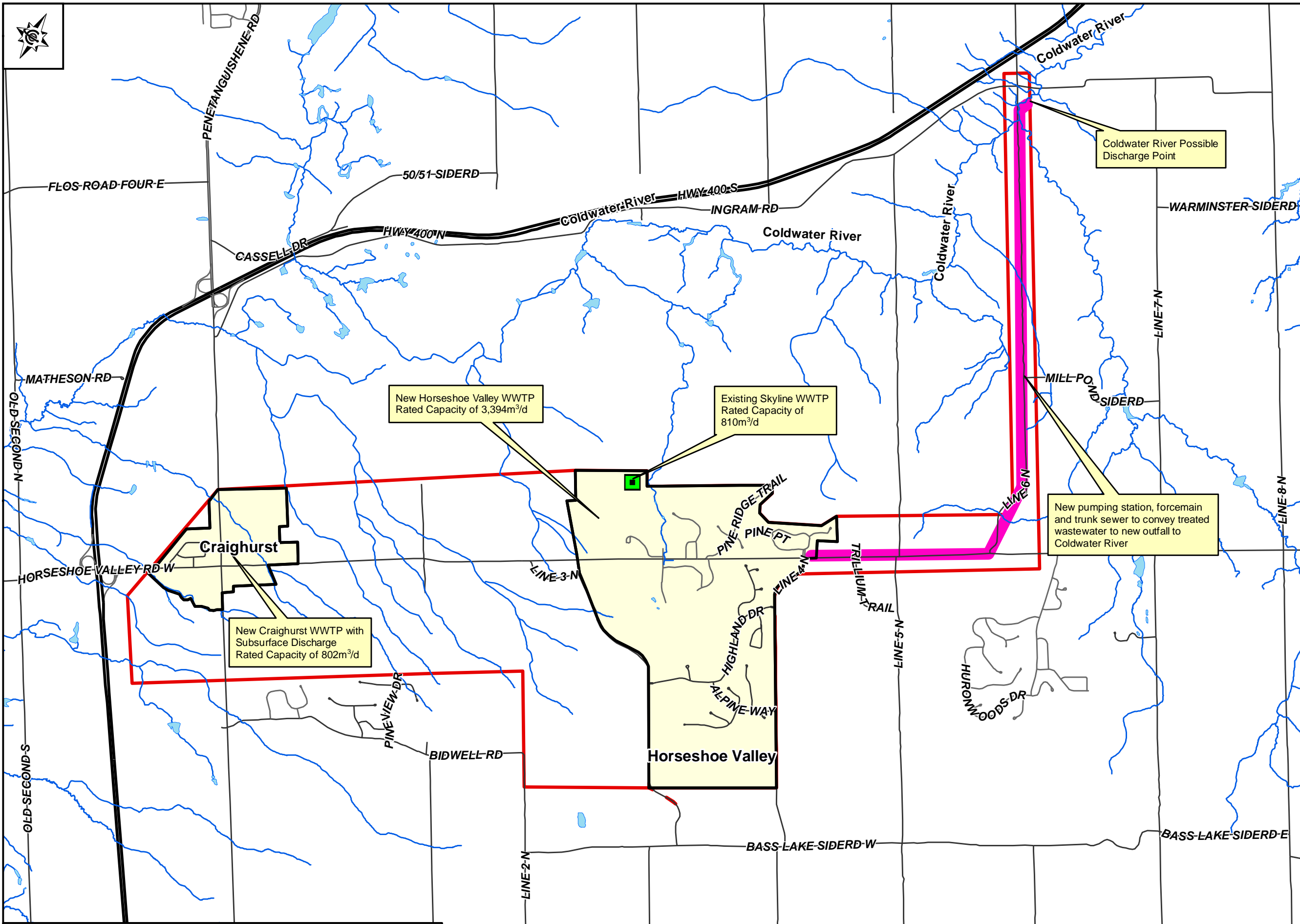
**Figure 7-8  
Alternative WW2B**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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- Legend**
- Existing WWTP
  - Watercourse
  - Conceptual Forcemain and Sewer Alignments
  - Waterbody Segment
  - Settlement
  - Study Area

New Horseshoe Valley WWTP  
Rated Capacity of 3,394m<sup>3</sup>/d

Existing Skyline WWTP  
Rated Capacity of 810m<sup>3</sup>/d

New Craighurst WWTP with  
Subsurface Discharge  
Rated Capacity of 802m<sup>3</sup>/d

New pumping station, forcemain  
and trunk sewer to convey treated  
wastewater to new outfall to  
Coldwater River

Coldwater River Possible  
Discharge Point

Notes:  
 1. Forcemain and sewer routes to be located within existing road ROW.  
 2. Location of new Horseshoe Valley WWTP and Craighurst WWTP to be determined through Schedule 'C' Class EA.



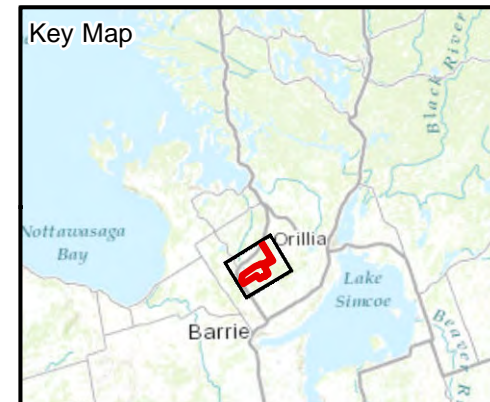
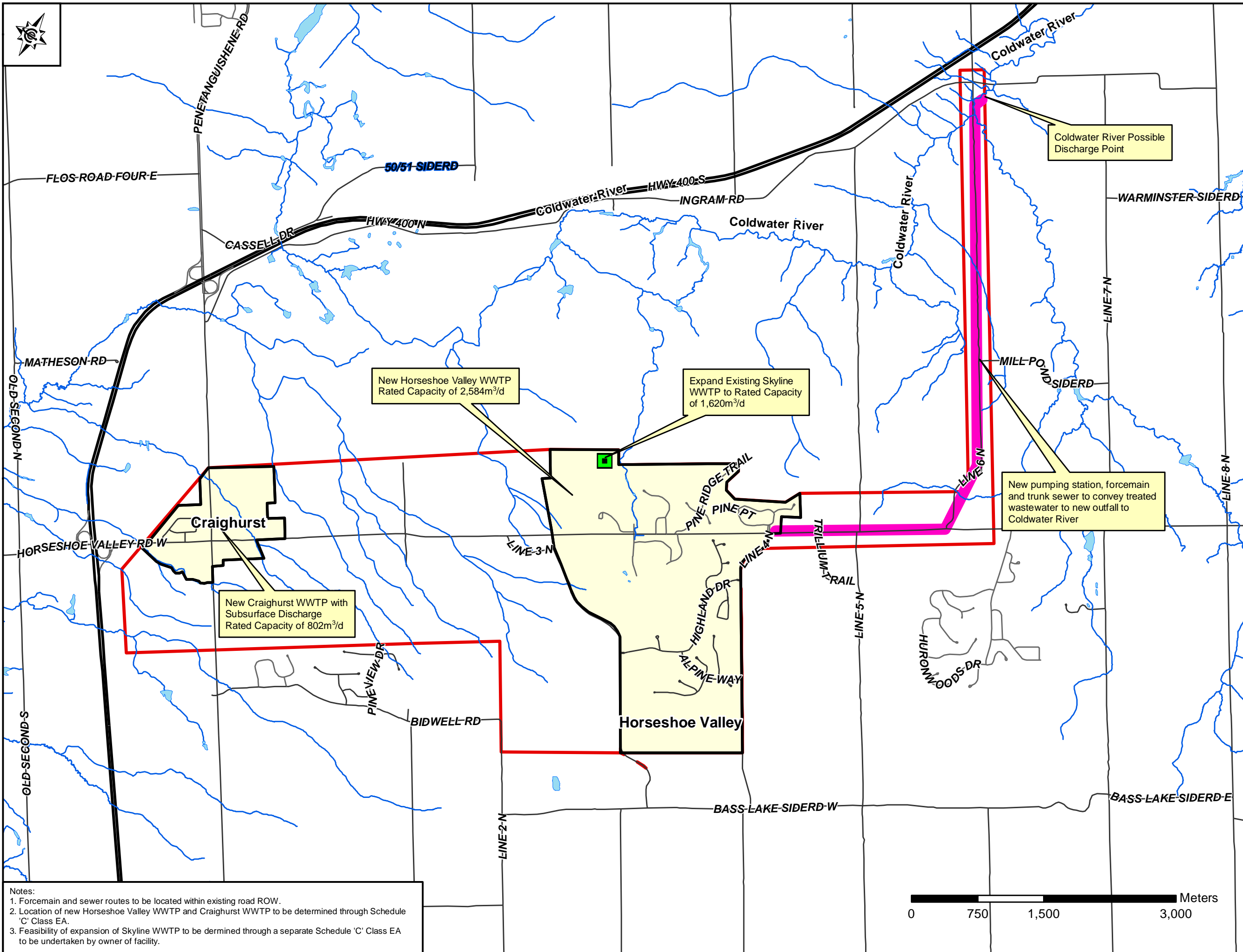
**Figure 7-9  
Alternative WW6A**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



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- Legend**
- Existing WWTP
  - Watercourse
  - Conceptual Forcemain and Sewer Alignments
  - Waterbody Segment
  - Settlement Area
  - Study Area

**Figure 7-10  
Alternative WW6B**

Horseshoe Craighurst Corridor  
Water, Wastewater and transportation  
Master Plan



- Notes:**
1. Forcemain and sewer routes to be located within existing road ROW.
  2. Location of new Horseshoe Valley WWTP and Craighurst WWTP to be determined through Schedule 'C' Class EA.
  3. Feasibility of expansion of Skyline WWTP to be determined through a separate Schedule 'C' Class EA to be undertaken by owner of facility.



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## 7.4 Evaluation of Servicing Alternatives

The following sub-sections describe the evaluation process used to gather and review all of the information to comparatively evaluate and select the preferred servicing solutions.

### 7.4.1 Evaluation Methodology

A set of evaluation criteria was developed based on the following four environmental components that together address the broad definition of the environment as described in the *Environmental Assessment Act*:

- Natural Environment – component having regard for protection of the natural and physical environment (i.e. air, land, water and biota), including natural heritage and environmentally sensitive areas;
- Social / Cultural – component that evaluates potential effects on residents, businesses, community features and historical / archaeological and cultural heritage components;
- Technical – component that considers the technical suitability and other transportation design aspects of the design; and,
- Economic / Financial – component that considers the potential financial costs.

Table 7.5 presents the evaluation criteria.

**Table 7.5 Evaluation Criteria**

Evaluation Criteria	Indicator	Measure / Consideration
Natural Environment		
Potential effects on terrestrial features	Vegetation	Loss of vegetation
	Wildlife	Loss of or disruption to wildlife habitat, including sensitive species habitat and greenway or wildlife corridor linkages / connectivity
Potential effects on Designated Natural Areas	Designated Natural Areas	Proximity to or crossing of Provincially Significant Wetlands, Locally Significant Wetlands, Areas of Natural and Scientific Interest and/or Environmentally Sensitive Areas
Potential effects on water resources and hydrogeology	Fisheries and Aquatic Habitat	Loss of fish habitat, including direct loss of aquatic habitat or indirect loss through sedimentation and debris
	Aquatics	Type of watercourse (warm / cold water)
	Watercourse Crossings	Number and size of watercourse crossings
	Dewatering	Potential for water-taking (dewatering) and associated impacts to groundwater users, natural ecosystem features and the groundwater system
	Surface Water	Loss of water quality or quantity, including potential for pollutants to enter receiving watercourses and potential for increased flood levels and erosion

**Table 7.5 Evaluation Criteria**

<b>Evaluation Criteria</b>	<b>Indicator</b>	<b>Measure / Consideration</b>
	Groundwater	Proximity to significant groundwater resources
Impacts to Species at Risk	Species at Risk	Extent of impacts to Species at Risk
Potential effects on air quality	Air pollution <sup>1</sup>	Potential air quality impacts caused by vehicle idling due to capacity constraints / intersection delays
<b>Social / Cultural Environment</b>		
Potential effects on heritage resources	Archaeological Resources	Potential for impact to known archaeological resources
	Cultural and Built Heritage	Proximity to designated cultural and built heritage resources
Potential effects on residents and businesses	Commercial / Industrial	Potential for temporary disruption to commercial and industrial business properties, including impacts to goods movement and travel delays / costs
	Community / Recreation	Potential for temporary disruption to nearby residents, property owners and community facilities, including access considerations
	Emergency Services	Potential increase or decrease in emergency service response times
Compatibility with proposed land uses	Provincial Land Use Planning Policies / Goals	Potential conflicts with provincial plans and policies (e.g. Places to Grow, Oro Moraine)
	Local Land Use Policies / Goals	Adherence to Township / County planning policies and guidelines
Potential impacts to property	Property Requirements	Potential land requirements, including permanent and/or temporary easements
Traffic impacts	Construction	Potential impacts to traffic flow and access to commercial, industrial and residential areas during construction
Nuisance impacts	Air and Noise	Impacts to air quality, noise, vibration during construction
<b>Technical Considerations</b>		
Impacts from soil / ground conditions	Soil / Ground Conditions	Ease of construction (e.g. soil stability, geotechnical considerations)
Ease of construction	Constructability	Ability to efficiently phase in additional wastewater capacity Use of Township / County Roads versus Local Subdivision Roads
Potential traffic management issues and/or opportunities	Traffic Access	Potential impacts to traffic flow and access to commercial, industrial and residential areas



**Table 7.5 Evaluation Criteria**

Evaluation Criteria	Indicator	Measure / Consideration
Potential constructability issues	Traffic Staging	Potential impacts to existing traffic operations due to temporary construction activities
Economic Considerations		
Estimated costs	Capital Costs	Relative construction costs compared to other alternatives
	Operating and Maintenance Costs	Relative difference between Operating and Maintenance costs including lifecycle replacement and operating requirements
	Land Acquisition Costs	Temporary and permanent easement requirements

In order to evaluate the servicing alternatives, each of the criteria presented **Table 7.5** were assessed in a descriptive manner. Rather than a numerical or weighted ranking system, the evaluation concentrates instead on the strengths and weaknesses of each servicing alternative to identify the best possible solution. For each criterion and for each possible alternative, the potential effects on the environment (natural, social, etc.) were identified and the relative advantages and disadvantages of each were considered.

Reasonable mitigation measures were then identified to avoid or minimize any potential negative effects. The selection of the preferred servicing alternative is based on the relative advantages and disadvantages of the net environmental effects, including the results of applying mitigating measures.

The ranking of each servicing alternative relative to the specific evaluation criteria was conducted using a colour coding system comprised of green, yellow and red, designed to be indicative of most (green) to least (red) preferred. The comparison of each criterion was made horizontally between the servicing alternatives and then vertically to derive the recommended preferred servicing alternative. The servicing alternative which demonstrated the greatest number of “most” preferred boxes and/or the fewest “least” preferred boxes relative to their potential environmental effects resulted in the recommended preferred servicing alternative.

#### **7.4.2 Evaluation of Water Servicing Alternatives**

**Table 7.6** presents the detailed evaluation of water servicing alternatives using the evaluation methodology identified in **Section 7.4.1**.

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
<b>Natural Environment</b>						
Potential effects on terrestrial features	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. Potential impacts associated with site selected for wells and storage facilities can be mitigated through site selection. Additional storage in Horseshoe Valley Zone 2 to be provided through expansion of existing Horseshoe Highlands Water Storage Facility where impacts will be limited.	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. Potential impacts associated with site selected for wells and storage facilities can be mitigated through site selection. Additional storage in Horseshoe Valley Zone 2 to be provided through expansion of existing Horseshoe Highlands Water Storage Facility where impacts will be limited.	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. Potential impacts associated with site selected for wells and storage facilities can be mitigated through site selection. Additional storage in Horseshoe Valley Zone 2 to be provided through expansion of existing Horseshoe Highlands Water Storage Facility where	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. By interconnecting the two zones and combining the storage in an elevated facility for Horseshoe Valley, the potential construction impacts will be minimized by reducing overall infrastructure development footprint.	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. Providing new in-ground storage for Craighurst as well as new in-ground storage for the interconnected Horseshoe Valley zones results in a larger infrastructure footprint than alternatives W4A and W4C.	All alternatives pose similar potential impact on terrestrial features, with potential to mitigate impacts via detailed site selection. By interconnecting the two zones and combining the storage in an elevated facility for Horseshoe Valley, the potential construction impacts will be minimized by reducing overall infrastructure development footprint.

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
			impacts will be limited.			
Potential effects on Designated Natural Areas	All alternatives pose similar potential impact on natural areas, however none are located within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment.	All alternatives pose similar potential impact on natural areas, however none are located within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment.	All alternatives pose similar potential impact on natural areas, however none are located within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment.	All alternatives pose similar potential impact on natural areas, however none are located within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment. By interconnecting the two zones and combining the storage in an elevated facility for Horseshoe Valley, the potential construction impacts will be minimized by reducing overall infrastructure	All alternatives pose similar potential impact on natural areas, however none are located within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment. Providing new in-ground storage for Craighurst as well as new in-ground storage for the interconnected Horseshoe Valley zones results in a larger infrastructure footprint than	All alternatives pose similar potential impact on natural areas, however none are proposed within a significant ANSI. Detailed site selection will mitigate impacts on local natural environment. By interconnecting the two zones and combining the storage in an elevated facility for Horseshoe Valley, the potential construction impacts will be minimized by reducing overall infrastructure



**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
				development footprint.	alternatives W4A and W4C.	development footprint.
Potential effects on water resources and hydrogeology	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.	Alternatives are equal in impact on water resources / hydrogeology. Detailed site locations will require site-specific considerations to mitigate impacts to water resources / hydrogeology.
Potential impacts to Species at Risk	All alternatives pose similar potential impact on SAR. Detailed site selection will mitigate impacts on potential SAR.	All alternatives pose similar potential impact on SAR. Detailed site selection will mitigate impacts on potential SAR.	All alternatives pose similar potential impact on SAR. Detailed site selection will mitigate impacts on potential SAR.	Interconnection of the pressure zones will reduce the number of required storage facilities, which minimizes the potential impacts on potential SAR identified in the study area.	Interconnection of the pressure zones will reduce the number of required storage facilities, which minimizes the potential impacts on potential SAR identified in the study area.	Interconnection of the pressure zones will reduce the number of required storage facilities, which minimizes the potential impacts on potential SAR identified in the study area.

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
					Providing new in-ground storage for Craighurst as well as new in-ground storage for the interconnected Horseshoe Valley zones results in a larger infrastructure footprint than alternatives W4A and W4C, which does not minimize the potential impacts to SAR.	
Potential effects on air quality	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.	Alternatives pose equally minimal air quality effects; any potential effects are largely based on transport during construction or use of operations vehicles.

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
<b>Natural Environment Summary</b>	Less Preferred	Less Preferred	Less Preferred	Most Preferred	Less Preferred	Most Preferred
<b>Social/Cultural Environment</b>						
Potential effects on heritage resources	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any expanded water	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any	No specific cultural heritage resources were identified in the Horseshoe Valley settlement area, or at the site of the proposed additional water supply for Craighurst. Three cultural heritage features, including Penetanguishene Road and two sites abutting it on the east side, will need to be considered during detailed design of any expanded water distribution system.



**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
	water distribution system.	expanded water distribution system.	expanded water distribution system.	expanded water distribution system.	expanded water distribution system.	
Potential effects on residents and businesses	Adding existing or new capacity for three elevated storage tanks will have the most effect related to visual obstruction or appeal and shadow effects.	Additional elevated storage in Horseshoe Valley Zone 2 will increase effects related to visual obstruction or appeal and shadow effects.	Additional elevated storage in Horseshoe Valley Zone 1 and Zone 2 will increase effects related to visual obstruction or appeal and shadow effects.	Additional elevated storage in Craighurst and Horseshoe Valley interconnected zone will increase effects related to visual obstruction or appeal and shadow effects.	Providing all additional water storage in in-ground tanks results in the least visual impact.	Additional elevated storage in the Horseshoe Valley interconnected zone will increase effects related to visual obstruction or appeal and shadow effects.
Compatibility with proposed land uses	Alternatives are equally compatible with proposed land uses at identified sites.	Alternatives are equally compatible with proposed land uses at identified sites.	Alternatives are equally compatible with proposed land uses at identified sites.	Alternatives are equally compatible with proposed land uses at identified sites.	Alternatives are equally compatible with proposed land uses at identified sites.	Alternatives are equally compatible with proposed land uses at identified sites.
Potential impacts to property	Elevated storage footprint is smaller than in-ground storage.	In-ground storage uses a greater footprint of the identified properties than elevated storage.	In-ground storage at Craighurst uses a greater footprint than elevated storage.	Elevated storage footprint is smaller than for in-ground storage.	In-ground storage uses a greater footprint of the identified properties than elevated storage.	In-ground storage at Craighurst uses a greater than elevated storage.

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
Potential traffic impacts	Construction for additional storage required at three sites rather than two, increasing potential traffic impacts.	Construction for additional storage required at three sites rather than two, increasing potential traffic impacts.	Construction for additional storage required at three sites rather than two, increasing potential traffic impacts.	Construction for additional storage required at only two sites rather than three, reducing potential traffic disruptions.	Construction for additional storage required at only two sites rather than three, reducing potential traffic disruptions.	Construction for additional storage required at only two sites rather than three, reducing potential traffic disruptions.
Potential nuisance impacts	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at three sites. Impacts can be mitigated.	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at three sites. Impacts can be mitigated.	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at three sites. Impacts can be mitigated.	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at two sites. Impacts can be mitigated.	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at two sites. Impacts can be mitigated.	Nuisance impacts during construction will include traffic, noise and dust. Construction to occur at two sites. Impacts can be mitigated.
Social / Cultural Environment Summary	<b>Least Preferred</b>	<b>Less Preferred</b>	<b>Least Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>
<b>Technical Considerations</b>						
Potential impacts from soil /	Location of well head protection areas in Craighurst and Horseshoe Valley will	Location of well head protection areas in Craighurst and Horseshoe Valley will	Location of well head protection areas in Craighurst and Horseshoe Valley will	Location of well head protection areas in Craighurst and Horseshoe Valley will	Location of well head protection areas in Craighurst and Horseshoe Valley will	Location of well head protection areas in Craighurst and Horseshoe Valley will

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
groundwater conditions	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.	need to be considered in detailed design and siting of new elevated storage facilities. Construction activities will occur within a significant groundwater recharge area. Construction will require a permit to take water if more than 50,000L/d of construction dewatering is required.
Ease of construction	All facilities are constructable. Careful construction sequencing will be necessary avoid impacts on existing water systems.	All facilities are constructable. Careful construction sequencing will be necessary avoid impacts on existing water systems.	All facilities are constructable. Careful construction sequencing will be necessary avoid impacts on existing water systems.	Construction of additional storage at Horseshoe Highlands will be constructable as facility has been designed to be expanded.	Construction of additional storage at Horseshoe Highlands will be constructable as facility has been designed to be expanded.	Construction of additional storage at Horseshoe Highlands will be constructable as facility has been designed to be expanded.



**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
Technical Considerations Summary	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>	<b>Most Preferred</b>
<b>Economic Considerations</b>						
Estimated capital costs	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.3M for new elevated storage tanks, disinfection system upgrades, and contact pipe upgrades for Horseshoe Valley.	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.6 M for new in ground storage, disinfection system upgrades, planned elevated storage and contact pipe upgrades for Horseshoe Valley.	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.5 M for new elevated storage tanks, disinfection system upgrades, and contact pipe upgrades for Horseshoe Valley.	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.0 M for new elevated storage tanks, disinfection system upgrades, and contact pipe upgrades for Horseshoe Valley.	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.6 M for new elevated storage tanks, disinfection system upgrades, and contact pipe upgrades for Horseshoe Valley.	Cost of proposed works for Craighurst expected to be same for all alternatives. Estimated project cost of \$9.2 M for new elevated storage tanks, disinfection system upgrades, and contact pipe upgrades for Horseshoe Valley.
Estimated operating costs	Elevated storage facilities will have lower maintenance costs than in-ground storage facilities due to additional maintenance	Elevated storage facilities will have lower maintenance costs than in-ground storage facilities due to additional maintenance	Elevated storage facility will have lower maintenance costs than in-ground storage facility due to additional maintenance	Elevated storage facilities will have lower maintenance costs than in-ground storage facilities due to additional maintenance	Elevated storage facilities will have lower maintenance costs than in-ground storage facilities due to additional maintenance	Elevated storage facility will have lower maintenance costs than in-ground storage facility due to additional maintenance

**Table 7.6 Detailed Evaluation of Water Servicing Alternatives**

Evaluation Criteria	W3A Additional water supply and elevated storage in Craighurst, additional elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3B Additional water supply and in-ground storage in Craighurst, additional in-ground storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W3C Additional water supply and in-ground storage in Craighurst, additional in-elevated storage in Horseshoe Valley Zone 1 and additional elevated storage in Horseshoe Valley Zone 2	W4A Additional water supply and elevated storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley	W4B Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional in-ground storage in Horseshoe Valley	W4C Additional water supply and in-ground storage in Craighurst, interconnection of Zones 1 and 2, disinfection improvements and additional elevated storage in Horseshoe Valley
	required for pumping station infrastructure. This alternative proposes only additional elevated storage, thus minimizing maintenance and operating costs.	required for pumping station infrastructure. In-ground storage facilities will have higher operating (energy) costs than elevated storage facilities. This alternative proposes only in-ground storage, therefore maintenance and operation costs are expected to be higher.	required for pumping station infrastructure. Elevated storage facility will have lower operating (energy) costs than in-ground storage facility and pumping station.	required for pumping station infrastructure. This alternative proposes only additional elevated storage, thus minimizing maintenance and operating costs.	required for pumping station infrastructure. In-ground storage facilities will have higher operating (energy) costs than elevated storage facilities. This alternative proposes only in-ground storage, therefore maintenance and operation costs are expected to be higher.	required for pumping station infrastructure. Elevated storage facility will have lower operating (energy) costs than in-ground storage facility and pumping station.
Economic Considerations Summary	<b>Least Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>
Overall Evaluation Summary	<b>Less Preferred</b>	<b>Least Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>

The evaluation of water servicing alternatives examined impacts to the natural, social, technical and economic environments. On the basis of the evaluation, Alternative W4C has been identified as the most preferred water servicing alternative. The rationale for the selection of Alternative W4C as the preferred water servicing alternative is as follows:

- Alternative W4C has the least potential impacts on the natural environmental. This alternative involves expansion of the existing Horseshoe Highlands Water Storage Facility on an existing site;
- Alternative W4C has fewer potential impacts on the social / cultural environment. Similar to environmental impacts, the construction of additional elevated storage at the existing facility will minimize new social / cultural impacts;
- Technical considerations identified the need for additional studies and work to implement Alternative W4C. These include a Schedule C Class EA for a new well supply in Craighurst; and,
- The cost of Alternative W4C is reasonable relative to the other alternatives evaluated.

### **7.4.3 Evaluation of Wastewater Servicing Alternatives**

**Table 7.7** presents the detailed evaluation of wastewater servicing alternative using the evaluation methodology identified in **Section 7.4.1**.



**Table 7.7 Detailed Evaluation of Wastewater Servicing Alternatives**

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
Potential effects on terrestrial features	<p>Forcemain/outfall sewer from new Horseshoe Valley WWTP to outfall will be located within road right of way (ROW). The ROW passes through woodlands and several unevaluated wetlands.</p> <p>Forcemain/sewer route from Craighurst to Horseshoe Valley will be located within Horseshoe Valley Road West ROW. The ROW passes through the edge of two unevaluated wetlands on the south side of the road and four small woodlots.</p> <p>Horseshoe Valley Road ROW has no significant wildlife habitat present.</p> <p>New Horseshoe Valley WWTP will be sited to minimize impacts on terrestrial features and will be subject to separate Schedule 'C' Class EA.</p> <p>New pumping stations will be sited to minimize impacts on terrestrial features.</p>	<p>Forcemain/ outfall sewer route from new Horseshoe Valley WWTP to outfall will be located within road ROW. The road ROW passes through woodlands and several unevaluated wetlands.</p> <p>Forcemain/sewer route from Craighurst to Horseshoe Valley will be located within Horseshoe Valley Road West ROW. The road ROW passes through the edge of two unevaluated wetlands on the south side of the road and four small woodlots.</p> <p>Horseshoe Valley Road ROW has no significant wildlife habitat present.</p> <p>New Horseshoe Valley WWTP will be sited to minimize impacts on terrestrial features. Location and sizing will be the subject of a separate Schedule 'C' Class EA.</p>	<p>Forcemain/outfall sewer route from new Horseshoe Valley WWTP to outfall will be located within road ROW. The road ROW passes through woodlands and several unevaluated wetlands.</p> <p>Horseshoe Valley Road ROW has no significant wildlife habitat present.</p> <p>New pumping stations will be sited to minimize impacts on terrestrial features. Fewer pumping stations will be required than Alternatives WW2A and WW2B. Smaller number of pumping stations will reduce the potential for terrestrial features impacts.</p> <p>Two new wastewater treatment plants, one in Horseshoe Valley and one in Craighurst will be sited to minimize impacts on terrestrial features and will be subject to a separate Schedule 'C' Class EAs.</p>	<p>Forcemain/outfall sewer route from new Horseshoe Valley WWTP to outfall will be located within road ROW. The road ROW passes through woodlands and several unevaluated wetlands.</p> <p>Horseshoe Valley Road ROW has no significant wildlife habitat present.</p> <p>New pumping stations will be sited to minimize impacts on terrestrial features. Fewer pumping stations will be required than Alternative WW2A and WW2B. Smaller number of pumping stations will reduce the potential for terrestrial features impacts.</p> <p>Two new wastewater treatment plants in Horseshoe Valley and Craighurst will be sited to minimize impacts on terrestrial features. Both of these facilities will be subject to separate Schedule 'C' Class EAs.</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
		<p>New pumping stations will be sited to minimize impacts on terrestrial features.</p> <p>Expansion of Skyline WWTP will be the subject of a separate Schedule 'C' Class EA which will consider potential impacts of expansion on terrestrial features. Expansion of the Skyline WWTP is expected to occur on the existing site.</p>		<p>Expansion of Skyline WWTP will be the subject of a separate Schedule 'C' Class EA which will consider potential impacts of expansion on terrestrial features. Expansion of the Skyline WWTP is expected to occur on the existing site.</p>
Potential effects on Designated Natural Areas	<p>Forcemain/sewer from Craighurst to Horseshoe Valley WWTP will be located within ROW. The ROW passes through the Oro Moraine core area, a small portion of the Moraine potential re-vegetation and enhancement area and two unevaluated wetlands.</p> <p>Forcemain/ outfall sewer from new Horseshoe Valley WWTP to the outfall will be located in ROW. This ROW passes through Oro Moraine core area, corridor area, and potential re-vegetation or enhancement areas,</p>	<p>Forcemain/sewer route from Craighurst to Horseshoe Valley WWTP will be located within ROW. The ROW passes through the Oro Moraine core area, a small portion of the Moraine potential re-vegetation and enhancement area and two unevaluated wetlands.</p> <p>Forcemain/ outfall sewer route from new Horseshoe Valley WWTP to the outfall will be located in ROW. This ROW passes through Oro Moraine core area, corridor area, and potential re-vegetation or</p>	<p>Forcemain / outfall sewer route from new Horseshoe Valley WWTP to the outfall will be located in ROW. This road ROW passes through Oro Moraine core area, corridor area, and potential re-vegetation or enhancement areas, significant woodlands and Provincially Significant Wetland.</p> <p>Siting of pumping stations, Craighurst WWTP and Horseshoe Valley WWTP will consider Oro Moraine core area, corridor area, vegetation</p>	<p>Forcemain / outfall sewer route from new Horseshoe Valley WWTP to the outfall will be located in ROW. This ROW passes through Oro Moraine core area, corridor area, and potential re-vegetation or enhancement areas, significant woodlands and Provincially Significant Wetland.</p> <p>Siting of pumping stations, Craighurst WWTP and Horseshoe Valley WWTP will consider Oro Moraine core area, corridor area, vegetation and enhancement areas,</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<p>significant woodlands and Provincially Significant Wetland. Siting of pumping stations and new Horseshoe Valley WWTP will consider Oro Moraine core area, corridor area, vegetation and enhancement areas, significant woodlands and Provincially Significant Wetland (Copeland Craighurst Guthrie Wetland Complex) to minimize any impacts.</p>	<p>enhancement areas, significant woodlands and Provincially Significant Wetland. Siting of pumping stations and new Horseshoe Valley WWTP will consider Oro Moraine core area, corridor area, vegetation and enhancement areas, significant woodlands and Provincially Significant Wetland (Copeland Craighurst Guthrie Wetland Complex) to minimize any impacts. Existing Skyline WWTP is located near Copeland Forest. Siting of expanded facilities will consider Copeland Forest to minimize any impacts.</p>	<p>and enhancement areas, significant woodlands and Provincially Significant Wetland to minimize any impacts. New Horseshoe Valley WWTP will be sited to avoid impacts on the Copeland Craighurst Guthrie Wetland Complex.</p>	<p>significant woodlands and Provincially Significant Wetland to minimize any impacts. Existing Skyline WWTP is located near Copeland Forest. Siting of expanded facilities will consider Copeland Forest to minimize any impacts. New Horseshoe Valley WWTP will be sited to avoid impacts on the Copeland Craighurst Guthrie Wetland Complex.</p>
Potential effects on water resources and hydrogeology	<p>New forcemain/sewer on Horseshoe Valley Road West from Craighurst to Horseshoe Valley will require crossings of 6 intermittent watercourses. Five of these watercourses provide warm water fisheries habitat. One watercourse, near the Craighurst Service Area, provides cold water fisheries habitat.</p>	<p>Construction of forcemain/sewer on Horseshoe Valley Road West from Craighurst to Horseshoe Valley will require crossings of 6 intermittent watercourses. Five of these watercourses provide warm water fisheries habitat. One watercourse, near the Craighurst Service Area,</p>	<p>Construction of forcemain/outfall sewer on Horseshoe Valley Road West from new Horseshoe Valley Road WWTP to outfall will require crossings of has 5 watercourses. These watercourses are characterized as having warm water fisheries habitat. Impacts could be</p>	<p>Construction of forcemain/outfall sewer on Horseshoe Valley Road West from new Horseshoe Valley Road WWTP to outfall will require crossings of has 5 watercourses. These watercourses are characterized as having warm water fisheries habitat. Impacts could be mitigated through the use of</p>





Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<p>Impacts could be mitigated through the use of trenchless construction techniques.</p> <p>Construction of forcemain/outfall sewer from new Horseshoe Valley Road WWTP to outfall will require crossings of 5 watercourses. These watercourses are characterized as having warm water fisheries habitat. Impacts could be mitigated through the use of trenchless construction techniques.</p> <p>New plant effluent limits for the new Horseshoe Valley WWTP will be set to maintain Policy 1 designation of Coldwater Creek. Design of outfall will need to consider potential thermal impacts of effluent discharge on Coldwater Creek.</p> <p>Alternative will not impact existing groundwater aquifers and water supply as new Horseshoe Valley WWTP will not be a subsurface discharge facility.</p>	<p>provides cold water fisheries habitat. Impacts could be mitigated through the use of trenchless construction techniques.</p> <p>Construction of forcemain/outfall sewer from new Horseshoe Valley Road WWTP to outfall will require crossings of has 5 watercourses. These watercourses are characterized as having warm water fisheries habitat. Impacts could be mitigated through the use of trenchless construction techniques.</p> <p>Examination of subsurface discharge reasonable use for expansion of Skyline WWTP will be needed. Effluent attenuation zone will consider Wellhead Protection Zones A, B, C and D in Horseshoe Valley.</p> <p>New plant effluent limits for the new Horseshoe Valley WWTP will be set to maintain Policy 1 designation of Coldwater Creek. Design of</p>	<p>mitigated through the use of trenchless construction techniques.</p> <p>New plant effluent limits for the new Horseshoe Valley WWTP will be set to maintain Policy 1 designation of Coldwater Creek. Design of outfall will need to consider potential thermal impacts of effluent discharge on Coldwater Creek.</p> <p>New Craighurst WWTP will be a subsurface discharge. Tile beds, located in the Craighurst Service Area will be required for effluent disposal. Siting of the Craighurst WWTP and attenuation zone will need to consider wellhead protection area zones A, B, C and D in Craighurst.</p>	<p>trenchless construction techniques.</p> <p>New plant effluent limits for the new Horseshoe Valley WWTP will be set to maintain Policy 1 designation of Coldwater Creek. Design of outfall will need to consider potential thermal impacts of effluent discharge on Coldwater Creek.</p> <p>New Craighurst WWTP will be a subsurface discharge. Tile beds, located in the Craighurst Service Area will be required for effluent disposal. Siting of the Craighurst WWTP and attenuation zone will consider wellhead protection area zones A and B in Craighurst.</p> <p>Examination of subsurface discharge reasonable use for expansion of Skyline WWTP will be needed. Effluent attenuation zone will consider Wellhead Protection Zones A, B, C and D in Horseshoe Valley.</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
		outfall will need to consider potential thermal impacts of effluent discharge on Coldwater Creek.		
Potential impacts to Species at Risk	<p>No record of threatened or endangered fish species present in the study area watercourses. There is no record of Species at Risk on Horseshoe Valley Road West from Craighurst to Horseshoe Valley or from Horseshoe Valley to the outfall. However, species that have the potential to occur include Butternut (endangered), Blanding’s Turtle (threatened), Eastern Ribbonsnake (special concern), Milksnake (special concern) and Snapping Turtle (special concern). New Horseshoe Valley WWTP and new pumping stations will be sited to minimize impacts to Species at Risk or Species at Risk habitat.</p>	<p>No record of threatened or endangered fish species present in the study area watercourses. There is no record of Species at Risk on Horseshoe Valley Road West from Craighurst to Horseshoe Valley or from Horseshoe Valley to the outfall. However, species that have the potential to occur include Butternut (endangered), Blanding’s Turtle (threatened), Eastern Ribbonsnake (special concern), Milksnake (special concern) and Snapping Turtle (special concern). New Horseshoe Valley WWTP and new pumping stations will be sited to minimize impacts to Species at Risk or Species at Risk habitat.</p>	<p>No record of threatened or endangered fish species present in the study area watercourses. There is no record of Species at Risk on Horseshoe Valley Road West from Horseshoe Valley to the outfall. However, species that have the potential to occur include Butternut (endangered), Blanding’s Turtle (threatened), Eastern Ribbonsnake (special concern), Milksnake (special concern) and Snapping Turtle (special concern). New Horseshoe Valley WWTP and new pumping stations will be sited to minimize impacts to Species at Risk or Species at Risk habitat. No record of Species at Risk in Craighurst Service Area. New Craighurst WWTP will be sited</p>	<p>No record of threatened or endangered fish species present in the study area watercourses. There is no record of Species at Risk on Horseshoe Valley Road West from Horseshoe Valley to the outfall. However, species that have the potential to occur include Butternut (endangered), Blanding’s Turtle (threatened), Eastern Ribbonsnake (special concern), Milksnake (special concern) and Snapping Turtle (special concern). New Horseshoe Valley WWTP and new pumping stations will be sited to minimize impacts to Species at Risk or Species at Risk habitat. No record of Species at Risk in Craighurst Service Area. New Craighurst WWTP will be sited</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
			to minimize impacts to Species at Risk or Species at Risk habitat.	to minimize impacts to Species at Risk or Species at Risk habitat.
Natural Environment Summary	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>	<b>Less Preferred</b>
Potential effects on heritage resources	<p>Penetanguishene Road is designated under the Ontario Heritage Act as a feature of cultural heritage value. Knox Presbyterian Church and St. Johns Anglican Church and Cemetery, located in Craighurst, have been identified as cultural heritage landscapes. Forcemain/sewer from Craighurst to Horseshoe Valley WWTP will have no impact on these features.</p> <p>Cultural/ heritage assessment identified that there may be other heritage resources in Craighurst. A field review will need to be completed to confirm and recommend mitigation measures.</p>	<p>Penetanguishene Road is designated under the Ontario Heritage Act as a feature of cultural heritage value. Knox Presbyterian Church and St. Johns Anglican Church and Cemetery, located in Craighurst, have been identified as cultural heritage landscapes. Forcemain/sewer from Craighurst to Horseshoe Valley WWTP will have no impact on these features.</p> <p>Cultural/ heritage assessment identified that there may be other heritage resources in Craighurst. A field review will need to be completed to confirm and recommend mitigation measures.</p>	<p>Penetanguishene Road is designated under the Ontario Heritage Act as a feature of cultural heritage value. Knox Presbyterian Church and St. Johns Anglican Church and Cemetery, located in Craighurst, have been identified as cultural heritage landscapes. Siting of new Craighurst WWTP and effluent disposal tile beds will consider location of cultural heritage resources to minimize impacts.</p> <p>Cultural/ heritage assessment identified that there may be other heritage resources in Craighurst. A field review will need to be completed to confirm and recommend mitigation measures.</p>	<p>Penetanguishene Road is designated under the Ontario Heritage Act as a feature of cultural heritage value. Knox Presbyterian Church and St. Johns Anglican Church and Cemetery, located in Craighurst, have been identified as cultural heritage landscapes. Siting of new Craighurst WWTP and effluent disposal tile beds will consider location of cultural heritage resources to minimize impacts.</p> <p>Cultural/ heritage assessment identified that there may be other heritage resources in Craighurst. A field review will need to be completed to confirm and recommend mitigation measures</p> <p>Forcemain/ outfall sewer from</p>



Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<p>Forcemain/ outfall sewer from new Horseshoe Valley WWTP to outfall will be located within Horseshoe Valley Road West ROW. Minimal potential for impacts as all infrastructure will be constructed within previously disturbed ROW.</p>	<p>Forcemain/ outfall sewer from new Horseshoe Valley WWTP to outfall will be located within Horseshoe Valley Road West ROW. Minimal potential for impacts as all infrastructure will be constructed within previously disturbed ROW. Minimal potential for impacts with expansion of Skyline WWTP as site has been previously disturbed.</p>	<p>Forcemain/ outfall sewer from New Horseshoe Valley WWTP to outfall will be located within Horseshoe Valley Road West ROW. Minimal potential for impacts as all infrastructure will be constructed within previously disturbed ROW.</p>	<p>New Horseshoe Valley WWTP to outfall will be located within Horseshoe Valley Road West ROW. Minimal potential for impacts as all infrastructure will be constructed within previously disturbed ROW. Minimal potential for impacts with expansion of Skyline WWTP as site has been previously disturbed.</p>
<p>Potential effects on residents and businesses</p>	<p>Moderate potential impacts to goods movement, emergency services and community/ recreation facilities during construction of forcemain/ sewer along Horseshoe Valley Rd W from Craighurst to Horseshoe Valley and from new Horseshoe Valley WWTP to outfall. Construction sites to include new Horseshoe Valley WWTP, pumping stations, forcemain/ sewer along Horseshoe Valley Road from Craighurst to new outfall, and new outfall to Coldwater Creek. Significant</p>	<p>Moderate potential impacts to goods movement, emergency services and community/ recreation facilities during construction of forcemain/ sewer along Horseshoe Valley Rd W from Craighurst to Horseshoe Valley and from new Horseshoe Valley WWTP to outfall. Construction sites to include new Horseshoe Valley WWTP, pumping stations, forcemain/ sewer along Horseshoe Valley Road from Craighurst to new outfall, and new outfall to</p>	<p>Moderate potential impacts to goods movement, emergency services and community/ recreation facilities during construction of forcemain/ sewer along Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall. Construction sites to include new Horseshoe Valley WWTP, new Craighurst WWTP, pumping stations, forcemain/ sewer along Horseshoe Valley Road from new Horseshoe Valley WWTP to new outfall,</p>	<p>Moderate potential impacts to goods movement, emergency services and community/ recreation facilities during construction of forcemain/ sewer along Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall. Construction sites to include new Horseshoe Valley WWTP, new Craighurst WWTP, pumping stations, forcemain/ sewer along Horseshoe Valley Road from new Horseshoe Valley WWTP to new outfall,</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<p>construction along Horseshoe Valley Road will impact local residents and businesses. Temporary construction related impacts (traffic, noise, odour, visual distraction, etc.) are anticipated and can be mitigated through good construction planning.</p>	<p>Coldwater Creek. Significant construction along Horseshoe Valley Road will impact local residents and businesses. Temporary construction related impacts (traffic, noise, odour, visual distraction, etc.) are anticipated and will be mitigated through good construction techniques. Temporary construction related impacts from expansion of Skyline WWTP (traffic, noise, odour, visual distraction, etc.), are anticipated and can be mitigated through good construction planning.</p>	<p>and new outfall to Coldwater Creek. Temporary construction related impacts (traffic, noise, odour, visual distraction, etc.) are anticipated and will be mitigated through good construction techniques.</p>	<p>and new outfall to Coldwater Creek. Temporary construction related impacts (traffic, noise, odour, visual distraction, etc.) are anticipated and will be mitigated through good construction techniques. Temporary construction related impacts from expansion of Skyline WWTP (traffic, noise, odour, visual distraction, etc.), are anticipated and can be mitigated through good construction planning.</p>
Compatibility with proposed land uses	<p>Sites will be required for multiple pumping stations and new Horseshoe Valley WWTP. Site selection criteria will be developed to mitigate impacts on proposed land uses. New pumping stations will likely be located within or adjacent to existing road ROWs.</p>	<p>Sites will be required for multiple pumping stations and new Horseshoe Valley WWTP. Site selection criteria will be developed to mitigate impacts on proposed land uses. New pumping stations will likely be located within or adjacent to existing road ROWs.</p>	<p>Sites will be required for fewer pumping stations than Alternatives WW2A and WW2B. Sites also required for new Horseshoe Valley WWTP and new Craighurst WWTP. Site selection criteria will be developed to mitigate impacts on proposed land uses. New pumping stations will be</p>	<p>Sites will be required for fewer pumping stations than Alternatives WW2A and WW2B. Sites also required for new Horseshoe Valley WWTP and new Craighurst WWTP. Site selection criteria will be developed to mitigate impacts on proposed land uses. New pumping stations will likely be</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	New forcemain/ sewer along Horseshoe Valley Road to be located within existing road ROW.	New forcemain/ sewer along Horseshoe Valley Road to be located within existing road ROW. Expansion of Skyline WWTP will enable some planned growth to proceed prior to construction of new Horseshoe Valley WWTP.	located within or adjacent to existing road ROWs. New forcemain/sewer along Horseshoe Valley Road to be located within existing road ROW.	located within or adjacent to existing road ROWs. New forcemain/sewer along Horseshoe Valley Road to be located within existing road ROW. Expansion of Skyline WWTP will be completed on existing site. Expansion of Skyline WWTP will enable some planned growth to proceed prior to construction of new Horseshoe Valley WWTP.
Potential impacts to property	Land will be required for construction of new Horseshoe Valley WWTP. New pumping stations will be located on municipally owned property.	Land will be required for construction of new Horseshoe Valley WWTP. New pumping stations will be located on municipally owned property. No additional lands will be required for expansion of Skyline WWTP.	Land required for new Craighurst WWTP and new Horseshoe Valley WWTP. Craighurst WWTP will require sufficient land to accommodate effluent discharge ponds for subsurface discharge. New pumping stations will be located on municipally owned property.	Land required for new Craighurst WWTP and new Horseshoe Valley WWTP. Craighurst WWTP will require sufficient land to accommodate effluent discharge ponds for subsurface discharge. New pumping stations will be located on municipally owned property. No additional lands will be required for expansion of Skyline WWTP.



Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
Potential traffic impacts	<p>Highest level of traffic impacts associated with construction of forcemain/sewer along Horseshoe Valley Road West (from Craighurst to new Horseshoe Valley WWTP) and on roads from Horseshoe Valley to outfall.</p> <p>Construction impacts associated with new Horseshoe Valley WWTP and new pumping stations can be mitigated through implementation of construction traffic management best practices.</p>	<p>Highest level of traffic impacts associated with construction of forcemain/sewer along Horseshoe Valley Road West (from Craighurst to new Horseshoe Valley WWTP) and on roads from Horseshoe Valley to outfall.</p> <p>Construction impacts associated with new Horseshoe Valley WWTP, new pumping stations, and expansion of Skyline WWTP can be mitigated through implementation of construction traffic management best practices.</p>	<p>Moderate level of traffic impacts associated with construction of forcemain/sewer along Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall.</p> <p>Construction traffic impacts associated with new Horseshoe Valley WWTP and pumping stations can be mitigated through implementation of construction traffic management best practices.</p> <p>Construction traffic impacts associated with new Craighurst WWTP. Construction impacts can be mitigated through implementation of construction traffic management best practices.</p>	<p>Moderate level of traffic impacts associated with construction of forcemain/sewer along Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall.</p> <p>Construction traffic impacts associated with new Horseshoe Valley WWTP and new pumping stations can be mitigated through implementation of construction traffic management best practices.</p> <p>Construction traffic impacts associated with new Craighurst WWTP. Construction impacts can be mitigated through implementation of construction traffic management best practices.</p>
Potential nuisance impacts	<p>Potential for air quality, noise and odour impacts during construction of new Horseshoe Valley WWTP and forcemain/sewer from Craighurst to new Horseshoe Valley WWTP and</p>	<p>Potential for air quality, noise and odour impacts during construction of new Horseshoe Valley WWTP and forcemain/sewer from Craighurst to new Horseshoe Valley WWTP and</p>	<p>Moderate potential for air quality and noise impacts during construction of new Horseshoe Valley WWTP and Craighurst WWTP, and forcemain/sewer from</p>	<p>Moderate potential for air quality and noise impacts during construction of 2 new plants, expansion of existing Skyline WWTP and forcemain/sewer from</p>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<p>forcemain / sewer from new Horseshoe Valley WWTP to outfall.</p> <p>Long term odour impacts from new Horseshoe Valley WWTP and pumping stations can be mitigated through odour control systems.</p> <p>Higher potential for dust impacts due to forcemain/sewer construction along Horseshoe Valley Road. Length of sewer/forcemain constructed will be longer than in Alternatives WW6A and WW6B.</p>	<p>forcemain / sewer from new Horseshoe Valley WWTP to outfall.</p> <p>Long term odour impacts from new Horseshoe Valley WWTP and pumping stations can be mitigated through odour control systems.</p> <p>Long term odour impacts from expanded Skyline WWTP can be mitigated through consideration of odour control systems.</p> <p>Higher potential for dust impacts due to forcemain/sewer construction along Horseshoe Valley Road. Length of sewer/forcemain constructed will be longer than in Alternatives WW6A and WW6B.</p>	<p>Horseshoe Valley WWTP to outfall.</p> <p>Long term odour impacts from new Horseshoe Valley WWTP and Craighurst WWTP and three pumping stations can be mitigated through odour control systems.</p> <p>Less potential for dust impacts due to forcemain/ sewer construction along Horseshoe Valley Road as length of sewer/forcemain constructed will be shorter than in Alternatives WW2A and WW2B.</p>	<p>Horseshoe Valley WWTP to outfall.</p> <p>Long term odour impacts from two new treatment plants and pumping stations can be mitigated through odour control systems.</p> <p>Long term odour impacts from expanded Skyline WWTP can be mitigated through consideration of odour control systems.</p> <p>Less potential for dust impacts due to forcemain/ sewer construction along Horseshoe Valley Road as length of sewer/forcemain constructed will be shorter than in Alternatives WW2A and WW2B.</p>
<b>Social / Cultural Environment Summary</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Most Preferred</b>

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
Potential impacts from soil / groundwater conditions	Horseshoe Valley Road West from Craighurst to new Horseshoe Valley WWTP and new Horseshoe Valley WWTP to outfall is located in a significant groundwater recharge area where new forcemain/ sewer and new pumping stations will be required. Construction will require permit to take water, if more than 50,000L/d of construction dewatering is required.	Horseshoe Valley Road West from Craighurst to new Horseshoe Valley WWTP and new Horseshoe Valley WWTP to outfall is located in a significant groundwater recharge area where new forcemain/sewer and new pumping stations will be required. Construction will require permit to take water, if more than 50,000L/d of construction dewatering is required.  Skyline WWTP expansion area is located within significant groundwater recharge area and may require permit to take water for construction period.	Sandy soil conditions in Craighurst will require testing of soil/ground conditions to support delineation of attenuation zones and to ensure reasonable use guidelines are met. Craighurst WWTP attenuation zone should not extend in the vicinity of Wellhead Protection Areas Zones A, B, C and D. Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall is located within a significant groundwater recharge area where new forcemain/sewer and new pumping stations will be required. Construction may require permit to take water, if more than 50,000L/d of construction dewatering is required.	Sandy soil conditions in Craighurst will require testing of soil/ground conditions to support delineation of attenuation zones and to ensure reasonable use guidelines are met. Craighurst WWTP attenuation zone should not extend in the vicinity of Wellhead Protection Areas Zones A, B, C and D. Horseshoe Valley Road West from new Horseshoe Valley WWTP to outfall is located within a significant groundwater recharge area where new forcemain/sewer and new pumping stations will be required. Construction may require permit to take water, if more than 50,000L/d of construction dewatering is required.  Skyline WWTP expansion area is located within significant groundwater recharge area and may require permit to take water for construction period.



Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
Ease of construction	<p>Forcemain/sewer from Craighurst to Horseshoe Valley and forcemain / outfall sewer from Horseshoe Valley to outfall will be difficult to construct due to significant elevation changes along 6 Line North and Horseshoe Valley Road. Forcemain/sewer to be constructed along municipal roads and requires a rail crossing. Continued operation of Skyline WWTP will allow for phasing of construction of new WWTP. Forcemain/sewer between Craighurst and Horseshoe Valley will be required to service any growth in Craighurst.</p>	<p>Forcemain/sewer from Craighurst to Horseshoe Valley and forcemain / outfall sewer from Horseshoe Valley to outfall will be difficult to construct due to significant elevation changes along 6 Line North and Horseshoe Valley Road. Forcemain/sewer to be constructed along municipal roads and requires a rail crossing. Expanded Skyline WWTP will provide additional flexibility for phasing of new Horseshoe Valley WWTP. Forcemain/sewer between Craighurst and Horseshoe Valley will be required to service any growth in Craighurst.</p>	<p>Forcemain / outfall sewer from Horseshoe Valley to outfall will be difficult to construct due to significant elevation changes along Horseshoe Valley Road and 6 Line North. Forcemain/sewer to be constructed along municipal roads and requires a rail crossing. Requires construction of new Craighurst WWTP. May be opportunities to phase construction of new plant depending on anticipated timing of growth. Continued operation of Skyline WWTP at current rated capacity will allow for phasing of construction of new Horseshoe Valley WWTP.</p>	<p>Forcemain / outfall sewer from Horseshoe Valley to outfall will be difficult to construct due to significant elevation changes along Horseshoe Valley Road and 6 Line North. Forcemain/sewer to be constructed along municipal roads and requires a rail crossing. Requires construction of new Craighurst WWTP. May be opportunities to phase construction of new plant depending on anticipated timing of growth. Expanded Skyline WWTP will provide additional flexibility for phasing of new Horseshoe Valley WWTP.</p>
<b>Technical Considerations Summary</b>	<b>Less Preferred</b>	<b>Less Preferred</b>	<b>Least Preferred</b>	<b>Most Preferred</b>
Estimated capital costs	Estimated capital cost of \$63M includes:	Estimated capital cost of \$67M includes:	Estimated capital cost of \$52M includes:	Estimated capital cost of \$60M includes:

Evaluation Criteria	Alternative WW2A One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with maintenance of the current rated capacity of the Skyline WWTP	Alternative WW2B One Plant (Surface Water Discharge) in Horseshoe Valley (Craighurst flows pumped to Horseshoe Valley) with expansion of the current rated capacity of the Skyline WWTP	Alternative WW6A One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and maintenance of the current rated capacity of the Skyline WWTP	Alternative WW6B One Plant (Subsurface Discharge) in Craighurst, a new plant (Surface Water Discharge) in Horseshoe Valley and expansion of the current rated capacity of the Skyline WWTP
	<ul style="list-style-type: none"> <li>• \$27M for construction of new forcemain/sewer and pumping stations;</li> <li>• \$18M for new Horseshoe Valley WWTP;</li> <li>• \$1.6M for upgrade of Skyline WWTP to current rated capacity; and</li> <li>• 35% for contingency and engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• \$27M for construction of new forcemain/sewer and pumping stations;</li> <li>• \$13M for new Horseshoe Valley WWTP;</li> <li>• \$9.6M to upgrade and expand Skyline WWTP to site capacity; and</li> <li>• 35% for contingency and engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• \$16M for construction of new forcemain/sewer and pumping stations;</li> <li>• \$8M for new Craighurst WWTP;</li> <li>• \$13M for new Horseshoe Valley WWTP;</li> <li>• \$1.6M for upgrade of Skyline WWTP to current rated capacity; and</li> <li>• 35% for contingency and engineering.</li> </ul>	<ul style="list-style-type: none"> <li>• \$16M for construction of new forcemain/sewer and pumping stations;</li> <li>• \$8M for new Craighurst WWTP;</li> <li>• \$11M for new Horseshoe Valley WWTP;</li> <li>• \$9.6M to upgrade and expand Skyline WWTP to site capacity; and</li> <li>• 35% for contingency and engineering.</li> </ul>
Estimated operating costs	Alternative will have lower annual O&M costs than Alternatives WW6A and WW6B as only one new treatment facility will be operated.	Alternative will have lower annual O&M costs than Alternatives WW6A and WW6B as only one new treatment facility will be operated.	Alternative will have higher annual O&M costs than Alternatives WW2A and WW2B due to need to operate two new wastewater treatment plants.	Alternative will have higher annual O&M costs than Alternatives WW2A and WW2B due to need to operate two new wastewater treatment plants.
<b>Economic Considerations Summary</b>	<b>Less Preferred</b>	<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Less Preferred</b>
<b>Overall Evaluation Summary</b>	<b>Less Preferred</b>	<b>Least Preferred</b>	<b>Most Preferred</b>	<b>Less Preferred</b>

The evaluation of wastewater servicing alternatives examined impacts to the natural, social, technical and economic environments. On the basis of the evaluation, Alternative WW6B has been identified as the most preferred wastewater servicing alternative with WW6A identified as the next preferred wastewater servicing alternative. The rationale for the selection of Alternative WW6B as the preferred wastewater servicing alternative is as follows:

- Alternative WW6B has fewer potential natural environmental impacts than Alternatives WW2A and WW2B as this alternative involves the construction of a smaller length of sewer and forcemain along Horseshoe Valley Road and 6 Line North;
- Alternative WW6B has the fewest potential impacts on the social / cultural environment as this alternative is reasonably compatible with existing and proposed land use, will involve less construction on Horseshoe Valley Road and as a result will have fewer nuisance and construction related impacts. In addition, Alternative WW6B will enable some development to proceed in Horseshoe Valley, making use of available capacity at the Skyline WWTP prior to the construction of the new Horseshoe Valley WWTP;
- From a technical perspective, this alternative is not preferred as it offers an opportunity to phase the construction of the Horseshoe Valley WWTP; and,
- Alternative WW6B is not the lowest cost alternative but does represent the highest annual operating and maintenance costs.





## 8 Preferred Servicing Alternatives and Strategies

Based on the results of the evaluation in Section 7, Alternative W4C and WW6B have been selected as the preferred water and wastewater servicing alternatives. In addition, the preferred servicing strategy also includes the recommendations for future works from the County Road 22 Class Environmental Assessment. The following sections present the recommended projects.

### 8.1 Preferred Alternatives

The preferred alternatives includes water, wastewater and transportation projects. **Table 8.1** presents information on each recommended project including estimated project costs, EA schedule and timing. For Schedule C projects, the project proponent is also provided.

**Table 8.1 Recommended Projects**

ID	Description	Estimated Capital Cost	Class EA Schedule	Implementation Trigger
W1	Craighurst Well improvements to provide an additional capacity of 15L/s (Township to be proponent)	\$0.7M	C	Will be required to support development
W2	Construction of new in-ground storage facility in the vicinity of the Craighurst well	\$2.7M	B	Will be required to support development
W3	Horseshoe Valley Interconnection works, Construct 30m of 1,000m watermain to provide chlorine contact chamber	\$0.3M	B	Can proceed immediately
W4	Expansion of storage at Horseshoe Highlands Storage Facility to extend tanks to a height of 18.6m and construct a third tank with a height of 18.6m.	\$5.5M	B	Current combined zone was excess storage capacity of 1,368 m <sup>3</sup> . With interconnection of Zones, current storage could support a population up to 6,000 persons.
WW1	Expansion of the Skyline WWTP up to the site capacity. (Skyline Investments to be proponents)	\$9.6M	C	Will be required to support development.
WW2	New Horseshoe Valley WWTP with a surface discharge to Coldwater Creek (Township to be proponent)	\$11M	C	Project will be required when excess capacity at expanded Skyline WWTP has been used.
WW3	New Craighurst WWTP with a sub-surface discharge (Township to be proponent)	\$8M	C	Project will be required to allow growth in Craighurst
WW4	New pumping stations, forcemain, outfall sewer and outfall from new Horseshoe WWTP to Coldwater Creek	\$16M	A+	Project will be required when excess capacity at Skyline WWTP has been used.

## 9 Mitigation Measures

Mitigation measures have been developed to mitigate potential impacts as the recommended projects are implemented. Mitigation measures are described in **Table 9.1**.

**Table 9.1 Mitigation Measures**

Effect	Mitigation Measure	Application
Streambank erosion from construction of new Horseshoe Valley WWTP outfall	Erosion control measures can be implemented in outfall structure design	Horseshoe Valley WWTP outfall to Coldwater Creek
Interference of shallow aquifers and springs during construction	Complete hydrogeological investigations in advance and consider options for avoidance during design	Excavations for sewers and forcemains, and new facilities
Reduce groundwater quantity through construction dewatering	Locate construction activities away from recharge areas and water bearing formations. Consider seasonal constraints on construction	Excavations for sewers and forcemains, and new facilities
Spills or leaks resulting in contamination of groundwater supply	Precautions during refueling activities during construction.	With high recharge areas and near watercourses
Drainage of wetland areas resulting in impacts to wetland areas and reduced groundwater contributions to surface waters	Restrict extent of impervious surfaces during construction	In the vicinity of existing wetlands where excavations are planned.
Interference with groundwater movement	Maintenance of groundwater regime through design	At excavations for new facilities and sewers/ forcemain
Contamination of existing wells through surface runoff during construction	Implementation of erosion and sediment controls during construction	Construction adjacent to well sites and aquifers.
Introduction of warm treated effluent into sensitive cold water fisheries creeks	Consider potential thermal impacts during design	Horseshoe Valley WWTP effluent discharge
Modification or removal of aquatic or terrestrial habitat	Restore all impacted areas to following construction. Consider seasonality in construction scheduling.	For all excavation and site work
Reduced water quality in area watercourses during construction	Make provisions for spill control, implement setbacks and minimize tree removal.	At excavations for new facilities and sewers / forcemain.

**Table 9.1 Mitigation Measures**

Effect	Mitigation Measure	Application
Impacts during spawning or breeding periods	Consider potential impacts for seasonal or construction staging	At excavations for new facilities and sewers / forcemain
Siltation in nearby watercourses	Implement erosion and sediment controls	At excavations for new facilities and sewer / forcemain
Removal or disturbance of trees and flora	Employ tree protection measures. Avoid areas of significant flora	At excavations for new facilities and sewer / forcemain
Deterioration of archaeological or cultural heritage resources	Avoid where possible. Take necessary steps to decrease harmful impacts from vibration or alteration of groundwater regime	At excavations for new facilities and sewer / forcemain



## 10 Consultation and Communications

A variety of consultation and communication tools were used with interested stakeholders, including the County of Simcoe, Nottawasaga Valley Conservation Authority (NVCA) and other external government review agencies, First Nations and Métis groups, and local residents and members of the general public. This was accomplished throughout the master planning process through letter and e-mail correspondence, individual meetings and a Public Open House. Other activities included posting of information of the Township of Oro-Medonte’s website, and Councillor presentations. This chapter documents these communication and consultation activities and the feedback received.

### 10.1 Public Communications and Consultation

Public communications and consultation efforts included publication and distribution of the Notice of Study Commencement, notice of and hosting one Public Open House, and correspondence with interested residents. The sub-sections below provide further details regarding these activities and summarize the issues that were raised and how they have been addressed. For further reference, a copy of all public communication materials and correspondence is included in **Appendix M**.

#### 10.1.1 Project Mailing List

A mailing list was compiled at the project onset and updated throughout the study. In addition to the review agencies and First Nations and Métis groups discussed in **Sections 10.2** and **10.3** below, the mailing list included local property and business owners, local environmental groups, special interest groups and community associations. The mailing list was initially compiled based on the requirements of the Municipal Class EA document and previous projects in the area. Interested stakeholders were then added to the list based on communications with the study team or registration at the Public Open House. A copy of the final project mailing list (personal information obscured) is provided in **Appendix M**.

#### 10.1.2 Notice of Study Commencement

The Master Plan was first introduced to the public via the Notice of Study Commencement. The Notice included a brief description of the study purpose and process, a preliminary Study Area map, request for comments and contact information. The Notice was first published in the Township’s May 11, 2015 Council Report and then in local newspapers as follows:

- Barrie Examiner – Thursday, May 14, 2015;
- Innisfil Examiner – Thursday, May 14, 2015; and,
- Orillia Packet & Times – Saturday, May 16, 2015.

The Notice was also posted on May 20, 2015 on the Township’s website: <http://www.oro-medonte.ca/community/horseshoe-craighurst-master-plan>.

The Notice of Study Commencement was directly mailed or e-mailed where possible, to a few individuals. It was also sent to a local property owner association and various local environmental groups who the Township thought might be interested in the study. A copy of the mailing list, cover letter and newspaper notices is provided in **Appendix M**.



### 10.1.3 Public Open House

A Public Open House was held on January 23, 2019 to present study information to interested members of the public while engaging residents regarding key issues. Specifically, the purpose of the Open House was to:

- Describe the purpose of the Master Plan and study process;
- Present study background information, specifically with regards to the Study Area, Problem Statement and existing conditions;
- Describe the alternative solutions, evaluation criteria and process, and recommended solutions;
- Highlight potential options for mitigating possible negative impacts of the recommended solutions;
- Solicit comments and obtain feedback;
- Respond to the concerns of those who may be affected; and,
- Identify next steps.

The Public Open House was advertised via a public notification process similar to that undertaken for the Notice of Study Commencement. The Notice of Public Open House included a brief description of the study purpose, process and alternatives solutions under consideration, a Study Area map showing the alternatives, Open House details and contact information. The Notice was published in the Township's website and then twice in local newspapers as follows:

- Barrie Advance – January 10, 2019 and January 17, 2019; and,
- Orillia Today – January 10, 2019 and January 17, 2019.

The Notice was also sent to those on the project mailing list. A copy of the mailing list, cover letter and newspaper notices is provided in **Appendix M**.

The Open House followed an informal format whereby large display boards were displayed. Attendees were invited to sign-in, review the display boards, ask questions and provide comments. No formal presentations were made. Copies of the sign-in sheets (personal information obscured) are provided in **Appendix M**.

Copies of the display boards were available for handout and posted on the Township's website (see previous link). A copy of the display boards are provided in **Appendix M**. Comment sheets were available for attendees to provide written comments for incorporation into this report. Comments sheets (personal information obscured) are provided in **Appendix M**.

The format provided visitors an opportunity to review the information most important to them and ask one-on-one questions of the study team representatives. Those who were unable to attend the Open House were advised in the Notice, to visit the project website for more information or to contact a study representative.

Documentation of comments received during the public open house is included in **Appendix M**.

### 10.1.4 Summary of Public Comments and Responses

Comments were received through a number of forums including e-mail and the public open house. **Table 10.1** summarizes comments received and the responses provided. **Table 10.2** presents the comments and issue raised at the PIC and responses.

**Table 10.1 Public Comments and Response Summary**

Type	Comment Summary	Response Summary
<b>Project Overview</b>		
E-mail Comment	Who are the “landowners” identified in the Notice of Study Commencement and what is their role?	<p>The HCC Landowners Group Inc. consists of four local developers, namely Skyline Horseshoe Valley Inc., Craighurst Land Corporation, Horseshoe Valley Lands Inc. and Kellwatt Lands Inc. Together, these developers own land (both developed and undeveloped) within the existing Horseshoe Valley and Craighurst settlement areas, but they cannot proceed with further development until new water and wastewater servicing is made available.</p> <p>The HCC Landowners Group as lead proponent is paying for this study exclusively, and will continue to pay for the design and construction costs of any new infrastructure recommended through this process. However, the Township of Oro-Medonte is involved (as co-proponent) to provide oversight of the development process, since the Township will eventually assume ownership for any new infrastructure and would be responsible for future operation and maintenance of this infrastructure.</p>
E-mail Comment	What do Schedule A, A+ and B projects refer to?	<p>In summary, Schedule A, A+ and B projects refer to different classifications of Municipal Class EA projects based on their increasing potential for environmental impact. This study will follow the Municipal Class EA master planning process, Approach #2, to address the requirements for Schedule A, A+ and B projects recommended through this study. If, at the end of this process – currently anticipated in early 2016 – the MECP agrees that all concerns have been adequately addressed, the projects may proceed to design and construction. Further details regarding the Class EA process and specific schedules are provided below.</p> <p>In Ontario, infrastructure projects are subject to the Municipal Class EA process and must follow a series of mandatory steps to address the requirements of the Environmental Assessment Act. These steps, such as identification of the problem or opportunity, evaluation of alternatives, documentation and public consultation, are outlined in the MEA Municipal Class EA document (October 2000, as amended October 2007 &amp; 2011).</p> <p>The Municipal Class EA process is comprised of Schedule A, A+, B and C projects which refers to different classifications of projects</p>



**Table 10.1 Public Comments and Response Summary**

Type	Comment Summary	Response Summary
		<p>based on their potential for adverse environmental impact. Schedule A projects are pre-approved and do not require following of the Class EA planning process because they have minimal adverse environmental effects. These projects generally include normal or emergency operations and maintenance, such as watermain repairs or replacements. Schedule A+ projects are also pre-approved but require some type of public notification prior to implementation, such as a newspaper notice or website announcement. Schedule B projects have the potential for some adverse environmental effects and therefore require screening through the Class EA process (known as Class EA Phases 1 and 2). This process includes at least one mandatory public consultation point and culminates in an EA report – made available for public review – to document the planning process and how concerns of either the general public or relevant government review agencies were addressed. If after the public review period there are no outstanding concerns, the project may proceed to implementation. Examples of Schedule B projects include watermain extensions where property is required outside of an existing road right-of-way or open cut of pipeline water crossings (i.e., non-trenchless methods). In addition there are Schedule C projects which have the potential for significant environmental effects and must proceed through Class EA Phases 1 through 4, including at least two public consultation points and preparation of an Environmental Study Report (ESR) and similar process of public review and comment. Schedule C projects typically include the siting and construction of new facilities or major expansions to existing facilities, such as water or wastewater treatment plants.</p>
E-mail Comment	<p>Will the residents along Penetanguishene Road in Craighurst be forced to hook up to municipal water and sewer services and will there be cost to homeowners for hookup? We like our water just the way it is.</p>	<p>Residents are not typically forced to hook up; however, the municipal by-law typically requires residents to pay for services as though they were connected. Residents were advised that at time of septic replacement, connection would be required.</p> <p>It is unlikely that you would be asked to discontinue use of your private well; however, cost implications are likely. The cost to homeowners will be decided by the municipality (e.g., based on property frontage or per house hook-up fee). The municipality will be determining formula to address these costs.</p>

**Table 10.1 Public Comments and Response Summary**

Type	Comment Summary	Response Summary
E-mail Comment	What is the anticipated timeline?	The overall development schedule is still to be determined. The Master Servicing Plan is projected to be complete in 2019, which will address expected infrastructure phasing.
<b>General and Miscellaneous Comments</b>		
E-mail Comment	I would like to be added to the project mailing list.	We have added you to the mailing list and will be sure to include you on all public notices henceforth.

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
<b>Wastewater Comments</b>	
<p>1. WWTP should be transferred to municipality - remove Skyline from owner due to:</p> <ul style="list-style-type: none"> <li>• High costs</li> <li>• Poor customer service</li> <li>• Unreliability</li> <li>• Wastewater costs with Skyline costs not regulated</li> </ul>	<ul style="list-style-type: none"> <li>• Costing in the Master Plan is done at a higher level to understand the difference between servicing options</li> <li>• Funding and ownership of the infrastructure is typically addressed following completion of the Schedule C Class EA (e.g., detailed design) when parties are in a better position to make these infrastructure related decisions</li> </ul> <p><i>Beyond scope of Master Plan and addressed in future Schedule C Class EA</i></p>
<p>2. Skyline plant should be upgraded to meet present and future environmental standards</p>	<ul style="list-style-type: none"> <li>• Work is ongoing on the Skyline plant to meet the Environmental Compliance Approval (ECA) established with the MECP</li> </ul> <p><i>Not part of Master Plan</i></p>
<p>3. Sensitivity of area</p> <ul style="list-style-type: none"> <li>• Copeland Forest</li> <li>• Coldwater River Watershed</li> <li>• Oro Moraine</li> </ul>	<ul style="list-style-type: none"> <li>• Sensitivity of the area was recognized and incorporated into evaluation of alternative servicing options and in the studies for the Master Plan and will continue to be further analyzed as part of the subsequent Schedule C Class EA and detailed design phase</li> </ul> <p><i>See Sections 5.1 and 7.4.3, Appendix B, Appendix C and Appendix D</i></p>
<p>4. Coldwater River is cold water with unique habitat that supports sensitive species (brook trout, salmon, salmon spawning area, rainbow trout, speckled trout) and</p>	<ul style="list-style-type: none"> <li>• No thermal impacts are expected as treated wastewater discharge will be within acceptable temperature range upon exit at the outfall</li> </ul>

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
<p>warm effluent would impact the river:</p> <ul style="list-style-type: none"> <li>• Not likely supported by DFO, MECP or MNRF</li> <li>• Long term adverse effects</li> </ul>	<ul style="list-style-type: none"> <li>• Will be further addressed during Schedule C process and detailed design and permitting phases</li> </ul> <p><i>See Sections 9.1 and Appendix K.</i></p>
<p>5. Impacts to water table for existing deep wells on Trillium Trail</p>	<ul style="list-style-type: none"> <li>• Effluent discharge and plant operation are part of the Schedule C Class EA and detailed design and permitting phases</li> </ul> <p><i>Beyond scope of Master Plan and addressed in future Schedule C Class EA</i></p>
<p>6. Why Line 6 the forcemain should run along Line 5 with Line 6 having:</p> <ul style="list-style-type: none"> <li>• undulating topography</li> <li>• fibre optic line and Bell line present</li> <li>• portion is only 49' wide</li> </ul>	<ul style="list-style-type: none"> <li>• Outfall location was identified by the Assimilative Capacity Study the forcemain route will be re-evaluated during the Schedule C Class EA process</li> </ul> <p><i>See Appendix K</i></p>
<p>7. Recycle wastewater effluent for snowmaking and irrigation</p>	<ul style="list-style-type: none"> <li>• Wastewater recycling requires extensive storage facilities and permitting from MECP consideration of wastewater recycling for irrigation and snowmaking purposes would be part of the Schedule C Class EA and detailed design phase</li> </ul> <p><i>Beyond scope of Master Plan and addressed in future Schedule C Class EA</i></p>
<p>8. Wastewater should be discharged within Horseshoe Valley community boundary</p>	<ul style="list-style-type: none"> <li>• Alternative wastewater treatment methods were evaluated and subsurface discharge was screened out for Horseshoe Valley with surface water discharge selected as the preferred option</li> <li>• Further analysis was undertaken in the reasonable use assessment to support screening out the subsurface discharge alternative</li> </ul> <p><i>See Sections 7.2.2 and 7.3.2 and Appendix L</i></p>
<p>9. Length of pipeline and need to expropriate land for pumping stations</p>	<ul style="list-style-type: none"> <li>• Assimilative Capacity Study identified nearest surface water discharge point and pumping stations will be small in size and sited within road right-of-ways to minimize potential costs and issues associated with private property (e.g., easements)</li> <li>• This will be examined further including siting of the pumping stations as part of the Schedule C Class EA process</li> </ul>

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
	<i>See Section 9.1 and Appendix K</i>
10. Craighurst – how will existing wastewater users be connected	<ul style="list-style-type: none"> <li>Sizing of the infrastructure has been based on accommodating the connection of existing and future residents with any decisions on how and when existing residents connect made by the Township in the future outside of the Master Plan</li> </ul> <p><i>Beyond scope of Master Plan</i></p>
11. Unconfined aquifer located north and east of Craighurst wells would be impacted by subsurface wastewater discharge	<ul style="list-style-type: none"> <li>Attenuation zone for subsurface discharge effluent considered wellhead protection zone and this will be examined further during Schedule C Class EA process</li> </ul> <p><i>See Sections 5.1, 7.4.3 and 8.1</i></p>
<b>Water Comments</b>	
1. What is the timing and who pays costs to interconnect Zones 1 and 2 in Horseshoe Valley	<ul style="list-style-type: none"> <li>Timing is driven by development and the interconnection is needed to address pressure issues within Zone 1.</li> <li>Interconnection is currently in the design phase with initial connection stages anticipated in 2019. The source funding is to be determined once the scope of connection staging and associated tendered pricing have both been firmly established.</li> <li>As well it will support growth in Zone 2</li> <li>These issues are considered further during detailed design phase</li> </ul> <p><i>Beyond scope of Master Plan</i></p>
2. Impacts to water table for existing deep wells on Trillium Trail	<ul style="list-style-type: none"> <li>Proposed solution is interconnection of Zones 1 and 2 and additional elevated storage with no new wells required and peak capacity of the wells remaining the same for Horseshoe Valley</li> <li>A new well was previously developed and the elevated storage tank will soon be commissioned so there will not be any new potential impacts on the water table in the area</li> <li>Permitting requires that no negative impact on existing wells occur in the area (e.g., Trillium Trail)</li> </ul> <p><i>See Section 8.1 and Appendix H</i></p>
3. Water issues in the summer so how can Craighurst support additional subdivision	<ul style="list-style-type: none"> <li>Construction of new well in addition to in-ground storage and changing pumping capacity to more efficiently utilize the water supply</li> </ul>



**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
	<ul style="list-style-type: none"> <li>Studies were undertaken to confirm water supply opportunities and this was incorporated into evaluation of alternatives and selection of the preferred alternative solution</li> </ul> <p><i>See Sections 8.1 and 9 and Appendix H</i></p>
<p>4. Where does new water supply come from for Craighurst</p>	<ul style="list-style-type: none"> <li>Additional water supply achieved using adding a new well and also using existing wells more efficiently (e.g., changing the pumping capacity but does not change peak capacity, adding in-ground storage tank)</li> </ul> <p><i>See Sections 8.1 and Appendix H</i></p>
<b>Transportation Comments</b>	
<p>1. Lines 3 &amp; 4 and County Rd 22 are dangerous for speeding</p>	<ul style="list-style-type: none"> <li>Agreed and issue was incorporated into County’s Class EA and Township’s transportation solutions</li> </ul> <p><i>See Sections 5.3.4 and 6.8</i></p>
<p>2. Trillium Trail needs a turning lane or duck in lane due to dangers</p>	<ul style="list-style-type: none"> <li>This study has carried forward the recommendations of the County Road 22 Class EA completed in 2017. The County Road 22 EA recommended right turn tapers at sideroad intersections including at the intersection of Trillium Trail and County Road 22.</li> </ul>
<p>3. Support for the Transportation Plan</p>	<ul style="list-style-type: none"> <li>No response required</li> </ul>
<p>4. Improvements to Line 6 intersection with Horseshoe Valley Road should be included in the Transportation Plan</p>	<ul style="list-style-type: none"> <li>These improvements were considered but not shown as focus was on Horseshoe Valley settlement area</li> </ul> <p><i>See Sections 6.8</i></p>
<p>5. Transportation Plan needs to address CPR crossings</p>	<ul style="list-style-type: none"> <li>The CPR crossing is outside of the study area of this study. However, the transportation analysis has considered the impact of this crossing on traffic on County Roads 93 and 22 as analysis was completed using traffic count data collected.</li> </ul> <p><i>See Sections 6.8 and Appendix J</i></p>
<p>6. Roundabouts for County Road 22 at Line 3 and 4 are not big enough for farm equipment and cause trucks to stop at the bottom of a hill</p>	<ul style="list-style-type: none"> <li>These types of issues are typically taken into further consideration during detailed design</li> </ul> <p><i>Beyond scope of Master Plan</i></p>
<p>7. Prefer turning lanes over roundabouts</p>	<ul style="list-style-type: none"> <li>Comment noted</li> </ul>
<b>General Comments</b>	

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
<p>1. Timeline for implementation</p>	<ul style="list-style-type: none"> <li>• Master Plan is completed with recommendations for further study (Schedule C Class EAs) for some of the servicing infrastructure and this will include developing an implementation plan</li> <li>• Growth Plan for the Greater Golden Horseshoe and land use requirements to meet Schedule 7 was basis for determining servicing requirements</li> </ul> <p><i>See Sections 3.2, 3.3, 3.4 and Appendix A</i></p>
<p>2. Slow project down to give further consideration to solutions</p>	<ul style="list-style-type: none"> <li>• Master Plan was initiated in 2015 with issuance of Notice of Commencement and time was taken to consider alternative solutions and the Master Plan needs to move forward for the Township to meet County and Provincial requirements for growth</li> </ul> <p><i>See Sections 3.2, 3.3 and 3.4</i></p>
<p>3. Population growth to 10,000 in Horseshoe is a concern:</p> <ul style="list-style-type: none"> <li>– Over what timeline</li> <li>– Is the growth achievable</li> <li>– No additional development should be allowed in the Valley</li> </ul>	<ul style="list-style-type: none"> <li>• 2031 forecasted population for the Township was estimated based on Schedule 7 of the Growth Plan for the Greater Golden Horseshoe and is meeting Provincial and County requirements for growth</li> <li>• Population is more than Schedule 7 due to different persons per unit used (based on input from the Township), updated information provided by industry stakeholders and considerations for potential land optimization and intensification opportunities on underutilized or vacant lands</li> </ul> <p><i>See Sections 3.2, 3.3, 3.4, 6.5, 6.7 and Appendix A</i></p>
<p>4. What natural heritage &amp; watershed studies were done</p>	<ul style="list-style-type: none"> <li>• Various studies were undertaken on: natural environment, hydrology / drainage conditions, geomorphic assessment of Coldwater River, hydrogeological conditions, Stage 1 archaeological assessment, built cultural heritage assessment, existing servicing conditions, assimilative capacity assessment and reasonable use assessment for subsurface discharge</li> <li>• Additional studies will be undertaken as required during Schedule C Class EA and detailed design and permitting phases</li> </ul> <p><i>See Section 5.1 and Appendix B, Appendix C, Appendix D, Appendix E, Appendix K and Appendix L</i></p>

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
<p>5. Who are the landowners on this project</p>	<ul style="list-style-type: none"> <li>• Landowner group consists of:                             <ul style="list-style-type: none"> <li>– Skyline Horseshoe Valley Inc.</li> <li>– Horseshoe Valley Lands Inc.</li> <li>– Kellwatt Lands Inc.</li> <li>– Craighurst Land Corp.</li> </ul> </li> <li>• These developers own land (both developed and undeveloped) within the existing Horseshoe Valley and Craighurst settlement areas, but they cannot proceed with further development until new water and wastewater servicing is made available</li> </ul>
<p>6. Residents on Line 6 North were not given due notice of open house</p>	<ul style="list-style-type: none"> <li>• Master Plan covers servicing for large area and followed typical MEA Class EA process by placing 2 newspaper advertisements and posting on Township website</li> <li>• Schedule C Class EA will be required to issue notices and contact residents adjacent to infrastructure based on confirmation of alignments and plant locations</li> </ul> <p><i>See Section 10.1 and Appendix M</i></p>
<p>7. Costs and who pays for the infrastructure (should be through development charges)</p>	<ul style="list-style-type: none"> <li>• HCC Landowners Group is paying for this study exclusively, and is anticipated, will continue to pay for the design and construction costs of any new infrastructure recommended through this process</li> <li>• Township provides oversight of the development process and will eventually assume ownership for any new infrastructure and would be responsible for future operation and maintenance of this infrastructure</li> </ul>
<p>8. Has NVCA been consulted and what are their thoughts</p>	<ul style="list-style-type: none"> <li>• NVCA has been consulted with during the Master Plan and they will be provided with the Master Plan Report for review and comment and consultation will continue during any Schedule C Class EAs and detailed design and permitting phases</li> <li>• NVCA provided comments on the PIC display boards and these comments and the response will be provided in the Master Plan Report</li> <li>• In general NVCA’s comments were related to the need for obtaining a permit prior to construction; outlining some general engineering design objectives, confirming hydrogeology related to water servicing (e.g., new wells required, changes to Permits to Take Water) and source water protection; natural heritage</li> </ul>

**Table 10.2 Public Comments and Response Summary**

Comment / Issue Raised by Public	Response / Section Where Addressed in Master Plan
	<p>considerations (e.g., Matheson Creek and tributary crossings supporting cold water fish communities, unevaluated wetland present, woodlands and ravine system supporting species at risk); and discharge of treated effluent into Coldwater River poses potential impacts related to water quality, erosion and impacts to fish communities</p> <p><i>See Section 10.2 and Appendix K</i></p>
<p>9. Availability of study reports online and concerned over 30-day review period for comments and review of information</p>	<ul style="list-style-type: none"> <li>• MECP Class EA outlines the review period which is normally 30 days however since this Master Plan addresses servicing for 3 components (water, wastewater and transportation) a 45-day review period will be provided for the Master Plan Report</li> <li>• Master Plan Report will be available in hard copy at the Township’s Municipal Offices and electronically with a link on the Township’s website</li> <li>• Once future Schedule C Class EAs are completed they will provide additional notification (e.g., newspaper notices, posting on Township website and delivery to residents adjacent to specific infrastructure) and a 30-day review period for the Environmental Study Report</li> </ul>

**10.1.5 Notice of Completion**

A Notice of Completion was prepared and advertised in the Barrie Advance and Orillia Today on December 19, 2019.

**10.2 Review and Agency Consultation**

In addition to the public communications and consultation activities described above, correspondence and individual meetings (where needed) were held with various government regulatory and review agencies to explain the purpose and rationale for the Master Plan, discuss alternative solutions, and obtain feedback. Comments have been received from various federal, provincial and municipal agencies including:

- Aboriginal Affairs and Northern Development Canada;
- Ministry of Tourism, Culture and Sport;
- Ministry of Transportation (MTO);
- Nottawasaga Valley Conservation Authority (NVCA);
- County of Simcoe; and,
- Various utilities including Bell Canada and Rogers Cable.

**Table 10.3** provides a summary of the communications with these agencies. A copy of all formal agency correspondence is provided in **Appendix M**.



All public notices were also sent to various other government review agencies and stakeholders as follows, but no comments have been received to date:

- Canadian Environmental Assessment Agency;
- Canadian Heritage;
- Environment Canada;
- Fisheries and Oceans Canada;
- GO Transit;
- Infrastructure Ontario;
- Lake Simcoe Region Conservation Authority;
- Ministry of Indian and Northern Affairs;
- Ministry of Aboriginal Affairs;
- Ministry of Agriculture, Food and Rural Affairs;
- Ministry of Community and Social Services;
- Ministry of Economic Development, Employment and Infrastructure;
- Ministry of the Environment, Conservation and Parks (MECP);
- Ministry of Municipal Affairs and Housing (MMAH);
- Natural Resources and Forestry (MNRF);
- Transport Canada;
- Canadian Transportation Agency;
- Ontario Provincial Police;
- Simcoe County District School Board;
- Simcoe Muskoka Catholic District School Board;
- Simcoe Muskoka District Health Unit;
- St. John Ambulance, Barrie Simcoe Muskoka Branch; and,
- Various utilities including Hydro One, Enbridge Gas, Bell Canada, Rogers Cable, and Powerstream.

Copies of the covering letters and/or e-mails are included in **Appendix M**.

**Table 10.3 Summary of Review Agency Communications**

Agency	Action Taken	Result
<b>Federal Agencies</b>		
Aboriginal Affairs and Northern Development Canada	The Notice of Study Commencement was e-mailed May 14, 2015 to the Director of Lands and Economic Development, the Associate Regional Director, the Negotiator for Métis and Non-Status Indians Relations and the Consultation and Accommodation Unit.	An automated e-mail response was received May 14, 2015 referencing the Aboriginal and Treaty Rights Information System (ATRIS), a web-based information tool to identify potentially affected Aboriginal groups as well related information on established rights. The ATRIS system was cross-checked against those already on the contact list.
<b>Provincial Agencies</b>		
Ministry of Tourism, Culture and Sport	The Notice of Study Commencement was e-mailed May 14, 2015 to the Director, Regional Advisor, EA Coordinator and Heritage Planner.	On May 21, 2015, a response was received from the Heritage Planner indicating that as part of the master planning process, cultural heritage resources within the study area should be inventoried, and

**Table 10.3 Summary of Review Agency Communications**

Agency	Action Taken	Result
		archaeological resources, built heritage and cultural heritage landscapes should be considered. Details were provided regarding the technical studies required and next steps. MTCS requested that the archaeological, built and cultural heritage studies and/or checklists / supporting documentation be provided for their review prior to issuance of the Notice of Completion, and requested to remain on the project mailing list.
MTO	The Notice of Study Commencement was e-mailed May 14, 2015 to the Regional Director, Director of the Transportation Planning Branch, and the Manager and Engineer of the Corridor Management Section.	An e-mail response was received on May 19, 2015 from the Corridor Management Section. The response indicated that both the Craighurst and Horseshoe Valley Settlement Areas are beyond MTO’s permit control area so MTO permits are not required for any works within these areas. However, MTO requested to be kept informed of study progress in the Craighurst area, presumably given the proximity to Highway 400.
<b>Municipalities Agencies</b>		
County of Simcoe	Representatives from the County of Simcoe attended internal project team meetings.	
<b>Others</b>		
NVCA	The Notice of Study Commencement was e-mailed May 14, 2015 to the Director of Planning Services. NVCA staff provided comments following the PIC.	On August 26, 2015, NVCA followed up on the study progress, requesting further information or any completed reports. Mr. Bull was advised that the Public Open House had been postponed until Spring 2016 and that the NVCA would be kept advised.  A response letter was sent to NVCA on October 15, 2019. A copy of the letter is included in <b>Appendix M</b> .
Various Utilities	In response to the Notice of Study Commencement, both Bell Canada and Rogers Cable requested that the project	The project mailing list was updated accordingly prior to distribution of the Notice of Public Open House.



**Table 10.3 Summary of Review Agency Communications**

Agency	Action Taken	Result
	mailing list be updated with new contact information.	

**10.2.1 Presentations to Council**

At their regularly scheduled meeting on February 11, 2015, the Township of Oro-Medonte Council was first introduced to this Master Plan study, including the preliminary study area, Problem or Opportunity Statement, future development areas, results of assimilative capacity modelling completed to date and the planning process and next steps. Council was supportive of the study. A second Council presentation occurred on January 23, 2019 prior to the PIC to inform Council of the recommended preferred alternative and to obtain their feedback. A copy of the Council presentations is provided in **Appendix M**.

**10.3 Indigenous Community (First Nations and Métis) Engagement**

Although the Study Area is not currently part of any known First Nations claims, First Nations and Métis consultation was completed in accordance with Municipal Class EA requirements. Mr. Murray Maracle is the Team’s First Nations Engagement Officer and facilitated all communications / inquiries regarding the Master Planning process. He is a member of the Turtle Clan from the Tyendinaga Mohawk Territory located near Belleville, Ontario, has strong ties to the First Nations communities, and has been active in governance and education in his past roles as Executive Assistant to the Grand Chief of Ontario, Vice President of First Nation Technical Institute and Director of Education for the Anishinabek Nation.

In developing the contact list, the study team referenced the First Nations EA Toolkit for Ontario (developed by the Chiefs of Ontario) to ensure improved understanding of the expectations of relevant First Nation and Métis communities. In addition, the Aboriginal and Treaty Rights Information System (ATRIS) was referenced to assist in understanding what groups have rights and interests in the area. As a result, all public notices were mailed to the following First Nation or Métis groups:

- Beausoleil First Nation;
- Chippewas of Georgina Island;
- Chippewas of Rama First Nation;
- Georgian Bay Métis Council;
- Metis Nation of Ontario; and,
- Moon River Métis Council.

*No correspondence has been received to date. Follow-up requests for comments will be made with distribution of the Notice of Completion. First Nations correspondence is provided in **Appendix M**.*

**10.4 Summary**

In summary, multiple steps were taken to proactively inform stakeholders about the Master Planning study, obtain their input and address their comments or concerns as much as possible. It is expected that further comments will be received through detailed design from those with a direct interest in the Schedule B projects identified. Meetings will be convened if necessary, to further discuss stakeholder comments and resolve any remaining issues, where possible. It is not anticipated that concerns will be raised that cannot be further addressed during detailed design.

## 11 Recommendations

The Horseshoe Craighurst Corridor Landowners Group Inc. and the Township of Oro-Medonte have completed the Water, Wastewater, Transportation Master Plan to identify a long term plan for servicing for future development of the two settlement areas, known as Horseshoe Valley and Craighurst.

Key recommendations of this study are as follows:

- Water
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for an expansion to the Craighurst water supply;
  - The Township should move forward into preliminary design of an in-ground storage facility in Craighurst and an expansion to the Horseshoe Highlands Water Storage Facility;
  - The Township should move forward with interconnection of Zones 1 and 2 in Horseshoe Valley; and,
  - The Township should consider implementation of water use reduction measures and programs to encourage residents to reduce their water use within both Horseshoe Valley and Craighurst.
- Wastewater
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for the construction of a new treatment facility in Horseshoe Valley. It is recommended that the Township include evaluation of alternative design concepts for pumping stations, forcemain, outfall sewer and outfall structure within the overall scope of the Schedule 'C' EA;
  - The Township should initiate a Schedule 'C' Class EA study to identify a preferred design concept for a new wastewater treatment facility in Craighurst; and,
  - Skyline Investments should initiate additional studies including a Schedule 'C' Class EA to select a preferred design concept for expansion of the Skyline Wastewater Treatment Facility up to its site capacity.
- Transportation:
  - To alleviate potential traffic impacts single lane roundabouts are recommended for the intersections of County Road 22 and 3 Line North and County Road 22 and Birch Grove Drive and a multi-lane roundabout is recommended for the intersection of County Road 22 and 4 Line North;
  - It is also recommended that a left turn lane be provided at the intersection of County Road 22 and Access # 2 in Craighurst for the eastbound left turn lane with 30m storage length and signalization;
  - A left turn lane be provided at the intersection of County Road 22 and Access # 3 in Craighurst with a left turn lane for the eastbound left turn lane with 50m storage length and signalization;
  - Reduce posted speed limits from 70 km/hr to 50 km/hr within the Study Area;
  - Add right turn tapers at all study area intersections;
  - Add an eastbound climbing lane from Country Club Lane to just east of County Road 22 and the 4 Line North intersection;
  - Add a westbound climbing lane between Horseshoe Boulevard and 3 Line North on County Road 22; and,
  - Add a median left turn lane on County Road 22 between the Horseshoe Resort and Country Club Lane.



## 12 References

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5. Cole Engineering, 2005. Functional Servicing Report for Kellwatt Ltd./ Fred Grant Square Ltd., Pinewood Estates Subdivision. October 2005.
6. Cole Engineering, 2011. Skyline Horseshoe Valley Inc., Water Supply and Distribution System Assessment. June 2011.
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11. Greenland Consulting Engineers, 2012. County of Simcoe Water and Wastewater Visioning Strategy, Final Draft Background Information Brief and Servicing Gap Analysis. 2012.
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13. Simcoe County, 2014. Simcoe County Transportation Master Plan Update, September 2014.
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