Town of Erin
Servicing and Settlement Master Plan Final Report

August 12, 2014

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TOWN OF ERIN

SERVICING AND SETTLEMENT MASTER PLAN

FINAL REPORT

August 12, 2014

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This document is a component of a Master Plan and should be read in conjunction with the other documents produced as part of this process, including:

- Town of Erin Servicing and Settlement Master Plan – Background Report by B.M. Ross and Associates Limited, 2012 (Appendix A of this report)
- Town of Erin Servicing and Settlement Master Plan Environmental Component – Existing Conditions Report by Credit Valley Conservation, Aquafor Beech Inc, and Blackport Hydrogeology Limited, 2011 (Appendix B of this report)

Acknowledgements

"Life is a journey, not a destination."

Ralph Waldo Emmerson

While the Settlement and Servicing Master Plan was the destination, the SSMP process was the journey. And while it turned out to be a longer journey than anyone anticipated, it certainly was interesting, educational, and created a great deal of awareness regarding the future of the Town of Erin, particularity in its urban settlement areas of Hillsburgh and Erin Village. There have been many people, groups, and government agencies involved. It was to be a collaborative effort, a compendium of needs, values, rules and policies. It was not always a walk in the park, but in the end, the result should help shape the future path of Erin. We would like to acknowledge the role of the participants in the process and thank them for being involved:

Town of Erin Council and staff

The Core Management Committee of government review and regulatory agencies:

Ministry of the Environment, County of Wellington, Credit Valley Conservation,

Region of Peel, Grand Valley Conservation

The members of the Liaison Committee:

- Glenyis Betts, East Wellington Community Services
- Jamie Cheyne, Heritage Committee
- Bill Dinwoody, Recreation and Culture Committee
- Jo Fillery, Public Representative
- Shelley Foord, Village of Erin BIA
- Bob Gardner, Public Representative
- Deanna MacKay, Public Representative
- Bonnie Peavoy, Public Representative
- Maurizio Rogato, Land Developer
- Matt Sammut, Concerned Erin Citizens
- John Sutherland, Public Representative
- Roy Val, Transition Erin
- Bob Wilson, Environmental Committee
- Chris Zuppan, Public Representative

The hundreds of residents of the Town of Erin, who participated in focus groups, attended public meetings and provided input through the project website.

<u>The Project Study Team</u>

- B.M. Ross & Associates, Engineers and Planners
- Triton Engineering Services Limited
- Credit Valley Conservation
- Blackport Hydrogeology Inc.
- Watson & Associates Economists Ltd.
- Montieth Brown Planning Consultants

Executive Summary

"Nothing we can do can change the past, but everything we do changes the future." – Ashleigh Brilliant

The goal of the SSMP is to develop appropriate strategies for community planning and municipal servicing, consistent with current provincial, county and municipal planning policies. The SSMP process followed the Master Plan approach, specifically Approach 1, as defined in the Municipal Class Environmental Assessment (Class EA) document, dated October 2000 (as amended in 2007 and 2011). Under Approach 1, a Master Plan is done at a broad level of assessment and identifies specific Schedule B and C projects, which require more detailed investigations. The Master Plan, therefore, is the basis for, and is used in support of, future investigations.

The Master Plan process was conducted over a five year period. There was considerable gathering of environmental data, an extensive consultation process, and evaluation of alternatives which led to the establishment of future servicing scenarios. Values, wants and needs formed the basis for the Master Plan. Policies, rules and technological requirements contributed to the framework and context of the Plan.

The resultant Master Plan report is a large document, which documents the process undertaken and the path going forward. There are literally hundreds of pages of background reports which contributed to the decision making process of the Plan. Synthesizing these into a few pages does not do the process justice. Key steps are presented here – details are in the SSMP Report and the appendices.

◆ Consultation

Extensive consultation was undertaken throughout the SSMP process. Consultation activities included numerous public meetings, meetings and workshops with Council, meetings of the Liaison Committee and Core Management Teams, workshops with community groups and feedback questionnaires. The consultation activities are summarized in Section 3.0 and in Appendix C.

◆ Issues and Opportunities

A number of issues and opportunities were identified during the consultation process. The relationships between the issues and opportunities were examined and linked to provide context for each. These relationships and linkages formed a framework for developing a Vision Statement and Problem/Opportunity Statement.

Vision Statement

The Vision Statement serves as a clear, unified vision of the future that expresses the unique qualities and common values of the community. It also served to guide the development of alternative planning and servicing strategies in the Master Plan, to ensure they are compatible with the values and needs of current residents.

> **The Town of Erin will remain a vibrant, safe and sustainable community, located at the headwaters of the Credit and Grand Rivers. The Town will continue to capitalize on its proximity to large urban centres, while maintaining its excellent community spirit. With a strong employment base, and a range and mix of housing, a high percentage of the residents will work and continue to live within the Town of Erin. Visitors will enjoy the small town atmosphere, unique shops and surrounding rural charm. Through responsible development and servicing, the Town's rich natural environment will be protected and preserved.**

Problem Opportunity Statement

The Problem/Opportunity Statement for the Master Plan was derived from information gathered during the first phase of the SSMP and guided by the Vision Statement. The statement formed the basis of the Master Plan and guides the development and evaluation of alternative planning and servicing scenarios. For the purposes of the Town of Erin SSMP, the following Problem/Opportunity Statement has been identified:

Presently, the Town of Erin lacks a long term, comprehensive strategy for the provision of water and wastewater servicing in the villages of Erin and Hillsburgh. The following limitations are associated with the current status of servicing within the Town's urban areas:

Wastewater

- **Wastewater is treated exclusively by private, on-site wastewater treatment systems. Within the Built Boundary of the settlement areas (Hillsburgh and Erin Village), private property investment and redevelopment is restrained by increasingly stringent setbacks required for septic systems, small lot sizes and the presence of private wells. Additionally, there are limited facilities in the area accepting septage from private systems for treatment.**

- **The settlement areas (Hillsburgh and Erin Village) have been identified as areas of modest growth under the Places to Grow Act and by Wellington County population projections. At present, the servicing infrastructure is inadequate to meet future demand to 2035. Lots sized to include septic systems will not allow for projected future development to occur in a manner consistent with the need for smaller, less-expensive homes in the community as identified in the Vision Statement.**

Water

- **Partial water servicing in Erin Village and Hillsburgh limits the operational and cost efficiency of the systems and inhibits redevelopment and future development.**
- **The capacity of the existing system will need to be augmented to address current limitations and the needs of future development.**

Stormwater Management

- **The West Credit River currently shows impacts from urban stormwater drainage, resulting from limited stormwater management infrastructure. Given existing impacts and potential future impacts relating to development, there is a need to assess existing and future stormwater management infrastructure.**

Transportation

- **Current transportation infrastructure may need upgrades to accommodate future growth.**

To address these limitations and opportunities, the Master Plan will investigate a range of alternative planning and servicing alternatives. The alternatives will be evaluated and possible mitigating measures will be identified. Preferred alternatives will also be identified for each component of the SSMP.

- ## Assimilative Capacity Study

This study of the capacity of the West Credit River to accept treated wastewater effluent had a significant influence on the SSMP. It would provide the basis for a locally based servicing solution. It was recommended by the Core Management Team that a conservative population of 6,000 persons of assimilative capacity should be carried forward as the potential for treating sewage and discharging effluent to the West Credit River. This study was subject to considerable review by the Ministry of the Environment and the Credit Valley Conservation Authority, two agencies charged with enacting regulations to preserve the integrity of the receiving stream.

- ## Servicing Scenarios

The target population was carried forward into servicing scenarios based on providing wastewater service to the existing developed areas of both Hillsburgh and Erin Village, with the remainder of the capacity allocated to future growth. The three servicing scenarios are recommended to be carried over into the next phase of the Class EA process as after evaluation, there was no reason to endorse or eliminate any at this stage of the Class EA process.

- **Scenario 1 – Split Growth**: service existing properties in Erin and Hillsburgh and provide for 250 units of growth in both Erin and Hillsburgh.

- **Scenario 2 – Growth in Erin**: service existing properties in Erin and Hillsburgh and provide for 500 units of growth in Erin (only).
- **Scenario 3 – Growth in Hillsburgh**: service existing properties in Erin and Hillsburgh and provide for 500 units of growth in Hillsburgh (only).

Infrastructure Needs

Chapters 6-9 contain detailed reviews of existing infrastructure and future needs based on the proposed servicing scenarios. A conceptual wastewater servicing plan was defined, which allowed for a financial review of implementation of the strategies. The villages have municipal water systems, but there are some existing deficiencies, not the least of which is that some properties within the urban boundaries are not yet connected. Upgrades to the systems, including connecting all properties, new water supply and storage facilities are identified and costed. The needs vary somewhat depending on where the new growth is potentially allocated.

Implementation Strategies

If the SSMP is to implemented there are a number of considerations that need to be undertaken. The Report provides strategies for meeting Environmental Assessment requirements using the Municipal Class EA process. It outlines what financial considerations are necessary to implement the Master Plan. And finally it addresses what land use planning considerations will need to be undertaken, such as changes to the Town and County Official Plans, which provide direction to growth and development.

Recommendations

The Report provides a number of recommendations that are key to implementing the SSMP:

- The Town of Erin move forward with the remaining phases of the Class EA process to develop an undertaking to provide a sanitary sewage collection system for the settlement areas of Hillsburgh and Erin Village based on the servicing scenarios reviewed in the report.
- That the Town of Erin initiates the process of seeking out senior government funding assistance for this undertaking. The SSMP can be used as a supporting document to build a case that this undertaking would provide considerable economic, health, and environmental benefits to the town. It is necessary to be ready to take advantage of any new funding programs that are introduced by the government.
- That the Town undertakes water servicing upgrades as defined in this report, so that appropriate facilities are in place when required to service future growth.
- That the Town review and amend its Official Plan as needed to implement the SSMP and allocate growth within its urban boundaries. Similarly, the County of Wellington should revise its Official Plan to reflect the Town's capacity to provide wastewater service, and adjust population forecasts accordingly.

- That the Town should apply stormwater management policies, as discussed in this report, to manage new growth areas and to address deficiencies with existing stormwater management.
- That transportation issues be monitored in conjunction with the growth of the urban areas and that the Town should work with the County to implement measures to alleviate issues.
- That the Town make use of the information and data gathered during the SSMP process to further the ongoing advancement of the municipality so that it will continue to be a place that people will want to live in as defined by the Community Vision Statement.

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1.0 Introduction

1.1 Servicing and Settlement Master Plan

The Town of Erin was formed in 1998 from the amalgamation of the former Township of Erin and Village of Erin. In 2004, the County of Wellington approved the Official Plan (OP) for the Town of Erin. The OP reflects recommendations and guidelines from both provincial and county policies as well as previous studies completed by the Town. Provincial policy, as directed by the 1997, 2005 and 2014 Provincial Policy Statements (PPS), requires: the protection and enhancement of ground and surface water resources, including aquifers, recharge and headwater areas and planning at the watershed scale (Ministry of Municipal Affairs and Housing, 2014). Additionally, the PPS outlines specific policies with regards to municipal infrastructure and servicing. The Wellington County OP, adopted in 1999 (since amended), directs growth to urban areas with municipal water and wastewater services, similar to the 2014 PPS. Guided by these policies, the Town of Erin OP outlined a community-based process for completing a Servicing and Settlement Master Plan (SSMP) to address servicing, planning and environmental issues within the Town.

The Terms of Reference (TOR) for the SSMP was established in September 2008 (Triton Engineering Services Limited, 2008). The TOR provides the framework for the SSMP and identifies the objectives and scope of the study. Also outlined in the TOR are the general process and components of the SSMP, including consultation requirements. Identified as a broad level assessment by the TOR, the SSMP is intended, to serve as the basis of future investigations for specific projects.

The goal of the SSMP is to develop appropriate strategies for community planning and municipal servicing, consistent with current provincial, county and municipal planning policies. The SSMP process followed the Master Plan approach, specifically Approach 1, as defined in the Municipal Class Environmental Assessment (Class EA) document, dated October 2000 (as amended in 2007 and 2011). Under Approach 1, a Master Plan is done at a broad level of assessment and identifies specific Schedule B and C projects, which require more detailed investigations. The Master Plan, therefore, is the basis for, and is used in support of, future investigations.

The SSMP consisted of two phases, the first being a data collection and background study phase. The findings of the first phase are summarized in the Town of Erin Servicing and Settlement Master Plan Background Report (included as Appendix A), completed by B.M. Ross and Associates, dated March 28, 2012. The second phase focused on the development and evaluation of alternative solutions to recognize and address potential impacts to sensitive land uses, surface and groundwater resources, concerns of residents, and the long-term objectives of the Town. Using a planning horizon of 25 years (to the year 2035), the SSMP examined four specific components: Community Design, Form and Function; Community Planning; the Environment; and Servicing. The culmination of the second phase is the Servicing and Settlement Master Plan Report.

The Servicing and Settlement Master Plan report documents the process undertaken and summarizes servicing and planning alternatives considered, evaluation criteria, and the rationale

associated with the selection of the preferred solution(s) and implementation strategies associated with moving forward into the remaining phases of the Class EA process.

1.2 Integration of the Study with MEA Class EA Process

Master Plan studies are carried out in accordance with the Municipal Class Environmental Assessment (Class EA) document, as prepared by the Municipal Engineers Association, dated October 2000 (as amended in 2007 and 2011). This study addresses the first two phases of the Class EA planning and design process, following Approach 1 of the Master Plan process. Under this approach, the study is done at a broad level of assessment, and becomes the basis for future investigations for any Schedule B and C projects identified in the Master Plan.

The tasks associated with Phases 1 and 2 of the Class EA planning process generally include the following:

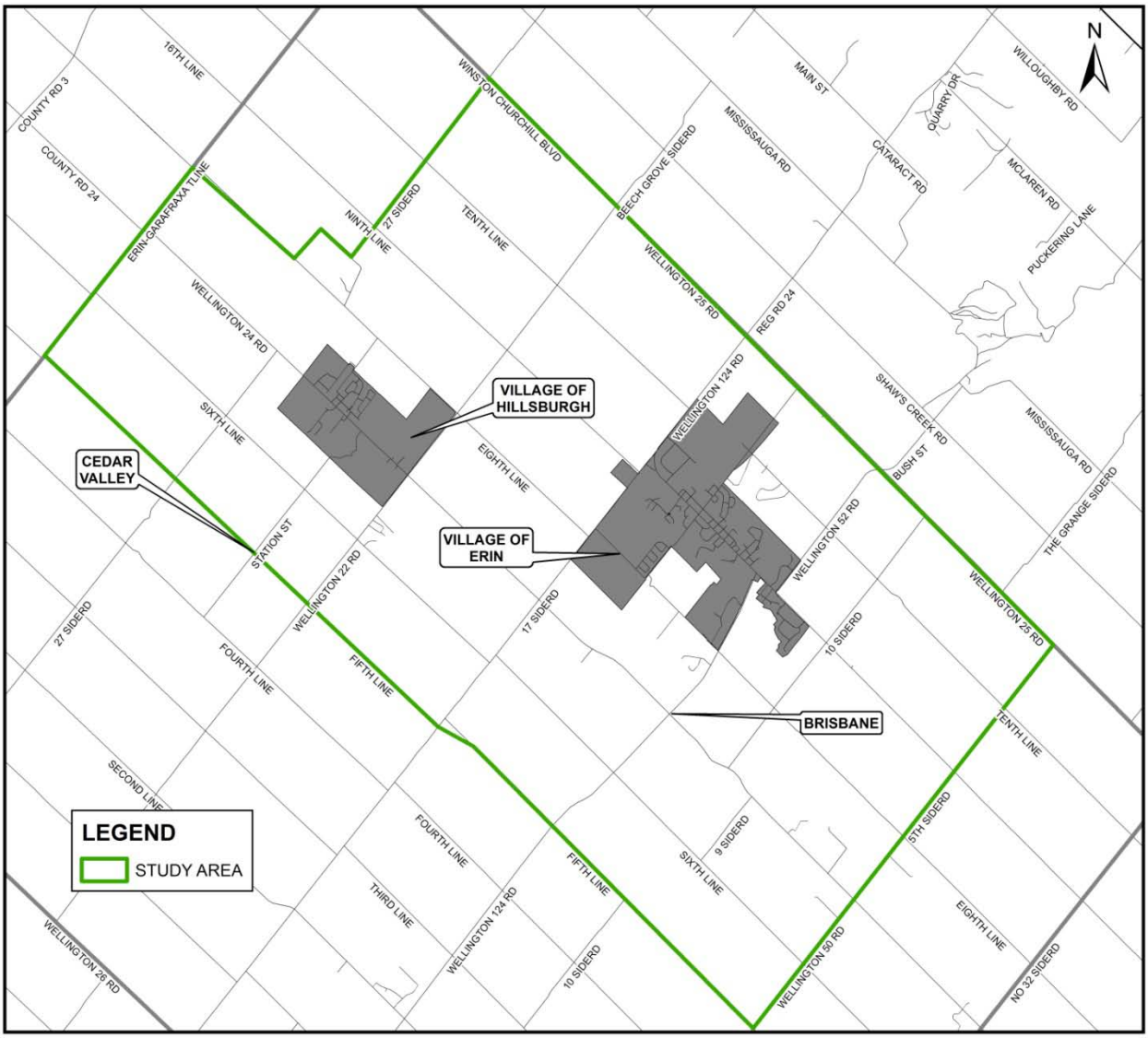
- Identification of the problem or opportunity.
- Collection, review and analysis of data.
- Communication with relevant government agencies, municipalities, the public and interested parties about the problem and possible solutions.
- Identification and evaluation of alternative solutions prior to determining the recommended solution.
- Identification of potential impacts and mitigation measures.
- Organization and participation in public information meetings for all interested groups.
- Definition of the preferred strategy in a Master Plan document.

1.3 Study Location and Service Area

The Town of Erin is a predominately rural municipality, located in southeastern Wellington County. The Town is bordered to the east by the Town of Caledon, the Town of Halton Hills to the south, Guelph and Guelph/Eramosa Township to the east, and the Township of East Garafraxa to the north. Located within the Town boundaries are the headwaters for the West Credit River, which drains into the Credit River; as well as the Speed and Eramosa Rivers, which are tributaries of the Grand River. Generally, the Town of Erin is characterized by scenic, rolling topography, interspersed by numerous wetlands and forest corridors.

The study area for the SSMP was set out in the TOR. It includes the villages of Erin and Hillsburgh, as well as a portion of the surrounding rural lands including the rural hamlets of Cedar Valley and Brisbane. **Figure 1-1** shows the study area. The inclusion of rural lands in the study area allows for the consideration of a number of broader issues, including relationships between adjacent land uses, groundwater and surface water resources, and other environmental features and functions. With a study area that includes a mix of urban and rural lands, the Master Plan affords the study the flexibility to consider a great number and range of servicing and settlement solutions.

Figure 1-1: Town of Erin Servicing and Settlement Master Plan (SSMP) Study Area



There are two urban centres in the Town: the villages of Erin and Hillsburgh. In addition to the two villages, there are six hamlets located within the Town: Ballinafad, Brisbane, Cedar Valley, Crewson's Corners, Orton and Ospringe. Approximately 11,000 residents live in the Town, with the majority of the population residing in the villages of Erin and Hillsburgh (Statistics Canada, 2012). In the villages, residents are serviced by separate, municipal groundwater systems for drinking water. Residents living outside the urban boundaries of Erin Village and Hillsburgh are serviced by private wells. Throughout the Town, most businesses and homes rely on individual, privately owned wastewater systems to treat sewage. In the downtown commercial core of the Village of Erin, many businesses are serviced by holding tanks (Town of Erin, 2010). A proprietary package plant formally provided service to Center 2000. It has since been replaced by a large scale communal type septic system.

The population of the Town of Erin is 11,104 persons (Wellington County, 2014). The growth rate in the Town of Erin is significantly lower than that of Wellington County, which is the result of a hold on development in the Town due to a lack of planned municipal services in the villages of Erin and Hillsburgh. Erin Village has a population of 3,087 with approximately 1,092 private dwellings. The population of Hillsburgh is 1,394 persons with approximately 472 private dwellings in the village. In both villages, the majority of residential dwellings are single-detached units.

1.4 Physiography

The Erin SSMP study area encompasses much of the West Credit River subwatershed. Areas of locally high elevation (approximately 500 m above sea level) are formed by the south, west and northwestern boundaries of the subwatershed. In the eastern portion of the subwatershed, northeast of Erin Village, the elevation drops to 365 m above sea level. The northern portion of the study area lies within the Orangeville Moraine, while the southernmost areas of the study area are characterized as part of the Paris Moraine. Generally, these physiographic regions are characterized by a hummocky landscape and being areas of significant groundwater recharge.

In the study area, groundwater generally flows from the northwest to the southeast. Groundwater also contributes significantly to baseflow in the West Credit River. Aside from maintaining baseflow, groundwater contributions are important for moderating water temperature and maintaining the general health of the river. Groundwater is also an important source of water in the study area for: municipal drinking water systems; private water wells; commercial water taking; aquaculture; agriculture; and industry, including use in the aggregate industry.

The West Credit River and its associated subwatershed drain a significant portion of the land within the Town of Erin and flows through the villages of Erin and Hillsburgh. Maximum streamflow in the West Credit River occurs between March and April, due to snowmelt and precipitation, while the lowest flows often occur during the summer months due to higher evapotranspiration and lower precipitation. However, storage in the hummocky terrain, wetlands and depressions throughout the subwatershed acts to moderate flows throughout the year. The West Credit River is also characterized by a number of dams and online ponds, which impact water quality and peak flows.

1.5 Credit Valley Conservation Existing Conditions Report

During Phase 1 of the SSMP process, Credit Valley Conservation (CVC), in partnership with Aquafor Beech Inc. and Blackport Hydrogeology Inc., investigated and evaluated the existing environmental conditions within the study area. The results are documented in the Erin Servicing and Settlement Master Plan Phase – Environmental Component – Existing Conditions Report, which is included as Appendix B to this report.

The report provides an understanding of key environmental features, limitations and sensitivities including:

- Hydrogeology;
- Hydrology and hydraulics;
- Natural heritage;
- Stream geomorphology;
- Benthic macroinvertebrates;
- Fisheries;
- Water and sediment chemistry;
- Septic system impact assessment

The West Credit River subwatershed, as found through the CVC study, includes numerous wetlands and depressional storage areas that are a significant influence on groundwater recharge and discharge in the area. These high recharge rates provide significant baseflow to the West Credit River through groundwater discharge. Additionally, the area also features a largely intact vegetated riparian zone, including wetlands, which have significant influence on flood attenuation, water quality, groundwater recharge and contributions to river baseflow.

Groundwater inputs into the West Credit River also strongly influence stream water quality. Generally, groundwater quality in the area is considered good, but shows some impacts from surface sources. In areas with higher aquifer vulnerability, such as the eastern and south portions of Erin Village and southern portion of Hillsburgh, the report found historical evidence of shallow groundwater contamination from urban and septic system sources. However, the municipal sources of groundwater (the bedrock aquifer) were found to be reasonable well protected by natural geologic conditions.

The study identified impacts from urban areas and septic systems in the West Credit River and tributaries in the study area. In Erin Village and Hillsburgh, the influence of roads, septic systems and urban land uses are apparent through increased concentrations of phosphorus, bacteria and nitrate, in comparison to rural areas. Downstream of Hillsburgh, water quality improved due to significant groundwater discharge into the West Credit River.

Similarly, urban impacts were found to influence fish health in the study area, specifically that of brook trout. Upstream of Erin Village, where water temperature was warmer due to wetlands and online ponds, fish health was found to be poor. In the Erin Village, urban runoff and water quality also negatively impacted fish health. Downstream of the Erin Village, improved fish health was linked to groundwater inputs.

Overall, the study found that the West Credit River subwatershed is relatively healthy and productive; however, there are some signs of impacts from septic systems, urbanization and agriculture.

2.0 Review of Development Status

2.1 General

The Town of Erin Servicing and Settlement Master Plan have been initiated to address servicing, planning and environmental issues in the community in a comprehensive and environmentally-minded manner. The Master Plan will identify servicing and planning strategies for the Town to meet expected needs over the next 25 years.

The following section of the report summarizes the nature of development and population growth in the Town of Erin. This section also summarizes policies impacting development, and identifies areas of future development and servicing. Much of this information is contained in the Background Report (included as Appendix A).

2.2 Existing Development

2.2.1 Existing Development Patterns

The Town of Erin is located in southeastern Wellington County, approximately 30 kilometers northeast of Guelph and 70 km northwest of Toronto. The Town, with a population of 11,104, was formed by the amalgamation of the former Village of Erin and Township of Erin. There are two major urban centres within the Town, Erin Village and Hillsburgh, and a number of small hamlets. The remainder of the Town is characterized by agricultural land and natural heritage areas.

The study area of the SSMP generally encompasses the lands between the Erin-Garafraxa Line, Wellington Road 50, the Fifth Line and Winston Churchill Boulevard. As such, the study area includes the Erin Village and Hillsburgh, the hamlets of Brisbane and Cedar Valley, as well as a portion of the rural land within the Town. Major land uses in the study area include: residential, commercial, industrial, institutional, and agricultural. The spatial distribution of land uses within the study area, current to 2009, is shown in **Figure 2-1**.

2.2.2 Residential

Residential development in the Town of Erin has primarily occurred within Erin Village and Hillsburgh, with limited development occurring in the hamlets and on rural properties. Development in the villages is predominately in the form of single, detached units. In Erin Village, the largest urban settlement, Statistics Canada reports a total of 1,092 private dwellings (Statistics Canada, 2012). **Table 2-1** summarizes the types and amounts of residences present in Erin Village, as reported in the 2011 census. It should be noted that the census counts by residential type are not in agreement with the reported total number of private dwellings. The majority of residences in the village are single-detached units (Statistics Canada, 2012), with a small number of semi-detached units and duplexes. Currently, there are two three-story apartment buildings within the village. Additionally, there are approximately 90 trailers, predominately located in the Stanley Park. There are no townhouses located in the village.

Figure 2-1: Land Uses in the Town of Erin SSMP Study Area

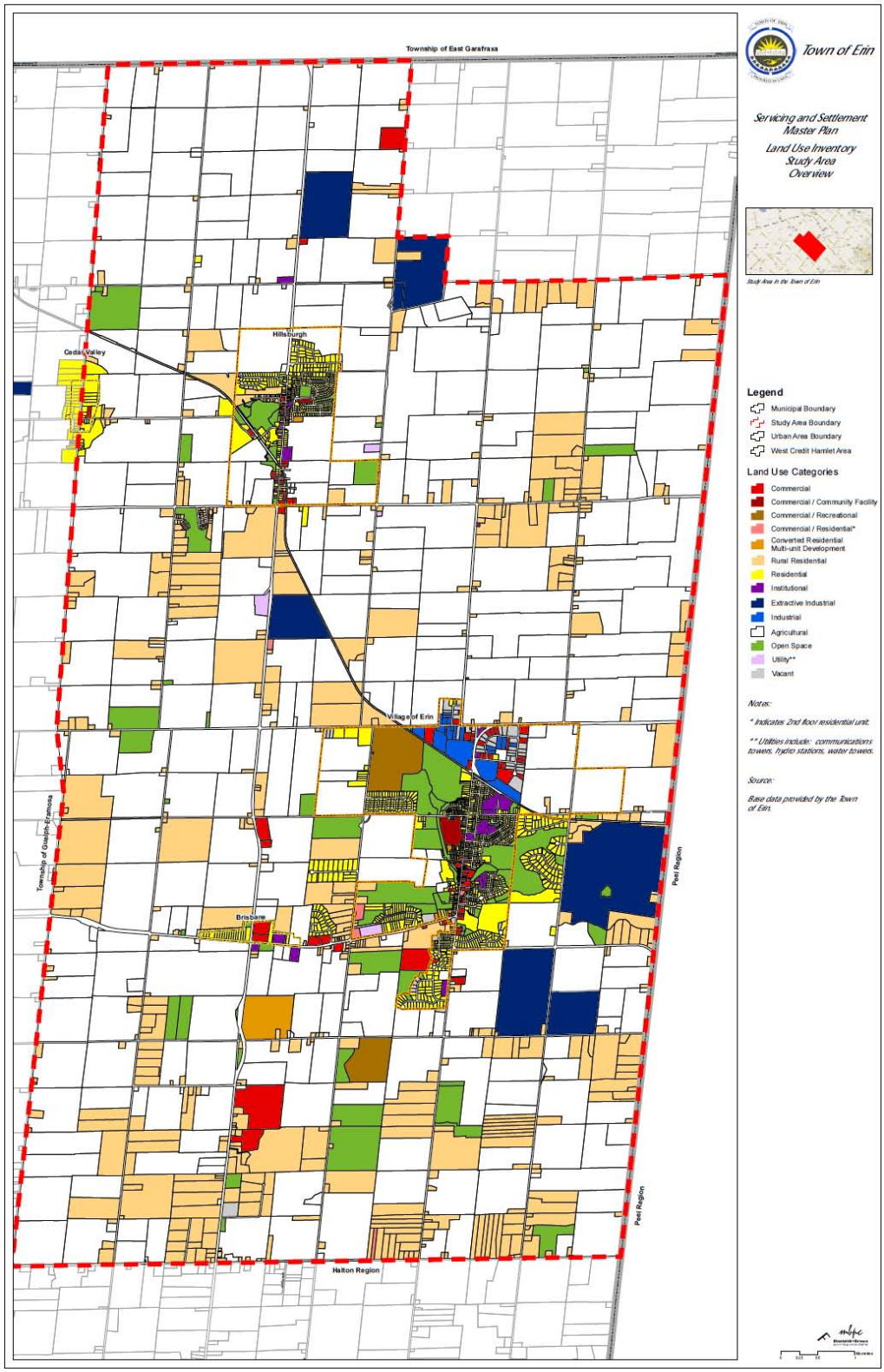


Table 2-1: Residential Types in Erin Village and Hillsburgh

Residential Type	Erin Village	Hillsburgh
Single-detached	815	330
Semi-detached	10	20
Row House	0	5
Duplex	5	0
Apartment	65	25
Other	100	55

In Erin Village, much of the existing residential development is located off Main Street. Existing types of residences found in the village include century homes, bungalows, side-splits, trailers and large modern homes. There are a limited number of single-story duplexes found in the area of Carberry Street. Recent residential developments have occurred primarily south of Wellington Road 24. Much of the recent development in and near the Erin Village is characterized as large estate-type residences on large lots.

Hillsburgh is the second most populous urban centre in the Town of Erin. There are a total of 472 total private dwellings in the community, with a majority of these being single, detached units (Statistics Canada, 2012 and Wellington County, 2014). In Hillsburgh, there is one, two-story apartment building. The majority of development within Hillsburgh has historically occurred west of Main Street, however recent developments can be found east of Main Street. Similar to recent developments in Erin Village, new development in Hillsburgh has been large homes on large lots.

Recent census data also shows that the average value of a dwelling within the Town of Erin has increased significantly. In 2011 the average value of a dwelling was $517,881 compared to the 2001 average value of $276,060 (Statistics Canada, 2007)(Wellington County, 2014). The observed increase in house values in the Town exceeded those of the County, Province and other nearby communities. The increase is a result of a general overall trend, but may also be influenced by the construction of a few, highly valued horse farms in the Town.

2.2.3 Commercial

Most commercial development in the Town of Erin is located along the Main Streets of Erin Village and Hillsburgh. Commercial development in Erin Village includes, but is not limited to: banks, a grocery store, specialty shops, restaurants, professional offices, auto repair services and a building supply store. Generally, the commercial buildings are well maintained and create a vibrant and attractive streetscape that draws residents and tourists to the core. The commercial core of Erin Village recently lost a dairy processing operation (Steen's Dairy), which moved to Guelph as a result of a lack of available space and municipal water and wastewater systems.

Similar to Erin Village, the commercial core of Hillsburgh is found on Main Street with the highest concentration of commercial uses between Church and Mill Streets. Commercial businesses found in Hillsburgh include, but are not limited to: a bakery, grocery store, hair salon, bank and

professional offices. As of 2012, there are three vacant commercial spaces between Mill and Church Street. The commercial core of the village is interspersed with residential development, creating a fragmented core.

2.2.4 Industrial

Industrial development within the SSMP study area is primarily found north of the Cataract Trail in Erin Village. Industrial activities include manufacturing, distribution and storage facilities. The largest manufactures are Guardian Industrial, which manufactures customized industrial supplies and Central Wire, maker of wire, fasteners, springs and belts. Within both Hillsburgh and Erin Village there are vacant lots of sufficient size for new industrial developments or expansions.

Outside of the urban areas, the extraction of aggregates is an important industry in the Town. Within the SSMP study area, there are five aggregate operations. The extraction of sand and gravel aggregates is a significant component of the local economy. The Town of Erin Official Plan states that aggregate resources will continue to be mined and made available to meet the needs of consumers, however, mined in such a way to minimize disturbances to the community and the natural environment.

2.2.5 Institutional

Institutional land uses within the SSMP study area are primarily found within the urban boundaries of Erin Village and Hillsburgh. The largest institutional land use is the Erin Community Centre/Centre 2000, which is a multi-purpose building that includes: Erin District High School, an arena, nursery school, theatre, cinema and library. In Hillsburgh, existing institutions include an elementary school, churches, library, rest home, community centre and arena.

2.2.6 Agricultural

A large portion of the SSMP study area includes rural lands, predominately used for agricultural purposes. Agricultural land in the Town of Erin is generally classified as either prime or secondary land. Under the Greenbelt Plan (see Section 2.4), some areas of agricultural land within the study area have been designated as protected countryside, promoting continued agricultural use.

2.3 Population and Service Areas

2.3.1 Existing Population

In 2011, the population of the Town of Erin was 11,104 persons, amounting to a 0.4% decrease in population from 2006. The population of Erin Village increased by 9.0% from 2,831 in 2006 to 3,087 in 2011. In Hillsburgh, the 2011 population was 1,394, an increase of 238 persons from the 2006 population.

The majority of the population of the Town and the two villages fall between the ages of 40-59 and 10-19. These age groups, generally older professionals and their children, are the age groups that are growing in terms of their proportion of total population. In recent years, there has been negative growth in the 0-10 and 25-29 age groups, typically considered young professionals and their children. The negative growth suggests young adults are leaving the Town and not returning,

which may be due to the high value housing. Growth in the senior population is also very low, much lower than what is commonly observed throughout Ontario. This suggests that seniors may be relocating from the Town of Erin upon retirement.

2.3.2 Existing Service Areas

There are two municipal service areas within the SSMP study area: Hillsburgh and Erin Village. In both communities, the municipality provides residents with communal water supply. Presently, there are no municipal wastewater services available in the Town.

In Erin Village, the municipality supplies communal water to a service population of 2,500, with 849 connections. The community is serviced by two wells (Well No. E7 and E8) and a distribution system consisting of 24.9 km of watermain, ranging in size from 50 mm to 250 mm. The extent of the municipal water system in Erin Village is shown in **Figure 2-2**. The service area extends outside of the northern and southern urban boundaries of the village, with the potential for servicing a number of large, undeveloped lots. Within the urban boundary, there are a number of unserviced lots, mostly in the northern portion of the village.

The Hillsburgh water supply system consists of 224 connections. Water is provided by two wells (H3, H2) and distributed by approximately 6.7 km of watermain, sized from 150 mm to 250 mm. The extent of the water supply system is shown in **Figure 2-3**. Within the urban boundary, a significant number of parcels are not serviced, primarily along the Main Street. There are also a number of properties with access to municipal water that have not connected.

2.4 Development Policies

Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe came into effect on June 16, 2006 and was amended in January of 2012. The plan guides urban growth in the Greater Golden Horseshoe region, with the aim to build compact and complete communities while protecting and preserving land and water resources. Within urban and rural areas of Greater Golden Horseshoe, the plan defines Settlement Areas where future, long-term development will be concentrated. Settlement Areas also include lands identified as Designated Greenfield (areas not currently developed), Built-Up Areas (areas already developed), and Intensification Areas (areas where growth will be focused).

Figure 2-2 : Extent of water servicing in Erin Village

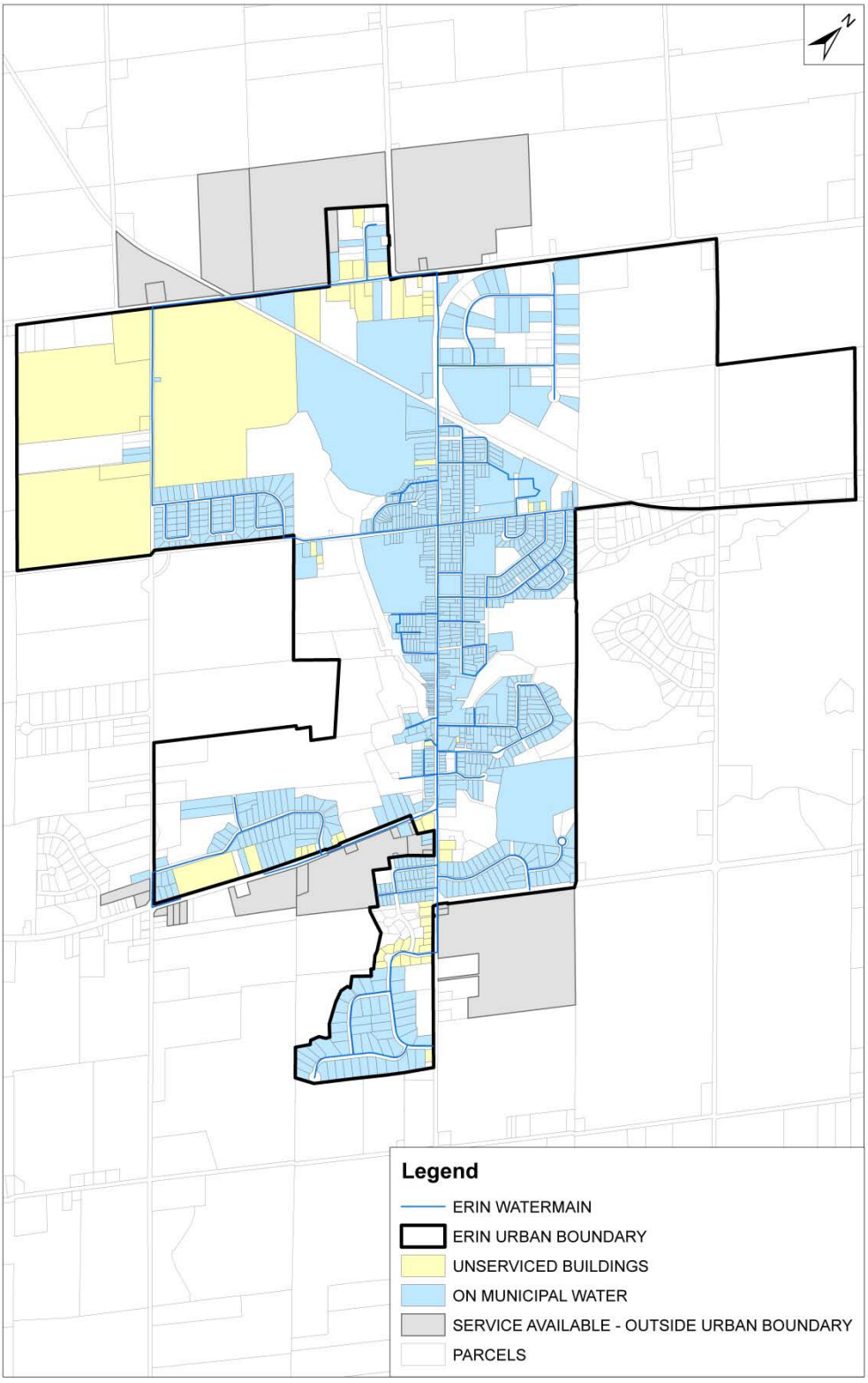
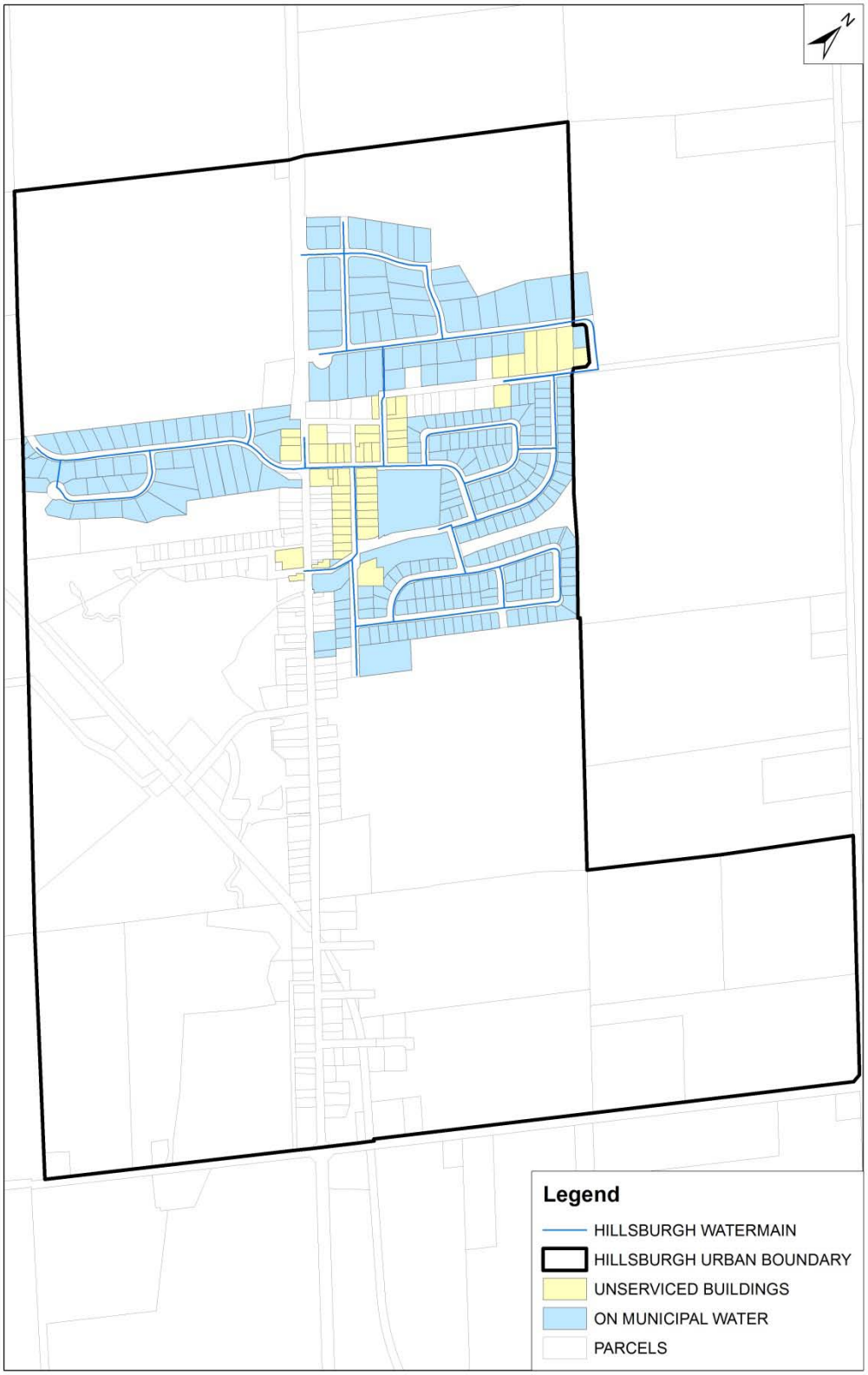


Figure 2-3 : Extent of Hillsburgh Water System



The Plan provides population and growth forecasts for the major areas included in the Plan, including Wellington County. The Plan directs growth to Settlement Areas and Intensification Areas through the development of mixed-use, transit-supportive, and pedestrian friendly urban areas. Additionally, the Plan stipulates that 40% of all residential development will occur within a municipality's built up area and that municipalities will develop and implement policies to meet intensification targets. The population and employment forecast for Wellington County is shown in **Table 2-2**.

Table 2-2 : Growth Plan Population Forecast to 2041 for Wellington County

	Population			Employment		
	2031	2036	2041	2031	2036	2041
Wellington County	122,000	126,000	130,000	54,000	54,000	56,000

Greenbelt Plan

The Greenbelt Plan, which came into effect on December 16, 2004, serves to protect agricultural land uses within the Greater Golden Horseshoe. Similar to the Growth Plan for the Greater Golden Horseshoe, local planning authorities and their policies are required to confirm to policies of the Greenbelt Plan.

The purpose of the Greenbelt Plan is to protect against the loss and fragmentation of agricultural land by identifying where building should not occur. The Plan also limits permitted uses and land use designations within the area identified as the Greenbelt. Under the Greenbelt Plan, the villages of Erin and Hillsburgh are identified as Towns/Villages contained within a Settlement Area. Development is permitted to occur within the Settlement Area and restricted in the Greenbelt. Expansions to Settlement Areas may occur following an extensive review.

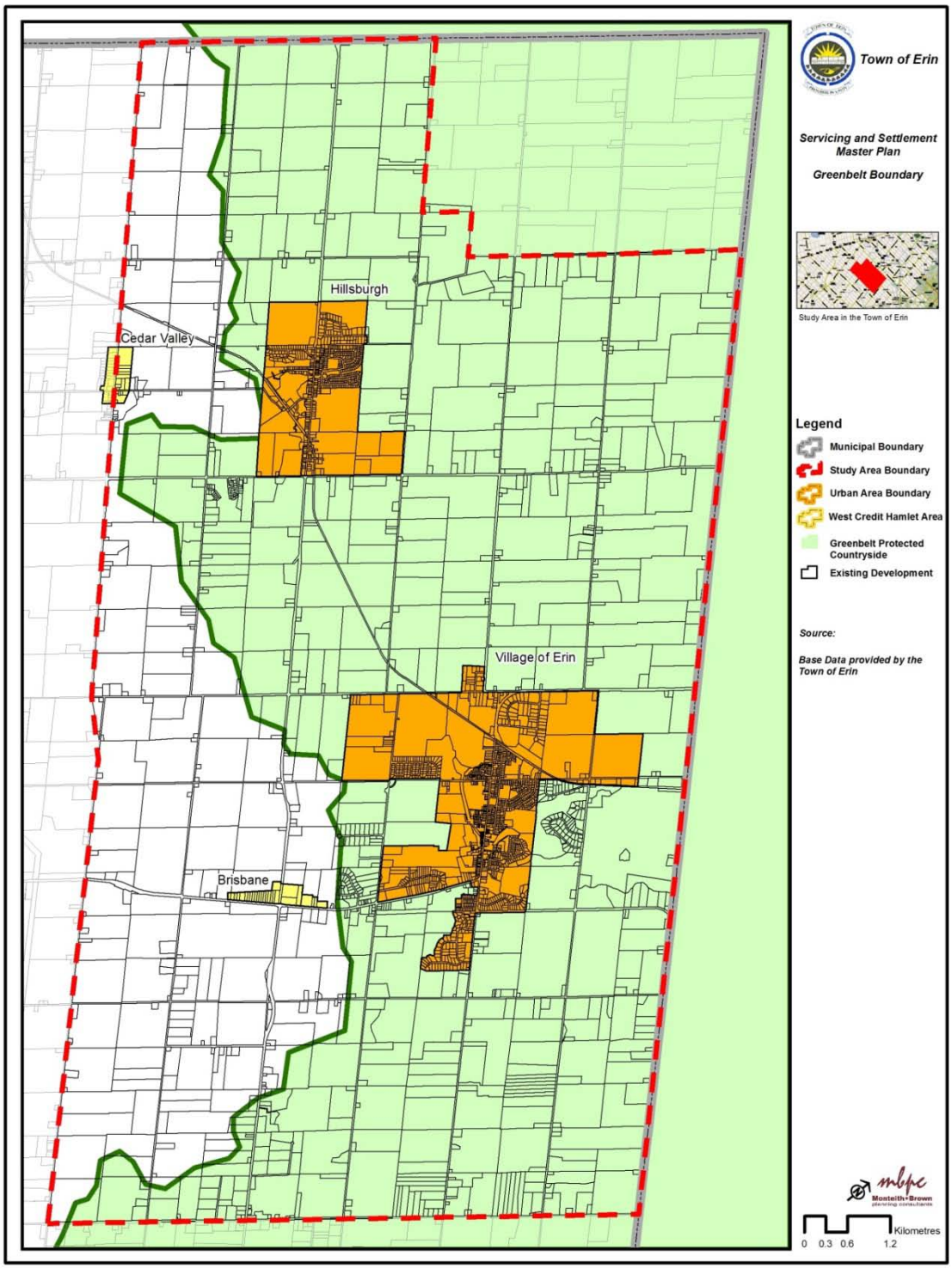
A large portion of the SSMP study area is occupied by the Greenbelt, as shown in **Figure 2-4**.

Wellington County Official Plan

The Wellington County Official Plan outlines land use and planning decisions in Wellington County. Generally, the Plan provides policy direction on matters pertaining to: servicing requirements, greenlands, and agricultural and aggregate resources. The Official Plan directs growth within the County to urban centres offering municipal services and states that full municipal water and wastewater services are preferred within urban centres. Additionally, the Plan promotes the construction or expansion of municipal services in an efficient manner to ensure that intensification and density targets are met.

Core Greenlands and Greenlands are recognized in the Plan with the intent of recognizing these lands as important for environmental and public health. Additionally, the Plan protects agricultural lands and mineral aggregate areas.

Figure 2-4: Greenbelt Boundary



Population and employment forecasts were developed for Wellington County under the Growth Plan for the Greater Golden Horseshoe. From these forecasts the County developed growth forecasts, including targets of 20% intensification by 2015 and Greenfield densities of 40 persons and jobs per hectare, for each lower-tier municipality. It is expected that population growth will occur based on the availability of municipal services and will allow communities to retain their small-town nature. The growth targets are expected to be met through higher density Greenfield development and intensification within urban centres.

Official Plan Amendment No. 65 (OPA 65) established built-boundaries for Erin Village and Hillsburgh (shown in **Figure 2-5** and **Figure 2-6**) as well as growth targets for the Town and the villages. In September 2013 Official Plan Amendment Number 81 (OPA 81) was adopted by Council, which provided significant changes as part of a 5-year review of the Official Plan.

Town of Erin Official Plan

The Official Plan of the Town of Erin contains goals, objectives and policies relating to land use and development within the Town. Most recently updated in 2012, the Official Plan promotes intensification as required by the Growth Plan for the Greater Golden Horseshoe. Section 2.2 of the Plan provides a vision for future residential development within the Town:

- That low density residential development, consisting of primarily single-detached dwellings, will continue to be the predominant form of housing given the lack of municipal sewers, but a variety of housing types will be encouraged;
- That new development will be provided for primarily by the expansion of existing settlement area of Erin and Hillsburgh. Limited expansion of other hamlet areas will also be considered where appropriate; and
- That urban design standards which retain the tradition small town character of the Town's urban centres be applied while envisioning their development as the focal point commercial, cultural and economic development activities.

Additionally, the Plan promotes a wide range of housing types to meet future need, including affordable housing. A minimum 10-year supply of land to accommodate residential growth through intensification and redevelopment is required by the Plan, as well as sufficient land with servicing capacity to provide at least a 3-year supply of residential units on suitably zoned lands to facilitate intensification and redevelopment.

In keeping with the County's Official Plan, the Official Plan of the Town of Erin requires that by the year 2015, a minimum of 20% of all residential development is targeted within the Town's defined built-up area. Developments in greenfield areas are to have a density of 40 persons and jobs per hectare with new subdivisions striving for a density of 16 units per hectare.

Figure 2-5 : Built Boundaries of Erin Village

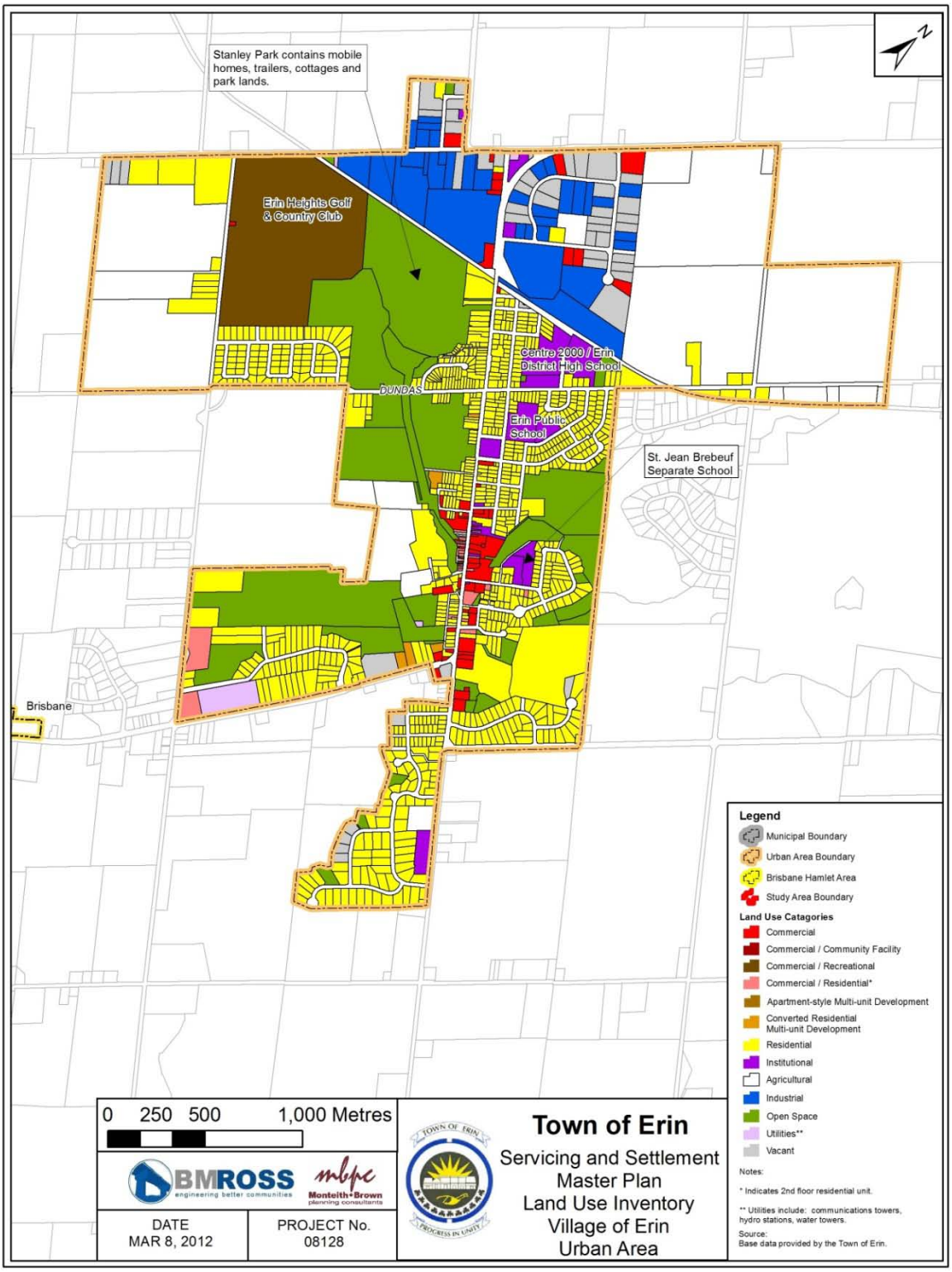
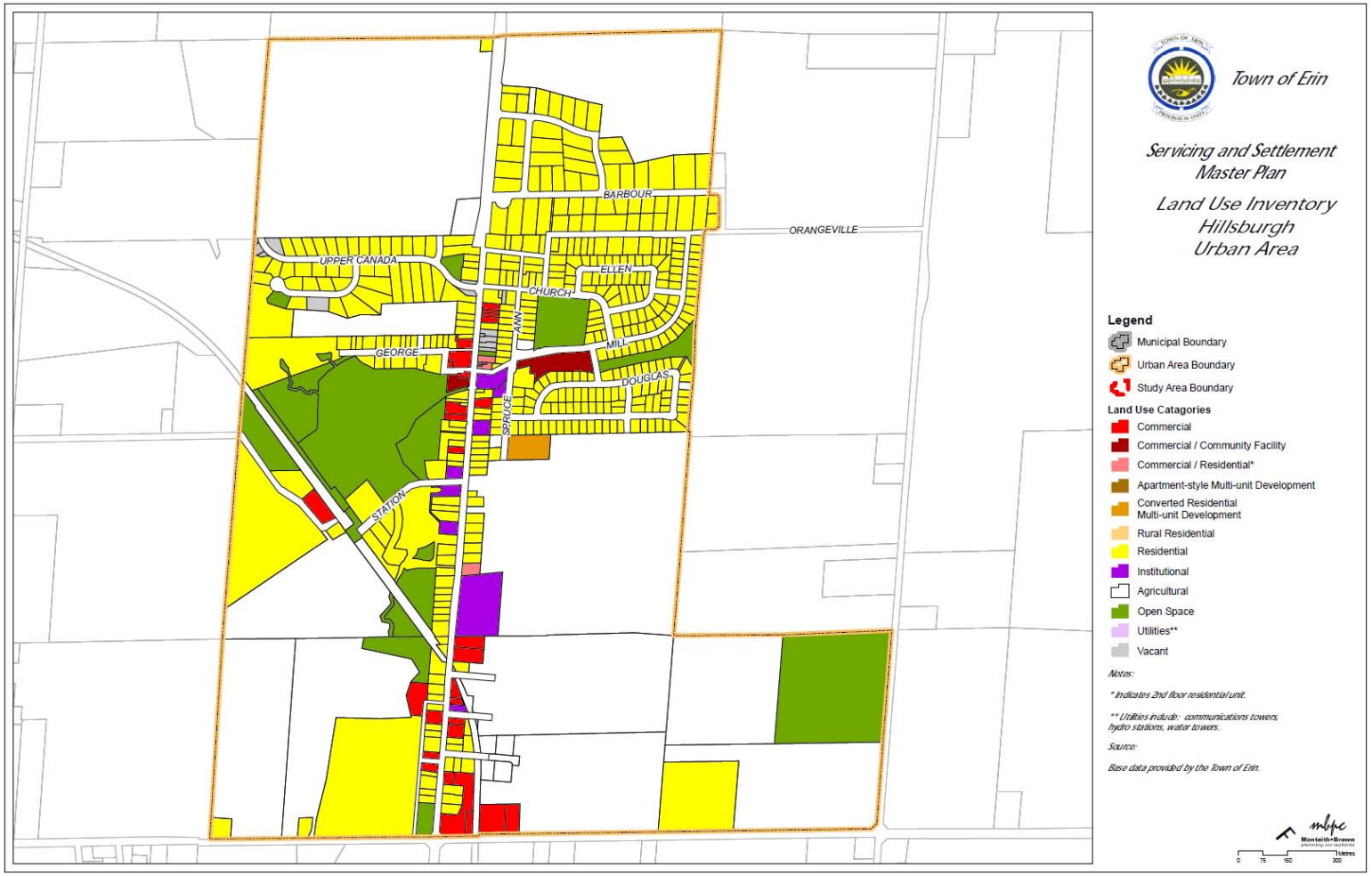


Figure 2-6 : Built Boundaries of Hillsburgh



The Official Plan also outlines policies related to municipal services. The objectives for providing municipal services are found in Section 3.6.2 of the Plan:

- *"To ensure that all development in the Town has access to a full range of available municipal services;*
- *To ensure that the necessary expansions to municipal services are anticipated and planned for in a fiscally efficient manner;*
- *To, where possible, provide available municipal services to areas where servicing problems have been identified;*
- *To develop a safe and efficient transportation system to serve residents and businesses in a manner which minimizes environmental impacts associated with new development; and*
- *To ensure that any expansion or reconstruction of municipal services is undertaken in a manner which reduces the environmental impacts associated with the provision of those services to improve and enhance environmental conditions."*

It is a goal of the Town to provide a full range of services for development and redevelopment; however, the Plan recognizes that at present all sewage treatment in the town is provided by individual private systems.

Section 3.6.6 –Urban Areas – Special Policy - of the Official Plan requires that a Servicing and Settlement Master Plan (SSMP) be completed to assess, in a comprehensive manner, the urban areas capacity to accommodate growth from an environmental servicing perspective. The SSMP must be completed and approved before any major development is permitted.

2.5 Potential Population Growth

2.5.1 Background

The Town of Erin has experienced only slight growth in population over the last 10 years. During this period, the population has increased a total of 52 persons or at an average annual rate of 0.04%. However, the most recent census data shows that in the last 5 years between censuses the population of the Town declined by 44 persons. In Erin Village, there was a similar trend observed in the population data from the past 10 years. Overall, there has been only slight growth in the village, amounting to a total increase of 197 people or an average annual increase of 0.66%. Over the past 10 years in Hillsburgh the population has increased by 196 persons. The average annual increase in population in Hillsburgh is 1.53%. The growth observed in the Town is significantly lower than that observed on average in Wellington County and Ontario as a whole. It is suspected that the lack of full municipal services in the villages may be contributing factor to the low rates of development and growth.

2.5.2 Population Projections

Wellington County Official Plan

Population and employment forecasts were developed by Wellington County for its lower tier municipalities under the Growth Plan for the Greater Golden Horseshoe. The forecasts identify growth based on the requirements of the Growth Plan, including increased intensification and new developments with densities of 40 persons and jobs per hectare. These forecasts assume development on full municipal services.

The growth forecasts developed for the Town, Erin Village and Hillsburgh, are shown in **Table 2-3**. The forecasts take into account numerous factors including: market forces, available land, servicing and planning policies. For the two communities, the expected total growth over the next 25 years is an additional 2,200 persons. The forecasted increase in the number of dwellings amounts to an additional 780 units.

Table 2-3 : Town of Erin, Erin Village and Hillsburgh Population Forecasts

	2006	2011	2016	2021	2026	2031
Town of Erin						
Total Population	11,680	11,930	12,490	13,510	14,530	15,530
Households	3,810	3,960	4,160	4,510	4,850	5,180
Total Employment	3,550	3,590	3,780	4,600	5,020	5,460
Erin Village						
Total Population	3,020	3,000	3,100	3,540	3,980	4,400
Households	1,030	1,050	1,090	1,240	1,390	1,530
Hillsburgh						
Total Population	1,240	1,280	1,380	1,610	1,850	2,080
Households	410	430	460	540	610	690

2014 Development Charges Background Study

In June 2014, Watson and Associates Economists Limited prepared population and building forecasts for the 2014 Development Charges Background Study. For the purposes of the Development Charges Background Study, residential and non-residential development in the Town was forecast over 10 years and to buildout, based on the Assimilative Capacity Study completed for the SSMP. The forecast predicts the population of the Town will grow to 12,920 persons in 2024 and to 14,080 persons by buildout (based on the Assimilative Capacity Study completed for the SSMP). This amounts to a total increase of 1,200 and 2,360 persons over the 10-year and buildout forecast periods, respectively. Over the 20 year forecast period, the average densities per unit used were calculated for low, medium and high density dwellings at 3.24 persons per unit (ppu), 2.52 ppu and 1.77 ppu, respectively.

Growth in the number of dwellings in the villages and rural area of the Town was also forecasted. The 20-year forecast assumed growth occurring as a mix of low, medium and high density units (see **Table 2-4**). It was assumed that 92% of residential growth in the Town will occur in the form of low density units (single detached and semis), 4% as medium density units (multiples excluding apartments) and 4% as high density units (apartments). In Erin Village, the anticipated growth is an average of 18 units per year, or 29% of the estimated housing demand. Similar growth is expected in Hillsburgh, with an average of 14 units per year or 29% of the forecasted residential demand. For both villages, the existing servicing constraints were identified as having an impact on growth between 2009 and 2015. After 2015, it was assumed that development would occur on full services.

A greater amount of residential development, approximately 42%, was predicted to occur in the rural areas of the Town. The development charges forecast estimated an average increase of 24 units per year. Non-residential growth in the Town was also forecasted and is shown in **Table 2-5**.

Table 2-4 : Forecast of Residential Growth from the 2014 Development Charges Background Study

	Timing	Low Density	Medium Density	High Density	Total Residential Units	Population in New Units
Erin Village	2014 - 2024	63	16	16	95	52
	2014 - Buildout	166	42	42	250	102
Hillsburgh	2014 - 2024	95	-	-	95	24
	2014 - Buildout	250	-	-	250	47
Rural	2014 - 2024	250	-	-	250	118
	2014 - Buildout	375	-	-	375	236
Town of Erin	2014 - 2024	409	16	16	441	194
	2014 - Buildout	791	42	42	875	385

Table 2-5 : Forecasted Non-Residential Growth from the 2014 Development Charges Background Report

	Timing	Industrial (SQF)	Commercial (SQF)	Institutional (SQF)	Total (SQF)
Erin Village	2014 - 2024	76,900	70,200	15,200	162,300
	2014 - Buildout	209,500	134,400	45,900	389,800
Hillsburgh	2014 - 2024	18,000	16,500	11,400	45,900
	2014 - Buildout	49,200	31,500	34,600	115,300
Rural	2014 - 2024	-	-	-	-
	2014 - Buildout	-	-	-	-
Town of Erin	2014 - 2024	94,900	86,700	26,600	208,200
	2014 - Buildout	258,700	165,900	80,500	505,100

2.6 Areas of Future Development and Servicing

2.6.1 Future Development Potential

Potential future developments within the Town of Erin are subject to planning policies outlined in the Growth Plan for the Greater Golden Horseshoe, the Greenbelt Plan, and the Town of Erin Official Plan. Generally, these documents detail where development should occur and the types of development preferred. The Growth Plan for the Greater Golden Horseshoe specifies that growth should occur within identified settlement areas (such as Erin Village and Hillsburgh), whether through new development in Greenfield Areas, or intensification. New developments in Greenfield Areas are to be designed and planned as complete communities, with a diverse mix of land-uses, and a density of 40 residents and jobs per hectare. The Growth Plan also specifies that an expansion of a settlement area boundary may only occur after a comprehensive municipal review, which demonstrates that there are insufficient opportunities for growth within the existing settlement area.

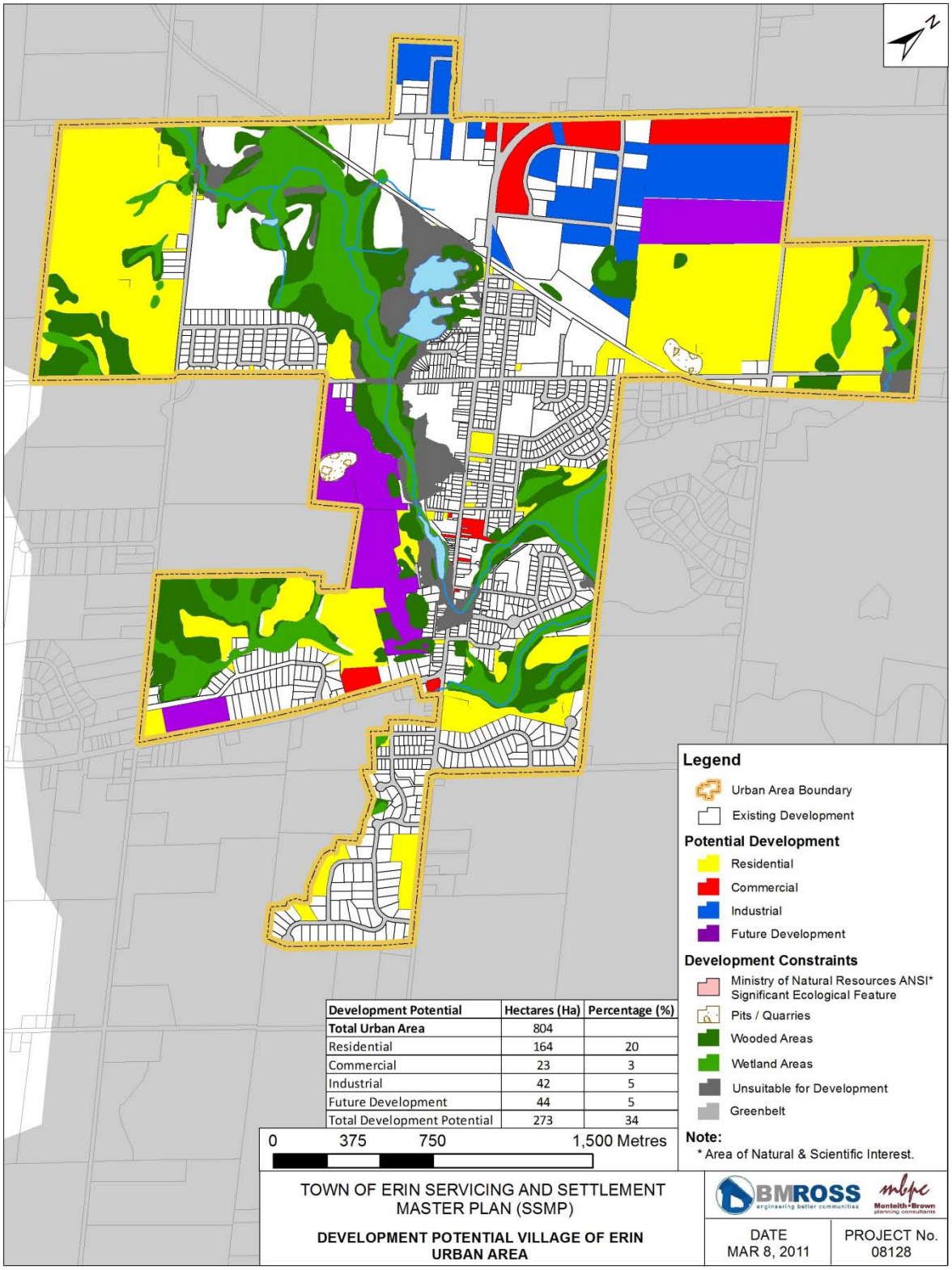
Where the Growth Plan identifies where development should occur, the Greenbelt Plan identifies the areas where development should not occur. Lands identified in the Greenbelt Plan are protected for primarily agriculture uses, and include a significant portion of the SSMP study area. The lands surrounding the two villages are designated as protected by the Greenbelt Plan, and as such, any expansions of the urban boundaries require review under the Plan.

The Town of Erin Official Plan and Comprehensive Zoning Bylaw identify lands zoned for future residential, commercial and industrial development. To determine the amount of land currently available and suitable for development in Erin Village and Hillsburgh, available lands and constraints, such as wetlands, flood plains, and other lands generally unsuitable for development, were identified in Phase 1 of the SSMP.

Within Erin Village, currently 273 hectares in the village are vacant and available for development (see **Figure 2-7**). This amounts to approximately 34% of the total land base. Of that, 164 hectares are identified for residential development. The majority of the available residential land is found in the eastern and western edges of the village, north of Dundas Street. There is approximately 23 hectares of vacant commercial land in the village, located primarily in the core and along the north urban boundary. Also in the northern portion of the village, there are 42 hectares of potential industrial land. There are also 44 hectares, spread throughout the village, that are zoned for future development.

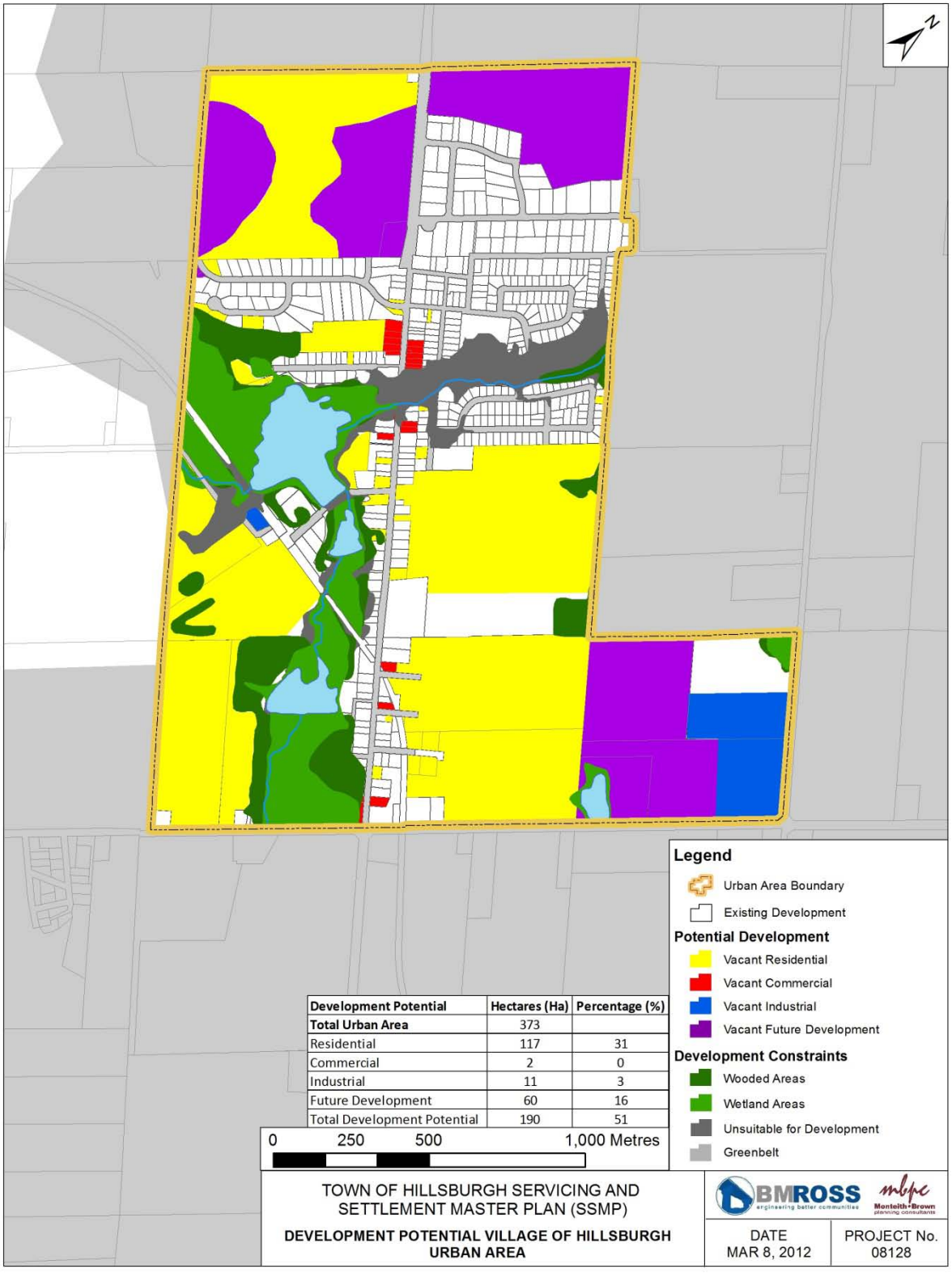
In the urban boundary of Hillsburgh, there are approximately 190 hectares suitable for development (see **Figure 2-8**). Similar to Erin Village, the majority of potentially developable land is zoned for residential. Presently, there are 117 hectares of future residential land in Hillsburgh, primarily in the southern half of the village. There is limited land available for future commercial development (2 ha) and industrial development (11 ha). There is also 60 hectares of land designated for general future development. The majority of land available for development is situated towards the edges of the urban boundary.

Figure 2-7: Potential Developable Lands in Erin Village



Development Potential	Hectares (Ha)	Percentage (%)
Total Urban Area	804	
Residential	164	20
Commercial	23	3
Industrial	42	5
Future Development	44	5
Total Development Potential	273	34

Figure 2-8 : Potential Developable Land in Hillsburgh



Development Potential	Hectares (Ha)	Percentage (%)
Total Urban Area	373	
Residential	117	31
Commercial	2	0
Industrial	11	3
Future Development	60	16
Total Development Potential	190	51

Development in the Town has been suspended in recent years pending the completion of the SSMP. However, there are a number of approved and proposed plans of subdivisions that have been submitted to Council. These are summarized in **Table 2-6.**

Table 2-6 : Approved and Proposed Plans of Subdivision in the Town of Erin

Development	Number of Units/Lots	Additional Details
Solmar	1239.5 units	-Mixed use development in Erin Village -Submitted to Council December 2012
Tavares/Dominion Meats	79 units	-Original submission included 79 single, detached units with municipal water service and private septic systems
Carson-Reid	25 lots	Approved by Council in 1989

2.6.2 Future Servicing Areas

There are a number of hamlets and areas of development located outside of the urban boundaries of Erin Village and Hillsburgh. However, given the large amounts of vacant developable land in Erin Village (273 ha) and Hillsburgh (190 ha), there is no need over the 25 year planning horizon for additional service areas. Furthermore, current planning policies direct future development to the existing urban centres and limit development outside of those areas.

There are two hamlets, Cedar Valley and Brisbane, located outside the urban boundaries of the two villages and beyond the Protected Countryside of the Greenbelt Plan. There are also some built up areas outside the village boundaries, but within the Protected Countryside. Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.

3.0 Consultation

3.1 Purpose

Consultation and feedback is a key component of the SSMP. Throughout the SSMP process, input was solicited from the public, review agencies and other interested stakeholders. During the first phase of the SSMP process, public consultation was integral to determining the current role and function of the Town, as well as the values and perceptions of the community. The second phase of the SSMP involved significant consultation with public meetings, Council workshops and presentations, and continued meetings of the Liaison Committee and Core Management Team. **Figure 3-1:** Consultation Activities of the SSMP highlights the consultation undertaken during the SSMP process. The consultation efforts of Phases 1 and 2 of the SSMP process are summarized in the following sections. Appendix C contains correspondence, notes and materials from the Liaison Committee and Core Management Team meetings, Council workshops and public meetings.

Figure 3-1: Consultation Activities of the SSMP

3.2 Community Form and Function Workshops

Four Community Form and Function Workshops were held during the first phase of the SSMP. The purpose of these workshops was to identify what features and characteristics are valued within the Town and what is considered missing or desired in the future. These workshops were held with three different community groups, as well as the public (see **Table 3-1**). At each workshop, participants completed a Strengths, Weaknesses, Opportunities and Threats (SWOT) exercise. The

SWOT exercises were used to develop an understanding of the values, perceptions and characteristics of the community, from the community.

Table 3-1: Community Form and Function Workshops

Workshop	Date	Location
Council and Town Staff	May 4, 2009	Town of Erin Municipal Office
Public	May 4, 2009	Centre 2000
Erin Village BIA	October 13, 2009	Tintagels Tea Room
Brampton Real Estate Board	October 13, 2009	Centre 2000

The SWOT workshops generated a large listing of characteristics, features, values and perceptions of the Town by its residents. The data from the workshops is included in Appendix C of this report and detailed descriptions of each workshop are part of the Background Report (included as Appendix A). The qualities and values brought forward by participants at the SWOT workshops describe the current and future role, form and function of the Town from a number of perspectives. The information from the workshops formed the basis of the vision statement.

3.3 Newsletter

In the Fall of 2010, a 'Defining Erin' newsletter was published. The newsletter was mailed to all properties owners within the Town of the Erin. Additional copies were made available at the Town of Erin Municipal Office. The newsletter provided an overview of the SSMP and the progress made to that point, including: a summary of the Master Plan process; a map of the study area; a summary of community input; the vision statement; and information on the Liaison Committee. A copy of the newsletter can be found in Appendix C of this report.

3.4 Website

A website for the SSMP was also used to disseminate information and receive feedback. The website, titled 'Defining Erin – Our Idea. Our Vision. Our Community' (www.erin.ca/definingerin) provided information about the SSMP, as well as access to the presentations and meeting notes from the Liaison Committee and public meetings. The website also included a feedback form, allowing residents to provide comments or ask questions about the SSMP. Approximately 75 feedback forms were received.

3.5 Liaison Committee

The Liaison Committee represented public and various interest groups, and was formed to provide input and direction on the SSMP process. Committee members were appointed by the Town at the beginning of the SSMP process. The Committee consisted of 18 members, and included representation from: Town Council and staff; environmental, heritage, economic development, community services and business committees and groups; the development industry; local community groups; and members of the public.

The Liaison Committee met regularly through the SSMP process and was actively involved in the progression of the study. Members of the Committee were encouraged to bring forward questions,

concerns and opinions and share information with the public. The Committee was also responsible for the Vision Statement used to guide the SSMP process.

At the outset of the SSMP process, twelve meetings were planned. An additional three meetings, following the direction of Town Council, were held. Additionally, on November 26, 2013 Town of Erin Council passed a resolution appointing two additional members to the Committee from two local community groups.

A total of 15 Liaison Committee meetings were held. The dates and topics of the meetings are listed in **Table 3-2**. The minutes and presentations from the meetings are included in Appendix C.

Table 3-2 : Dates and Topics of Liaison Committee Meetings

Meeting	Date	Topic
1	April 8, 2009	Introduction to the SSMP
2	June 9, 2009	Brainstorming – Community Role and Function
3	October 19, 2009	Septic Systems 101
4	November 18, 2009	Community Planning 101
5	December 16, 2009	Introduction to Vision Statements
6	July 25, 2010	Drafting a Vision Statement
7	August 25, 2010	Finalizing the Vision Statement
8	November 3, 2010	CVC Draft Existing Conditions Report
9	April 11, 2012	SSMP Background Report
10	October 17, 2012	Servicing 101
11	December 5, 2012	Wastewater Treatment 101
12	May 15, 2013	Progress to Date
13	December 4, 2013	SSMP Update
14	April 9, 2014	Community Wastewater Planning Strategies
15	July 23, 2014	Financial Analyses

3.6 Core Management Team

A Core Management Team (CMT) provided technical advice and input throughout the SSMP process. The CMT also provided the SSMP with direction with respect to applicable policies, the development of the Problem/Opportunity Statement and review of the Background Report. The following agencies/groups were invited to participate as members of the CMT:

- Ministry of the Environment
- Ministry of Natural Resources
- Wellington County (Planning Department)
- Credit Valley Conservation
- Grand River Conservation Authority
- Peel Region

- Mississaugas of the New Credit First Nation
- Triton Engineering Limited
- Town of Erin, Council and staff

The CMT met on five occasions during the SSMP process. The dates and topics of the meetings are summarized in **Table 3-3** below. Presentations and meeting notes from the CMT meetings are included in Appendix C.

Table 3-3: Dates and Topics of the Core Management Team Meetings

Meeting	Date	Topic
1	April 8, 2009	Introduction to the SSMP
2	April 11, 2012	SSMP Background Report
3	May 13, 2013	Draft Assimilative Capacity Study
4	March 5, 2014	Servicing Strategies
5	July 23, 2014	Financial Analyses

3.7 Council Workshops

During the SSMP, a number of workshops were held with the Town of Erin Council. These workshops were held to keep Council members informed of the SSMP process and provide information for decisions related to the study. The workshops also presented Council with an opportunity to ask questions and provide input. Materials from the Council Workshops are included in Appendix C and summarized in **Table 3-4**.

Table 3-4: Dates and Topics of Council Workshops

Workshop	Date	Topic
1	January 17, 2012	Background Report
2	February 6, 2013	Assimilative Capacity
3	March 20, 2014	Servicing Strategies
4	July 9, 2014	Financial Analyses

3.8 Public Meetings

Three public meetings were held in conjunction with the SSMP, at key steps in the process. All of the public meetings were held at Centre 2000 in Erin Village and were advertised in the Erin Advocate and on the Town's website.

An initial public meeting was held on May 4, 2009 to introduce the public to the SSMP. This public meeting was also a form and function workshop and attendees were asked to provide input on the strengths, weaknesses, opportunities and threats to the Town. This meeting was attended by approximately 25 members of the public.

The second public meeting was held on May 8, 2012 following the completion of the Background Report. At this meeting, the findings of the Background Report were outlined to approximately 200 members of the public.

A third public meeting was held on February 21, 2013. This meeting was also well attended, with approximately 200 members of the public attending. The meeting outlined the conclusions of the initial Assimilative Capacity Study, conceptual servicing and planning scenarios and a conceptual cost estimate of a sewage treatment facility and gravity collection system (based on the growth estimate from the initial Assimilative Capacity Study). Materials from the public meeting are included in Appendix C.

4.0 Problem/Opportunity Identification

4.1 Introduction

The Town of Erin Official Plan outlines a community-based process for completing a Servicing and Settlement Master Plan (SSMP) to address servicing, planning and environmental issues within the Town. The SSMP study area includes Erin Village and Hillsburgh, as well as the lands between, and surrounding, the villages.

During the first phase of the Master Plan process the Problem/Opportunity statement was defined. Under the Master Plan approach, infrastructure requirements are assessed in conjunction with existing and future land uses using environmental planning principles over extended time-periods and geographic areas. Servicing scenarios are evaluated using environmental, technical and financial sustainability lenses to define a preferred strategy. This statement serves to provide guidance and direction during the development of alternative community planning and servicing strategies during the second phase of the SSMP process.

Upon completion, the Master Plan document will be the basis for, and used in support of, future investigations for specific Schedule B and C projects identified within it.

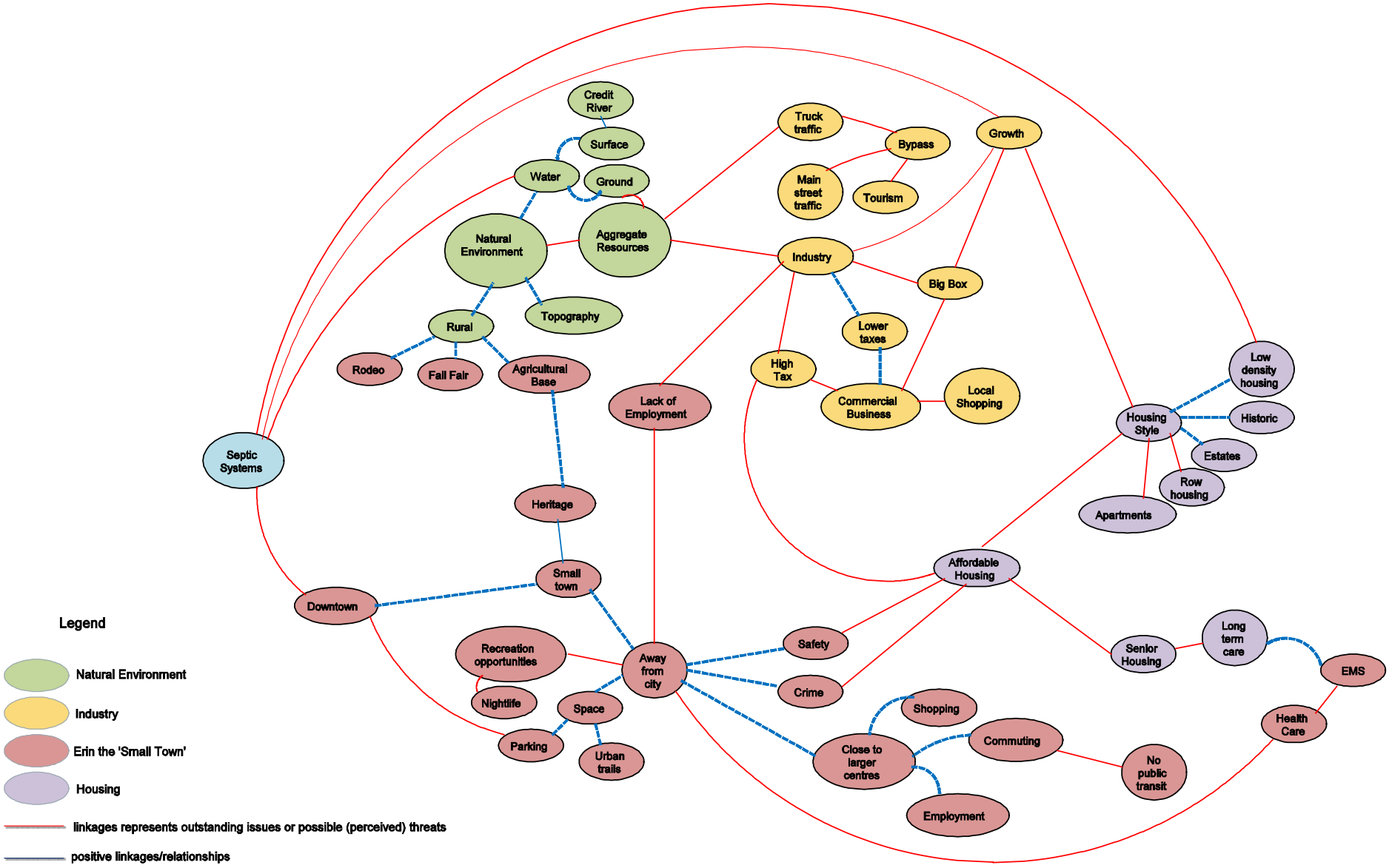
4.2 Phase 1 of the Servicing and Settlement Master Plan

The first phase of the SSMP, the Data Collection and Review Phase, is summarized in the **Servicing and Settlement Master Plan Background Report** (Appendix A). Information regarding community design, form and function; community planning; the environment; and existing infrastructure was collected, assessed and summarized. This information serves as the basis for development of alternative planning and servicing strategies identified in the Master Plan.

Information regarding community design, form and function was collected through public consultation (as described in Section 3 of this report and Appendix C). Community members identified a characteristics, features, values and perceptions relating to the Town's natural environment, small town, housing and industry. Residents described the Town as a bedroom community, but perceived the proximity to larger urban centres as a strength related to employment and shopping opportunities. Concerns regarding high taxes, affordability and the absence of starter and senior homes were also brought forward. **Figure 4-1** illustrates the range of issues and opportunities that were raised.

Building on input and feedback garnered from the community during the public meeting, various workshops, and discussions and input from the Liaison Committee, a Vision Statement for the Town of Erin was developed:

Figure 4-1: Issues and Opportunities Discussed During Consultation



The Town of Erin will remain a vibrant, safe and sustainable community, located at the headwaters of the Credit and Grand Rivers. The Town will continue to capitalize on its proximity to large urban centres, while maintaining its excellent community spirit. With a strong employment base, and a range and mix of housing, a high percentage of the residents will work and continue to live within the Town of Erin. Visitors will enjoy the small town atmosphere, unique shops and surrounding rural charm. Through responsible development and servicing, the Town's rich natural environment will be protected and preserved.

This Vision Statement serves as a clear, unified vision of the future that expresses the unique qualities and common values of the community. It will also serve to guide the development of alternative planning and servicing strategies in the Master Plan, to ensure they are compatible with the values and needs of current residents.

4.3 Problem/Opportunity Statement

The Problem/Opportunity Statement for the Master Plan was derived from information gathered during the first phase of the SSMP and guided by the Vision Statement. The statement forms the basis of the Master Plan and guides the development and evaluation of alternative planning and servicing scenarios. For the purposes of the Town of Erin SSMP, the following Problem/Opportunity Statement has been identified:

Presently, the Town of Erin lacks a long term, comprehensive strategy for the provision of water and wastewater servicing in the villages of Erin and Hillsburgh. The following limitations are associated with the current status of servicing within the Town's urban areas:

Wastewater

Wastewater is treated exclusively by private, on-site wastewater treatment systems. Within the Built Boundary of the settlement areas (Hillsburgh and Erin Village), private property investment and redevelopment is restrained by increasingly stringent setbacks required for septic systems, small lot sizes and the presence of private wells. Additionally, there are limited facilities in the area accepting septage from private systems for treatment.

The settlement areas (Hillsburgh and Erin Village) have been identified as areas of modest growth under the Places to Grow Act and by Wellington County population projections. At present, the servicing infrastructure is inadequate to meet future demand to 2035. Lots sized to include septic systems will not allow for projected future development to occur in a manner consistent with the need for smaller, less-expensive homes in the community as identified in the Vision Statement.

Water

Partial water servicing in Erin Village and Hillsburgh limits the operational and cost efficiency of the systems and inhibits redevelopment and future development.

The capacity of the existing system will need to be augmented to address current limitations and the needs of future development.

Stormwater Management

The West Credit River currently shows impacts from urban stormwater drainage, resulting from limited stormwater management infrastructure. Given existing impacts and potential future impacts relating to development, there is a need to assess existing and future stormwater management infrastructure.

Transportation

Current transportation infrastructure may need upgrades to accommodate future growth.

To address these limitations and opportunities, the Master Plan will investigate a range of alternative planning and servicing alternatives. The alternatives will be evaluated and possible mitigating measures will be identified. Preferred alternatives will also be identified for each component of the SSMP.

5.0 Community Planning Alternatives

5.1 General

The information gathered in Phase 1 of the SSMP regarding community planning, form and function, in addition to the Vision Statement and Problem/Opportunity Statement, helped guide the development of planning alternatives for the future of the Town. The extent and scope of what may be considered in alternative planning scenarios is also bound by planning policies, the type and extent of servicing that may be considered feasible, and the assimilative capacity of the West Credit River, which is considered to be a potential effluent receiver.

There are a number of planning policies that are relevant to the development of alternative planning scenarios for the Town of Erin. The policies range from provincial, regional and local in their scope, as discussed previously in Section 2.4. Future development in the Town of Erin, specifically the expansion of urban centres of Hillsburgh and Erin Village, is essentially constrained by the policies of the Greenbelt Plan, which limits development in the Greenbelt area surrounding the two villages. While urban boundaries may be expanded into the Greenbelt following an extensive and comprehensive review, planning policies promote development within the existing urban areas. As such, the alternative planning scenarios assume development will occur within the current boundaries of Erin Village and Hillsburgh and do not consider an expansion of the urban boundaries.

It has been discussed during the consultation process undertaken throughout the SMP study that, prior to the Greenbelt Plan being enacted there were a number of lands added to the urban settlement areas, particularly in Erin Village. This would account for the considerable amount of land with development potential, as shown on Figures 2.7 and 2.8. However there was no servicing study undertaken at the time to define whether there was any ability to provide these lands with municipal servicing. This would not be allowed under today's planning regime. The 2014 Provincial Policy Statement, Section 1.1.3.8 states:

> *"A planning authority may identify a settlement area or allow the expansion of a settlement area boundary only at the time of a comprehensive review and only where it has been demonstrated that…. (b) the infrastructure and public service facilities which are planned or available are suitable for the development for the long term, are financially viable over their life cycle, and protect public health and safety and the natural environment."*

As discussed earlier the Town of Erin Official Plan, Section 3.6.6, Urban Areas – Special Policy, sets out a requirement to undertake a Servicing and Settlement Master Plan to be completed before any major development is approved. The purpose Statement of the SSMP study as set out in the Terms of Reference state:

"It is therefore necessary for the Town to undertake a Servicing and Settlement Master Plan (SSMP) to identify strategies for community planning and municipal servicing within the service area of Erin Village and Hillsburgh (the Study Area), consistent with current Provincial, County and Municipal policies. These strategies will ensure that the growth in the community will met Provincial, County and Municipal projections, while providing levels of municipal servicing consistent with provincial regulations in a safe, reliable, sustainable and cost effective manner to meet both long and short term demands."

Alternative planning scenarios will then include both urban areas in their consideration.

5.2 Defining Planning Scenarios

There are a number of considerations which frame the development of a scenario:

Growth Target

- The study was to recognize a planning horizon of the year 2035. The Wellington County Official Plan allocates a growth target of approximately 6,500 persons to Erin Village and Hillsburgh for the year 2031. Given that there is an existing population of around 4,500, this forecast anticipates 2000 persons of future growth. This is easily accommodated within the existing potential development lands available.

Servicing Constraints

- Future planning scenarios are also influenced by the type and extent of municipal services available. The availability of municipal services directly impacts density, the amount of future development, as well as redevelopment in existing areas. The absence or presence of municipal services also impacts existing residents via effects on the community's form and function. Future planning scenarios may be controlled by the findings of the Assimilative Capacity Study (Appendix D) and its relationship to servicing capacity. The assimilative capacity of the West Credit River, specifically referencing phosphorus and nitrogen loadings, defines a maximum population based on treatment objectives that must be met. Under current Ministry of Environment requirements for treatment levels in the West Credit River and assuming best available treatment technologies, the maximum serviceable population is estimated, at this time, to be 6,000 persons. This is considerably less than can be accommodated on the potential development lands.

- It was suggested during the SSMP process that a "Big Pipe" option for treatment, described as sending the sanitary sewage from Erin to another jurisdiction, could provide the municipality with a larger potential population.

Given the considerations above, the future planning scenarios are described in reference to the availability of municipal wastewater services. The four planning scenarios considered are:

- **Scenario 1**: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Locally based sewage service)
- **Scenario 2**: Planning based on providing municipal services for the existing residents and future development in Erin Village only. (Servicing only one village)
- **Scenario 3**: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Sewage treatment via a Big Pipe)
- **Scenario 4**: Planning based on no municipal wastewater services in the Town. (Status-Quo/Do Nothing)

5.3 Future Planning Scenarios

Scenario 1: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village. (Locally Based Servicing)

This planning scenario is based on the provision of full municipal services to all existing and future residents in Hillsburgh and Erin Village. Under this scenario, it is assumed that greenfield development will occur at a density of 40 persons/jobs per hectare, resulting in an overall increase in the population densities of the villages. However given the ACS population limit of 6,000 persons for both villages combined, this will not have a great impact depending on where new growth occurs. However, it should be noted that higher growth levels may be achieved by alternative treatment options, which could allow for a greater discharge to the receiving stream. Alternative treatment options would be further explored in a Municipal Class Environmental Assessment.

The availability of full municipal services in the villages will allow for the creation of smaller lots, and a better range and mix of housing types. It is expected that a range of housing, including starter, senior and affordable homes, will attract/retain the population segments, such as seniors and young families, which have recently declined in the Town. This alternative also includes the possibility of intensification and redevelopment in existing areas of the villages.

It is expected that infrastructure improvements in the downtown cores of the villages will increase opportunities and retention of new and existing businesses. The availability of municipal services may also attract new industry to the Town and increase the number of jobs available for residents within the Town. The Town will have to set aside some sewage capacity specifically for this purpose.

Scenario 2: Planning based on municipal services for the existing residents and future development in Erin Village only. (Servicing only one village)

Under this scenario, only Erin Village would be serviced by a municipal wastewater system and the remainder of the Town, including Hillsburgh would continue to be serviced by private, on-site septic systems. This scenario is included because the natural division of the two settlement areas seems to lend itself to the possibility of providing service to only one area. As Hillsburgh is at a higher elevation than Erin Village, and the ACS identified that the discharge of a Waste Water Treatment Plant (WWTP) must be downstream of Erin Village, it would be technically feasible to service only Erin Village.

The possibility of a Hillsburgh only servicing scenario was deemed unlikely from a cost efficiency view, due to the distance to the WWTP discharge location below Erin Village. However, it is technically possible to service only Hillsburgh and flow/pump through Erin Village to a treatment point and discharge location.

Servicing only one village has a number of planning implications. Future development will be concentrated in Erin Village, as provincial and county policy direct, given the availability of municipal services. Given the ACS limit of 6,000 there would be the potential for approximately 2,500 persons of growth in Erin, after allowing for some limited infill in Hillsburgh. New development in Erin Village is also expected to occur at the densities outlined in the County and Town Official Plans: 40 persons/jobs per hectare. There may also be intensification and redevelopment of land within the existing built boundary of the village. The availability of smaller lots will promote a better range and mix of housing types, including starter and senior homes, and will also attract and retain a more age-diverse population in Erin Village.

Without municipal wastewater service, it is expected that minimal residential and commercial development will occur in Hillsburgh. Any future development in Hillsburgh in this scenario, would likely occur as low density, estate-type developments with large lots to accommodate the required septic system setbacks. This type of development does not meet the needs or intent of the Provincial Policy Statement and would require developing a special policy area in Hillsburgh to be allowed.

Given this, it is expected that there would continue to be an absence of starter and seniors homes in the Hillsburgh. Existing residences on small lots may face challenges replacing septic systems under current setback requirements and may have to replace conventional septic systems with tertiary systems, which are often more costly and require annual maintenance and inspections.

New businesses may choose to locate in Erin Village instead of Hillsburgh due to the availability of full municipal services and existing commercial developments may also relocate to Erin Village for the same reason. Under this scenario it is expected that the downtown core of Hillsburgh will continue to struggle to attract and retain small businesses. Different service levels between Erin Village and Hillsburgh may also have a bearing on where community facilities and institutions, such as schools, are located.

Scenario 3: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village. (Big Pipe Servicing)

It is noted that the assimilative capacity of the West Credit River at 6,000 persons provides limited opportunity for large scale residential development in the two urban areas. The amount available for future growth, 1,500 persons, does represent a 30% increase over the current population, but as noted previously, there is considerable more land within the urban boundary where development was anticipated. This scenario considers that sanitary servicing be provided to the existing development in both villages and to some future population that could be defined based on the treatment capacity the Town could purchase from another jurisdiction. Sewage would be piped to a willing host who would charge a fee for the treatment. This option would involve the construction of a larger diameter pipe and pumping facilities and quite likely the purchase of sewage capacity at a facility operated by another municipality.

Section 9.9.7 of the Wellington County Official Plan, as set out in OPA 81, discussed the role of Settlement Areas within the context of the Greenbelt. Hillsburgh and Erin are considered under the category Towns/Villages and the following policy applies:

> *"Municipalities are encouraged to continue efforts to support the long term viability of these settlements through appropriate planning and economic development approaches which seek to maintain, intensify and/or revitalize these communities. This includes modest growth that is compatible with the long-term role of these settlements as part of the Protected Countryside and the capacity to provide locally base sewage and water services."*

Utilizing a Big Pipe approach to providing a large amount of future growth capacity to the two urban areas seems counter intuitive to the above policy which promotes modest growth and locally based sewage and water services. However Section 9.9.9.2, Sewage and Water Infrastructure, discusses the potential to utilize such an approach.

> *"None of the settlements in Wellington have Great Lakes based sewage and water services. As such, extensions to or expansions of Great Lake based services is not permitted, unless such servicing is required to address failed individual on-site sewage or water services or to ensure the protection of public health where it has been determined by a medical officer of health (or health authority) that there is a public health concern associated with existing services within the settlement.*
>
> *The capacity of the services required in these circumstances will be restricted to that required within the approved settlement boundary as it existed on the date the Greenbelt Plan came into effect."*

One of the key issues identified through the Problem/Opportunity Statement is the issue of on-site services in the urban areas. There is a potential for failures due to age and condition and constraints on the area, through the need for larger lots to support proper systems under current regulations. At this time though, there does not exist the conditions that a threat to public health is

imminent. Rather the threat is to community function and development, availability for growth and protection of the environment.

If a decision to plan the future of these communities based on a Big Pipe treatment option is considered, it is anticipated that the system would be developed to take advantage of the opportunity to service all or most of the lands within the urban boundaries, through the purchase of available capacity and the construction of an appropriately sized conveyance truck sewer.

It may be difficult to find a willing host for the treatment of the sewage. Neighbouring jurisdictions which utilize lake based systems have policies in their Official Plans which direct their servicing capacities to municipalities in their jurisdiction for the most part. There may also be issues with inter-basin transfers of water, so only systems utilizing Lake Ontario as a receiver could be considered.

Scenario 4: Planning based on no municipal wastewater services in the Town. (Status-Quo/Do Nothing)

This planning scenario assumes that in Erin Village and Hillsburgh, wastewater services will continue to be provided by individual, privately-owned septic systems. This scenario represents the 'Do Nothing' or 'Status Quo' alternative. Typically, the 'Do Nothing' alternative is considered when other alternatives are proven to be economically or environmentally not viable.

Under this scenario, future development in both Erin Village and Hillsburgh will be limited due to the large lot sizes required to meet septic system setbacks. It is expected that the majority of any future development will be estate-type housing on large lots. This would be subject to meeting the policies of the County and local official plans. Development in this fashion is low in the servicing hierarchy of the Provincial Policy Statement. Within the villages, redevelopment may be limited by setback requirements. As such, improvements to the range and mix of housing types in the villages will be limited and there will continue to be a lack of senior and starter homes. Given the amount of land required per lot for individual septic systems, this planning scenario represents the low density and growth alternative. Population growth in this scenario is expected to be minimal and is limited through low density development. Low population growth and the continuation of current demographic trends may impact the Town through school closures and relocation of community facilities and services.

Maintaining the status quo will continue to impact commercial and industrial development within the Town. The absence of full municipal services may deter new commercial and industrial development from locating in the Town. Existing businesses may also be forced to relocate from the downtown cores of the communities, due to the costs and environmental concerns associated with holding tanks and septic systems. Given this, it is likely that local employment levels will not improve and a majority of residents will continue to work outside of the Town.

It should also be noted that under this scenario, it is possible that a developer may want to build a communal sewage treatment system solely servicing a new development within the Town. This would be subject to planning approvals and a successful EA process. Under current provincial regulation, the Town would be required to assume ownership and operate the system.

5.4 Evaluation of Future Planning Scenarios

An evaluation of alternatives process was carried out using a comparative assessment method designed to predict the nature and magnitude of environmental impacts resulting from each defined option and to assess the relative merits of the alternative solutions. The evaluation method involves these principal tasks:

- Identification of existing environmental conditions (baseline conditions, inventories)
- Assessment of existing land use activities, infrastructure, natural features and socioeconomic characteristics (i.e., environmental scoping).
- Review of proposed alternatives.
- Identification of environmental components and sub-components that may be affected by the defined alternatives (i.e., define evaluation criteria).
- Prediction of environmental impacts (positive, negative) resulting from the construction and implementation of the preferred alternative.
- Identification and evaluation of measures to mitigate adverse effects.
- Selection of a preferred alternative following a comparative analysis of the relative merits of each option.

Section 5.2 of this report listed the alternative planning scenarios. As part of the evaluation procedure, it is necessary to assess what effect each option may have on the environment and what measures can be taken to mitigate the identified impacts. The two main purposes of this exercise are to:

- Minimize or avoid adverse environmental effects associated with a project.
- Incorporate environmental factors into the decision-making process.

By definition, the EA Act generally separates the "environment" into five general elements:

- Natural environment
- Social environment
- Cultural environment
- Economic environment
- Technical environment

The identified environmental components can be further subdivided into specific elements which have the potential to be affected by the implementation of the alternative solutions. **Table 5-1** provides an overview of the Specific Environmental Components considered of relevance to this

investigation. These components were identified following the initial round of public and agency input, and a preliminary review of each alternative with respect to technical considerations and the existing environmental setting of the project area.

Table 5-1 : Identification of Environmental Components

Environmental Component	Consideration
Natural Environment	• Wildlife and Fisheries • Vegetation • Natural Heritage • Surface Water
Cultural Environment	• Heritage • Archaeological
Social	• Aesthetics • Quality of Life • Policy Requirements • Meets Vision Statement Objectives • Meets Problem/ Opportunity Statement Objectives
Economic	• Capital and Operating Costs • Taxes

Table 5-2 provides a summary of the key considerations for each option with respect to the environmental components described in **Table 5-1**. The table identifies benefits and impacts that were identified as significant during the initial evaluation of alternatives. Potential mitigation measures for the identified impacts are also presented.

Table 5-2 : Evaluation of Environmental Impacts

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Natural Environment	**Wildlife and Fisheries**	• Will have greenfield development within urban boundaries of Hillsburgh and Erin Village which may affect habitat. • May impact fish habitat through increased loadings via a sewage treatment plant.	• Will have greenfield development within urban boundaries of Hillsburgh (on large lots) and Erin which may affect habitat. Majority of greenfield development expected in Erin Village. • May impact fish habitat through increased loadings via a sewage treatment plant in Erin Village. • May continue to and have additional impacts to fish habitat from septic systems in Hillsburgh.	• Will have large scale Greenfield development within urban boundaries which may affect habitat • No local discharge to streams. Impact transferred downstream to another jurisdiction. Would have to meet requirements of particular receiver.	• Will have greenfield development within urban boundaries of Hillsburgh and Erin which may affect habitat; however, development expected to be limited. • May continue to have additional impacts to fish habitat from septic systems in both Erin Village and Hillsburgh.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Natural Environment	**Vegetation**	• Greenfield development will impact vegetation. • Extent of development is limited by the urban boundaries and Greenbelt. • Higher density development will reduce the total amount of land developed given assimilative capacity restraints. • Intensification and redevelopment in existing urban areas will reduce impacts.	• Greenfield development will impact vegetation. • Extent of development is limited by the urban boundaries and Greenbelt. • Higher density development and redevelopment will reduce the total amount of land developed in Erin Village given assimilative capacity restraints. • Large-lot development in Hillsburgh will have greater impacts.	• Greenfield development will impact vegetation. • Extent of development is limited by the urban boundaries and the Greenbelt. • Higher density development. Potential for all developable lands to be built out if treatment capacity available.	• Greenfield development will impact vegetation. • Extent of development is limited by the urban boundaries and Greenbelt. • Development will require a greater amount of land to accommodate septic setbacks. May have more wide-spread impact to vegetation.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Natural Environment	**Natural Heritage**	• Extent of development is limited by the urban boundaries and Greenbelt. • Potential for new development to fragment natural areas and impact natural features. • Higher density development will reduce the total amount of land developed given assimilative capacity restraints.	• Extent of development is limited by the urban boundaries and Greenbelt. • Potential for new development to fragment natural areas and impact natural features. • Higher density development will reduce the total amount of land developed around Erin Village given assimilative capacity restraints. • Large-lot development in Hillsburgh may have more wide-spread impact.	• Extent of development is limited by the urban boundaries and Greenbelt. • Potential for new development to fragment natural areas and impact natural features. • Higher density development over large amount of land will intensify impacts on natural heritage.	• Extent of development is limited by the urban boundaries and Greenbelt. • Potential for new development to fragment natural areas and impact natural features. • Development will require a greater amount of land to accommodate septic setbacks. May have more wide-spread impact.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Natural Environment	**Surface Water**	• Reduced impacts from septic systems. • Some impacts from loadings via a sewage treatment plant. • Potential for greater impacts from stormwater runoff given the likelihood of a greater amount of development.	• Reduced impacts from septic systems in Erin. • Continued and possible increase in impacts from septic systems in Hillsburgh. • Some impacts from loadings via a sewage treatment plant. • Potential for greater impacts from stormwater runoff in Erin Village, given the likelihood of a greater amount of development.	• Reduced impacts from septic systems. • Surface water impacts transferred from local area to a downstream receiver. • Potential for greater impacts from stormwater runoff in Erin Village and Hillsburgh, given the likelihood of a greater amount of development.	• Continued and possible increase in impacts from septic systems.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Cultural	**Heritage**	• Increased development will improve the long term sustainability of historic cores. • Expected to retain small town atmosphere and rural characteristics	• Potential for impacts to historic core of Hillsburgh if businesses vacate. • Expected to retain small town atmosphere and rural characteristics	• Increased development will improve the long term sustainability of historic cores. • Small town atmosphere and rural characteristics will be threatened as growth could be significantly increased.	• Potential for impacts to historic cores of the villages if businesses vacate. • Expected to retain small town atmosphere and rural characteristics.
Cultural	**Archaeological**	• Greater chance of impacts given the potential for a greater amount of development.	• Greater chance of impacts given the potential for a greater amount of development in Erin Village. • Low potential for impacts in Hillsburgh given reduced development levels.	• Greater chance of impacts given the potential for a greater amount of development.	• Low potential for impacts given reduced development levels.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Social	**Aesthetics**	• Reconstruction following servicing will improve the streetscape, replacing ditches with curb and gutter. • Landscaping will not be restricted by septic systems. • Allow for redevelopment of vacant buildings. • Potential for more diverse range and mix of housing, which may or may not fit the Town aesthetics.	• Reconstruction following servicing will improve the streetscape, replacing ditches with curb and gutter in Erin Village. • Restricted redevelopment of vacant buildings in Hillsburgh. • Visual difference in streetscapes between Hillsburgh (ditches) and Erin Village (curb and gutter). • Continuation of development of large estate-type housing in Hillsburgh. • Potential for more diverse range and mix of housing in Erin Village.	• Reconstruction following servicing will improve the streetscape, replacing ditches with curb and gutter. • Landscaping will not be restricted by septic systems. • Allow for redevelopment of vacant buildings. • Larger potential for greater range and mix of housing than other options.	• Restricted redevelopment of vacant buildings. • Continuation of the development of large, estate-type housing. • Businesses in the commercial core may relocate, resulting in sparse and run-down looking main streets. • Space required for septic systems will limit landscaping opportunities for property owners.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Social	**Quality of Life**	• The availability of full municipal services may attract and retain businesses, creating local job opportunities. • Better range and mix of housing will retain seniors and attract young adults and families. • Improved opportunities for affordable housing. • Increased population will support a wider range of community services and facilities. • Expected to retain small town atmosphere and rural characteristics.	• The availability of full municipal services may attract and retain businesses, creating local job opportunities in Erin Village. • Better range and mix of housing will retain seniors and attract young adults and families to Erin Village only. • Improved opportunities for affordable housing in Erin Village. • Increased population will support a wider range of community services and facilities in Erin Village. Services and facilities may leave Hillsburgh. • Creates two-tiered service level between Erin Village and Hillsburgh. • Expected to retain small town atmosphere and rural characteristics.	• The availability of full municipal services may attract and retain businesses, creating local job opportunities. • Better range and mix of housing will retain seniors and attract young adults and families. • Improved opportunities for affordable housing. • Increased population will support a wider range of community services and facilities. • Depending on target population, small town atmosphere and rural characteristics will change.	• Continue to have a lack of local employment. • Continue to have an absence of certain populations segments (children, young adults and seniors). • Absence of population segments may impact the availability of community services and facilities (such as schools). • Expected to retain small town atmosphere and rural characteristics. • Continue to lack affordable housing opportunities.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Social	**Policy Requirements**	• Meets population and servicing policies set out in the Planning Act, the Growth Plan for the Greater Golden Horseshoe, Greenbelt Act, and Wellington Official Plan.	• Meets population and servicing policies set out in the Planning Act, the Growth Plan for the Greater Golden Horseshoe, Greenbelt Act, and Wellington Official Plan, for Erin Village. • Absence of servicing in Hillsburgh is not consistent with policies.	• Inconsistent with section 9.9.7 of Wellington County Official Plan OPA 81 regarding modest growth and capacity to provide locally based sewers and water infrastructure. • Surpasses 2035 planning to 6,500 persons. Would allow the Town of Erin to contribute more growth to the Wellington County Growth Plan allocations.	• Is not consistent with policies set out in the Planning Act, the Growth Plan for the Greater Golden Horseshoe, Greenbelt Act, and Wellington Official Plan.
Social	**Meets Vision Statement Objectives**	• Meets the social, environmental and servicing objectives set out in the vision statement	• Somewhat meets the social, environmental and servicing objectives set out in the vision statement.	• Meets the social, environmental and servicing objectives set out in the vision statement, except "small town atmosphere" will be changed due to the scale of growth.	• Does not meet the social, environmental and servicing objectives set out in the vision statement.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Social	**Meets Problem/ Opportunity Statement Objectives**	• Addresses the limitations associated with existing wastewater services relating to septic systems and septage disposal in Erin Village and Hillsburgh. • Addresses wastewater servicing inadequacies for meeting future demand in Erin Village and Hillsburgh. • Addresses the need for smaller, less expensive homes in Erin Village and Hillsburgh.	• Only addresses the limitations associated with existing wastewater services relating to septic systems and septage disposal in Erin Village. Does not address limitations in Hillsburgh. • Addresses wastewater servicing inadequacies for meeting future demand in Erin Village, not Hillsburgh. • Addresses the need for smaller, less expensive homes in Erin Village, not in Hillsburgh.	• Addresses the limitations associated with existing wastewater services relating to septic systems and septage disposal in Erin Village and Hillsburgh. • Addresses wastewater servicing inadequacies for meeting future demand in Erin Village and Hillsburgh. • Addresses the need for smaller, less expensive homes in Erin Village and Hillsburgh.	• Does not address the limitations associated with existing wastewater services relating to septic systems and septage disposal. • Does not address wastewater servicing inadequacies for meeting future demand. • Does not address the need for smaller, less expensive homes.

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Economic	**Capital and Operating Costs**	• High capital cost • Existing and future development will pay for operating and maintaining services. • Grant money may mitigate high capital cost. • Potential to offset operating costs through fees for septage disposal.	• High capital cost for residents in Erin Village. • Existing and future development in Erin Village responsible for operating and maintaining services. • Potential to offset operating costs through fees for septage disposal. • Property owners in Hillsburgh solely responsible for costs associated with septic systems (pump-outs, repairs, replacements). • Grant money may mitigate high capital cost. • Creates two-tiered service level between Erin Village and Hillsburgh.	• High capital cost • Existing and future development will pay for operating and maintaining services. • There will be a loss of control over the cost of future treatment as this will be provided by another jurisdiction. • Grant money may mitigate high capital cost.	• No capital or operating costs. • Property owners solely responsible for costs associated with septic systems (pump-outs, repairs, replacements).

Environmental Component	Consideration	Scenario 1: Planning based on municipal services for existing and future residents in both villages	Scenario 2: Planning based on municipal services for existing and future residents in Erin Village only	Scenario 3: Big Pipe Servicing	Scenario 4: Status Quo/Do Nothing
Economic	**Taxes**	• Increased commercial and industrial opportunities will provide a more diversified tax base.	• Increased commercial and industrial opportunities will provide a more diversified tax base.	• Increased commercial and industrial opportunities will provide a more diversified tax base. • The potential for greater positive benefits exists with this option as the scale is significantly larger than Scenario 1.	• The tax base will remain primarily residential.

5.5 Evaluation Summary of Planning Scenarios

Four identified future planning scenarios for the Town of Erin were evaluated on the basis of their impacts to the different components (social, economic, natural, etc.,) that comprise the environment. Additionally, the scenarios were evaluated against planning policy, as well as the Vision Statement and Problem/Opportunity Statement of the SSMP. The planning scenarios that were evaluated are based on the availability of municipal services, and are as follows:

- Scenario 1: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Locally Based Servicing)
- Scenario 2: Planning based on municipal services for existing residents and future development in Erin Village only (Servicing only one Village)
- Scenario: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Big Pipe Servicing)
- Scenario 4: Planning based on no municipal wastewater services in the Town (Status-Quo/Do Nothing)

5.5.1 Scenario 1 – Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Locally based sewage servicing)

Scenario 1 is a planning alternative based on the availability of local, full municipal services for existing and future development within both Hillsburgh and Erin Village. This scenario is limited by the Assimilative Capacity of the receiver (the West Credit River). The communal water system would be expanded to meet the needs of the current population and accommodate growth as it occurs. A new sanitary sewage system would be put in place to provide service to the existing population and to accommodate new development. There are adequate lands available within the urban boundaries of the two villages to support the potential development of 500 new homes under this scenario. Where and when this build out would occur is a function of available servicing capacity and market forces.

The Assimilative Capacity Study presents a significant constraint to the ultimate population. The study of the assimilative capacity of the West Credit River (the receiving stream) defined a conservative population of 6,000 persons. This will be further defined during any future EA process and would be a condition on any sewage treatment plant approval. The SSMP was to consider a 20 year planning window to 2031 and a future population of 6,500 persons (from the Wellington County OP) in the serviced communities. Given the timing of the SSMP final report, the planning window is now set for the year 2035. This population target is achievable given the possible ACS limits and represents a growth rate of approximately 1.5% to 2035. This is higher than historic growth rates, which have been constrained by the need for the completion of the SSMP. However, it is considered attainable based on the availability of developable land and the expressed needs of the development community.

The availability of full municipal services will allow for the creation of smaller lots, which will support a range and mix of housing types, and will allow for redevelopment and intensification in the villages. A greater variety of housing types, including affordable housing, will attract and retain segments of the population that are relatively absent from the Town – such as seniors, young professionals and young families. Additionally, the availability of municipal services may attract commercial and industrial developments, creating local jobs and improving the diversity of the tax base.

Impacts to the natural environment related to Scenario 1 are primarily associated with greenfield development. In this scenario, similar to the others, the extent of development is constrained by the urban boundaries of the villages and the Greenbelt. Providing full municipal services will also reduce the impact of septic systems on nutrient levels in local surface water; however, there are impacts associated with effluent from a sewage treatment plant. These impacts may be managed by using the best available technology and monitoring.

This scenario has a number of potential positive social and economic impacts. The availability of services may attract and retain commercial and industrial developments, which will positively impact the availability of local jobs and the long-term sustainability of the historic cores. Additionally, an increased population base may improve the retention and availability of community services and facilities, such as schools. Given the growth limitations presented by the assimilative capacity study and the Greenbelt, the two villages are expected to retain their small town atmosphere and rural character. This is in keeping with the values and needs expressed in the community's Vision Statement and Problem/Opportunity Statement.

During the public consultation, there has been a considerable expression of interest in keeping the villages small and a fear of growing too large. The fear of growing large is derived from the perceived ills associated with larger population centres – increased crime, congestion and loss of a sense of community. The impression of size is very subjective. Presently, the two settlement areas have a population of 4,500 persons. The 2035 population projection of 6,500 persons between the two villages still represents small communities.

An issue that has become more apparent based the assimilative capacity of the West Credit River is that there is more vacant land available (based on 40 person/ha) than there is available servicing capacity. The allocation of capacity to new development will need to be carefully considered by Town Council. Under this planning scenario, the **servicing of the existing population in both communities should be considered a priority**. This is consistent with the Vision Statement and the Problem/Opportunity Statement developed through the consultation process. The need to accommodate future development is also a priority in meeting these goals. Under the present ACS assumptions, there is available capacity to achieve both these goals, with future growth limited to an approximately 30% increase over the existing population.

From a capital cost perspective the full servicing scenario represents a significant investment by the community. This type of project is typically user pay and benefiting properties are assessed the cost. In Sections 6.5 and 10.2., a generic cost for a project of this scale was developed for discussion and evaluation purposes. At an estimated cost of $28,000 per existing lot, this is a significant

burden to the property owner. Most projects of this size usually receive senior government funding assistance, and it would be unusual to proceed to construction without some assistance. The SSMP can be used as a foundation to build the Town's case for funding assistance.

For discussion purposes, if one were to assume a two-third senior government and one-third municipal funding scenario (as has typically been the case recently), the levy to a typical homeowner would be $9,333. Adding in an average connection cost on private property of $5,000, the total cost could be $14,000. This would normally be spread over 10-20 years as an annual assessment. In comparison the cost to fully replace an existing septic system can range from $10,000 to $35,000 or more, depending on the type of system required to meet regulations. There is no government funding available to replace private sewage systems.

5.5.2 Scenario 2 – Planning based on providing municipal services for the existing residents and future development in Erin Village only (Servicing only one village)

Long term planning in Scenario 2 is based on providing full municipal services only in Erin Village. In this scenario, sanitary services in Hillsburgh continue to be provided by private, individually owned septic systems.

This scenario is put forth as a possibility to accommodate greater future development in Erin Village. This is achieved by removing capacity for servicing of existing or future development in Hillsburgh. It is in consideration because there is a natural divide between the two settlement areas of approximately 4 km and a need for an infrastructure connection.

Similar to Scenario 1, population growth is expected; however the population growth is expected to be concentrated primarily in Erin Village. With the availability of municipal services, greenfield development in Erin Village can meet the policy objectives of 40 persons/jobs per hectare. Additionally, this will improve the range and mix of housing available in Erin Village, making it more attractive to a demographically-diverse population. In Hillsburgh, development will be limited to large, estate-type developments that can meet the setbacks required for septic systems.

This planning alternative does not address the existing servicing issues in Hillsburgh, including old septic systems, small lots, and increasingly stringent setbacks. The provision of full municipal services in one community and not the other may also create social and economic tensions between the communities. Hillsburgh may struggle to retain businesses, industries and community services due to the lack of services, which will impact the downtown core. There also may be an out-migration of residents from Hillsburgh to Erin Village to take advantage of a more diverse housing stock. The over-all impact of servicing Erin Village and not Hillsburgh is the creation of 'have' and 'have not' communities. **Given these impacts, this scenario is not considered in keeping with the Problem/Opportunity Statement or Vision Statement.**

From a capital cost perspective this alternative would still cost the benefiting property owners in Erin Village a significant amount. Property owners in Hillsburgh would be responsible for replacing their private septic systems when needed. The only benefit to Hillsburgh property owners would be the availability of septage handling and treatment facilities in Erin Village. It would be expected that

under either Scenario 1 or 2, all owners of private sewage systems within the Town would be assessed a capital charge for the inclusion of septage handling and treatment at the sewage treatment plant.

5.5.3 Scenario 3: Planning based on municipal services for existing residents and future development in both Hillsburgh and Erin Village (Sewage treatment via a Big Pipe)

Planning scenario 3 is based on providing full municipal services to both urban areas and has the potential to provide for a larger amount of future growth than provided for by using the local receiver for treatment. While the Wellington County Official Plan OPA 81 encourages modest growth and locally based servicing, there is the possibility of introducing a treatment option via a lake based system in another jurisdiction. This would allow for the Town to negotiate capacity that would include growth up to the amount that could be accommodated within urban boundary. This could be as high as 3,500 potential lots of new development given the amount of developable land. The resultant population of the two villages could be in the range of 15,000 persons, over three times the current population. This scenario is only possible if the municipality is addressing failed individual on-site sewage issues.

It is expected that there may be considerable difficulty finding a willing host municipal system that would negotiate a sale of their sewage treatment capacity to accommodate this scenario. Additionally, the need for a conveyance pipe and pumping facility adds additional costs to the overall cost of the infrastructure.

It could be expected that under this scenario there are positive benefits to the Town, particularly in the areas of providing a range of housing types and affordability. There are also benefits in the potential for attracting non-residential development, which would provide employment opportunities within the Town. This would also increase the tax base and contribute towards the stability of the municipality.

As expressed in Scenario 1, during public consultation for the SSMP, there was a considerable expression of interest in keeping the villages small and a fear of growing too large. The fear of growing too large is derived from the perceived ills associated with large population centres – increased crime, congestion, and loss of a sense of community. The impression of size is very subjective. The current population is approximately 4,500 persons and the 2035 target is 6,500 persons. Providing full growth capacity under this scenario could eventually result in a population of 15,000 persons over time. This is inconsistent with the Vision Statement developed for the SSMP.

This scenario does address the issues regarding sanitary sewage in the Problem/Opportunity Statement. However, there may be issues providing enough drinking water capacity to advance this solution. It will be necessary to undertake an investigation of water supply services to meet the potential population growth. Any investigations to date have only considered the 2035 target population.

There are considerable challenges facing the municipality if it intends to advance this scenario. Finding a willing host for the sanitary sewage flows is the prime concern and may not be possible,

given needs and policies in potential target municipalities. Given the availability of assimilative capacity in the West Credit River to meet the 2035 estimates and the direction of the Vision Statement, **we would suggest this planning alternative not be carried forward at this time**.

5.5.4 Scenario 4: Status Quo (Do Nothing)

A Do Nothing alternative is considered in Class EA processes as a benchmark to use when considering other alternatives. If there are significant environmental/technical/financial implications of an alternative that cannot be mitigated through project planning, the fallback remains the status quo.

The long term planning implication of this scenario would be that any future growth is limited to low density and large lots in order accommodate private sewage systems. Under this scenario though, a private developer could exercise his option under the Class EA process to plan/approve/build a sewage treatment system for their own development. Current practice would require the municipality to assume the new facilities and become the operator.

This scenario is associated with a number of long term impacts that are not addressed by the status quo. Under this scenario, it is expected that the Town will continue to have an absence of certain population segments, including seniors and young adults, due to the absence of small starter and senior homes. This may have impacts on community services and facilities, such as recreation facilities and schools. The absence of full municipal services may deter redevelopment and new commercial and industrial development within the Town and as such, there will continue to be a lack of local employment opportunities. Additionally, existing businesses, especially in the downtown cores, will continue to be negatively impacted by the limitations associated with holding and septic tanks. Given this, it is expected that the tax base in the Town will remain primarily residential.

The consequences of maintaining the status-quo are not in keeping with planning policies, nor the Vision Statement or Problem/Opportunity Statement developed through the SSMP consultation process. Although, from a financial perspective the burden of funding a large capital project is eliminated, there are cost implications to maintaining the status quo. Individual private septic systems in the settlement areas will need replaced at some time. It can be assumed that over the next 25 years most will need replaced, many sooner than later. At an average cost of $20,000 this represents $30,000,000 in future expenditures for the existing properties.

Municipalities are responsible for the regulation/control of private sewage facilities through the Ontario Building Code Act. The municipality is aware that there are a considerable number of older, possibly deficient septic systems in the settlement areas. If the chosen scenario is Do Nothing, it is suggested that a septic reinspection program should be implemented across the whole municipality. This type of program is becoming more common in areas where there is a concentration of septic systems and known issues. This program would be funded by the benefiting property owners and could be structured to target the settlement areas as a first priority. Rural areas would need to be included as well (as required by the Act) but could be a second-level priority. Under this scenario, the management of septage will remain an issue as intake facilities are located quite a distance away.

6.0 Sewage Collection and Wastewater Treatment and Disposal

6.1 Existing Systems

6.1.1 General Background

As noted in the Background Report (B.M. Ross and Associates Limited, 2012) there are no municipally owned communal sewage systems servicing communities in the Town of Erin. The villages of Erin and Hillsburgh are typically serviced by Class 4 and Class 6 individual private septic systems of various ages (Town of Erin, 2010). Many establishments in the core commercial area of Erin Village are serviced by holding tanks.

The total number of septic tanks in the Town of Erin is approximately equal to the number of properties. Since the Town of Erin began issuing septic permits in 1999 there have been 484 permits issued for new septic systems and 209 for replacement or alteration (Town of Erin, 2010).

6.1.2 Shared Private Systems

There is a shared proprietary system at Centre 2000 which services the Erin High School and the Erin Community Centre. Large septic systems also serve the Stanley Park mobile home development in Erin Village, and the St. John Brebeuf Catholic School. These facilities both operate under a MOE Certificate of Approval (Town of Erin Building Departmnet, 2001).

6.1.3 Approval Process

As of April 6, 1998, the rules for septic systems treating less than 10,000 litres per day (most residential septic systems) are covered by the Ontario Building Code (OBC). While these rules are put in place by the Province of Ontario, local agencies such as municipal building departments are responsible for issuing permits and doing inspections (Town of Erin Building Departmnet, 2001). As of April 1999, a permit must be obtained from the Town of Erin Building Department before any work is commenced to install or repair a septic system.

6.1.4 Past Study Work

There have been numerous studies investigating the impacts of septic systems by a number of agencies (B.M. Ross and Associates Limited, 2012) as summarized below.

Village of Erin Private Sewage System Survey, 1995

In 1995, the Wellington–Dufferin–Guelph Heath Unit conducted a survey of private sewage disposal systems in Erin. This report helped define the problem for the Class EA conducted in the same year. The Heath Unit determined that numerous sewage disposal systems in the downtown core and on the south end of Main Street are in close proximity to the West Credit River which increases the potential of pollution to the river. As well, many lots in the Village were determined to have inadequate septic tank replacement areas (Wellington-Dufferin-Guelph Public Health Unit, 2010).

Town of Erin Septic Investigation, 2005

The Ministry of Environment (MOE), West Central Region Technical Support Section Surface Water Unit, conducted a study at the request of the CVC to determine if impacts from septic systems within the Town of Erin could be isolated from those entering upstream of Hillsburgh and Erin Village in the agricultural and rural areas of the watershed (West Central Region Technical Support Section - Surface Water Unit, 2005). The study concluded that, although the results indicate that septic systems are a contributor of nutrients to the west branch of the Credit River, the relative impact to the receiver was low in 2005 (West Central Region Technical Support Section - Surface Water Unit, 2005). The study recommended that an investigation be conducted in the older developed areas of the Town of Erin and where septic systems are found to be contributors of nutrients to the river, remedies such as new technologies or replacing the system should be implemented.

Erin SSMP Environmental Component – Existing Conditions Report, 2011

The purpose of the septic investigation under the Existing Conditions Report (2011) was to assess the potential impact of septic system effluent on the West Credit River in the context of the SSMP. The study looked at existing studies and data collected for this purpose in 2009. The study led to the following interpretations (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011):

- The existing municipal wells show no apparent impact from septic systems.
- Historical water quality data show only a slight increase in nitrate concentration over time at the Provincial Water Quality Monitoring Network (PWQMN) station, downstream of Erin Village.
- Chloride concentrations and mass loading to the West Credit River have increased considerably during the last 20-30 years of monitoring, at a much faster rate than nitrate.
- Phosphorous concentrations and mass loadings are high and appear to reflect contributions from surface runoff loadings rather than septic systems.
- Data collected for the study does show that there are relatively higher impacts from urban activity, including septic systems, on reaches of both the tributaries downstream of Erin Village immediately adjacent to the urban area, compared to the main branch of the West Credit River.

6.2 Issues and Constraints

6.2.1 Contamination from Septic Systems

As summarized in the preceding, a number of studies have concluded that septic systems are contributing to nutrient loading in the groundwater and subsequently in the West Credit River. The most recent Existing Conditions Report has concluded that the assessment of septic system impact must be combined with other component studies to determine the overall sensitivity of the

environmental features, functions, and linkages within the Town of Erin (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

6.2.2 Age of Septic Systems

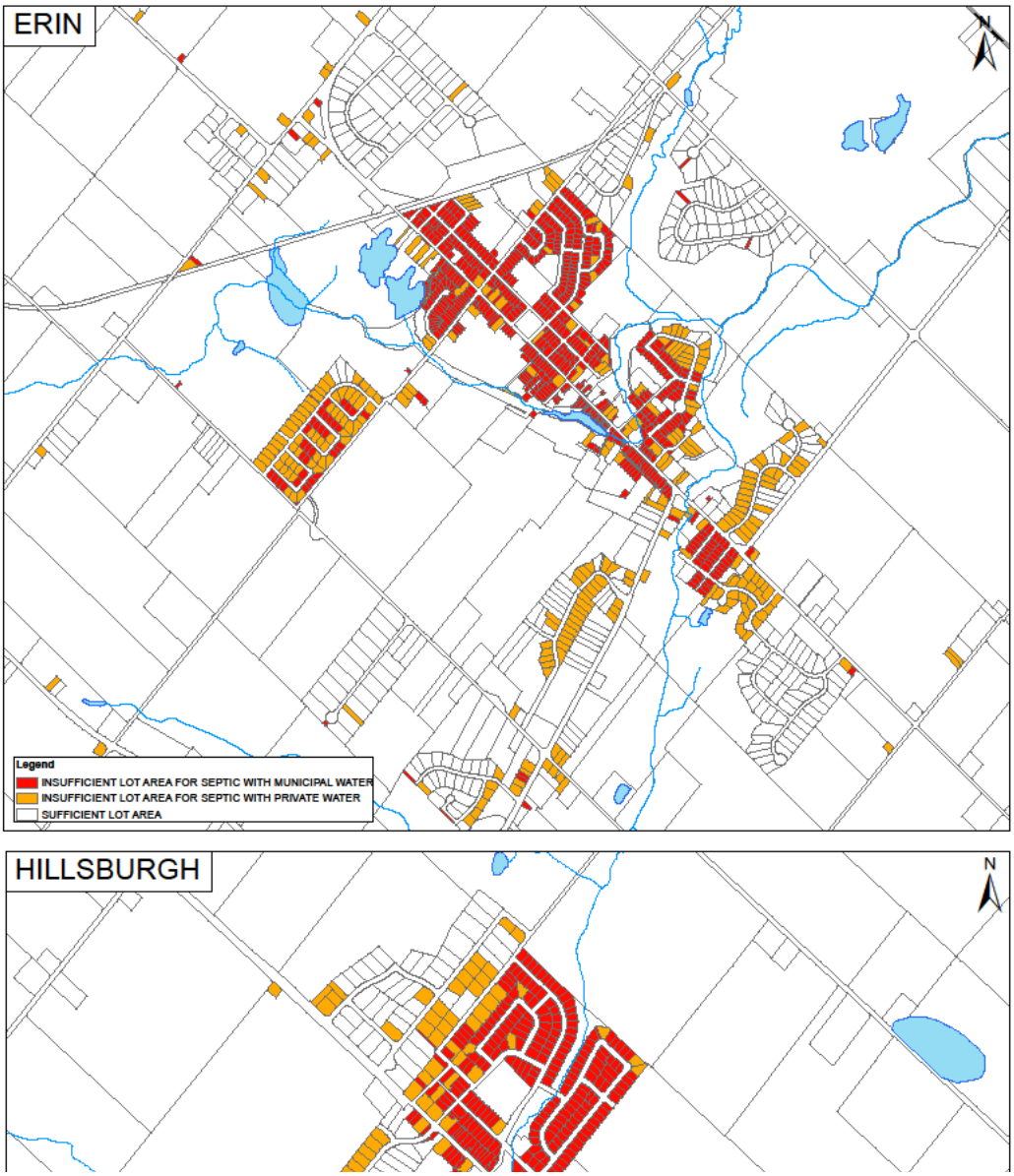
The issue of water contamination from septic systems is generally attributed to older or failing septic systems. The typical lifespan of a septic system is 20-25 years, beyond which systems often function poorly or experience complete failure. A study completed by the Wellington District Health Unit in 1995 found the average age of septic systems in Erin Village was 19 years old (Wellington-Dufferin-Guelph Health Unit, 1995). In the period between 1999 and 2008, there were approximately 300 septic system replacements in the Town of Erin (or an average of 30/year) (Town of Erin, 2010). The relatively low number of replacements in the last 10 years, given that the Town relies almost exclusively on private systems, suggests that many septic systems in the Town are over 30 years old. It is suspected that few of the septic systems within the urban settlements of Hillsburgh and Erin Village have been replaced since 2004 when the Official Plan of the Town was approved with the intent of undertaking a servicing master plan. People would be unwilling to invest in their existing systems if a new form of servicing would be introduced in the near future. A review of septic system data from 2012, revealed that of the almost 1,500 systems in the urban areas, only 3 septic systems in Erin Village were replaced due to deficiencies and 3 in Hillsburgh were replaced after building alterations. Given the age of existing systems, this replacement rate, of less than 0.5%, is much lower than expected.

6.2.3 Lot Size

One of the issues encountered when attempts are made to replace ageing or failing systems is that many lots are below the minimum lot size required by current standards for both an operational tile bed and a reserve area for a replacement bed. An analysis of lot sizes was conducted for the villages of Erin and Hillsburgh, by B.M. Ross and Associates Limited, and presented to the Liaison Committee.

The analysis revealed that in Erin Village 54% of properties within the urban boundary, are presently not large enough for a replacement septic system, even if the property was already connected to the municipal water system (**Figure 6-1**). Under current standards, properties must be at least 1,400 m^2 to accommodate a septic system and observe the required setbacks. Another 20% of the properties do not have sufficient space for both a septic system and a private well (or are between 1,401 m^2 and 2,787 m^2 in size). In Hillsburgh, 55% of the properties are not large enough for a replacement septic system if the property is connected to municipal water (**Figure 6-1**). A further 24% are not large enough for a replacement septic system and a private well.

Figure 6-1 : Assessment of Lot Sizes for Septic Systems in Erin Village and Hillsburgh



6.2.4 Source Water Protection

Source water is any untreated water found in rivers, lakes and underground aquifers which is used for the supply of raw water for municipal drinking water systems. Source water protection is the action taken (Source Protection Plan) to protect that raw source of municipal drinking water from overuse and contamination. A Source Protection Plan (SPP) is a strategy and suite of policies developed by residents, businesses and the municipalities within a watershed or series of watersheds, which outlines how water quality and quantity for municipal drinking water systems will be protected to ensure adequate safe, clean water is available; and protect current and future sources of municipal drinking water from significant threats. Drinking water threats may include (but are not limited to) agriculture practices, wastewater treatment facilities and septic systems. These are considered potential threats to our drinking water sources because of the possibility of leaching of contaminants like chemicals and bacteria into ground or surface water (CTC Source Protection Region, 2014).

The Town of Erin is within the CTC Source Protection Region (Credit Valley, Toronto and Region and Central Lake Ontario) and specifically the Credit Valley Source Water Protection Area. The CTC Source Protection Plan has identified, through technical and scientific work, vulnerable areas within the region that may be susceptible to threats. Vulnerable areas include Wellhead Protection Areas (WHPA), Intake Protection Zones (IPZ), Highly Vulnerable Aquifers (HVA), and Significant Groundwater Recharge Areas (SGRA).

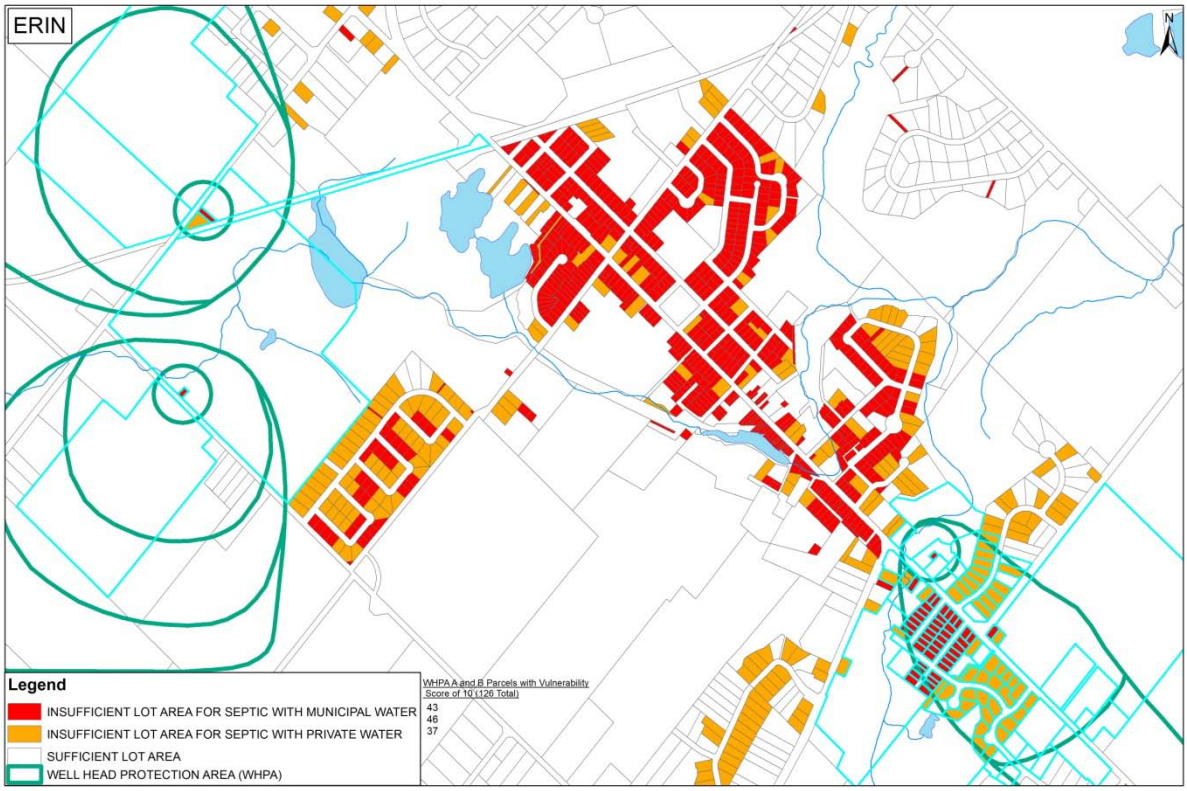
The SPP, once finalized, will require that septic systems in the most vulnerable areas surrounding municipal drinking water sources be inspected every five years.

As the municipal water supply in Erin is from a groundwater source, vulnerable WHPA's within each community have been identified as part of the CTC Source Protection Plan. The identified WHPA's in both Hillsburgh and Erin Village extend beyond the well supply site with an impact zone that encompasses a number of residential lots.

As shown in **Figure 6-2**, a number of existing lots will be impacted by the WHPA identified for each community. In Hillsburgh and Erin Village there are a total of 26 and 126 properties, respectively, that are within the WHPA, of which 14 and 43 properties, respectively, are not large enough to accommodate a replacement septic system.

As noted, the properties identified within the WHPA will be subject to a five year mandatory septic system inspection commencing upon finalization of the SPP and the 14 and 43 properties that have insufficient lot size may have issues with replacement systems.

Figure 6-2: WHPA and Impacted Properties



6.2.5 Septage Management

The Town of Erin recommends that septic tanks be inspected at least every two years by a qualified person and that septic tanks are pumped out at least every 3 – 5 years (depending on tank/household size) (Town of Erin Building Departmnet, 2001).

Not all sewage plants in the vicinity of Erin accept septage, as it 30 to 60 times more concentrated (in terms of biochemical oxygen demand and suspended solids) than wastewater and can subsequently complicate the biological processes of a sewage plant if it is not designed for accepting and treating the material.

At present, septage from pump-outs in the Town of Erin is typically hauled to either Hamilton or Collingwood which increases the cost of disposal significantly. The difficulties in finding facilities within a reasonable commute have been expressed by local septage haulers and there is concern with the long term feasibility of transporting septage to other municipalities for disposal.

6.3 Future Servicing

As summarized in Section 5, future planning scenarios are primarily related to the availability of municipal wastewater services, there is a population servicing potential of approximately 6,000 people between the two communities and within the urban boundaries of Hillsburgh and Erin. This equates to a growth allowance of over 1,500 people. This population is based on the assimilative capacity of the West Credit River for a wastewater treatment plant discharging to this receiving stream.

Through the SSMP process, Council agreed to consider three development servicing scenarios related to the existing community and the potential growth allocation of approximately 1,500 people. The planning scenarios considered are as follows:

- Scenario 1: Planning based on municipal services for existing residents in both Hillsburgh and Erin Village with future development allocated to both communities in equal proportions.
- Scenario 2: Planning based on municipal services for the existing residents in both Hillsburgh and Erin Village with future development allocated to Erin Village only.
- Scenario 3: Planning based on municipal services for the existing residents in both Hillsburgh and Erin Village with future development allocated to Hillsburgh only.

In the case of Scenario 1, the 1,500 persons of potential growth has been split equally between the communities providing an additional 750 people in Hillsburgh and an additional 750 people in Erin. In Scenario 2, the 1,500 persons are allocated only to Erin Village and in Scenario 3, the 1,500 persons are allocated only to Hillsburgh.

In order to satisfy the above scenarios, municipal sanitary sewage servicing will be required through collection and treatment. A review of the various alternatives and methods available to meet the long term collection and treatment needs for the community is beyond the scope of the

current phase of EA study work, however, some of the available technologies are discussed further herein.

Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries (such as in the hamlets of Cedar Valley and Brisbane) are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.

Conceptual level planning related to sewage servicing was prepared for the purpose of ascertaining the feasibility of providing collection and wastewater treatment and will be discussed in the forthcoming sections of the report. The need for local septage receiving and management is recognized and has been considered in a conceptual level servicing plan.

The next phase of an Environmental Assessment will need to consider and investigate a range of alternatives and technologies available for both the collection and treatment of sewage and future study work will be required to review alternatives with respect to their impact on the natural environment, social/cultural environment, economic, and technical/operational considerations. Future investigations should expand upon the need and requirements for adequate septage management in the community including **the need to address septage handling from the entire Town not just from the urban areas.**

6.3.1 Previous Class Environmental Assessments

In 1995, Triton Engineering conducted a Class Environmental Assessment (EA) and a draft Environmental Study Report (ESR) for Sewage Works in the former Village of Erin. At the time, the study did not extend beyond the boundaries of the Erin Village and Hillsburgh was not considered as part of the servicing alternatives developed. Several strategies related to pipe routing and treatment locations were considered in conjunction with the report. The report concluded that the preferred sanitary servicing solution included a Wastewater Treatment Plant (WWTP) with a gravity sewer collection system. Based on a Council decision at the time, the 1995 EA process was not finalized.

The report went as far as selecting a preferred WPCP location with a preferred discharge for treated effluent situated at the bridge over the West Credit River on the 10th Line of Erin Township.

A request for an “approval in principal” from the MOE for a WWTP discharge to the West Credit River was made by the former Village of Erin and Triton Engineering Services Limited in order for that option to be carried forward in the Class EA process. In conjunction with their review, the MOEE provided preliminary Effluent Quality Criteria (EQC) which they suggested could be utilized in the evaluation of options, including a treated effluent discharge to the West Credit River, through the Class EA process.

6.3.2 Effluent Receiver – Surface Water – West Credit River

6.3.2.1 Description

As established in the 1995 EA, the most probable receiving stream for a WWTP is the West Credit River.

The West Credit River is located in the West Credit Subwatershed which covers an area of approximately 126.1 km^2 and drains significant portions of the Town of Erin and the Town of Caledon (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011). The West Credit River flows from the northwest to the southeast though the villages of Hillsburgh, Erin and Belfountain.

The main branch of the West Credit River flows all year, however many of the smaller streams, which feed into the main branch, only convey water for a few weeks of the year (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011). The West Credit Watershed has a nearly contiguous riparian zone comprised predominantly of forests or wetlands, which helps to moderate the severity of floods and retain nutrients that come from adjacent lands.

The West Credit River maintains a high volume of baseflow relative to most of the of the Credit River watershed. This baseflow, which is a result of groundwater discharge to the stream, maintains a minimum depth of water in various stream channels and moderates temperatures (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011). As a result, the West Credit River and its tributaries provide habitat for brook trout and support cold water fisheries.

6.3.2.2 Historic Studies

Many studies have been undertaken in the West Credit River investigating the health of the stream and watershed. Several reports investigated and described the hydrology and hydraulics of the watershed along with geomorphologic and benthic characterizations. Water chemistry and temperature were also evaluated, as well as the impact of existing septic tanks and the proposed discharge of treated sewage effluent on water quality.

West Credit River Assimilative Capacity Report, Triton Engineering Services Limited, 1995

One of the earliest studies available is from Triton Engineering Services Limited in 1995 looking at the stream assimilative capacity. This report concluded that the addition of a WWTP direct discharge to serve a projected population of 4,100 persons in the Village of Erin would not have a detrimental impact on the existing water quality in the West Credit River (Triton Engineering Services Limited, 1995).

West Credit Watershed Study: Characterization Report (Phase I), 1998

The purpose of Phase I of the West Credit Subwatershed Study was to develop an environmental resources management plan that would preserve the high quality systems and features that exist, as the natural systems in the watershed were reportedly in a relatively healthy state and no large

major land use changes were expected (Credit Valley Conservation, 1998). One recommendation set forth in the study was that any future development in the subwatershed, including the potential installation of a wastewater treatment plant at the Village of Erin, should address the criteria of no net increase in total phosphorous loading to the Lower Great Lakes. As well, it was concluded by the Credit Valley Conservation (CVC) that the unit yield approach (used by Triton in 1995) provided a reasonable method for modelling flow at different locations in the subwatershed (Credit Valley Conservation, 1998).

Erin SSMP Environmental Component – Existing Conditions Report, 2011

The purpose of the existing conditions report was to analyze the data from each discipline (hydrogeology, hydrology and hydraulics, natural heritage, fluvial geomorphology, macroinvertebrates and fisheries, and water quality, including a septic system assessment) collected over 2007 and 2008 as well as integrate the disciplines' findings to give an overall understanding of the key environmental features and functions of the study area. The long-term monitoring data summarized by the CVC in the Existing Conditions Report indicate that the West Credit River is a Policy 1 stream. Under the MOE's Policy 1 statement, the MOE states that for those water quality parameters that are below their PWQO, some minimal degree of degradation may be accepted; however, degradation beyond the PWQO is not accepted (Ontario Ministry of the Environment, 1999).

6.3.2.3 Current Studies - Assimilative Capacity Study, BMROSS, 2014

As part of the Settlement and Servicing Master Plan, an Assimilative Capacity Study (ACS) was completed by BMROSS for the West Credit River to determine if capacity to accept treated wastewater effluent, for various population scenarios, exists within the watercourse. A copy of the report is included in Appendix D.

The investigation considered projected effluent discharge for population scenarios ranging from 3,087 people to 6,000 people. Monthly characteristics of the receiving stream, including flow conditions and water quality were taken from the CVC Environmental Component of the "Existing Conditions Report - 2010" and updated in 2014, with respect to river flow and quality. The monthly analysis was undertaken to more accurately reflect the seasonal characteristics of the watercourse.

A parameter by parameter evaluation of the impact of the proposed effluent discharge was completed related to Total Phosphorus, Ammonia, Biochemcal Oxygen Demand, Total Suspended Solids, Dissolved Oxygen, E. coli, and Nitrates. For purposes of the study, it was assumed that the plant outfall would be situated in close proximity to Winston Churchill Boulevard where West Credit River quality and quantity are optimal.

Based on the completed analysis, it is evident that a surface water discharge is a viable alternative to service annual average daily discharge rates in the order of 2,610 m^3/day (6,000 people), while not negatively impacting the stream's habitat for aquatic life.

Recommended Effluent Quality Parameters for a possible treatment facility were developed as part of the study (**Table 6-1**).

Table 6-1: Effluent Quality Criteria (Current Study)

Parameter	Proposed Design Values	
	Treatment Objective	Non-Compliance
Total Suspended Solids (mg/L)	3.0	10
Total Phosphorous (mg/L)	0.10	0.15
Total Ammonia (mg/L)	0.4	2.0
Nitrate Nitrogen (mg/L)	5	6
E. coli (org/100 mL)	100	100
Dissolved Oxygen (mg/L)	5 (min)	4 (min)
BOD_5 (mg/L)	4	8

Through the development of the ACS, it became apparent that there is more assimilative capacity during the spring and fall of the year. Effluent storage during the months when assimilative capacity is at its lowest and a time controlled discharge could be considered as a method of increasing the population serviced.

Further investigation through the next phases of the Class EA process will be required to review and select a preferred treatment method as well as a preferred plant and outfall location. Once details become finalized, it is suggested that further review of dissolved oxygen, thermal impacts, and effluent storage be considered through consultation with the CVC and the MOE.

6.3.3 Effluent Receiver - Subsurface

In order to provide a comprehensive review of all wastewater servicing options for the Town to consider, preliminary consideration was given to the possibility of a system that would discharge to the subsurface. It is generally agreed, by the various approval agencies, that a review of the feasibility of a subsurface discharge is site specific and will require detailed assessments at specific locations and cannot be completed in the broad based technical review of the SSMP. As such, this SSMP provides a description of the studies that would need to be completed to sufficiently review the feasibility of a subsurface discharge

Just as you would complete a preliminary Assimilative Capacity Study of a surface water body in order to demonstrate the feasibility of discharge of treated effluent to a surface water, it is necessary to demonstrate, in at least a preliminary manner, that the site has the proper characteristics to support the hydraulic loading of effluent and to identify whether there are any constraints to the operation of a subsurface system such as restrictive soil horizons, groundwater

sensitive habitat or existing groundwater users whose wells cannot be jeopardized. This would include, but not be limited to, a detailed hydrogeological investigation including:

- Assessment of soil permeability and infiltration rates in the receiving geologic unit, including whether there are any potential impedances to infiltration (e.g. low permeability layers).
- Determination of depth to the water table to ensure there is sufficient unsaturated zone to allow for water table mounding and dissipation of the infiltrating effluent.
- Assessment of the ability of the soils to treat (i.e. attenuate) contaminants of concern such as nitrate, phosphorous and BOD.
- Determination of the probable migration path of the sewage impacted aquifer systems.
- Identification of potential environmental receptors such as wetlands or cold water fisheries.

After having demonstrated the viability of a particular site(s) due to suitable soils and lack of other constraints, it would also be necessary to undertake an assessment of impact on the water resources (both ground and surface) prepared following the guidance in section 22.5 of the Design Guidelines for Sewage Works, 2008, MOE and following the guidance in ministry Guideline B-7 which is more commonly referred to as the *Reasonable Use Guideline.*

This particular assessment would include, but not be limited to the following:

- A water resources impact assessment of to all sensitive users including drinking water and environmental receptors (e.g. the West Credit River and its tributaries) using applicable water quality guidelines.
- Determination of critical contaminants such as nitrate in groundwater and phosphorous and ammonia potentially discharging to surface water.
- Setting water quality limits in accordance with the *Reasonable Use Guideline*, which would include assessing existing and background water quality, and prediction of contaminant attenuation and dilution at the property boundary.
- Assessment of sewage effluent volumes.
- Assessment of effluent quality.

The above assessment is better suited as part of a Schedule "C" Class EA in order to fully demonstrate feasibility and enable the subsequent consideration of different technologies. A long term environmental monitoring program might also be required to assess the effectiveness of the proposed groundwater aquifer contamination control measures.

6.4 Potential Servicing Plan

As indicated, conceptual level planning related to sewage servicing was prepared for the purpose of ascertaining the feasibility of providing sewage collection and wastewater treatment. Although future EA work will be required to fully evaluate the possible alternatives, the concept was developed to establish a better understanding of possible constraints and conceptual costs associated with the provision of sewage servicing to the Town.

The concept was created on the basis that sewage from both Hillsburgh and Erin would be conveyed to a common wastewater treatment plant suitably situated near the lower end of the Village of Erin to take advantage of topography within the community.

6.4.1 Sewage Collection System Types

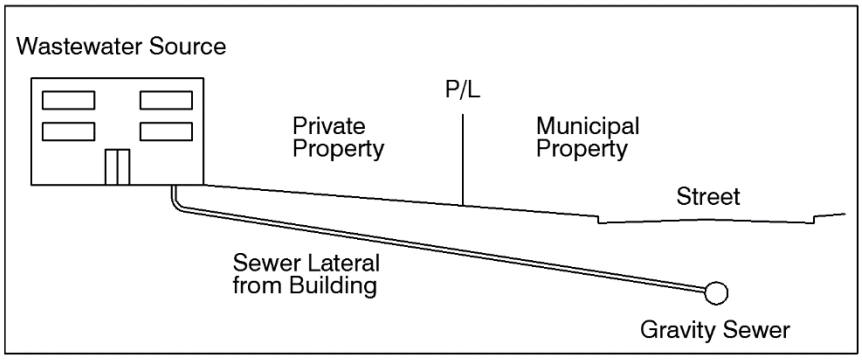
There are a number of different conveyance system types that can be considered as part of a sewage collection system. The alternatives range from conventional gravity sewers to low pressure systems which incorporate individual grinder pumps into the overall plan. Each system has their own advantages and disadvantages related to capital cost, construction impacts, and operation and maintenance consequences. Future EA work should consider the benefits and potential impacts associated with the available technologies which include, but are not limited to:

- Traditional Gravity Sewer System
- Modified Gravity Collection System
- Septic Tank Effluent Gravity System (STEG)
- Septic Tank Effluent Pumping System (STEP)
- Low Pressure System
- Vacuum Sewer System

6.4.1.1 Traditional Gravity Sewer System

A gravity sewer system is used to collect wastewater from multiple sources and convey the wastewater by gravity to a central location (**Figure 6-3**). Wastewater from each source is conveyed through a building sewer to a collection line. Collection (sewer) lines are typically 200 mm or larger diameter pipe. Pipe diameters increase with increasing volume of water being transported. Pipes are installed with sufficient slope to keep the suspended solids moving through the system.

Figure 6-3: Gravity Sewer System



If gravity flow is not possible throughout the system, lift stations (pumps) are employed. Lift stations are installed at lower elevations of the network in order to pump the sewage up to another gravity line, to convey wastewater over hills, and/or up to a treatment facility. Manholes are installed at regular intervals to provide maintenance access to collection lines. Properly designed and constructed gravity sewers are a viable collection option for urban areas, but can be expensive for small communities. In its purest form (i.e., uniform slope from service connections to treatment components) gravity is an inexpensive means to convey water (Water Environment Research Foundation, 2014).

6.4.1.2 Modified Gravity Sewers

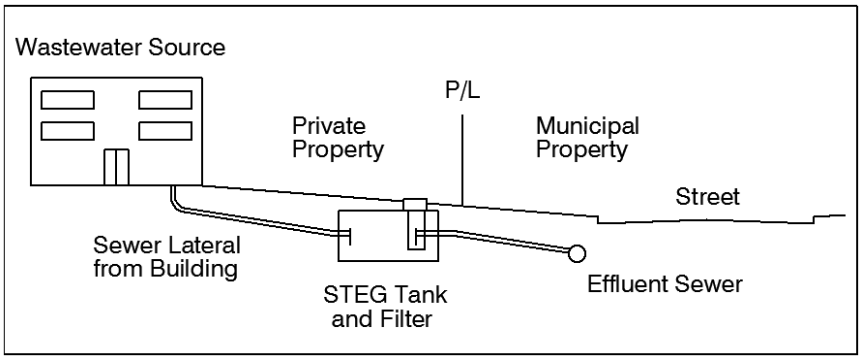
A modified gravity sewer system is similar in principle to a traditional gravity sewer system but is installed with a decreased depth of cover and may not be able to provide full basement servicing in all or portions of the service area. Because of the decreased depth, the initial capital costs of the collection system are typically less than the costs associated with a traditional gravity sewer installation.

6.4.1.3 STEG and STEP Sewer Systems

The term effluent is commonly defined as liquid flowing out of a component or device after undergoing treatment. A 100 mm to 200 mm diameter gravity effluent sewer carries wastewater that has undergone liquid/solid separation or primary treatment. Septic Tank Effluent Pump and Septic Tank Effluent Gravity sewers (commonly referred to as STEP or STEG) use on-lot septic tanks to provide liquid/solid separation. Raw sewage flows from the house or business to a watertight underground tank (septic tank). The clarified effluent then moves into the collection system using either a pump (STEP) or gravity (STEG) (**Figure 6-4**). Through the clarification process, solids are removed at the source and stored in the tank for pumping and disposal of the material at a wastewater treatment plant.

The tanks are typically owned by the municipality but are often located on private property requiring easements for maintenance purposes.

Figure 6-4: STEG Sewer System

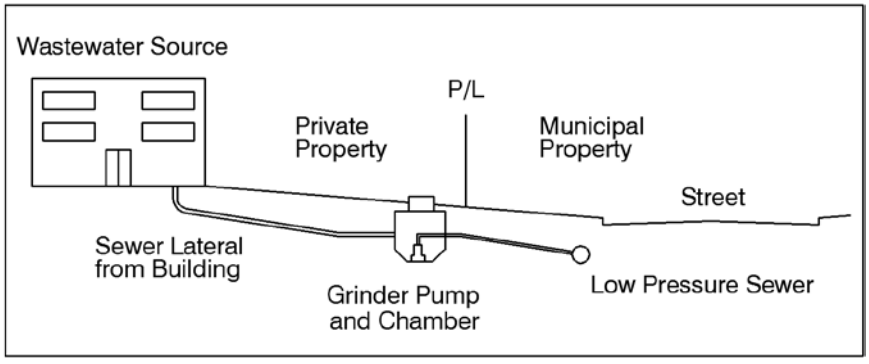


As a collection system, effluent sewers are used to convey effluent from multiple sources to a central location where it can be treated. STEP and STEG configurations can be combined within a given collection system. In a STEG system, each source or group of sources has a watertight septic tank with an effluent screen and an access riser. Effluent flows out of the tank and into a collection sewer by gravity (Water Environment Research Foundation, 2014).

6.4.1.4 Low Pressure System

Pressure sewers are a means of collecting wastewater from multiple sources and delivering the wastewater to an existing collection sewer, and/or to a local or regional treatment facility. Pressurized sewers are not dependent on gravity to move wastewater; and thus there is less concern about the local topography **(Figure 6-5)**.

Figure 6-5: Low Pressure Sewer System



A typical arrangement is for each connection (or small cluster of connections) to have a basin that receives wastewater. When the basin fills to a set point, a pump within the basin injects wastewater into the sewer. This transfer of wastewater pressurizes the sewer. As various pumps along the length of the sewer inject sewage into the line, the wastewater is progressively moved to the treatment facility. The principle advantage of pressure sewers is the ability to sewer areas with undulating terrain, rocky soil conditions and high groundwater tables. Because lines are pressurized, sewer pipe installation can follow the surface topography and remain at a relatively constant depth below the soil surface. As compared to gravity sewers, pressure sewers have

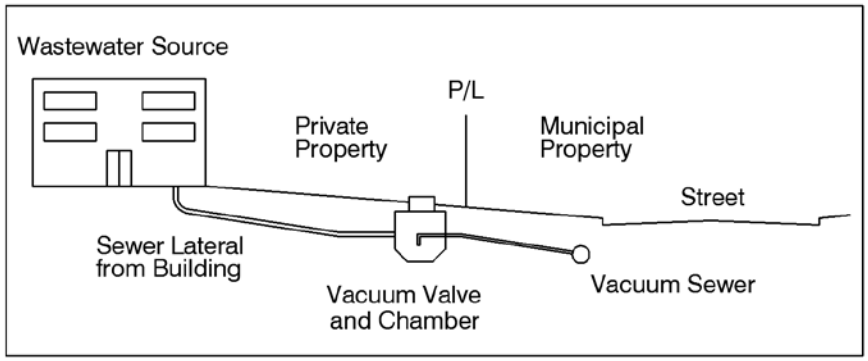
smaller diameter pipes. Shallower placement, lack of manholes or lift stations and longer sections of smaller diameter piping equates to a less expensive and less obtrusive installation. This is especially true for road crossings. Horizontal directional drilling (HDD) allows small diameter systems to be installed without disrupting traffic, opening trenches across paved roadways, or moving existing utilities. The piping can also be located along the shoulder instead of the middle of the paved surface (Water Environment Research Foundation, 2014).

The pump vaults are typically owned by the municipality but are often located on private property requiring easements for maintenance purposes.

6.4.1.5 Vacuum Sewer System

A vacuum sewer system is used to collect wastewater from multiple sources and convey it to a central location where it can be treated (**Figure 6-6**). As the name suggests, a vacuum (negative pressure) is drawn on the collection system. When a service line is opened to atmospheric pressure, wastewater and air are pulled into the system. The wastewater that enters with the air forms a "plug" in the line, and air pressure pushes the wastes toward the vacuum station. This differential pressure comes from a central vacuum station. Vacuum sewers can take advantage of available slope in the terrain, but are most economical in flat terrain. Vacuum sewers have a limited capacity to pull water uphill. The maximum expected lift is between 30 and 40 feet. Vacuum sewers are designed to be watertight since any air leakage into the system reduces the available vacuum.

Figure 6-6: Vacuum Sewer System



Vacuum sewers do not require a septic tank at each wastewater source. All of the domestic wastewater and waste constituents are collected and transported by this collection method. Sewage from one or more homes or businesses flows by gravity into a small valve pit. A service line connects the valve pit to the main vacuum line. Each valve pit is fitted with a pneumatic pressure-controlled vacuum valve. This valve automatically opens after a predetermined volume of sewage has entered the sump. The difference in pressure between the valve pit (at atmospheric pressure) and the main vacuum line (under negative pressure) pulls wastewater and air through the service line. The amount of air that enters with the sewage is controlled by the length of time that the valve remains open. When the vacuum valves closes, atmospheric pressure is restored inside the valve pit. The sewage travels in the vacuum main as far as its initial energy allows, eventually coming to rest. As other valve pits in the network open, more sewage and air enters the system. Each input of

energy moves the sewage toward the central vacuum station. The violent action in the pipe tends to break up the larger suspended solids during transport. Like gravity sewers, vacuum sewers are installed on a slope toward the vacuum station. Periodic upturns or 'lifts' are installed in the vacuum line to return it to a shallower elevation. Overall, the lines are installed in a saw-tooth or vertical zigzag configuration so that the vacuum created at the central station is maintained throughout the network (Water Environment Research Foundation, 2014).

The vacuum vaults are typically owned by the municipality but are often located on private property requiring easements for maintenance purposes.

6.4.2 Conceptual Collection System

For the purpose of establishing a conceptual level design for a sanitary collection system, a traditional gravity sewer and combination of pumping stations was utilized. Attention was given to existing topography to maximize the use of gravity while minimizing the number of required pumping systems. Gravity sewers are typically constructed at depth sufficient to provide full basement servicing, however, a modified gravity system could be designed in some areas to reduce the depth, provide main floor service only, and potentially reduce the associated construction costs.

Conceptual level design and pipe sizing was completed based on The Town of Erin Municipal Servicing Standards, 2007 and the proposed land use designations and related population densities provided in the Background Report, (B.M. Ross and Associates Limited, 2012).

6.4.2.1 Conceptual Sewer Routing

Consideration to connecting the two urban centres of Hillsburgh and Erin was viewed as an important aspect in the development of the conceptual plan. The topography for the area is such that there is an elevation difference between the two communities of over 30 metres with Hillsburgh being higher. Given the existing elevation difference between Hillsburgh and Erin there are a few possible routing alternatives for pipe installation that would allow gravity flow towards Erin. This could occur either within the existing road allowance of the 8th Line or perhaps more appropriately within the right of way for the Elora Cataract Trail (ECT). The trail connects the two urban centres within the former railway corridor and provides a reasonable 3.6 km link between County Road 22 and Shamrock Road.

The CVC has indicated that consideration of use of the ECT will require the following:

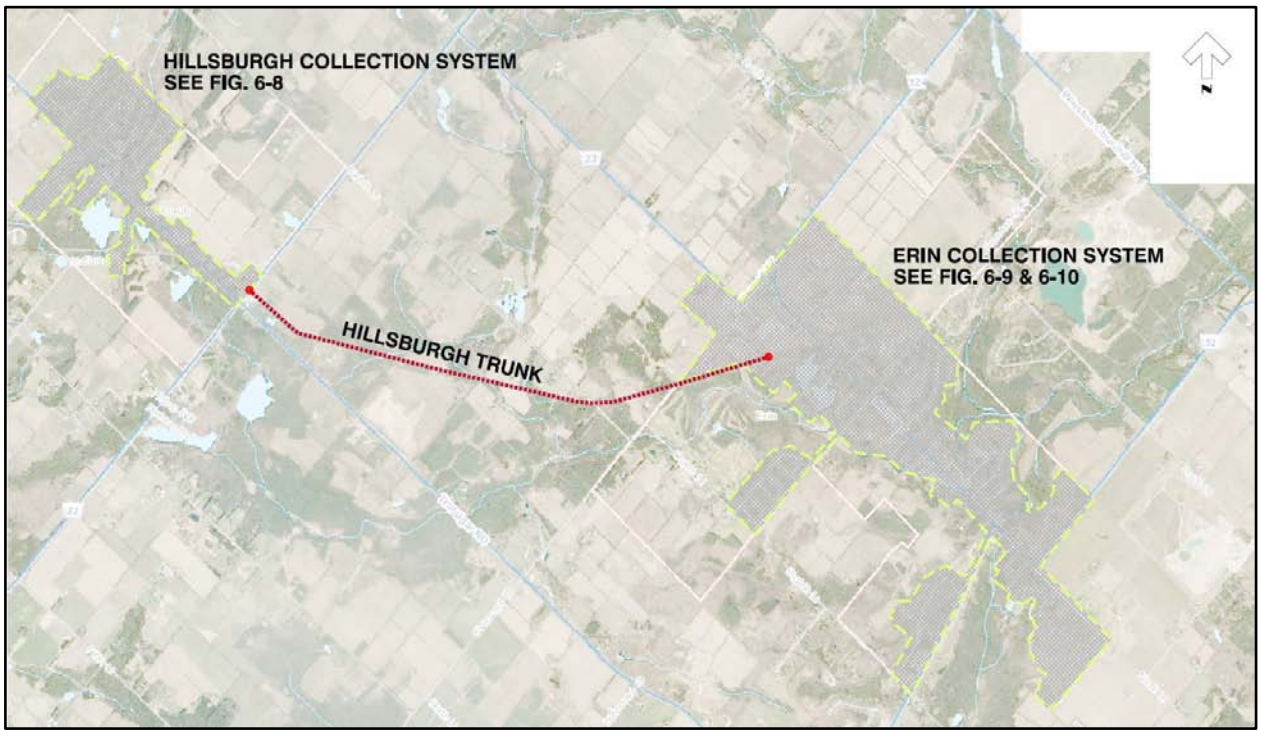
- Completion of an environmental assessment including a review of the past commitments made to the original ECT-acquisition funding agencies and partners surrounding the intended use of the corridor.
- Request to amend the current CVC Board approved trail management plan that specifically speaks to the intended purpose as stated above.
- Request and obtain from MNR approval for a significant land disposition that would be inconsistent with meeting the test of "conservation purposes" as provided for in the Conservation Authorities Act.

Notwithstanding the above, a portion of the trail, by agreement, is being used to convey stormwater discharge from the Deer Pit/OWMS Industrial Park storm pond. This would support the argument for the use of the corridor for the conveyance of sewage and/or water piping in conjunction with the intended use of the corridor.

Figure 6-7 provides a schematic detail of the possible interconnection between the two urban centres within the ECT.

In general the topography for both communities is typically from west to east, generally following, the meander of the West Credit River through both Hillsburgh and Erin. The general lay of the land can be utilized to maximize gravity and minimize the requirement for pumping stations throughout the Town.

Figure 6-7: Potential Pipe Routing Between Communities



Conceptual level planning was completed related to pipe layout and sizing for each community system. **Figure 6-8, Figure 6-9, and Figure 6-10** provide plan details of the conceptual level collection system for both Hillsburgh and Erin and includes possible sewer routes, servicing boundaries, and pumping station locations.

Generally speaking a traditional gravity sanitary sewer system does appear feasible with minimal pumping facilities required. Apart from a main sewage pumping station that would be situated in the lower end of Erin Village (i.e., CR124 and CR52 area) and some isolated areas throughout the community that may require individual pumping facilities (i.e., grinder pumps and/or small sewage pumping station the majority of the communities can be serviced by gravity conveyance.

Figure 6-8: Conceptual Sanitary Servicing Routing, Hillsburgh

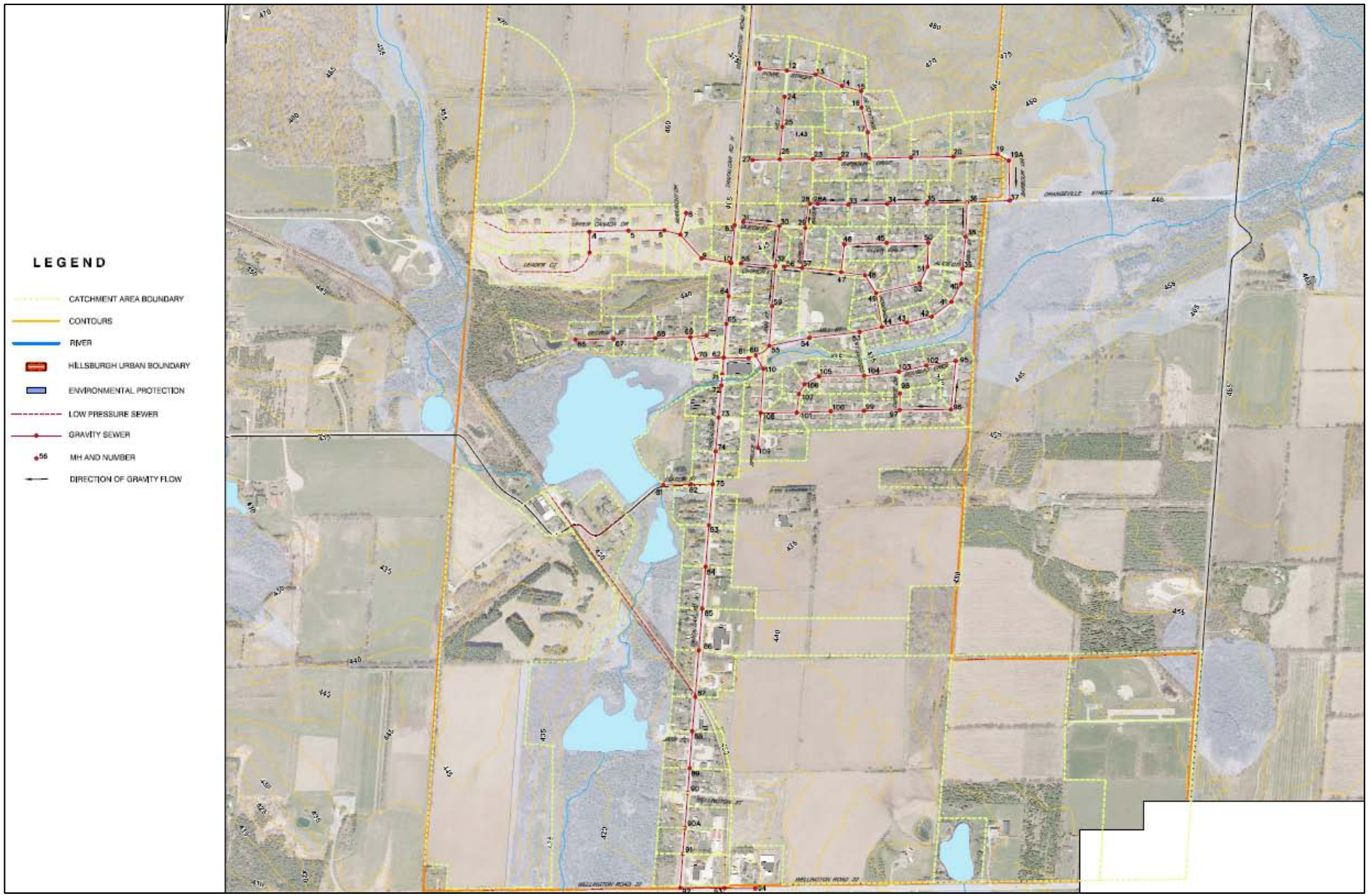


Figure 6-9: Conceptual Sanitary Servicing Routing - Erin Village (Northern Quadrant)

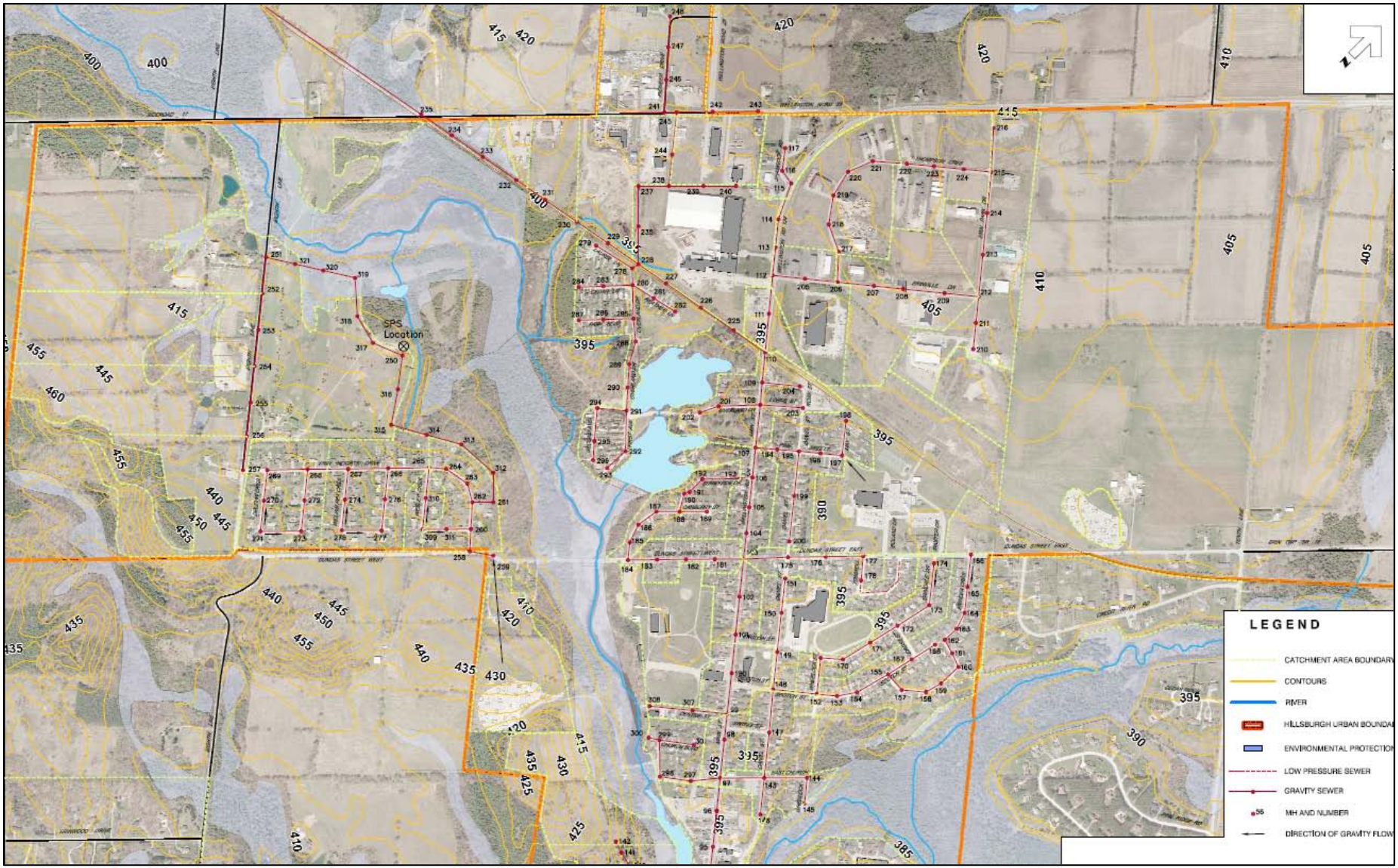


Figure 6-10: Conceptual Sanitary Servicing Routing (Southern Quadrant)

6.4.2.2 Sewage Collection Costs

Based on similar projects completed across Ontario, Table 6-2, provides an estimate of probable costs associated with the conceptual level collection system considered for Erin,

Table 6-2: Conceptual Probable Costs - Collection System

Item	Cost (Millions)		
	Erin	Hillsburgh	Total
Capital Cost	$24.2	$9.3	$33.5
Annual Operating Cost			$0.15

(see Appendix E for details related to these estimates)

Given the conceptual nature of the probable costing, estimating allowances and various contingencies have been incorporated into the suggested amount. It does not reflect possible grants or funding through assistance programs that may become available.

The probable costs developed for the conceptual system include capital costs related to the required sewage pumping station(s) as well as restoration of road surfaces and disturbed areas to reflect existing conditions.

In review of the three growth scenarios considered, and given the methodology related to sanitary sewer sizing, the various growth allocations between each community did not result in significant pipe size changes and subsequently did not impact upon the conceptual level probable cost estimate prepared for the collection system.

6.4.3 Wastewater Treatment

The extent of wastewater treatment that is necessary for a particular sewage system is directly related to the effluent quality requirements for the discharge. Wastewater treatment processes are designed to achieve improvements in the quality of the wastewater and to reduce suspended solids, biodegradable organics, nutrients, and pathogen bacteria.

Given the EQC established for the West Credit River, the level of treatment required for a future wastewater treatment system will need to be carefully designed with an advanced treatment process consisting of best available technology. It is anticipated that the process will include primary, secondary, tertiary (or advanced), final disinfection, wastewater treatment components including consideration to handling/processing of sludge/biosolids. Brief descriptions of the various processes are described below:

Primary (mechanical) treatment is designed to remove large, suspended and floating solids from raw sewage. It includes screening to trap solid objects and sedimentation by gravity to remove suspended solids. This level is sometimes referred to as “mechanical treatment”, although chemicals are often used to accelerate the sedimentation process. Primary treatment can reduce the BOD of the incoming wastewater by 20-30% and the total suspended solids by some 50-60%.

Primary treatment is usually the first stage of wastewater treatment. Septage receiving facilities, as required, would normally be incorporated into the primary treatment facilities located at the head-works of a wastewater treatment plant.

Secondary (biological) treatment removes the dissolved organic matter that escapes primary treatment. This is achieved by microbes consuming the organic matter as food, and converting it to carbon dioxide, water, and energy for their own growth and reproduction. The biological process is then followed by additional settling tanks sometimes referred to as secondary sedimentation to remove more of the suspended solids. About 85% of the suspended solids and BOD can be removed by a plant utilizing secondary treatment.

Tertiary treatment is additional more advanced treatment beyond the secondary process. Tertiary treatment can remove more than 99 percent of all the impurities from sewage, producing an effluent of almost drinking-water quality. The related technology typically includes filtration and requires a high level of technical know-how and well trained treatment plant operators.

Disinfection of wastewater is the removal of pathogens and microorganisms in the effluent. This can be provided by either chlorination or ultraviolet light.

6.4.3.1 Secondary Treatment Possibilities

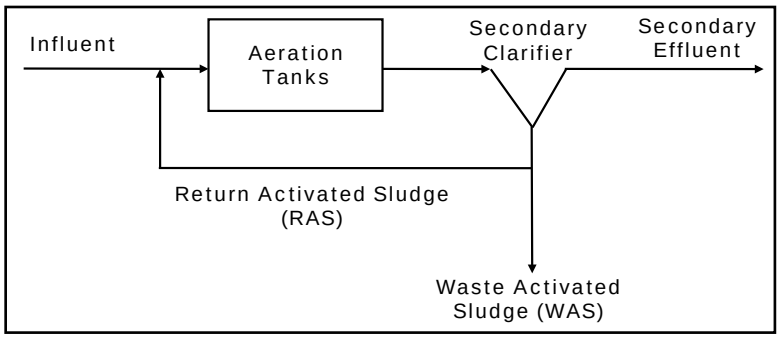
There are several secondary treatment alternatives that could be considered in future Class EA study work including (but not limited to) the following:

- Extended Aeration Process (EAP);
- Conventional Activated Sludge (CAS);
- Rotating Biological Contactor (RBC);
- Sequencing Batch Reactors (SBR); and
- Membrane Bioreactors (MBR).

Extended Aeration

The extended aeration (EAP) process consists of an aerated biological reactor (bioreactor) followed by a secondary clarifier. In the bioreactor, suspended biomass degrades the influent organic material. The biomass is subsequently separated from the effluent in a secondary clarifier. Thickened biomass from the clarifier underflow is recycled to the aeration tank to maintain biomass concentration (**Figure 6-11**). Aeration is typically supplied through blowers and a fine pore aeration system.

Figure 6-11: Extended Aeration



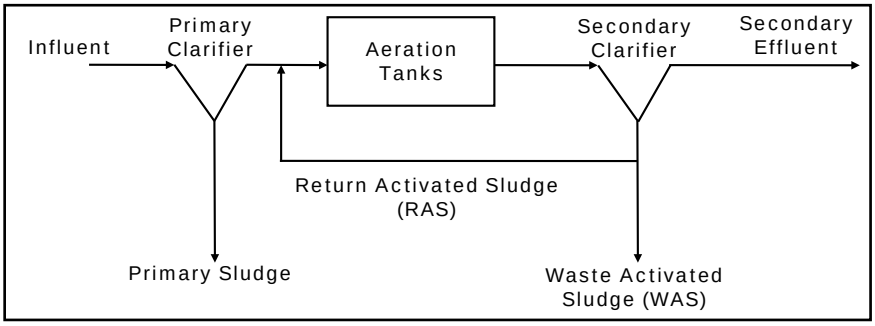
Conventional Activated Sludge

A conventional activated sludge (CAS) process is similar to the EAP process with the addition of a primary clarifier prior to the secondary treatment step. The CAS process consists of a primary clarifier followed by an aerated bioreactor and a secondary clarifier (**Figure 6-12**).

The CAS process typically uses long rectangular plug-flow aeration basins, with primary effluent and return activated sludge (RAS) introduced at one end of the basin and effluent removed at the other.

Aeration is typically supplied through blowers and a fine pore aeration system. The CAS process is well-suited for treating low strength domestic waste. Selection of process operating parameters is dependent on environmental factors and the desired effluent quality.

Figure 6-12: Conventional Activated Sludge



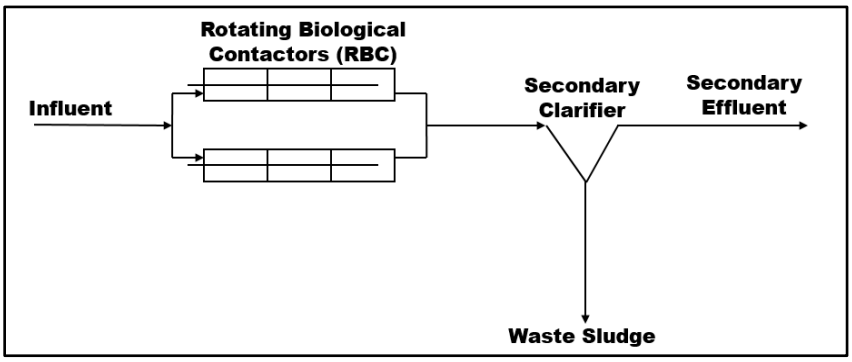
Rotating Biological Contactor

The rotating biological contactor (RBC) process consists of an RBC reactor and a secondary clarifier.

The RBC is an attached growth process where biomass grows on the surface of a rotating disc, which is partially submerged in the wastewater. The rotation of the media carries a film of wastewater that contacts with air, supplying the oxygen for biological growth and contaminant degradation on the media surface.

As the thickness of the biomass layer increases, it is sheared from the media and flows with the RBC effluent to the secondary clarifier. An RBC plant usually involves a number of parallel trains of RBC reactors with each train divided in several stages (**Figure 6-13**)

Figure 6-13: Rotating Biological Contactor

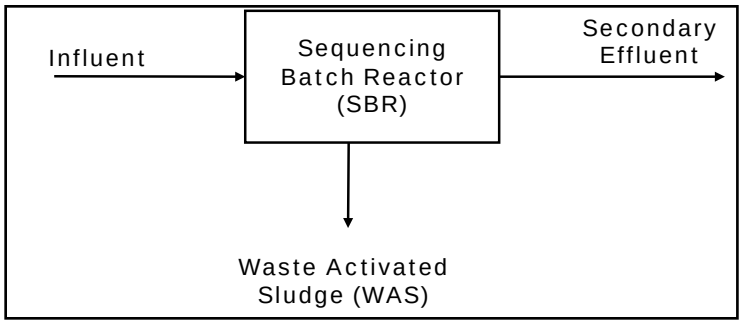


Sequencing Batch Reactor

A sequencing batch reactor (SBR) is a "fill-and-draw" activated sludge treatment system, where aeration and secondary clarification processes are carried out sequentially in the same tank. Unlike other activated sludge processes in which flow moves continuously along a series of tanks, the SBR is a time-oriented batch system, which can satisfy different treatment objectives by simply modifying the application and duration of mixing and aeration in a single-tank, making the SBR process very flexible. A typical operating sequence for a SBR is composed of the following five stages: fill, react (aeration), settle (mixing/aeration off to allow clarification), draw (decant) and idle. Sludge wasting is generally conducted during the settle or idle phases, but can occur in the other phases depending on the mode of operation.

Similar to an RBC plant, the SBR plant usually involves a number of parallel trains of SBR reactors with each train divided in several stages (**Figure 6-14**).

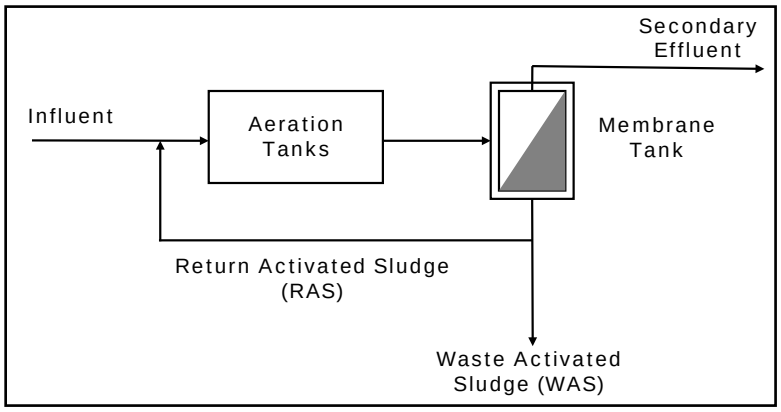
Figure 6-14: Sequencing Batch Reactor



Membrane Bioreactor (MBR)

Membrane bioreactors (MBR) for municipal wastewater treatment consist of a suspended growth biological reactor coupled with a microfiltration membrane system. The microfiltration membranes, which are in direct contact with the mixed liquor, effectively replace the solids separation function of the secondary clarifiers in an EAP or CAS process. Oxygen requirements are provided by a combination of diffused air and an air scouring system. Excess biological sludge is pumped directly from the process tank (**Figure 6-15**).

Figure 6-15: Membrane Bioreactor (MBR)



This technology is still considered relatively new and is more operationally complex than other alternatives in municipal applications. Additional tertiary treatment is usually not required.

6.4.3.2 Tertiary Treatment and Disinfection Options

The following tertiary treatment alternatives that could be considered as part of future Class EA study work are (but not limited to) the following:

- Shallow bed granular media filtration;
- Deep bed, continuous backwash filtration;
- Ballasted flocculation;
- Cloth filtration; and
- Membrane ultra-filtration.

Shallow Bed Granular Media Filtration

Shallow-bed granular media filtration has shown good historical performance in tertiary treatment operations. Granular media filtration is an advanced treatment process that removes TSS and particulate phosphorus to a higher degree than secondary treatment alone. The process is designed to allow for continuous filtration through the filter bed that consists of either single or dual media. Typically, the bed consists of sand (single media) or sand/anthracite (dual media) media. The

solids in the secondary effluent (filter influent) are removed by the media by a variety of mechanisms as the influent passes through the filter. Generally, the particulates are retained by the filter grains or previously deposited particulates by straining, interception, impaction, sedimentation, flocculation, and adsorption (Metcalf & Eddy, 2003). The filtered effluent flows through the filter underdrain system and a series of ports to the effluent channel. The filter backwash is initiated and stopped automatically based on headloss and/or run time. For automatic backwash filters, the backwash system consists of a travelling bridge equipped with a hood and a pumping system. During the backwash cycle, the bridge moves across the filter and backwashes the media in each of the lateral compartments. The backwash pump draws treated water from the filter effluent channel upwards through the underdrain and the filter media. Reject water from the backwash is transferred back into the treatment process for additional treatment.

Deep Bed, Continuous Backwash Filters

Deep bed, continuous backwash filters consist of a vertical vessel filled with granular media. The wastewater is distributed radially inside the filter bed and flows upward through the downward moving media where the solids are removed. The filtrate overflows a weir and exits at the top of the filter. Media within the filter is cleaned continuously by recycling of the sand from the bottom of the filter through an airlift pipe and cleaning it in a sand washer. Following cleaning, the sand is redistributed on the top of the sand bed. The continuous cleaning of the filter media generates a constant supply of reject water that is transferred back into the treatment process for additional treatment and polishing.

Ballasted Flocculation

In the ballasted flocculation process, a coagulant or polymer, such as alum, ferric sulphate and/or anionic polymer, is used with a ballast material, typically micro-sand (micro-carrier or chemically enhanced sludge can also be used) (United States Environmental Protection Agency, 2003). Water is pumped into a rapid-mix tank and coagulant is added. The ballast material is added to the chemically stabilized and coagulated suspension of particulate solids and, simultaneously, the ballast agent coagulates with the chemical precipitate and particulate solids to form “ballasted” flocs (Young & Edwards, 2003). After flocculation, the suspension is transferred into a sedimentation basin where the ballasted floc settles. The floc formed is heavier and larger than conventional chemical floc and sedimentation can occur ten times faster than with traditional processes (United States Environmental Protection Agency, 2003). A hydrocyclone separates the ballasting agent from the ballasted floc and the ballasting agent is recycled back to the flocculation basin while the sludge is sent for processing and disposal (Young & Edwards, 2003).

Cloth Filtration

Cloth filtration consists of a process tank that contains several submersed disk filters. The disks are configured in series in a vertical position, fixed on a horizontal cylindrical shaft. During filtration, the wastewater enters the process tank and flows by gravity through the cloth media on the stationary hollow disk. Solids collect on the outside of the cloth media, and the filtrate flows through the hollow shaft that supports the disks and is directed to the final effluent discharge. The

filter uses no moving parts during the filtration process. Similar to granular media filters, cloth media filters require backwashing to remove the accumulated solids on the media surface and restore their operating capacity.

Membrane Ultrafiltration

Membrane ultrafiltration processes are typically used for advanced treatment of wastewater. A high quality effluent, referred to as permeate, is produced by passing the wastewater through a membrane barrier. The permeate passes through the membrane surface while the impermeable components are retained on the feed side creating a reject stream. In the membrane system, the particles are removed from the wastewater through surface filtration as the wastewater is passed through the membrane surface and the particles are mechanically sieved out (Metcalf & Eddy, 2003).

Similar to granular media filters, membrane ultrafilters require backwashing to remove the accumulated solids on the membrane surface and restore their operating capacity. There are two methods of cleaning membranes: by reversing the flow of permeate through the membrane, and by chemical cleaning of the membranes modules to remove attached solids.

Disinfection Technologies

This section provides a brief description of UV disinfection and chlorination/dechlorination technologies that could be considered in future Class EA study work.

UV Disinfection

Ultraviolet (UV) disinfection is an alternative to chlorination/dechlorination that produces a non-toxic effluent. Commonly, UV disinfection utilizes either low pressure lamps that emit near monochromatic UV light at a wavelength of 253.7 nm, or medium pressure lamps that emit energy at wavelengths from 180 to 1,370 nm.

Chlorination / Dechlorination

The most commonly used disinfectant in wastewater treatment is chlorine. Chlorine is relatively inexpensive and an efficient biocidal agent. Chlorine can be applied as:

- sodium hypochlorite liquid; or
- chlorine gas.

For larger treatment plants, where larger quantities of chlorine are required, gaseous chlorine is often used. For smaller facilities, the use of sodium hypochlorite is generally preferred.

In order to produce a non-toxic effluent prior to discharge, any remaining chlorine residual can be neutralized by the addition of a dechlorinating agent. Chemicals commonly used for dechlorination are:

- sulphur dioxide gas; and
- sodium bisulphite.

6.4.3.3 Sludge/Biosolids Treatment Options

Most wastewater treatment processes produce a sludge which also requires stabilization and disposal. Secondary sewage treatment plants typically generate a primary sludge in the primary sedimentation stage of treatment and/or a secondary, biological, sludge in final sedimentation after the biological process. Sludge can typically be either dewatered and disposed of at an accepting landfill or treated/processed to create biosolids (nutrient rich organic material) that can be managed in a number of ways. Three biosolids management alternatives exist based on the possible end uses and are classified as follows:

- Utilization on Land
- Thermal Processes
- Disposal to Landfill

6.4.3.3.1. Utilization on Land

Overview

Stabilized sludge, or biosolids, can be applied to land as a beneficial product. Utilization of biosolids on land involves applying the material to soil in order to replenish the soil using the nutrients contained in the biosolids. In order to land apply biosolids for beneficial reuse, the biosolids must meet regulatory requirements regarding constituent concentrations. Before biosolids can be land applied they must be treated to reduce pathogens, odours, and vector attraction. This treatment can take the form of conventional or advanced digestion processes, alkaline stabilization, composting and drying.

Physical Requirements

This alternative would require the construction of facilities (i.e. digesters, compost facilities, or dryers) to treat the sludge. A storage facility would also be required to store stabilized sludge during the months when it cannot be land applied.

Sludge Handling

Following treatment stabilized sludge, or biosolids, would be transported to a storage facility located on or off-site. From the storage site the biosolids would be hauled to agricultural land and applied to the soil. During the non-winter months, it may be possible to transport biosolids directly to fields, reducing the need to transport the biosolids twice.

6.4.3.3.2. Thermal Processes

Overview

Thermal processing involves high temperature treatment of biosolids and results in a large reduction in the volume of the end product which requires disposal. In some cases it also allows for energy recovery.

Physical Requirements

This alternative requires the construction of a sludge incineration facility for thermal processing of dewatered sludge.

Sludge Handling

Dewatered sludge is conveyed then be transported to the incineration facility. Incinerated material is then typically stored as slurry in an on-site lagoon. The slurry must then ultimately be dewatered and disposed in a landfill.

6.4.3.3.3. Disposal to Landfill

Overview

Landfill disposal involves the disposal of solids to a municipal landfill site. This disposal method may be applied to either stabilized biosolids or undigested sludge. The biosolids may be combined with either the solid wastes being applied to the landfill or with soil utilized in a soil layer that acts as a landfill cover.

Physical Requirements

Sludge Handling

The dewatered sludge would be transported to an accepting landfill site.

6.4.3.3.4. Technology Alternatives

There is a wide range of biosolids management methods available for implementation that could be considered in future Class EA study work including (but not limited to) the following (**Table 6-3**):

Table 6-3: Technology Alternatives

Technology	General Description/ Related Considerations
1. Utilization on Land	
Conventional Mesophilic Anaerobic Digestion	- Anaerobic breakdown of organic material in digester units at mesophilic temperatures (30-38^{0}C). - Most common biosolids stabilization process for CAS plants in Ontario. - Potential for biogas utilization. - Does not produce Class A biosolids.
Thermophilic Anaerobic Digestion	- Anaerobic breakdown of organic material in digester units at thermophilic temperatures (50-57^{0}C). - Produces a higher quality biosolids in relatively small tankage. - Potential to produce Class A biosolids. - Potential for high biogas production.
Staged Mesophilic Anaerobic Digestion	- Anaerobic breakdown of organic material in multiple digesters operated in series. Digesters are designed to completely mix material and heat to mesophilic temperatures. - Produces a higher quality biosolids in relatively small tankage. - Potential to produce Class A biosolids. - Potential for high biogas production.
Staged Thermophilic Anaerobic Digestion	- Anaerobic breakdown of organic material in multiple digesters operated in series. Digesters are designed to completely mix and heat to thermophilic temperatures. - Produces a higher quality biosolids in relatively small tankage. - Potential to produce Class A product. - Potential for high biogas production.
Temperature Phased Anaerobic Digestion	- Two variations are possible; thermophilic anaerobic digestion followed by mesophilic digestion, or mesophilic anaerobic digestion followed by thermophilic anaerobic digestion. - Produces a higher quality biosolids in relatively small tankage. - Potential to produce Class A biosolids. - Potential for high biogas production.
Autothermal Thermophilic Aerobic Digestion	- Aerobic breakdown of organic material in reactors designed to operate at thermophilic temperatures without the requirement for supplemental energy for heating. Heat released from the exothermic microbial oxidation process can be recovered and used to maintain operating temperatures in the thermophilic range. - Pasteurization possible which can lead to the production of Class A biosolids. - May not be suitable for CAS plants, due to the energy requirement for the aeration component of the process.

Technology	General Description/ Related Considerations
Dual Digestion	- Process in which aerobic thermophilic digestion is followed by anaerobic mesophilic digestion, in order to increase pathogen reduction, improve volatile solids reductions and to provide higher methane production. - Potential to produce Class A biosolids. - May not be suitable for CAS plants, due to the energy requirement for the aeration component of the process.
Open Composting	- Mechanical mixing of dewatered biosolids cake with a bulking agent and mounding the material into long piles on top of aeration pipes (i.e., static composting). Alternatively, mixing dewatered biosolids with a bulking agent and mounding into windrows for occasional mechanical turning (i.e., dynamic composting). Both processes are carried out in an outdoor setting and typically result in a low-odour, well-stabilized biosolids material. - Potential to produce Class A biosolids. - Biosolids would likely have to be land applied. - Under draft Compost Guidelines, Class A compost could be used for uses other than land application if it meets certain quality criteria.
In-Vessel Composting	- Mechanical mixing of wastewater cake with a bulking agent in a mechanical composter. Air and heat (if needed) are applied to the composting process, which typically results in a low-odour, well-stabilized biosolids material. - Potential to produce Class A biosolids. - Biosolids would likely have to be land-applied. - Under draft Compost Guidelines, Class A compost could be used for uses other than land application if it meets certain quality criteria.
Heat Drying	- Removal, by evaporation, of most of the water content from dewatered biosolids via the application of heat. The heat dried product typically has a solids content of between 90% and 95%. - Produces Class A biosolids.
Greenhouse Drying	- Removal, by evaporation, of most water content from dewatered biosolids via the utilization of passive solar heat. - Potential to produce Class A biosolids.
Alkaline Stabilization (N-Viro™)	- Application of an alkaline material and heat drying to dewatered biosolids to produce a pathogen-free product which has an unrestricted end use. - Produces Class A biosolids.
Lystek™	- Application of alkaline agent, heat and mechanical shearing to dewatered sludge in a reactor vessel to create a stable liquid, pathogen-free product. - Produces Class A biosolids.
Bioset™	- Process mixing biosolids, lime and sulphamic acid into a reactor to create a semi-dry, pathogen-free product. - Potential to produce Class A biosolids.

Technology	General Description/ Related Considerations
2. Thermal Processes	
EFW/ Incineration	- Thermal destruction of organic content in biosolids and conversion of some solid inorganics to gas.

3. Disposal to Landfill	
Landfilling	- Disposal of dewatered solids at a municipal waste landfill site

6.4.4 Conceptual Waste Treatment and Disposal

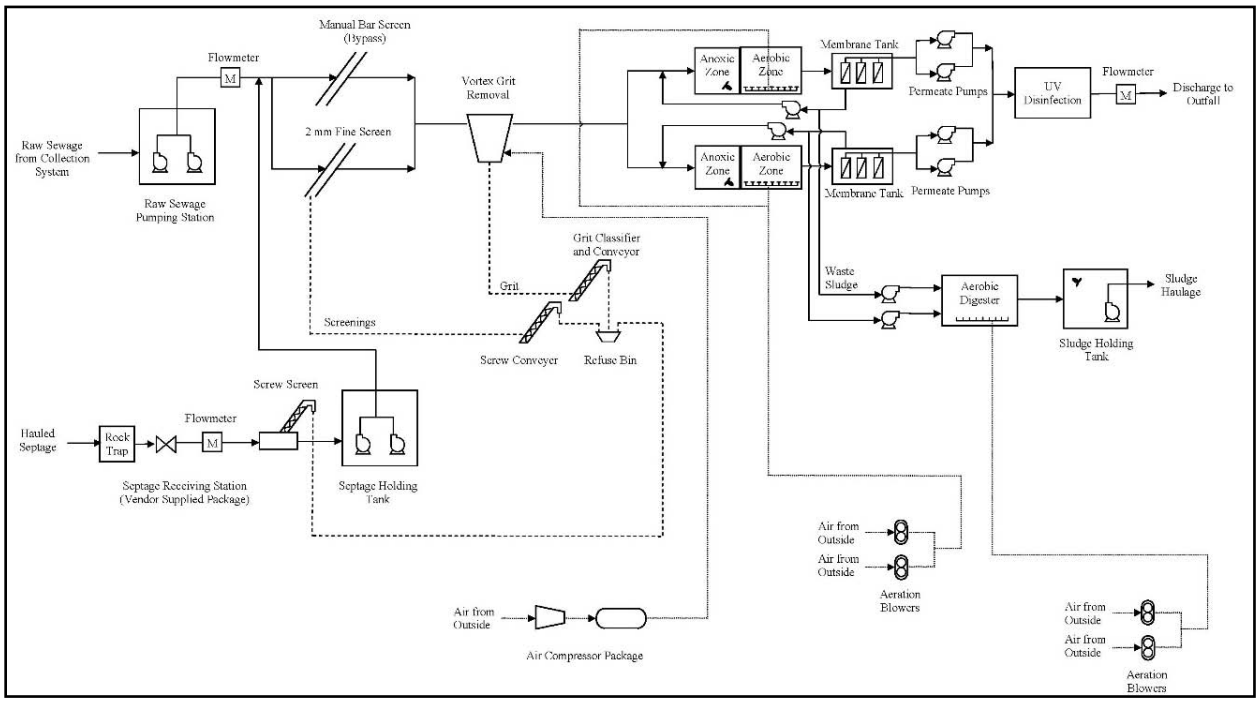
Following completion of the Assimilative Capacity Study (ACS) and the establishment of stringent effluent quality criteria (EQC), it has been assumed that Best Available Technology (BAT) will need to be utilized to ensure that the raw wastewater received at a Wastewater Treatment Plant (WWTP), via the collection system, will be treated to standards that will maintain the current level of water quality in the West Credit River. The EQC established for a future WWTP, through the ACS, and in consultation with the MOE and the CVC is a means to ensure that the health of the receiving stream is generally maintained at its current level.

As noted, a preliminary investigation confirmed that sewage treatment technology, capable of producing the effluent quality suggested in the ACS, is currently available. Although future EA work will be required to fully evaluate the possible alternatives, a concept was developed to establish a better understanding of possible constraints and costs associated with the provision of sewage servicing to the Town.

One example of BAT that is economically achievable and can meet the required effluent quality established in the ACS is membrane filtration (or membrane bioreactor). A membrane bioreactor (MBR) is the combination of a membrane process like microfiltration or ultrafiltration with a suspended growth bioreactor and is capable of producing effluent discharge of very high quality.

The Town's treatment facility should also incorporate septage unloading facilities and specialized treatment equipment as required to manage the additional loadings received from septic system pump-outs throughout the Town. A conceptual level process flow diagram of a possible MBR plant is shown in **Figure 6-16**:

Figure 6-16: Process Flow Diagram - Membrane Filtration WWTP



6.4.5 Conceptual WWTP Location

As noted, the topography for the area is such that there is an elevation difference between the two communities of over 30 metres with Hillsburgh being higher and generally falling as the West Credit River does towards County Road 52 at the bottom end of Erin Village.

Given the naturally topographical relief, the location of a future waste water treatment facility is better suited somewhere along the County Road 52 corridor between County Road 124 and Winston Churchill Boulevard.

Future Class EA study will be required to determine the preferred location of the site

6.4.6 Wastewater Treatment Costs

Based on a comparison of recent MBR plants recently or soon to be constructed in Ontario, a conceptual level annual operating cost and total capital cost (related to construction) was developed for a facility capable of meeting a design flow for 6,000 people of approximately 2,610 m^3/day. **Table 6-4** provides a summary of the probable cost.

Table 6-4: Wastewater Treatment Conceptual Probable Costs

Wastewater Treatment Plant	Cost (Millions) Total
Capital Costs	$24.5
Annual Operating Costs	$0.75

(See Appendix E for background information related to these costs)

Given the conceptual nature of the probable costing, estimating allowances and various contingencies have been incorporated into the suggested amount. It does not reflect possible grants or funding through assistance programs that may become available.

6.4.7 Issues and Constraints

6.4.7.1 Sewage Bylaws

In proceeding forward with a servicing plan, the Town will need to consider implementing both a Sewer Connection By-Law and a Sewer Use By-Law.

Sewer Connection By-Law

It is recommended that the Town implement a mandatory servicing bylaw for connection to the future municipal system. There are a number of positive reasons that the Town would want all the properties within the urban areas connected to the municipal system including issues with construction phasing, responsibility to provide a comprehensive system, and to assist in the financial aspect associated with the continued operation of these facilities.

Sewer Use By-Law

The purpose of this By-Law is to provide limits related to discharges from the connected properties. The By-Law is intended to prevent discharges of contaminants to the sewage system which could result in negative impacts to the collection system and/or treatment facility resulting in possible non-compliance concerns for the system. In some cases, the limits established in the By-Law may result in pre-treatment at the source for some connected properties (usually relates to Industrial type applications and users).

6.4.7.2 Septage Management

Section 6.2 describes the current difficulties in finding facilities for local septage haulers to transport and dispose of septage within a reasonable commute from the Town of Erin.

Any future treatment facility should incorporate septage unloading facilities and specialized treatment equipment as required to manage the additional loadings.

6.4.7.3 West Credit River and Assimilative Capacity

Ultimately, the future servicing scenarios are framed by the findings of the Assimilative Capacity Study and its relation to servicing capacity. The assimilative capacity of the West Credit River, specifically referencing phosphorus and nitrogen loadings, sets a maximum population based on treatment objectives that must be met. Under current MOE and CVC requirements for treatment levels in the West Credit River and assuming best available treatment technologies, the maximum serviceable population is estimated at this time to be approximately 6,000 people.

6.5 Cost of a Municipal Communal Sanitary Sewage System

The collection system and treatment facility when combined form what is known as the sanitary sewage system. The costs of these systems vary depending on the technologies selected, the type of construction, the characteristics of the underlying geology (i.e., rock, location of groundwater), and many other factors.

Recognizing that the conceptual level planning related to sewage servicing was prepared for the purpose of ascertaining the feasibility of providing collection and wastewater treatment, a conceptual level probable cost was prepared.

Given the conceptual nature of the probable costing, estimating allowances and various contingencies have been incorporated into the total amount. It does not reflect possible grants or funding through assistance programs that may become available. **Table 6-5** summarizes the anticipated costs of the conceptual level wastewater servicing plan developed to date:

Table 6-5: Wastewater Conceptual Probable Costs

Sewage System Component	Cost (Millions)		
	Erin	Hillsburgh	Total
Collection	$24.2M	$9.3M	$33.5M
Treatment	Based on Design Population of 6,000 people		$24.5M
Land Costs			$0.5 M
Total Cost			$58.5M

6.5.1 Cost of Connection to Sewers

The cost estimates included in this report are for works constructed on municipal property only. Sewers are typically constructed within the municipal right of way, with service connections constructed to the private property line at a location specified by the property owner. The property owner is responsible for the piping from the service connection to the building. The cost of this will vary with each property, depending on the proximity of the building to the lot line and location of interior plumbing. This work is generally undertaken by a qualified contractor and the property owner looks after arranging for this work. Senior government funding assistance does not typically apply to the cost of work on private property.

6.5.2 Operating Costs

Sanitary sewage service is generally user pay. Operating costs are borne by the households connected to the sewer system. There are a number of different land uses in Erin, which can be expected to generate different amounts of sewage. To accommodate this, sewage rate charges are typically aligned with the water use of a property.

6.6 Consideration for Future Study

Depending on the future population allocation for each community, it is suggested that future study and project work consider the following:

- Finalize plant discharge location to allow additional review of temperature and dissolved oxygen modelling;
- Complete assessment necessary to determine the feasibility of a subsurface discharge;
- Investigate alternatives related to sewage collection systems and select preferred alternative;
- Investigate alternatives related to sewage treatment technologies, including the additional requirements related to septage management and select preferred alternative;
- Investigate alternative sewage treatment site locations along the County Road 52 road corridor area.
- Initiate discussions with the CVC related to the possible use of the Elora Cataract Trail system between Hillsburgh and Erin Village.

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7.0 Water Supply, Storage and Distribution

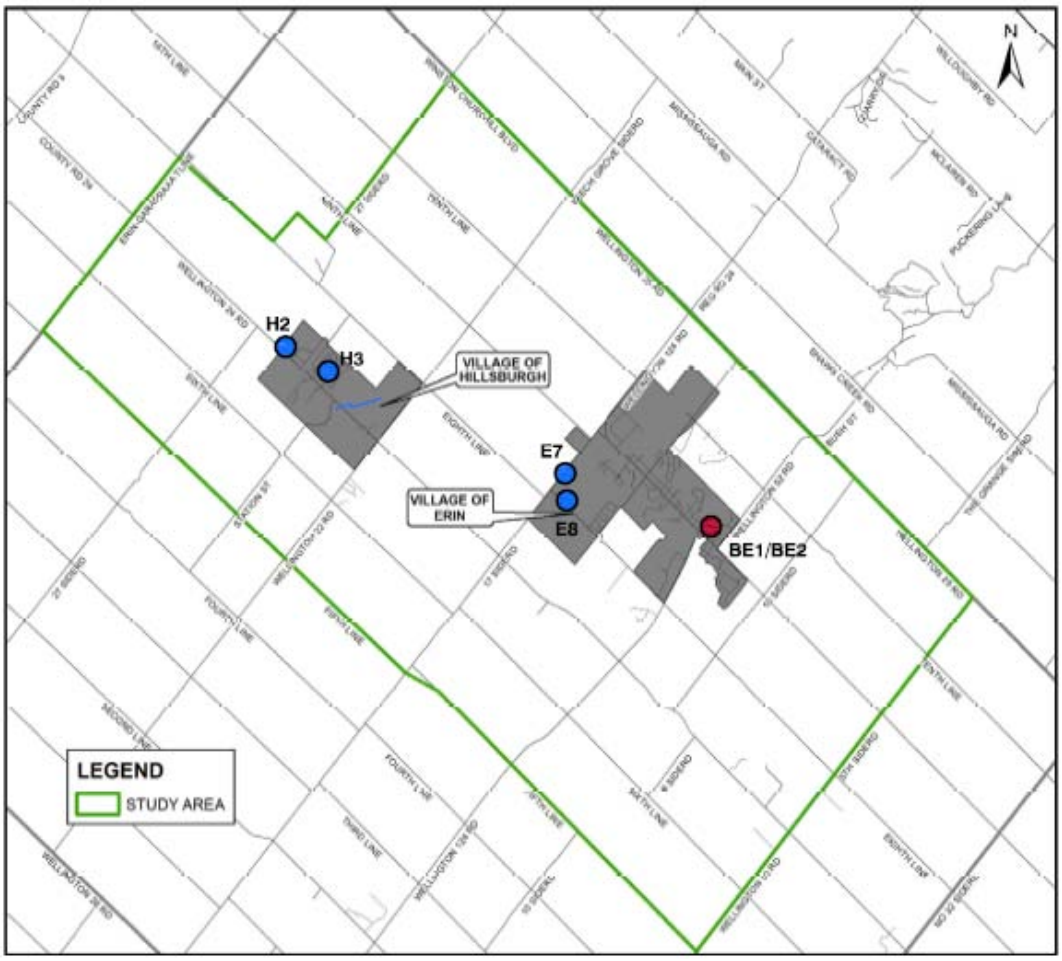
7.1 Existing Water System

7.1.1 General Background

The Town of Erin owns, operates and maintains two residential drinking water systems: the Erin Municipal Water System, and the Hillsburgh Municipal Water System. Currently, each community is serviced by two wells. Several previous water supply wells have been taken out of service or abandoned (primarily in Erin Village) due to water quality issues such as elevated nitrates where bedrock was near the surface (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011). It is important to note that currently not all properties within each community are connected to the municipal supply. These properties are subsequently serviced by their own private well supply.

The Erin Village system consists of Well No. E7 and E8 and the Hillsburgh system includes Well No. H2 and H3 (**Figure 7-1**). There is one non-operating municipally owned water supply system known as the Bel-Erin wells located adjacent to the Bel-Erin subdivision in the south part of Erin Village (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Figure 7-1: Municipal Well Supply Locations



Raw water from each of the supply wells (E7, E8, H2, and H3) are directed to their respective pumphouse which contains water storage, treatment facilities and monitoring equipment. Gaseous chlorine is used for disinfection at Well No. E7 and E8 while a sodium hypochlorite solution is used at Well No. H2 and H3 (Ontario Ministry of the Environment, 2009). In addition to chlorination, ferric chloride solution is added to the raw water at Well No. H2 to treat naturally-occurring lead present in the raw water.

In addition to the properties within the urban areas that are not presently connected to the Municipal systems, the properties outside of the urban areas typically obtain their water from private residential water supplies.

7.1.2 Groundwater Resources

The majority of water in the Town is obtained from the uppermost bedrock unit in the Town (Blackport Hydrogeology Inc, 2003). This layer consists predominantly of the Guelph-Amabel Formation, the upper portion of which is typically fractured and is reported to produce a considerable quantity of water.

Vulnerability to contamination of the bedrock aquifer that supplies the municipal wells in Erin Village and Hillsburgh is generally medium to low (Golder and Associates, 2006). The overburden thickness ranges from approximately 10 m in the vicinity of the wells to over 40 m in other areas of the well capture zones. There are, however, areas of high vulnerability in the vicinity of Erin Well 8 and Hillsburgh Well H3. The area of high vulnerability around Well H3 is found in the two-year capture zone around the well; however, water quality data for the well does not indicate any surface source of contamination (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

There is a high level of recharge throughout much of the Town (Blackport Hydrogeology Inc, 2003). This results in a significant contribution of groundwater to the baseflow in the West Credit River and the tributaries of the Eramosa River and Blue Springs Creek in the Grand River watershed. (For more information, see the CVC Report in Appendix B)

7.1.3 Private Systems

There are approximately 2,300 private domestic water wells in the Town of Erin including, as noted, some properties within the urban boundaries. Additionally, there are a number of private water takers which require Permits to Take Water, since their water taking is greater than 50 m^3/day. There are approximately 28 permit holders including those for municipal wells, agricultural (aquaculture), aggregates washing, water bottling and golf course irrigation (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Typically, private residential wells are located in the uppermost bedrock unit in the Town of Erin. This unit consists predominantly of the Guelph Formation. Information is not collected about how many users treat well water or how. However, if water is treated, the Heath Unit has suggested that residents tend to use Ultraviolet (UV) Light systems due to aesthetic issues with chemical home treatment methods (Wellington-Dufferin-Guelph Public Health Unit, 2010). Water testing is

available from the Health Unit and in 2009 approximately 400 sample bottles were distributed in the Town of Erin (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

7.2 Municipal Water System

As noted, there are currently two separate municipal water supply systems in the Town of Erin, one system in Hillsburgh and one in Erin Village. Each community is currently serviced by two communal wells. Details of each system are provided in the following sections.

The operating municipal well supplies obtain water from the bedrock aquifer as do the majority of private wells. All known municipally operated residential drinking water supplies in the Town of Erin are from water wells (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

7.2.1 The Erin Village Municipal Water System

7.2.1.1 Connected Population

The Erin Municipal Water System is a ground water supply system serving an estimated population of approximately 2,700 customers in the former Village of Erin. There are approximately 900 residential (including about 6 moderately sized multiple dwelling buildings) and 108 non-residential properties connected. The Erin Water System also supplies water to the Stanley Park development that contains 97 mobile homes and 11 cottages. The estimated connected population accounts for the users within the Stanley Park development and multiple dwelling units.

7.2.1.2 Distribution System

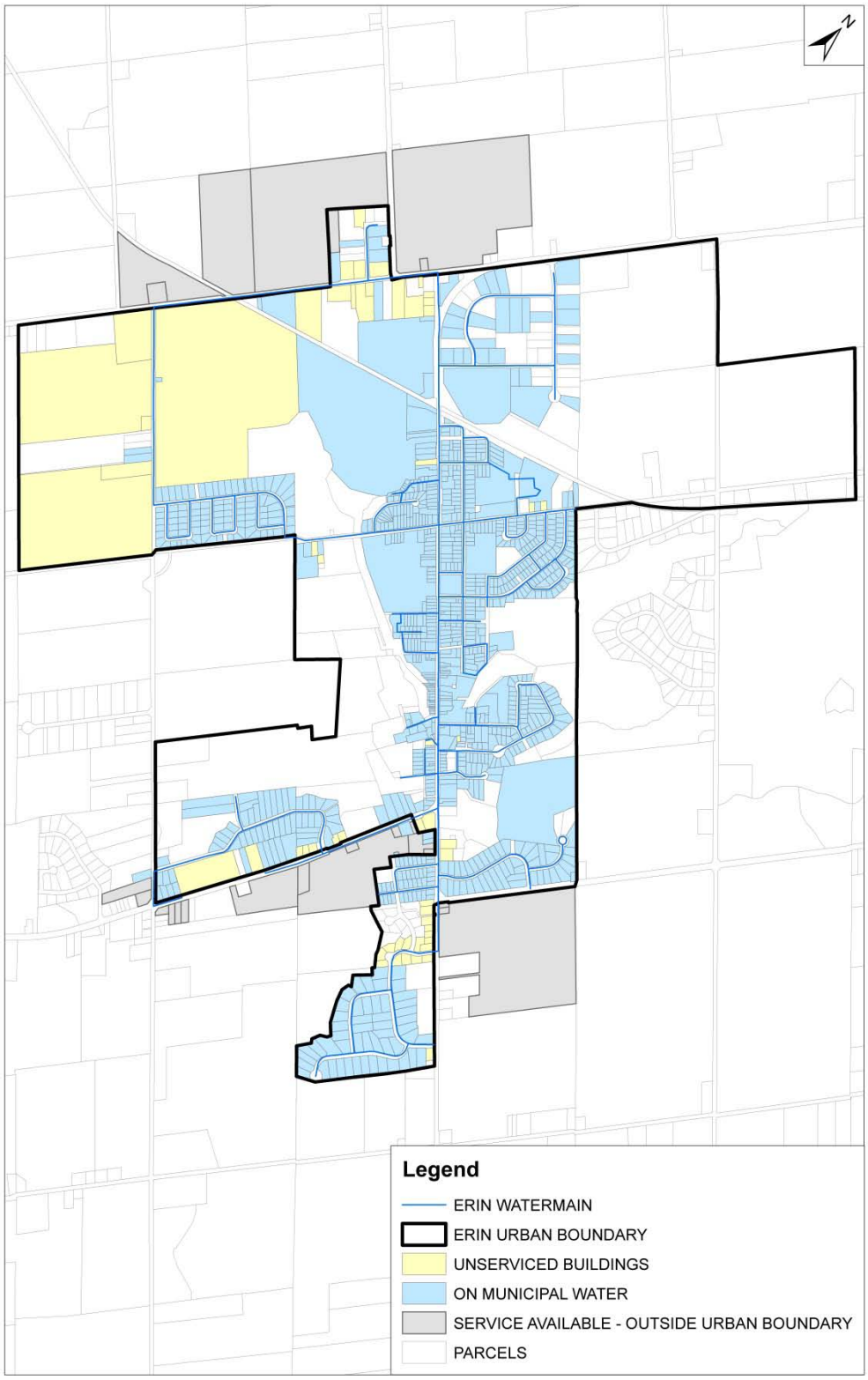
The Erin Village distribution system (**Figure 7-2**) has 26 km of watermain that range in size from 50 mm to 250 mm with some sections of pipe dating back to 1965. Pipe materials vary from cast iron to ductile iron, and PVC.

The pressure in most of the Erin Village Municipal Water System is maintained by the existing water tower; however sixty-five residences in the Erin Heights subdivision require a booster pump to maintain adequate pressure. The system is divided into two pressure zones.

7.2.1.3 Storage

Water system storage provides water for equalization during peak demand periods, for fire protection, and for emergencies. The Erin system has approximately 2,200 m^3 of water storage between the existing tower and the two well supplies (Well No. 7 and Well No. 8). 1,700 m^3 of the noted water storage is accounted for in the water tower.

Figure 7-2: Existing Watermain in Erin Village



7.2.1.4 Well Supply

The water is supplied from two wells (Well No. 7 and Well No. 8) drilled into the fractured limestone bedrock, with a total rated capacity of 4,128 m^3/d (refer to **Table 7-1**). Erin Well No. E7 and Well No. E8 are in use in the Erin Village, and are operated under a permit to take water for each facility.

Table 7-1: Erin Municipal Water Supply Wells

Well #	PTTW	Description†	Production Limit (m^3/day)
E7	4364-7LWPT7	Located at 46 Shamrock Road and is equipped with a submersible pump rated at 1,800 L/min at TDH of 78 m	**2,160**
E8	2201-7LQN73	Located on Lot 17, Concession Road 8-9 and equipped with a submersible pump rated at 1,640 L/min at TDH of 32 m	**1,968**

†from the 2009 MOE Inspection Report

As noted, both well treatment facilities use gaseous chlorine for disinfection purposes.

There is one non-operating municipally owned water supply system known as the Bel-Erin wells located adjacent to the Bel-Erin subdivision in the south part of Erin Village.

Well No. E7

Well No. E7 is located at 46 Shamrock Road adjacent to the Elora Cataract Trail (**Figure 5-3**), was drilled in 1986 for the former Village of Erin and has been in production since the early 1990's. The pump house was reconstructed in compliance with the new regulations imposed by the Safe Drinking Water Act 2002. The land surface slopes towards the river and the neighbouring land is used for both industrial and agricultural purposes. The pumphouse is a masonry structure and includes a ground level reservoir. The well is equipped with a submersible pump rated at 1,800 L/min.

The total depth of the well is 42 metres below ground surface (mbgs) and obtains water from the bedrock aquifer. The well was originally a flowing well, flowing at a rate of about 456 L/min. The well was originally pump tested at a rate of 1,362 L/min [300 imperial gallons per minute (igpm)]. Water levels stabilized at about 10 mbgs, during the original pumping test. It was concluded at the time that the well could provide a sustained yield of 1,362 L/min without causing undue interference.

Upgrades to the well were conducted in 2004, including building a new storage reservoir for chlorine contact time. Well No. E7 is currently permitted for a rate not to exceed 1,800 L/min (395 igpm). The well supplies water to the existing 246 m^3 reservoir and two high lift pumps, each rated at 1,800 L/min feed the distribution system as necessary.

During the system upgrades in 2004, concerns were noted with respect to the shallow portion of the well casing and possible GUDI (Groundwater Under the Direct Influence) issues. GUDI refers to groundwater sources (wells, springs, infiltration galleries, etc.) where there is a hydraulic connection that allows rapid recharge between the groundwater source and surface water and that there is potential for microbial pathogens to travel from nearby surface water to the groundwater source. To ensure there were no GUDI issues, the well casing was extended to 19.1 mbgs. The assessment of the impact of water loss to the well from the upper bedrock, as a result of extending the casing, was discussed in the *2004 Annual Monitoring Report* submitted to the MOE by the Town of Erin (Blackport Hydrogeology Inc. 2005). It was concluded that there was only a 7% loss in well yield as a result of extending the casing further into the upper bedrock. Water production from the well is from the lower portion of the bedrock. No hydraulic connection to surface sources of water has been found for this water source (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Well No. E8

Well No. E8 is located at 5555 Eighth Line (**Figure 5-3**), was drilled in 1991 for the former Village of Erin and has been in production since 1993. The pump house has been upgraded, bringing it into compliance with the new regulations imposed by the Safe Drinking Water Act 2002. The neighboring land is used for both residential and agricultural purposes. The well is located approximately 50 m south of the West Credit River and is slightly elevated above the flood plain. There is a golf course adjacent to the pumphouse along with undeveloped land. The pumphouse is a masonry structure with the well located outside in a concrete well tile. The outer casing diameter is 350 mm and extends to a depth of 6.7 m. The inner casing has a diameter of 200 mm and extends to a depth of 8.53 m. It is equipped with a submersible pump rated at 1,636 L/min. Two high lift pumps, one rated at 1,740 L/min and the other rated at 348 L/min feed the system as necessary from the reservoir. The pumphouse includes a ground level reservoir with a storage volume of 246 m^3.

The total depth of the well is 46 mbgs, also obtaining water from the bedrock aquifer. The well was originally cased to 8.5 mbgs. The well was pressure grouted to a depth of 16.8 mbgs to minimize any potential connection to the local surface water. The well was also originally a flowing well, estimated to be capable of flowing at 1,152 L/min (244 igpm). The original static water level was about 6.5 m above ground surface. At the time of construction, a pumping test was conducted at a rate of 1,794 L/min (395 igpm) and it was concluded that the well could provide a sustained yield of this rate. The well is still under artesian conditions when not being pumped. Well No. E8 is permitted for a rate not to exceed 1,640 L/min (360 igpm) and an amount not to exceed 1,964,000 L/day (equivalent of 20 hours a day at the permitted rate).

Extensive testing was conducted in 1993 to assess the potential for impact on and hydraulic connection to local surface water features (the two wells are located near the main branch of the West Credit River) from the pumping of Well E7 and Well E8 under normal operating conditions. Testing included the installation of numerous shallow monitoring wells and stream bed piezometers along the West Credit River, and continuous monitoring of these wells during normal pumping cycles. Results of testing showed there was no direct connection or impact of

groundwater discharge to the West Credit River or adjacent wetlands caused by the pumping of Wells E7 and E8. Currently, water levels in the municipal wells typically recover daily, from the daily cycle of pumping, of approximately 8-10 hours in operation and then shutdown. (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Bel-Erin Municipal Wells, BE1 and BE2

The Town of Erin owns two municipal non-operating water supply wells, referred to as Bel-Erin Wells, BE1 and BE2 (**Figure 7-3**). The Bel-Erin subdivision is located at the southeast edge Erin Village, between a small tributary of the West Credit River and Wellington Road 52. The Bel-Erin wells are installed into an unconfined overburden aquifer, consisting of a sand and gravel outwash deposit. The shallowest well is cased to 11 metres depth and the well screen is only 8 metres below the water table. The wells were originally used to supply the Bel-Erin Estates residential subdivision. The drift thickness mapping indicates that the overburden is about 8 metres thick near the tributary of the West Credit River located about 100 m to the north of the wells. Several water wells are reported for the subdivision area located south of the Bel-Erin wells. One test-hole drilled near Wellington Road 52 encountered bedrock at 13.4 metres. Two private wells, reported between the Bel-Erin municipal wells and Wellington Road 52, indicate that a local bedrock depression is present, with overburden thickness of up to 50 metres. A buried bedrock valley is mapped throughout this area but the exact locations and dimensions are variable.

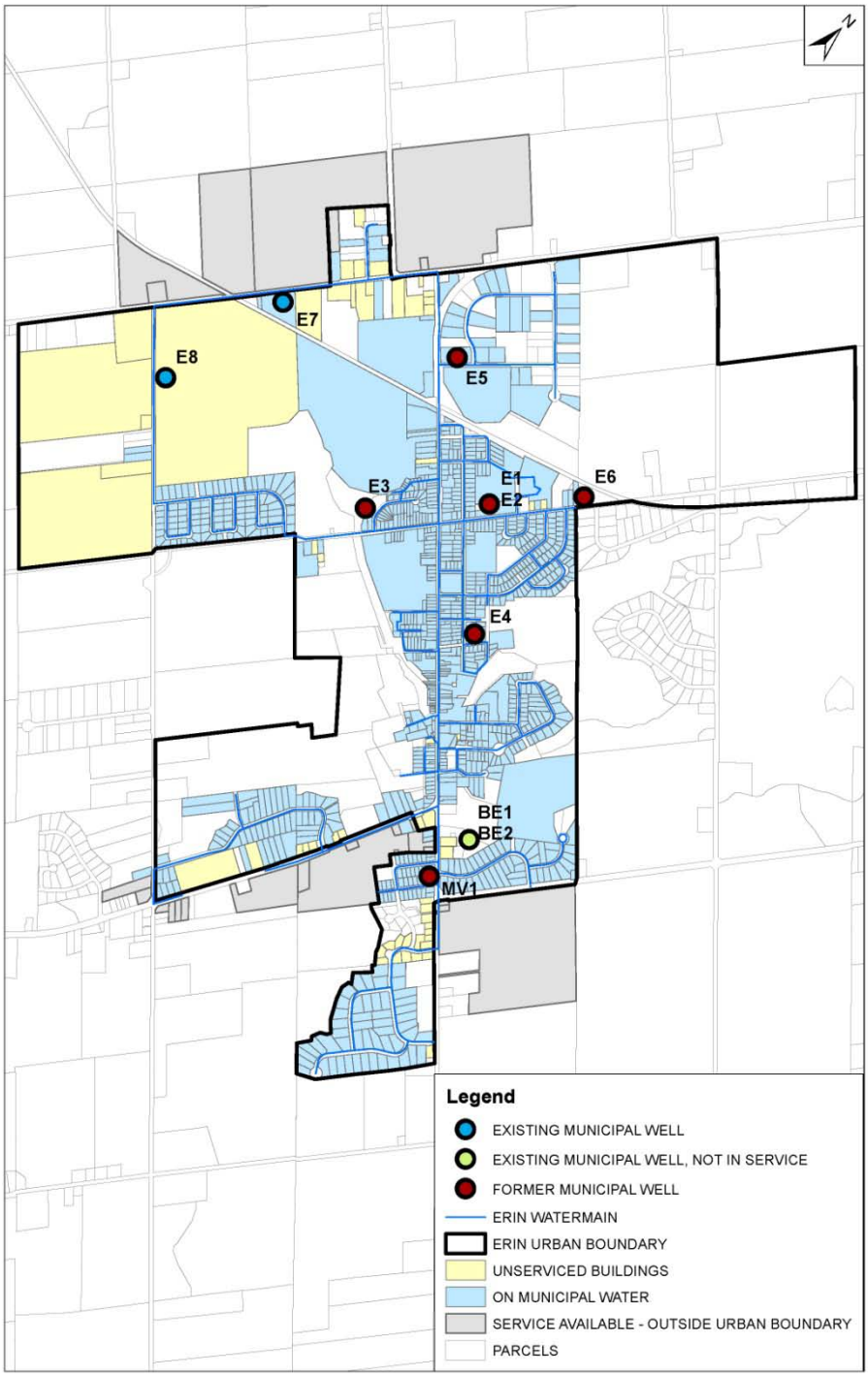
The wells were installed in July 1991 and December 1990, prior to the construction of the subdivision. Wells BE1 and BE2 are permitted for individual pumping rates of 456 L/min with total pumping from either well or both wells not to exceed this rate. When the two wells were in use for the subdivision they were pumped on an alternate basis, with an average water taking of about 75 L/min.

As part of an initial screening for a GUDI assessment in 2001 (Blackport Hydrogeology Inc, 2002), shallow monitoring wells and stream bed piezometers were installed along a tributary of the West Credit River, located less than 100 m north of the wells. The assessment concluded the wells were not GUDI under the existing pumping rates, which were lower than the permitted rates, however it was concluded that chemically assisted filtration would likely be required in order to use the wells for a municipal supply. It was decided in 2001 to supply the Bel-Erin subdivision with water from the Erin Village municipal wells. The Bel-Erin wells have not been in operation since then (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Historical Municipal Water Supply Wells

As noted, a number of municipal water supply wells have been developed and abandoned in the former Village of Erin. Prior to amalgamation of the former Township of Erin and Village of Erin, in 1998, the Village of Erin obtained municipal water supplies from within the municipal boundary of the Village. Several private communal wells existed in subdivisions adjacent to the Village of Erin but within the former Township of Erin. The following is a summary of the history of municipal water supply development in Erin Village and the area adjacent to Erin Village (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Figure 7-3: Existing and Former Well Locations, Erin Village



The first wells for municipal use in the Village of Erin were Well E1 and Well E2. These wells were drilled along Dundas Street East in September 1954 and May 1955, respectively, and were only 4.5 m apart (**Figure 7-3**). Well E1 was drilled to 19 m and Well E2 to 20 m depth. Both wells were completed in bedrock. Bedrock was encountered at about 8.8 m depth with overburden material mostly sand and gravel. Initial testing was at 1,590 L/min (350 igpm) with the static water level at 3 mbgs and a drawdown to 6.7 mbgs when pumped at the test rate. Retesting of the wells in 1974 showed a considerable decline in sustainable yield. A review of the Village of Erin Water Supply System by Gamsby and Mannerow (1984) indicated a further decline in well yield, as the wells were operating at a combined rate of 588 L/min (130 igpm) with a water level at about 9 mbgs (Gamsby and Mannerow, 1984). Water quality was also an issue with high levels of iron and iron reducing bacteria as well as some water samples results showing the presence of coliform bacteria. These wells were taken out of service when Well E5 (discussed below) was brought into operation in July, 1984 (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

To supplement Well E1 and Well E2, Well E3 was drilled in 1976, further west on Dundas Street near the West Credit River (**Figure 7-3**). Aquifer testing at this location identified three aquifer units, a shallow sand deposit, extending from surface to a depth of 6 m, a basal sand and gravel zone from 2-3 m thick, directly overlying the bedrock and a fracture zone at a depth of 33.5-35 mbgs. A series of four test wells were drilled to various depths but the only well that produced much water was ultimately Well E3, which was drilled 15.8 m into bedrock but subsequently screened in the basal sand, from 7.6-9.1 mbgs. It appears that a bored well was also installed in the shallow sand and gravel and both were connected into the distribution system at the pump house. The *Municipal Waterworks System, Village of Erin, February, 1984* report by Gamsby and Mannerow (1984) indicates that the bored well was not used and Well E3 was used at the time only for emergencies under a temporary PTTW to meet peak demands. This report concluded the amount of water available did not justify the installation of permanent pumping and treatment facilities at Well E3 (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Well E4, located on Daniel Street was brought into service in 1976 (**Figure 7-3**). It is assumed the well was drilled earlier as it was indicated at the time the well was brought into service it was rehabilitated to yield 408 L/min (90 igpm). Limited information was found on the well. It was observed by Gamsby and Mannerow (1984) that the well yield quickly decreased after rehabilitation. There were water quality issues, including high iron concentrations and high concentrations of nutrients, as well as coliform counts. It appears the well was only used for a short time before being abandoned due to water quality issues and well performance associated with water quality problems (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

In 1980, Hydrology Consultants Limited drilled a test well (TW1/80), which later became Well E5 (**Figure 7-3**). The well was drilled to a depth of 38 m in bedrock, with the top of bedrock encountered at 6 m. The well was located in an industrial subdivision. Well testing indicated the well could be pumped at a sustained rate of 1,362 L/min (330 igpm). Higher pumping rates caused interference with bedrock wells to the northwest. Water quality was determined to be excellent (e.g., low iron, nitrate, chloride, and sodium). Well E5 was officially brought into operation in July,

1984. In 1992, elevated concentrations of trichloroethylene (TCE) were found in the well and the well was shut down. An attempt was made to control the off-site migration of TCE to the well, under actual operating conditions, but this was ultimately determined not to be feasible and the well was officially abandoned in 2007 (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

At the same time the drilling program for Well E5 was being initiated, a preliminary hydrogeological investigation was conducted to identify additional areas exhibiting the potential for large-yield supply wells (Hydrology Consultants Limited 1979). Four target areas were selected, and three were later tested. Two locations were tested in 1985 (Well E6) and 1986 (existing Well E7). The other location was the Bel-Erin wells, previously discussed. Well E6, was drilled in the eastern portion of Erin Village, along Dundas Street East, to the east of Well E1 and Well E2 (**Figure 7-3**). Well E6 was drilled to a depth of 36 m. Bedrock was encountered at 8.3 mbgs. Overburden consisted of mainly sand and gravel, with minor silt. The initial pumping test indicated that the well could produce a continuous yield of about 342 L/min (75 igpm) however there was considerable drawdown in the well. The well was never developed for use as a municipal well and rather than being abandoned, the well is currently part of the Provincial Groundwater Monitoring Network.

Well E8 was subsequently drilled and as discussed previously, Well E7 and Well E8 are the two municipal wells currently in use in the Erin Village (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

The Bel-Erin Subdivision Well Supply (BE1 and BE2) was taken out of service and the subdivision connected to the Erin Village Well Supply System in November 2003.

The Mountainview Subdivision Well Supply (MV) (**Figure 7-3**) which was initially developed to service the existing Mountainview subdivision was taken out of service and connected to the Erin Village Well Supply System in October 2003.

7.2.2 The Hillsburgh Municipal Water System

7.2.2.1 Connected Population

The Hillsburgh Municipal Water System is a ground water supply system serving an estimated population of approximately 880 residential customers in the former Village of Erin. The Hillsburgh Municipal Water System currently has about 275 residential and 4 non-residential properties connected. The Hillsburgh Water System also supplies water to the multiple dwelling complex on Spruce Street that contains the equivalent of approximately 50 people. The estimated connected population accounts for the users within the multiple dwelling complex.

7.2.2.2 Distribution System

The Hillsburgh water distribution system consists of 7.1 km of watermain ranging in size from 150 mm to 250 mm (Town of Erin, 2009) (See **Figure 7-4**) with some sections of pipe dating back to 1965. Pipe materials vary from cast iron to ductile iron and PVC. The existing system is separated into two pressure zones (Upper and Lower) where Well No. H2 supplies water to the Upper zone and Well No. H3 supplies water to the Lower zone.

7.2.2.3 Storage

Water system storage provides water for equalization during peak demand periods, for fire protection, and emergencies. The Hillsburgh system has approximately 790 m^3 of water storage between the two in-ground reservoirs (Well No. H2 and Well No. H3).

7.2.2.4 Booster Pumping Station

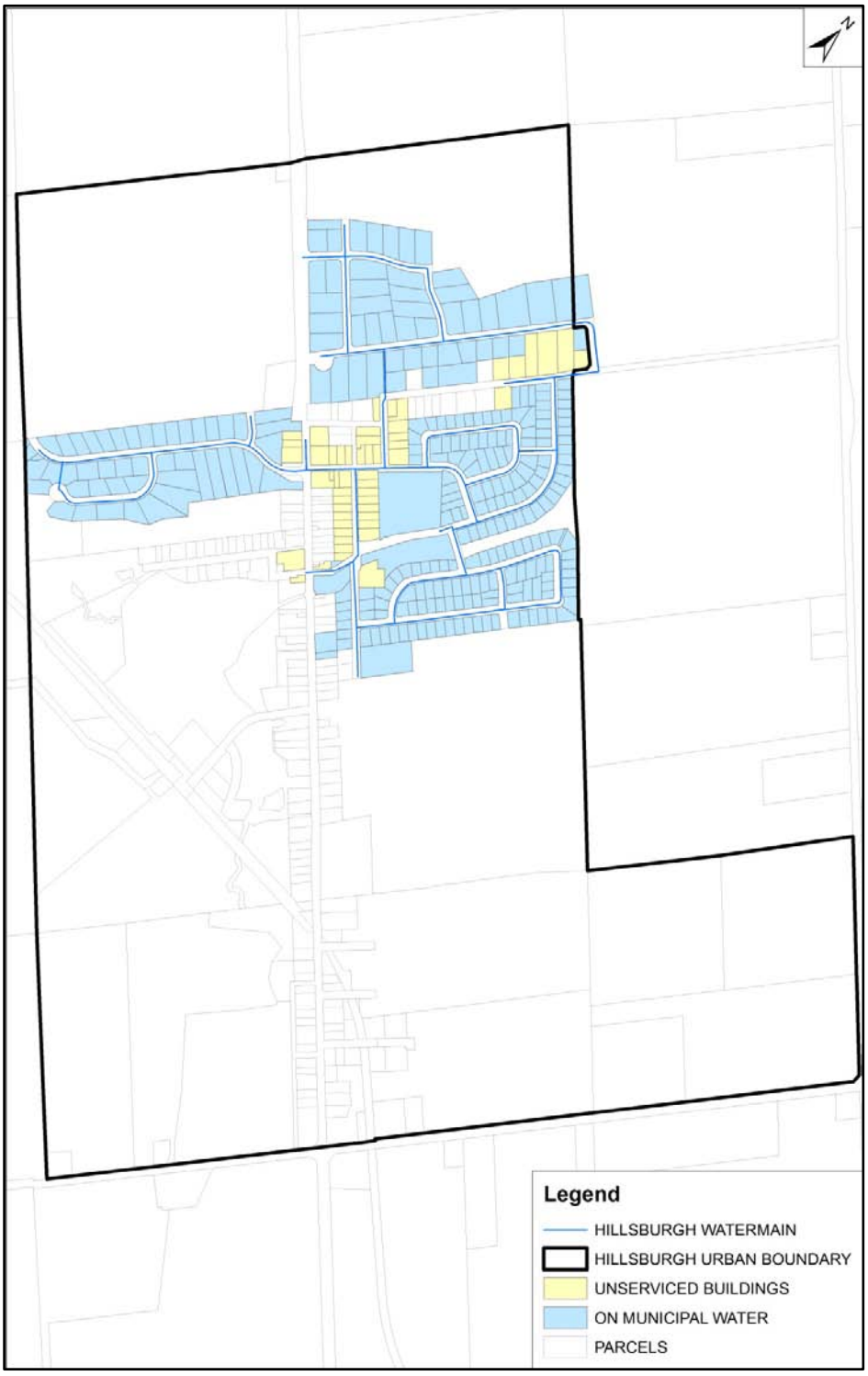
The existing Hillsburgh system is subdivided into two pressure zones, the Upper Pressure Zone and the Lower Pressure Zone. Well No. H2 supplies the Upper zone while Well No. H3 supplies the Lower zone. The zones are interconnected and up until recently were controlled by a pressure sustaining valve which would allow water to transfer from the Upper zone to the Lower zone in the event of insufficient supply but not in reverse.

In 2008, the Town undertook an Environmental Assessment to investigate the concern that the Upper zone could not be alternatively supplied and included an assessment of the feasibility of constructing a new booster pumping station that could supply water to the Upper zone from the Lower zone and Well No. H3. The preferred solution determined through the Class EA process included the construction of a booster pumping station.

Recently, the Hillsburgh Booster Pumping station was constructed with the following main objectives (Gambsy and Mannerow Ltd, 2013):

- Supply water from the lower zone to the upper zone;
- Provide high lift pumps to meet both current minimum flow and future conditions in the Upper pressure zone;
- Maintain pressures in the distribution system within the range of 275 kPa (40 Psi) and 700 kPa (100 Psi), during peak and minimum demand periods;
- Ensure 100% mechanical standby for high lift pumps;
- Accommodate pumping station expansion for a future fire flow pump, low lift pumps and rechlorination system;
- Allow for a portable power generator connection for emergency operation.

Figure 7-4: Existing Watermain in Hillsburgh



7.2.2.5 Well Supply

Water is supplied from two groundwater wells (Well No. H2 and Well No. H3) drilled into the fractured limestone bedrock with a total rated capacity of 1,637 m^3/d (refer to **Table 7-2**). Each well is accompanied by a pumphouse and in-ground reservoir. Pressure throughout Hillsburgh is maintained through high-lift pump operation.

Sodium hypochlorite solution is used at Well No. H2 and H3 (Ontario Ministry of the Environment, 2009) for disinfection. In addition, ferric chloride solution is added to the raw water at Well No. H2 to treat the naturally-occurring lead present in the water.

Table 7-2: Summary of Municipal Water Supply Wells, Hillsburgh

Well #	PTTW	Description†	Production Limit (m^3/day)
H3	8548-6SBGWC	Located on the grounds of Victoria Park and equipped with a submersible pump rated at 454 L/min at TDH of 50 m	**655**
H2	6306-8X5KRY	Located in the Hillsburgh Heights subdivision and is equipped with a submersible pump rated at 682 L/min at TDH of 52.7 m	**982**

†from the 2009 MOE Inspection Report

Well No. H2

Well No. H2 (Hillsburgh Heights Well) is located at 5929 Trafalgar Rd in the north part of the community (**Figure 7-4)**. The pump house has been upgraded, bringing it into compliance with the new regulations imposed by the Safe Drinking Water Act 2002. The neighboring land is used for both residential and agricultural purposes. It is an 88 m deep drilled groundwater well, constructed of steel casing of 200 mm diameter to a depth of 51.0 m. It is equipped with a submersible pump rated at 702 L/min but is not to exceed 682 L/min. The well discharges through a 150 mm diameter line into the in-ground reservoir. Two high lift pumps, one rated at 820 L/min and the other rated at 274 L/min feed the system as necessary from the reservoir. To meet system demands during a possible fire, a fire pump rated at 2,400 L/min exists at the well site.

In 2002, elevated concentrations of naturally occurring lead (the standard is 10 µg/L and lead concentrations in raw water were as high as 15 µg/L) were found in the raw water. The well was offline in 2003 and did not come back online until June 2004 when a new treatment system including dosing with ferric chloride and filtration to remove lead was approved. The well has been operated routinely since 2005 with the filtration system reducing lead levels in the treated water to levels less than 6 ppb (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Well No. H3

Well No. H3 (Victoria Park Well) is located at Victoria Park, approximately 150 metres north of the Glendevon pumphouse (**Figure 7-4**). The pump house has been upgraded, bringing it into compliance with the new regulations imposed by the Safe Drinking Water Act 2002. The neighbouring land is residential. It is a 57.9 m deep drilled groundwater well, constructed of steel casing of 200 mm diameter to a depth of 20.1 m. The well is equipped with a submersible pump rated at 456 L/min. One high lift pump rated at 615 L/min feeds the system as necessary from the existing reservoir.

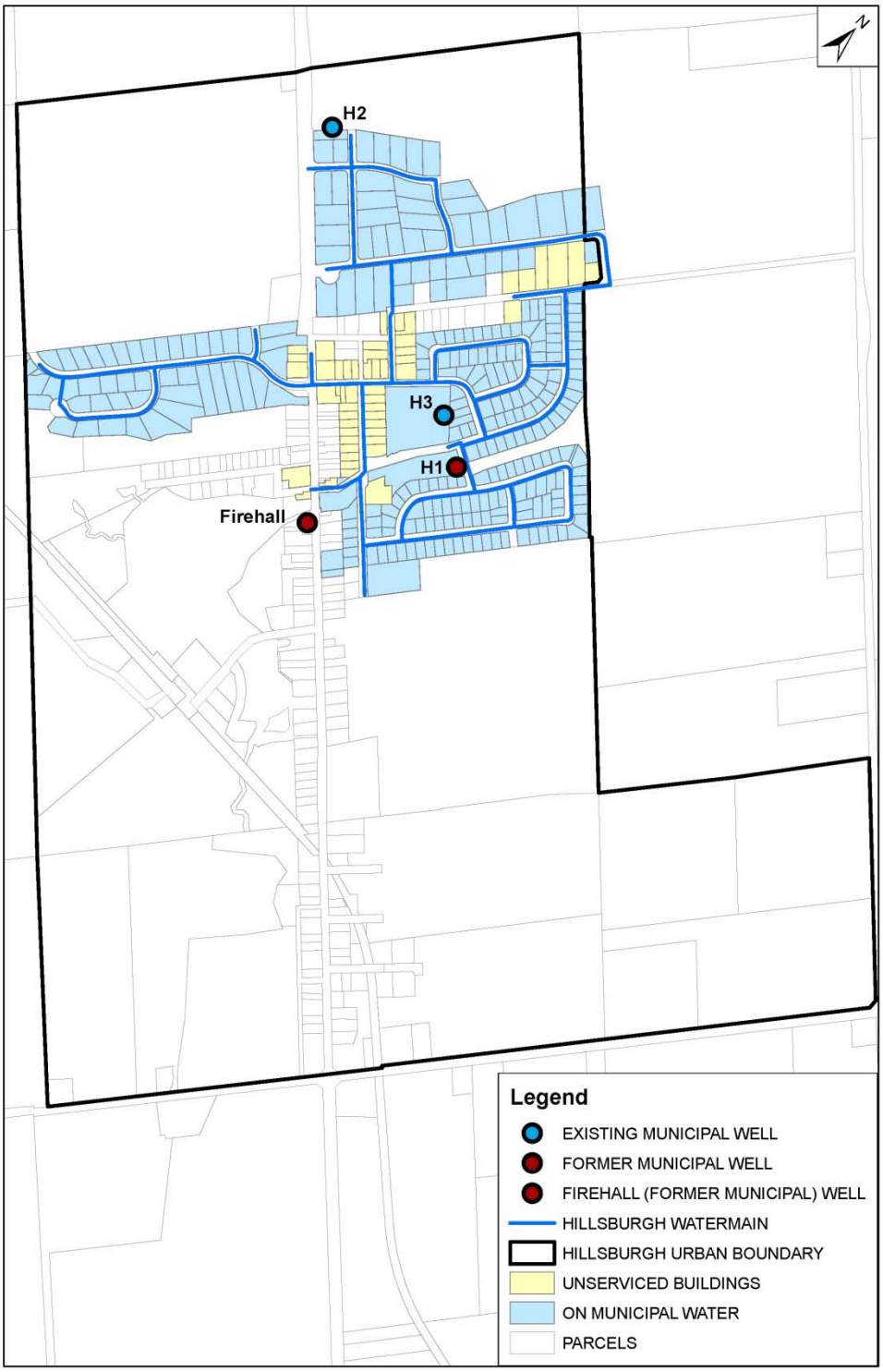
The well obtains water from the regional bedrock aquifer. It is permitted to pump at 454 L/min and a total volume of 653,760 L/day. H3 replaced well H1, known as the Glendevon well, which was located at the Glendevon reservoir and adjacent to the West Credit River. Well H1 was abandoned due to problems with iron-reducing bacteria. Prior to abandonment a long-term pumping test was conducted in 1995 (Terraqua Investigations Ltd, 1995) to assess the potential hydraulic connection to the adjacent upper portion of the West Credit River. Shallow monitoring wells and stream bed piezometers were installed and water levels were monitored in the wells and surface water to assess the potential for hydraulic connection between the pumping well and shallow groundwater/surface water. Results of the pumping test indicated no direct connection between H1 and the adjacent 400 m reach of the West Credit River at the pumping rate it was being used (199.8 L/min) to provide the municipal water supply. Well H2 was used as a replacement well, several hundred metres further away from the West Credit River and currently pumps at a lower rate. It was concluded that Well H3 is not hydraulically connected to the surface water system and the well is not GUDI (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Historical Municipal Water Supply Wells

The original municipal water supply well in Hillsburgh, Well H1, was drilled in 1968 by International Water Supply Limited (IWS). The well was located on Water Street near the West Credit River, in the core area of Hillsburgh about 120 m south of Well H3. The well was drilled into bedrock to a total depth of 37.2, with bedrock encountered at 17.4 m below ground surface.

Well H1 (**Figure 7-5**) was rated for 408 L/min (90 igpm). The well was used until 1995 and was abandoned due to apparent iron bacteria problems and the need for regular rehabilitation. A decision was made in 1995 by the former Township of Erin to abandon the well and drill a replacement well, farther away from the West Credit River but still in close proximity to the reservoir at H1.

Figure 7-5: Existing and Former Well Supply Locations, Hillsburgh



Well H3 was the replacement well, located about 120 m to the north of Well H1. Additional water supply well testing was undertaken in 1989. The "Firehall" well was drilled at the Hillsburgh Firehall (2 Station Street, about 600 m south west of H3) in 1989 to assess the potential for municipal water supply at the Firehall and for use as supply well for fire services. The well is a bedrock well, 62 m deep with 13 m of sand and gravel overburden. The well was tested at a rate of 570 L/min (125 igpm) but was interpreted to have the potential to produce 1,362-1,818 L/min (300-400 igpm) with limited drawdown at the well.

Water quality testing at the time showed generally good water quality, however there was evidence of impacts from surface sources of contamination with a nitrate (as NO3-N) concentration of 3.12 mg/l and a chloride concentration of 23.8 mg/L. The well has not been used for a municipal supply as it was ultimately decided that well H3 would be used instead, given the short distance to the reservoir. The Firehall well currently provides water for fire services (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

7.2.3 Summary – Municipal Systems

The Erin Village system consists of Well No. E7 and E8 and the Hillsburgh system includes Well No. H3 and H2. **Table 7-3** provides a description of each of the wells and summarizes the maximum permitted daily production allowed by the Permit to Take Water (PTTW).

Raw water from each of these wells is directed to the corresponding pumphouses which contain treatment and monitoring equipment in accordance with the Safe Drinking Water Act 2002.

Table 7-3: Summary of Municipal Water Supply Wells, Hillsburgh

Well #	PTTW	Description†	Production Limit (m^3/day)
E7	4364-7LWPT7	Located at 46 Shamrock Road and is equipped with a submersible pump rated at 1,800 L/min at TDH of 78 m	**2,160**
E8	2201-7LQN73	Located on Lot 17, Concession Road 8-9 and equipped with a submersible pump rated at 1,640 L/min at TDH of 32 m	**1,968**
H3	8548-6SBGWC	Located on the grounds of Victoria Park and equipped with a submersible pump rated at 454 L/min at TDH of 50 m	**655**
H2	6306-8X5KRY	Located in the Hillsburgh Heights subdivision and is equipped with a submersible pump rated at 682 L/min at TDH of 52.7 m	**982**

†from the 2009 MOE Inspection Report

7.2.4 System Capacity

7.2.4.1 Firm Capacity

The firm capacity of a system is the capacity available if the highest capacity well is out of service. The total system capacity is the cumulative sum of all the well capacities. Included in **Table 7-4** is a summary of the capacity of the Town of Erin municipal well supplies based on the Permit to Take Water (PTTW), Drinking Water Works Permit (DWWP) and the ability of the existing pumping equipment.

Table 7-4: Town of Erin Water Supply

Well	PTTW Capacity (m^3/d)	DWWP Capacity (m^3/d)	Existing Pumping Equipment (m^3/d)
E7	2,160	2,592	2,592
E8	1,968	2,361	2,356
H3	655	654	656
H2	982	982	1,011

The limiting condition for Erin Village is the PTTW. In Hillsburgh it is the DWWP. In Erin Village with the largest well out of service the firm capacity of the smaller well, Well No. E8, is 1,968 m^3/day. Similarly, in Hillsburgh the firm capacity of the system with the largest well out of service is the permitted capacity of Well No. H3, 654 m^3/day. These firm capacities have been summarized and compared to the total system capacity in **Table 7-5**.

In addition to the supply capacity of the existing systems, both systems contain water storage and/or pumping infrastructure which allow for maintenance of adequate flow and pressure in the distribution system during peak hour water demand, and to meet critical water demands during fire flow and emergency conditions.

Treated water storage is determined in accordance with MOE guidelines related to both fire flow and duration required given the anticipated population. The MOE guidelines suggest the following storage equation:

Total Treated Water Storage Requirement = A + B + C

Where: A = Fire Storage;

B = Equalization Storage (25% of maximum day demand); and

C = Emergency Storage (25% of A + B).

The maximum day demand referred to in the above equation is determined based on existing flow data.

Existing total storage volumes available in both Hillsburgh and Erin are summarized in **Table 7-5**.

Table 7-5: Existing Firm and Total System Capacity

System	Firm Capacity (m^3/d)	System Capacity (m^3/d)	System Storage (m^3)
Hillsburgh	655	1,637	790
Erin	1,968	4,128	2,200

7.2.5 Water Usage

The MOE Design Guidelines for Drinking-Water Systems (MOE Guidelines) suggest that domestic water demands typically range from 270 L/d/cap to as high as 450 L/d/cap, but that actual water use records should be used for design where available. Water usage data for the Erin and Hillsburgh systems are available related to water supplied to each community. Usage and flow values for the two municipal systems for the years from 2011 to 2013 are summarized in **Table 5-6**.

The Ministry of Environment guidelines provide recommended values for peaking factors, which can be used to calculate maximum day flow rates. Average day and maximum day flows in each system are shown in **Table 7-6** for the past three years. For each year, an empirical maximum day factor is calculated by dividing the maximum day flow by the average day flow.

Table 7-6: Summary of Water Usage Rates

Year	Yearly Volume (m^3)			Max Day Factor					
	Well Supply			Hillsburgh (m^3/day)			Erin (m^3/day)		
	Hillsburgh	Erin	Total	Avg Day	Max Day	Max Day Factor	Avg Day	Max Day	Max Day Factor
2011	66,960	425,240	492,200	183	474	2.6	1,165	2,492	2.1
2012	75,500	349,760	425,260	207	499	2.4	958	2,191	2.3
2013	61,590	353,290	414,880	169	476	2.8	968	1,657	1.7
Total	68,020	379,100	454,120	190	499	2.6	1,030	2,492	2.4

In the last three years of record, the maximum day demand was 499 m^3/d and 2,492 m^3/d in Hillsburgh and Erin, respectively. The maximum day factor of 2.6 for Hillsburgh and 2.4 for Erin are consistent with that recommended by the MOE Guidelines for communities similar in size.

It is evident in reviewing the summarized demands for Erin Village that the maximum day demand on the system exceeds the firm capacity. Although, the maximum day demand in Hillsburgh did not exceed the firm capacity of the system for the years listed (**Table 5-6**), historic well record information for the community indicates that there have been times during the operation of the wells that the maximum day demand is greater than the firm capacity.

7.3 Existing Community

7.3.1 Existing Connections

Provided in **Table 7-7** is a summary for each water system of the estimated population that is currently connected relative to the estimated total population.

Table 7-7: Population Growth Scenarios for Water Usage Calculations

Location	Existing Population	Existing Estimated Connected Population
Hillsburgh	1,394	880
Erin	3,087	2,720
Combined	4,481	3,600

Based on information provided for the existing water systems, in Hillsburgh there are 280 water connections and in Erin Village there are approximately 1,010 water connections. These connections include all residential and non-residential usages. By comparison it is estimated that there is potential for about 510 connections in Hillsburgh and 1120 connections in Erin which equates to 230 properties not connected in Hillsburgh and 110 properties not connected in Erin.

In each community there a number of developed properties that have not yet been connected to the system as they remain on their own private well supply. In Hillsburgh it is estimated that there are approximately 50 properties and in Erin Village it is estimated that there are approximately 58 properties that are developed and could immediately connect to the distribution system.

7.3.2 Per Capita Usage

A summary of the suggested design values (based on actual usage and connected population) is presented below in **Table 7-8**. It is noted that a future inter-connection of the Erin and Hillsburgh water systems has been considered in later parts of this document and as such the demand characteristics of a combined system have also been estimated.

Table 7-8: System Design Parameters

System	Average Day Usage (L/Cap./d)	Max. Day Factor	Maximum Day Usage (L/Cap./d)
Hillsburgh	220	2.6	570
Erin	380	2.4	910
Combined	340	2.5	850

7.3.3 Mandatory Connections

In 2011 the Town proposed a mandatory servicing bylaw with the intent to incorporate existing lots in both Hillsburgh and Erin that were not connected to the municipal systems. For various reasons some of the existing properties, as noted, were not connected to the systems as the mains and / or the properties were developed. There are a number of reasons that the Town would want all the properties within the urban areas connected to the municipal system, including issues with property setbacks and septic systems, security of the groundwater supply, responsibility to provide a comprehensive system, and the need to include all properties in future planning.

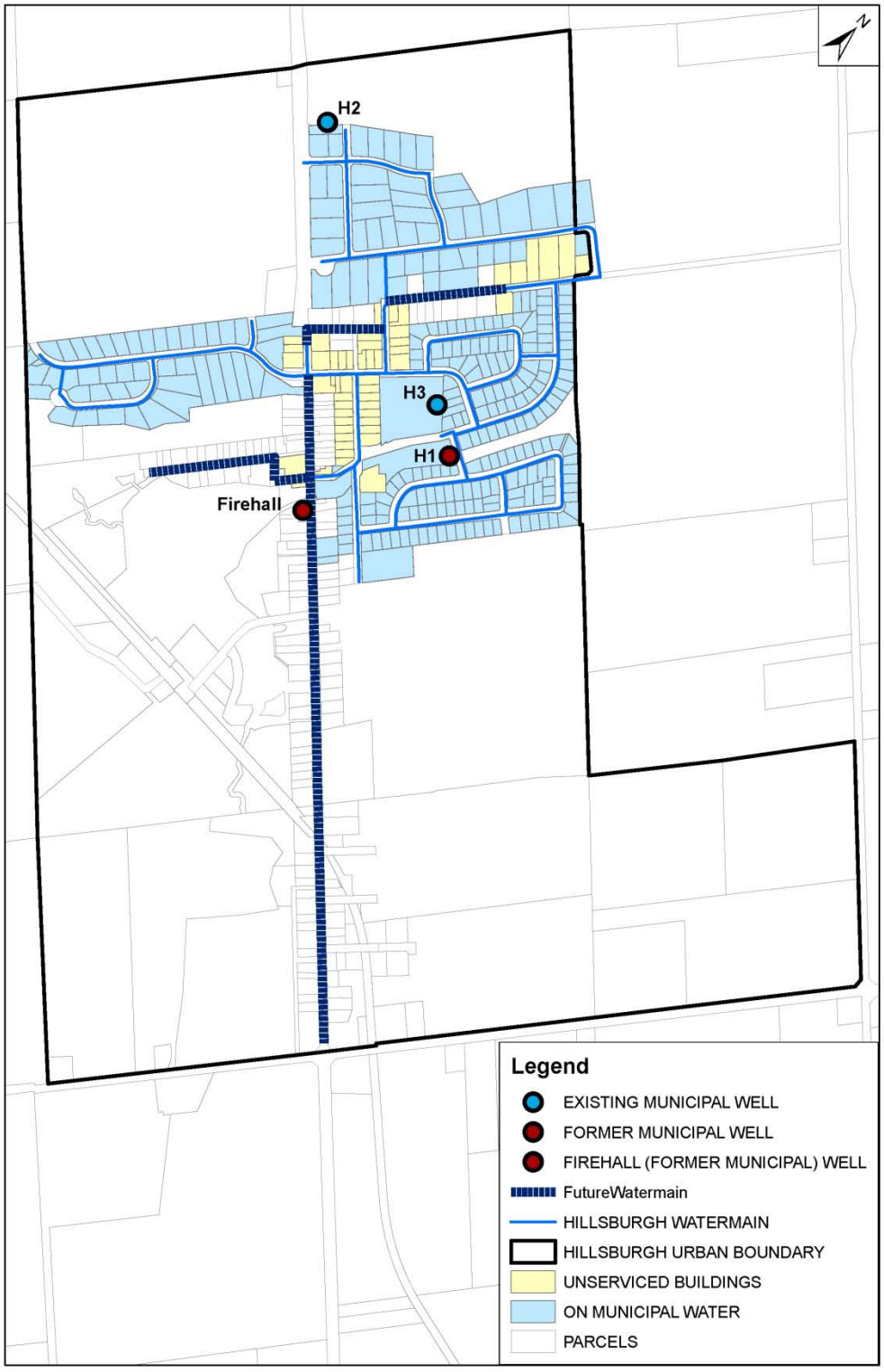
Going forward with the future servicing of the urban areas it is **recommended that all properties be connected to the municipal water systems**. On this basis, all properties have been considered in the calculations for design of future facilities, supply and storage, and the ultimate cost of the constructed works.

7.3.4 Extension of Distribution Systems

In Erin Village, most of the properties that have not been serviced (whether they are vacant or on their own well) could be connected to the existing distribution system without a significant extension of the pipe network.

In Hillsburgh, it is estimated that there are 180 properties that do not presently have access to the distribution main and an extension of the existing watermain will be necessary. **Figure 7-6** provides a schematic illustration of the Hillsburgh distribution system and the future watermain installation that will be necessary to provide servicing to the 180 properties that, at the present time, could not connect to the system.

Figure 7-6: Future Watermain Extension, Hillsburgh



In general terms, the water system in Hillsburgh will need to be extended to include over 2,000 metres of watermain as well as the individual services that would be required for each property that does not currently have a service connection.

7.3.5 Capability of Well Supply

In addition to the pipe network and distribution systems in each community, the major infrastructure of the Erin Water Works is the supply and storage located within Hillsburgh and Erin Village. Using the average day demands and maximum day factors for each system (**Table 5-**8), the system requirements for a future condition where the existing population is to be fully connected is summarized in **Table 7-9**.

As noted previously, in each water system the maximum day demand, at times, has exceeded the firm capacity which suggests that at present (without any extra demands) **additional system redundancy is required** in both the Erin Village and Hillsburgh water systems. Although subject to future hydrogeological study, in some cases, additional redundancy may be possible by constructing (drilling) a standby well at the largest well site, in each community, to increase overall firm capacity of the systems.

Table 7-9: Water System Requirements - Existing Population Connected

		Demands (m^3/day)		Treated Storage Requirements						Existing Available Stor.
Scenario	**Pop.**	**Avg. Day**	**Max. Day**	**Fire Flow** (L/s)	**Period** (hrs)	**Fire** (m^3)	**Eq.** (m^3)	**Emer.** (m^3)	**Total Stor .** (m^3)	(m^3)
SEPARATE SYSTEMS MAINTAINED										
HILLSBURGH										
Existing	1,394	307	795	75	2	540	199	185	923	790
ERIN										
Existing	3,087	1,034	2,475	105	2	806	702	377	1,886	2,200

7.3.5.1 Hillsburgh

Under a situation where the existing community is fully connected in Hillsburgh and based on firm capacity for the system, there will be a supply deficit of approximately 140 m^3/day and a storage deficit of approximately 130 m^3. Although a future Class EA study will be required to fully review the possibilities of providing additional supply to Hillsburgh, the deficits noted are relatively small and could possibly be accommodated through expansion of Well No. 3 and the Glendevon well system.

In Hillsburgh, it is recognized that there is a potential that future changes to the Ontario Drinking Water Standards may result in the maximum allowable concentration for lead to be reduced from the current value of 10 ppb to something less than 5 ppb. Should this occur, there are concerns that the existing filtration system at Well No. H2 (Hillsburgh Heights Well) would not be able to provide adequate treatment. Also, the booster pumping station recently put into operation in Hillsburgh was constructed to allow a feed from Well No. H3 in the lower pressure zone to the higher pressure zone area in the event that Well No. H3 needed to be abandoned. Although H3 and the booster station have the ability to feed the higher pressure zone, it does not fully address the existing well supply concerns in Hillsburgh particularly if it becomes necessary in the future to take Well No. H2 off-line.

7.3.5.2 Erin

Based on firm capacity for the system, and with the entire existing community connected, in Erin there will be a supply deficit of approximately 840 m^3/day. However, system storage is adequate to satisfy fire and emergency demands for the existing population. A future Class EA study will be required to fully review the possibilities of providing additional supply to Erin, the deficit noted could be addressed by reinstating the Bel-Erin (BE1 and BE2) well supplies.

The Bel-Erin wells (BE1 and BE2) are currently not operational and cannot be connected to the Erin water supply system until appropriate approvals are obtained for treatment. The wells have the piping to connect to the Erin water system and the water quality is currently good but there is a potential for surface interference with these wells which will likely require expanded treatment prior to connection.

Given the above, it is necessary that the Town begin to take steps to plan for the future need of an increased supply and additional/expanded treated water storage where required.

7.3.6 Costs

On a conceptual level, the costs associated with system improvements/upgrades which may be required to connect the entire existing community are suggested below in **Table 7-10**:

Table 7-10: Water System Expansion Costs to Connect All Existing Residents

System	Description	Conceptual Incremental Costs
Hillsburgh	Watermain Extensions, water services, and Expansion of Well No. H3	$1,485,000
Erin	Watermain Extensions, water services, and Reinstatement of Bel-Erin Wells	$1,230,000

Included in the above conceptual level costing is an allowance for additional well testing to determine the feasibility of replacing or adding a new well at the Well No. H2 site in Hillsburgh.

7.4 Growth and Development

7.4.1 Future Connections

As developed through the West Credit River assimilative capacity study completed in conjunction with wastewater component of the SSMP, there is a population servicing potential of approximately 6,000 people between the two communities and within the urban boundaries of Hillsburgh and Erin. This equates to a growth allowance of over 1,500 people (given an existing population of 4,500).

Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries (such as in the hamlets of Cedar Valley and Brisbane) are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.

Through the SSMP process and as discussed elsewhere in the document, Council agreed to consider three development servicing scenarios related to the existing community and the potential growth allocation of approximately 1,500 people. The servicing scenarios considered are as follows:

1. Existing Erin and Hillsburgh with future growth allocated to both communities.
2. Existing Erin and Hillsburgh with future growth allocated only to Erin Village.
3. Existing Erin and Hillsburgh with growth allocated to only Hillsburgh.

Based on the above scenarios, **Table 7-11** summarizes the allocation of the potential future population under each condition. In the case of Scenario 1, the 1,500 people of potential growth has been split equally between the communities providing an additional 750 people in Hillsburgh and an additional 750 people in Erin. In Scenario 2, the 1,500 people are allocated only to Erin Village and in Scenario 3, the 1,500 people are allocated only to Hillsburgh.

Table 7-11: Population Growth Scenarios for Water Usage Calculations

Allocation Scenario	Location		Total (Pop.)
	Hillsburgh (Pop.)	Erin Village (Pop.)	
Existing Community	1,394	3,087	4,481
Scenario 1	2,144	3,837	5,981
Scenario 2	1,394	4,587	5,981
Scenario 3	2,894	3,087	5,981

7.4.2 Future System Requirements

With consideration to the above scenarios, calculations were completed to determine the system requirements for each water system under the range of growth allocations within each community. **Table 7-12** provides a summary of results of those calculations and includes values for a possible future combined water system connecting the two urban centres.

Table 7-12: Water System Requirements

		Demands (m^3/day)			Treated Storage Requirements				
Scenario	**Pop.**	**Avg. Day**	**Max. Day**	**Fire Flow** (L/s)	**Period** (hrs)	**Fire** (m^3)	**Eq.** (m^3)	**Emer.** (m^3)	**Total Stor.** (m^3)
SEPARATE SYSTEMS MAINTAINED									
HILLSBURGH									
Existing + 750	2,144	472	1,222	93	2	670	306	244	1,219
Existing + 1500	2,894	637	1,650	108	2	778	412	297	1,487
ERIN									
Existing + 750	3,837	1,458	3,492	124	2	893	873	441	2,207
Existing + 1500	4,587	1,743	4,174	136	2	979	1044	506	2,528
COMBINED WATER SYSTEM (ERIN AND HILLSBURGH)									
Existing	4,481	1,524	3,809	134	2	965	952	479	2,396
Existing + 1500	5,981	2,034	5,084	154	3	1,663	1,271	734	3,668

It is evident in the preceding table that as development in the urban areas proceed, including full connection of the existing population, demands on the existing water systems will increase and the existing supply and storage components will ultimately require expansion and additional redundancy. With a firm capacity of 655 m^3/day in Hillsburgh and a firm capacity of 1,968 m^3/day in Erin Village each system is already over-committed.

Possible alternatives to address the deficits include upgrades for each individual system and/or the possible inter-connection between the two systems.

In the previous section, the supply and storage deficits (as applicable) for each community were summarized under a situation where the existing community is fully connected. The following table expands upon the previous summary and provides the supply and storage deficits (where applicable) that may be realized for the various future population scenarios.

It is noted that the calculations in **Table 7-13** assumes that all of the existing community is to be connected in addition to the various allocation of future development.

Table 7-13: Potential System Deficits for Future Population Scenarios

Scenario	Population	Storage Deficit (m^3)	Supply Deficit (m^3/day)
Separate Systems Maintained			
Hillsburgh + 750 people	2,144	430	570
Hillsburgh + 1500 people	2,894	700	1,000
Erin Village + 750 people	3,837	nil	1,500
Erin Village + 1500 people	4,587	330	2,200
Combined Water System (Erin and Hillsburgh)			
Combined – All Existing	4,481	nil	200
Combined + 1500 people	5,981	680	1,500

In the case of Erin and Hillsburgh as separate systems, the addition of 750 people appears to trigger the need for additional supply that is likely beyond what the expansion abilities of the existing wells. For purposes of providing conceptual level costing it has been assumed that a new well supply system will be required to address the additional demands on the basis of firm capacity.

As noted, there may be an advantage to inter-connecting the two systems through an extension of the distribution system either within the existing municipal road allowances or possibly within the Elora Cataract Trailway.

7.4.3 Costs

On a conceptual level, the costs associated with system improvements/upgrades which may be required to connect the entire existing community as well as the incremental costs associated with expanding the population in each are suggested below in **Table 7-14 and Table 7-15**. In all cases, the costs provided are additional to those suggested to connect the full existing population.

Table 7-14: Water System Expansion Costs to Expand Each System to Include 750 Future People

System	Description	Conceptual Incremental Costs
Hillsburgh	◆ Expand system needed to connect existing community. ◆ Construction of new well system. ◆ Additional Storage for future 750 people	$1,750,000
Erin	◆ Expand system needed to connect existing community. ◆ Construction of well system for future 750 people	$2,000,000

Table 7-15: Water System Expansion Costs to Expand Each System to Include 1,500 Future People

System	Description	Conceptual Incremental Costs
Hillsburgh	◆ Expand system needed to connect existing community. ◆ Construction of well system and additional Storage for future 1,500 people.	$2,070,000
Erin	◆ Expand system needed to connect existing community. ◆ Construction of well system for future 1,500 people	$2,440,000

As noted, **an option that should be pursued as part of future Class EA study work is the inter-connection of the Hillsburgh and Erin Village water systems**. Based on a conceptual level review, it appears possible to undertake a future connection which, on the basis of firm capacity, would minimize the upgrades needed to connect the two existing communities.

Table 7-16 summarizes the conceptual level costs associated with interconnecting the two water systems under scenarios of full existing population connection and future development with 1,500 additional people.

Table 7-16: Water System Inter-Connection Costs

Scenario	Description	Conceptual Costs
Connect Existing Communities	◆ Complete distribution system extension and installation of individual services to allow connection of existing community that has not yet been connected. ◆ Construct 4800 metres +/- of transmission watermain between communities. ◆ Include allowance for possible pressure booster station to allow for transmission of flows from Erin Village to Hillsburgh.	$4,340,000
Add 1,500 people	◆ Provide additional supply and storage possibly including reinstatement of the Bel-Erin wells.	$3,440,000

7.5 Possible Well Locations

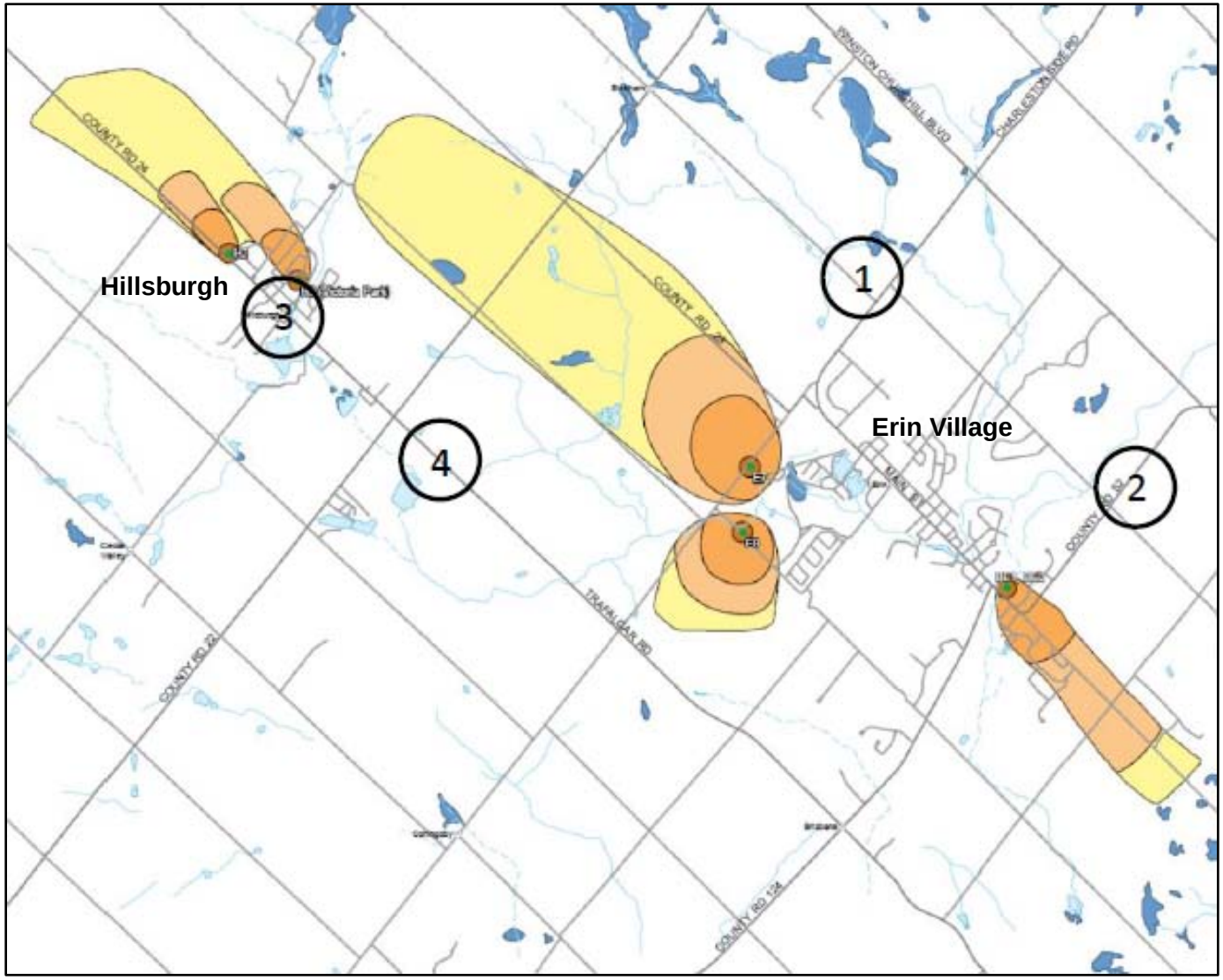
Recognizing the requirement for future supply, Blackport Hydrogeology Inc. provided input on potential locations for possible new well sites. In reviewing potential new well locations, consideration was given to various factors/assumptions in the development of the alternatives (Blackport Hydrogeology Inc, 2014) (**Figure 7-7**).

The factors and assumptions that were considered are summarized below:

7.5.1 General

- Wells are to be located outside of the existing Well Head Protection Areas (WHPAs) to limit the likelihood of mutual interference;
- Locations should be selected where a reasonable level of natural protection from surface sources of contamination can be provided;
- In general, locations are to be away from potential or known sources of contamination;
- Areas should generally be excluded where the existing well yield information shows limited promise for higher yielding wells (> 500 m^3/day);
- Where possible, wells should be located in relatively close proximity to the existing distribution system;
- It is assumed that each new well will be capable of producing at least 1,000 m^3/day.

Figure 7-7: Potential Future Well Locations



Blackport Hydrogeology Inc., 2014

7.5.2 Specific

As noted, the Bel-Erin wells (BE1 and BE2) in Erin are currently not operational but could be connected to the existing water system if the appropriate approvals are obtained for treatment. The wells have the piping to connect to the Erin water system and the water quality is currently good. There is, however, a potential for surface sources of contamination given the shallow depth and number of septic systems within the capture area. Although the wells are currently classified as not GUDI and not having effective filtration, it is likely that under the new GUDI rules (currently in draft form under review by the MOE) the wells will be GUDI without effective filtration. The wells will have to be pumped at their sustained permitted rate to ensure there are no issues, in particular, a hydraulic connection to the adjacent south tributary of the West Credit River. It is possible that additional treatment possibly including ultraviolet disinfection may be required should these wells be put back into service (Blackport Hydrogeology Inc, 2014).

In Hillsburgh, there is the potential to use the Firehall well. The well was tested at 300 Igpm (2000 m^3/day) in 1989 with results indicating increased turbidity at higher pumping rates (which could indicate a poor casing seal in the bedrock). The pump testing also showed a low level of nitrate. Should the Firehall well location be considered, the well should be retested to assess if the noted issues are still prevalent or if there are any new concerns. It is possible that a new well may be needed in the general vicinity of the existing well should the noted concerns be confirmed with future testing (Blackport Hydrogeology Inc, 2014).

Figure 5-7 illustrates the potential location for possible new wells in the area of both communities.

7.6 Consideration for Future Study

To increase redundancy in both communities and to meet future supply and storage requirements, depending on the future population allocation for each community, it is suggested that future study and project work consider the following:

- Viability of increasing the firm capacity of each system by adding an additional well at the largest well supply for redundancy.
- Reinstatement of Bel-Erin wells related to additional supply demands.
- Addition of a new well supply in each community as may be required to address the future growth scenarios.
- Implementation of mandatory connection requirements within the urban boundary of each community.
- Consider the possibility of an inter-connection of the Erin and Hillsburgh water systems including new supply as required to accommodate growth.
- Review the long-term viability of Well No. H2 in Hillsburgh (primarily related to the natural occurrence of lead) and consider alternatives for its replacement including the expansion of the new booster pumping station as the primary supply to both the Upper and Lower Zones.

Planning for any new facilities will take into account the identified growth targets for the municipality as identified within the SSMP.

Final EA work will need to be completed for the individual projects in accordance with the Municipal Class EA.

8.0 Stormwater Management

8.1 Background

Effective management of stormwater is critical to the continued health of streams, rivers, fisheries and terrestrial habitats. Changes to the existing land use pattern, within the watershed, will have impacts on topography, ground cover, contaminant loadings and surface drainage. These impacts in turn can lead to reduced water quality, increased erosion, habitat loss and reduced recreational resources.

The Town of Erin encourages the effective management of stormwater drainage and run-off through the implementation of Municipal Servicing Standards, best management practices and stormwater management techniques in accordance with applicable provincial policies and guidelines. It is noted that the West Credit River currently shows impacts from urban stormwater drainage, resulting from limited stormwater management infrastructure. Given the existing impacts and potential future impacts relating to development, there is a need to assess existing and future stormwater management infrastructure.

The intent of this section of the report is to provide a framework that can be considered in planning stormwater management for existing and future land use development and will be useful for the review and regulation of stormwater management issues related to individual development proposals.

8.2 Stormwater Management

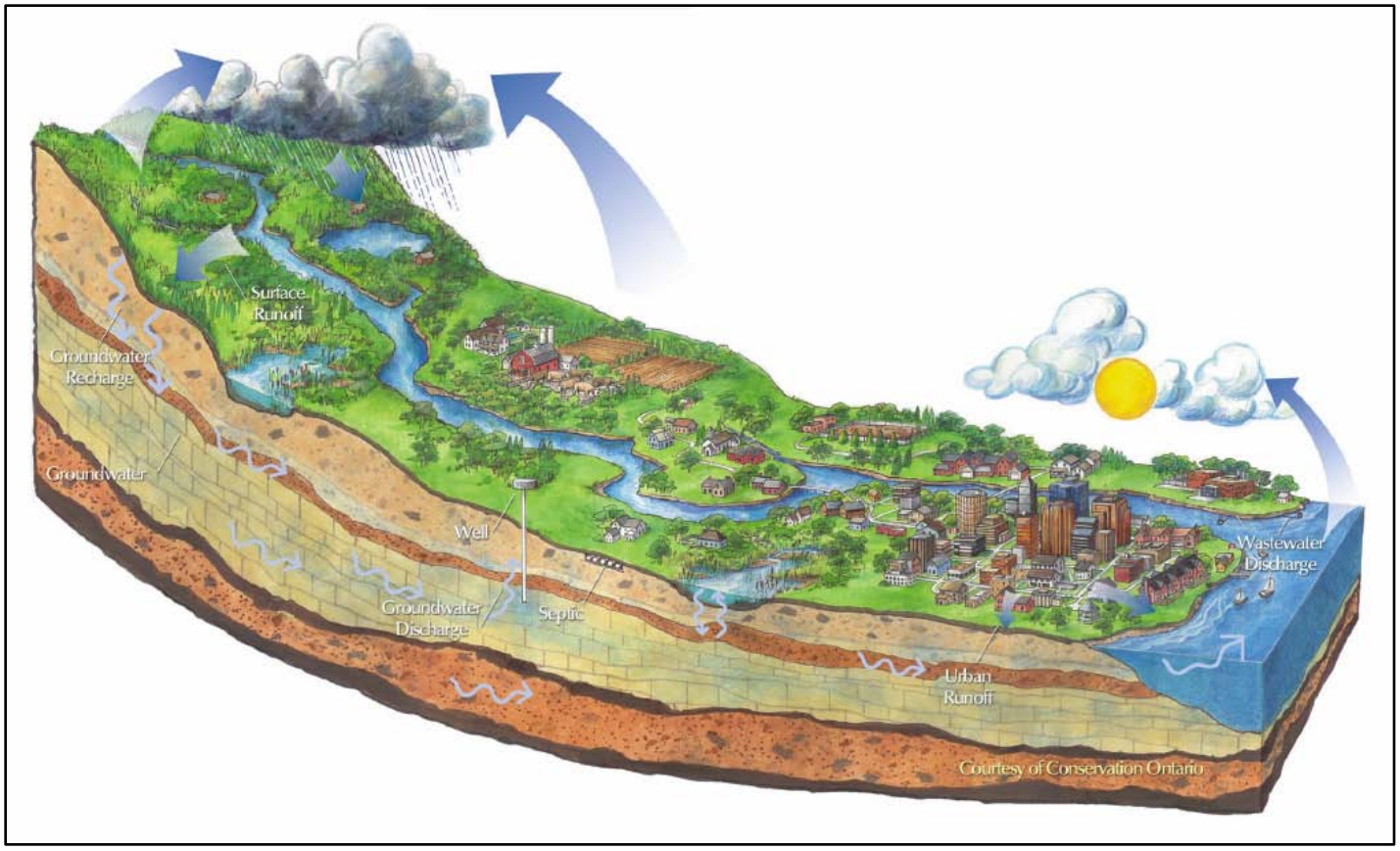
8.2.1 What is Stormwater Management

To fully understand what is being contemplated in conjunction with the SSMP, it is important to have an understanding of how stormwater is defined and what is meant by stormwater management. Stormwater is simply defined as any precipitation, be it rainfall or snow melt, that either runs off the surface of the land or is allowed to infiltrate through the soil and ultimately reach the water table. How we manage this precipitation as it interacts with municipal infrastructure (roads and storm drains) before ultimately being absorbed into the soil or being discharged to a receiving water body, is stormwater management.

8.2.2 Hydrologic Cycle

The Hydrologic Cycle Schematic, illustrated on **Figure 8-1**, provided by Conservation Ontario, illustrates how water takes different forms as it moves through the hydrologic cycle. In a natural system, more water is absorbed into the soil or is taken up by plants, replenishing groundwater supplies and base flows for adjacent watercourses. However, as a system becomes more urbanized and ground surfaces are hardened through man-made activities such as road construction and the construction of buildings, less stormwater is absorbed or taken up by natural plant material. This results in increased runoff which can create flooding and erosion problems and can also flush pollutants and sediments into receiving watercourses.

Figure 8-1: The Hydrologic Cycle



Courtesy of Conservation Ontario

8.2.3 Stormwater Management

In implementing stormwater management concepts, designers try to replicate the natural hydrologic cycle by utilizing man-made measures to slow stormwater down. This allows water to infiltrate into the soil, or evaporate and allows sediment and pollutants to be filtered out. The technology of stormwater management is evolving and has changed significantly from early efforts which simply sought to direct stormwater to a piped drainage system and then to an outlet as quickly as possible. Guidelines have been developed by local conservation authorities and by the Ministry of the Environment to assist municipalities with designing the most suitable stormwater management systems for the type of development which is proposed.

8.3 Stormwater Design Concepts

8.3.1.1 Lot Level Controls

Lot level controls are typically implemented at the individual property level, with the intent to slow down and reduce the volume of stormwater before it enters a piped conveyance system. A number of measures are available which can be described as lot level controls such as directing roof leaders onto grassed areas, use of rain barrels, constructing infiltration gardens, reducing the amount of

hard surfaces such as driveways and sidewalks or by using more absorptive material to construct driveways and walkways such as gravel or stone. Lot grading can also be utilized as a lot level control measure, using flatter slopes and grassed swales to help to slow down stormwater before it leaves the property.

8.3.1.2 End of Pipe Solutions

End of pipe solutions, in contrast, refer to stormwater measures which are typically implemented at the end of the piped conveyance system, prior to the stormwater being discharged to the receiving stream or water body. Types of facilities which are characterized as end of pipe would be stormwater management ponds, wetlands, infiltration basins and oil/grit separators. End of pipe facilities can be utilized as the only form of stormwater management being implemented or they can be used as part of an overall management system in partnership with other control measures. Often these facilities include a water quantity, as well as a water quality, component. The water quantity aspect will typically require that a certain volume of stormwater be retained following a storm event and then be allowed to enter the receiving stream at a reduced rate over a longer period. Stormwater quality controls try to slow down the stormwater to allow suspended sediments and pollutants to settle out or be filtered out before stormwater leaves the facility.

8.3.1.3 Conventional Stormwater Management Measures

Conventional stormwater management measures typically refer to techniques which are widely utilized in new and existing stormwater drainage systems such as grassed swales, a piped conveyance system, typically designed to handle a 5 year return storm event and often a stormwater management pond installed at the end of the pipe, to provide quantity and quality control prior to discharge to the receiving stream.

8.3.1.4 Low Impact Development (LID) Measures

A relatively new concept in stormwater management, low impact development (LID) has gained popularity in recent years as approval agencies seek to minimize the impact of increased urbanization on natural systems. Low impact development sets a higher standard for new development by incorporating a landscape based standard for new development, which significantly reduces the amount of runoff generated by a development. Many of the lot level controls described above, would be included as a component of this design concept, however additional measures would also be incorporated, including green roofs, cisterns, infiltration trenches, reduced road and parking lot surfaces, as well as other innovative techniques designed to hold back and retain stormwater before it enters the piped conveyance system. LID concepts can be best implemented in conjunction with new development, where the innovative design concepts can be incorporated into various aspects of the development design. Some of these measures can be implemented within existing developed areas, although with more difficulty, given that existing infrastructure is already in place.

8.4 Existing Stormwater Management

There are a few existing stormwater management facilities in both Hillsburgh and Erin Village that include end of pipe quality and/or quantity control facilities. Stormwater management facilities are located in the residential subdivision of Upper Canada Drive in Hillsburgh and in Erin Village they are located in the residential subdivisions referred to as Del Armbro, Erinbook, McCullogh Drive, and the industrial subdivision called OWMS. Stormwater management facilities are also located in the new residential developments located in Orton, Ospringe, and Crewson's Corners.

A large proportion of the streets within the urban centres are either urban or semi-urban in nature with conveyance of flows to their respective storm outlet being conveyed either within a localized storm sewer system or roadside swales. As of 2008, there were 13.2 km of urban roads, which are served by storm sewers (AECOM, 2013).

In addition to the development related stormwater management facilities, there are a number of dams and online ponds within the West Credit River subwatershed that are directly impacting water quality and quantity. Within the subwatershed there are a total of 11 dams, all of which are privately owned, with the exception of the Belfountain Dam which is owned and maintained by CVC. The condition of the dams varies from site to site, with most of the dams being earthen structures. The storage area behind the dams is also variable, ranging from 0 hectares to 8.9 hectares (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Currently, the urban development area to subwatershed area ratio is low, which results in moderated stormwater runoff. Storm runoff, generated within the villages of Erin, Hillsburgh and Belfountain, does not appear to be resulting in increased erosion. However, historic development has resulted in the hard lining of banks adjacent to road crossings and private properties as well as some bank instability of the West Credit in a reach within Erin Village (B.M. Ross and Associates Limited, 2012).

To mitigate future impacts associated with development, future urban intensification and expansion will be required to incorporate stormwater management design criteria.

8.4.1 West Credit River

The West Credit River subwatershed drains a significant portion of the land within the Town of Erin, and flows through the villages of Hillsburgh and Erin. This surface water feature is a key headwater system of the Credit River and is critically important in maintaining the river's water levels downstream.

The mean annual precipitation in the West Credit River subwatershed is approximately 892 mm. Much of this precipitation reaches the West Credit River, either directly through surface runoff or indirectly through infiltration into shallow groundwater aquifers. Approximately 18% of the total precipitation received in the area falls as snow. June, August, September and November tend to be the wettest months while January and February are the driest. The annual maximum streamflow tends to occur between March and April as a result of snowmelt or precipitation on frozen ground. The lowest flows are often during the summer months, due to high evapotranspiration and lower

precipitation. Analysis of streamflow also reveals the importance of storage within wetlands and depressions in the surrounding hummocky terrain in moderating river flows (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

Currently, there are three flood damage centers along the main branch of the West Credit River: Hillsburgh, Erin Village and Belfountain. Flood modeling reveals that approximately 28 buildings would be inundated in Hillsburgh and 28 buildings would be inundated in Erin Village, during a storm of Hurricane Hazel's magnitude. The fact that there are flood damage centres provides support for the need to manage development runoff in a controlled and responsible manner so that impacts to the existing peak flow rates during storm events are minimized (Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc., 2011).

8.5 Current Stormwater Management Standards

There are a number of documents currently available to the Town that can be referenced related to development proposals and stormwater management. In addition to what is included in the following, the Official Plan contains a summary of applicable general policies related to stormwater management.

Stormwater Management Planning and Design Manual, MOE, 2003

The manual, as developed by the Ministry of Environment, provides technical and procedural guidance for the planning, design, and review of stormwater management practices. It is important that the manual be viewed as a tool for understanding the performance requirements of stormwater management projects and not as a rulebook for all stormwater management solutions.

Municipal Servicing Standards, Town of Erin, 2007

The Town of Erin has established specific storm sewer design criteria which must be adhered to for new development and includes the requirement for the preparation and approval of Stormwater Management Plan. Currently the standards reference the Ministry of the Environment's Stormwater Management Planning and Design Manual (Ontario Ministry of the Environment, 2003) and the CVC Stormwater Management Guidelines (Credit Valley Conservation, 1996).

Low Impact Development Stormwater Management Planning and Design Guide, Credit Valley Conservation and the Toronto and Region Conservation Authority, 2010

The Low Impact Development Stormwater Management Planning and Design Guide (LID SWM Guide) has been developed by Credit Valley Conservation (CVC) and Toronto Region Conservation Authority (TRCA) as a tool to help developers, consultants, engineers, municipalities and landowners understand and implement more sustainable stormwater management planning and design practices in their watersheds(Credit Valley Conservation and Toronto and Region Conservation Authority, 2010).

The LID SWM guide provides information and direction to assist engineers, ecologists and planners with landscape-based stormwater management planning and the selection, design, construction

and monitoring of sustainable stormwater management practices. The focus of the guide is on guidance regarding the planning and design of structural low impact development practices for stormwater management (Credit Valley Conservation and Toronto and Region Conservation Authority, 2010).

Stormwater Management Criteria, Credit Valley Conservation, 2012

As of September 14, 2012 all Planning Act applications shall consider this new document in preparation of all Environmental Studies and associated Technical Reports in the CVC watershed. The purpose of this document is to consolidate and supersede current design guidelines and requirements relating to SWM from watershed plans and hydrology studies, and provide additional and specific detail for those areas within CVC's jurisdiction (Credit Valley Conservation, 2012).

8.5.1 Planning Documents and Order of Precedence

The planning framework and discussion that follows is not intended to supersede the preceding documents but is intended to augment the process during the planning of stormwater management for development within the urban areas of Erin and Hillsburgh.

8.5.2 Standards Update

It is recommended that an update of the 2007 Municipal Standards be completed to refresh current references and possibly revise servicing criteria that may be impacted by the various components of the SSMP.

8.6 Stormwater Management Criteria

Stormwater criteria are defined to provide study targets for the development of stormwater management plans at both the watershed or subwatershed level. Ultimately, the establishment of SWM criteria and the development of a plan should consider the following objectives:

- Prevent any increases in flood risk potential;
- Maintain runoff volume;
- Protect water quality;
- Preserve groundwater and baseflow characteristics;
- Prevent undesirable geomorphic changes in watercourses; and
- Maintain an appropriate diversity of terrestrial and aquatic life and opportunities for human uses.

The following subsections discuss the stormwater management criteria which should be considered for peak flow (stormwater quantity), and water quality protection of the receiving water bodies (stormwater quality requirements). The preparation of all future drainage plans, should reference the following, in addition to the standard documents noted in the preceding.

8.6.1 Stormwater Quantity

The target for water quantity and base flow maintenance should be to maintain the pre development hydrologic regime by implementing the following primary volume and peak flow controls:

- Attenuation of all post development flows to pre-development (existing) levels, up to and including the 100-year storm event;
- Minimum of 24-Hour detention of the 25 mm storm. 48-Hour detention may also be required, depending on downstream erosion characteristics;
- All attempts should be made to maintain or enhance existing infiltration amounts; and,
- A review of pre and post downstream erosion rates of the downstream receiving bodies should be undertaken.

8.6.2 Water Balance and Infiltration

One of the objectives of a stormwater management design is to preserve groundwater and baseflow characteristics. Urbanization may reduce groundwater recharge and in turn may reduce baseflow, leading to the impairment of aquatic habitats as well as water available for domestic, agricultural, or other uses. The goal of stormwater management with regard to infiltration on developed properties is to match as closely as feasible the pre-development water balance.

8.6.3 Stormwater Quality

The MOE 2003 SWMP Manual recommends that the required level of water quality protection should be associated with the habitat sensitivity of the receiving water. The receiving water body, for the majority of the urban areas in Erin and Hillsburgh, is the West Credit River, which has a high level of water quality. This level of protection is referred to in the MOE 2003 SWMP Manual as "Enhanced" level water quality protection. Stormwater quality control and water quality protection is achieved through various methods generally classified into two categories: lot level and conveyance controls; and end-of-pipe controls. It is recommended that opportunities to improve water quality through lot level controls be investigated for individual developments on a case by case basis moving forward.

It is important to note that the CVC Stormwater Management Criteria, 2012 documents the minimum requirement for each of the preceding elements. In this regard, future SWM planning exercises should only proceed following consultation with the CVC and the Town of Erin.

8.6.4 Climate Change

Municipal stormwater management is complex, partly due to the multi-functional purpose of the infrastructure system and the many different agencies involved. Climate change is an additional factor contributing to the complexity.

Although it is recognized that it is difficult to be definitive with respect to how the anticipated effect of climate change will impact the flows in Southern Ontario watercourses, the economic, health and environmental risks dictate a need to be proactive in the management of stormwater and as such future planning should be cognizant of the changing climatic conditions when developing strategies to mitigate development impacts. Accordingly, there are some municipalities, for example the City of Barrie, that have adjusted their rainfall-intensity curves upwards by 10 to 15%(City of Barrie, 2009).

Support for the use of a climate change factor is provided in the "Guide for Assessment of Hydrologic Effects of Climate Change in Ontario, EBNFLO Environmental AquaResource Inc, 2010". In this document, the authors looked at how various hydrologic indicators, including low frequency events through to 7Q20 flow values, would be impacted using 57 different climate models. The simulations were based on a calibrated streamflow generation model of a subwatershed in Southwestern Ontario.

The report findings suggested that the impact to 7Q20 flow values would decrease while lower frequency events would increase.

There are numerous mechanisms and practices that can be incorporated into a proposed development or related project to achieve the overall objectives of a stormwater management plan (Credit Valley Conservation, 2012). It is important that consideration during the development of a plan be given to developing a resilient system. Resilient systems for municipal stormwater management are systems that strengthen the treatment train approach by building in resiliency to climate change.

8.6.5 Existing Community

A number of measures are available which, depending on the size and lot grading of the property, can reduce runoff rates significantly. The Credit Valley Conservation offers the **"Your Green Yard" program** which provides workshops and other resources to assist private landowners with the implementation of on-site measures to reduce run-off rates. The Town may wish, in consultation with the CVC, to educate the public with respect to measures which can be easily implemented on private property. Some of the measures that can be implemented include the following:

8.6.5.1 Rain Barrels and Cisterns

Rainwater from roof leaders is diverted to a rain barrel or a cistern where it is stored temporarily for later use in your garden or home. If used properly, this measure can significantly reduce runoff and lower water consumption rates for your home. Rain barrels can be installed in tandem to provide greater storage capacity. Cistern devices need to be used with caution to ensure that there is no cross connection with potable water systems.

8.6.5.2 Soaker Hoses

Soaker hoses can be a much more efficient method of watering outdoor vegetation than the traditional use of a hose or sprinkler due to reduced water losses from evaporation and runoff. This measure can be used in conjunction with rain barrels and cisterns to allow stored water to slowly irrigate surrounding vegetation following a rainfall event.

8.6.5.3 Downspout Control

If not discharging directly to a rain barrel or cistern, roof leaders are commonly directed onto grassed areas or into a piped conveyance system where they are directed toward the road allowance. By directing this flow away from hard surfaced areas and into existing vegetated areas where it can gradually be absorbed into the ground, runoff rates can be significantly reduced. Disconnecting the piped conveyance system and allowing roof leaders to discharge onto grassed areas, will improve the quality of stormwater and also reduce discharge rates.

8.6.5.4 Rain Gardens

A rain garden is an area of the property where runoff from roof leaders, driveways and sidewalks can be directed to gradually soak into the ground. Designed to mimic a natural system, rain gardens should be located in natural depressions where water can be retained following rainfall events and also provide habitat for insects and other wildlife.

8.6.5.5 Permeable (Porous) Surfaces

Hard surfaces on residential properties such as asphalt or concrete driveways, patios and sidewalks, can prevent rainwater from infiltrating naturally into the ground. The use of porous materials like wood chips, stepping stones, interlocking brick and gravel can serve the intended purpose while allowing for infiltration of stormwater. If the use of these materials is not possible, runoff collected from these areas can be directed to rain gardens or onto grassed areas where infiltration is possible.

8.7 Stormwater Management Planning

When the nature of future development in the areas of Hillsburgh and Erin becomes more known, it will be important to undertake study work to develop a Master Drainage Plan for the impacted areas of the watershed.

Typically, and as development is being considered in the Town, the preparation and submission of a Stormwater Management Report in support of new development applications will be necessary. The submitted report should be completed to demonstrate that the proposed plan and SWM strategy meets the general intent of the Municipal Servicing Standards and the Stormwater Management Criteria as summarized in the 2012 CVC document.

A suggested list of minimum study considerations that should be referenced in each SWM report has been summarized in the following section.

8.7.1 Stormwater Management Information

- External drainage areas should be identified and the associated release rates specified.
- Predevelopment flows at the proposed stormwater discharge location should take into consideration the watershed or subwatershed area.
- Sufficient detail should be provided to demonstrate that all water quality control criteria have been met. A post construction monitoring plan should be prepared to confirm conclusions made in the report.
- The conceptual design of the SWM facility should include: storage volumes, water levels, water level fluctuations, inverts of inlets and outlets, berm elevations, and slope information. The relationship between the pond components (i.e. permanent pool, flood storage) should be referenced and details included.
- Screening requirements for stormwater facilities adjacent to residential areas should be investigated.
- The location of the 100-Year and Regional Storm floodlines in relation to the SWM facility should be indicated and accounted for in the outlet conveyance capacity calculations from the proposed facility.
- Possible impacts to adjacent and upstream properties should be considered and commented on.
- Calculations related to sizing of all conveyance elements should be provided.

8.7.2 Conceptual Grading and Drainage

- A Conceptual Grading Plan should be prepared for the site and should demonstrate that minor and major system flow routes have sufficient capacity to meet current standards.
- Where the development abuts adjacent properties, confirmation that existing drainage patterns are not impacted should be provided.
- Where the SWM plan contains conveyance devices that are to be transferred to municipal ownership, sufficient blocks of land shall be provided for this purpose.
- Where a development contains a stormwater management (SWM) facility, a Conceptual Grading Plan should be prepared to confirm that the future land parcel is of sufficient size.
- Confirmation should be provided to illustrate that SWM pond design criteria for the Town, CVC, and MOE have been met.
- Confirmation that maintenance access to the site is attainable within reasonable geometric design standards.

8.7.3 Existing Urban Areas

As noted, storm drainage facilities in each community typically consist of either storm sewers (urban cross-section) or road side swales (semi-urban cross-section). During the planning stage for future reconstruction projects within the urban centres the municipality will need to consider their preferred cross-section and whether to upgrade the semi-urban sections to a full urban cross-section with storm sewers. This will ultimately be at the discretion of the municipality as it will be dependent on the existing drainage and topographic characteristics for each street.

It is recognized that there is not a lot of opportunity to implement LID measures in the existing road allowance given the established nature of the urban centres, however, where practical, efforts should be made to promote infiltration prior to discharge of storm runoff to the appropriate drainage outlet.

8.7.4 Storm Sewer Design Criteria

In general, storm sewers should be provided to service all of the existing community and should be located in the street right-of-way or in an approved easement. The storm sewer discharge must be carried to an appropriate outlet with sufficient capacity so that no damage is done to lands or road. Storm sewers should be designed to accept all drainage from the contributing area and should be sized in accordance with the following:

- The system of street gutters, catch basins, storm sewers and road side swales, shall be designed for the 1:5 year storm (rainfall distribution as provided by the CVC). Culverts or sewers crossing major County roads shall be designed and approved in accordance with the requirements of the County Highways Department.

- In general, the Rational Method shall be used for the sizing of the minor sewer system at the final design stage. Calculations based on a hydrologic simulation model are required for systems serving large areas or involving treatment and/or storage systems.

8.7.5 Future Development Lands

Current Stormwater Management Design Standards require the restriction of stormwater flows outletting from a development to existing values. The impact of future flows on downstream facilities should be no greater than at present, but will also be contingent on the condition of the outlet. All new development proposals should undergo a pre-consultation process with the Town and the Conservation Authority to review the design criteria relative to the proposal and the current environmental conditions of the sub-basin.

A Stormwater Management Report setting out the existing and proposed drainage pattern shall be submitted to and approved by the Municipal Engineer, the local Conservation Authority (Credit Valley Conservation) and the Ministry of the Environment. Should the development be of a size or location where the Conservation Authority has no requirement to regulate the stormwater management criteria, or in the event that specific design details are not provided by the Conservation Authority, the municipality has the following objectives for the management of storm drainage within its boundaries:

- Reduce to acceptable levels, the potential risk of health hazards, loss of life and property damage from flooding.
- Reduce to acceptable levels, the incidence of inconvenience caused by surface ponding and flooding.
- Ensure that any development or redevelopment minimizes the impact of change to the groundwater regime; increased pollution; increased erosion or increased sediment transport, especially during construction; and impact to surrounding lands and areas of existing development.
- Maintain, where applicable, any natural stream channel geometry insofar as it is feasible, while achieving the above objectives.

The following general requirements shall apply:

- Quality and quantity control – as dictated by the local Conservation Authority and/or the MOE. Quantity control shall restrict post-development runoff flows to pre-development flows between the 2 year and 100 year storm event.
- In general, the Town supports the concept of drainage having two separate and distinct components – the minor drainage system and the major drainage system. The minor system comprises swales, street gutters, ditches, catch basins and storm sewers. The major system comprises the natural streams and valleys and man-made channels, roads, or other overland conveyance systems.
- The major system shall be designed to convey the Regional storm event.
- The design storm for the minor systems shall be the 5 year storm for new local storm sewers (the system of street gutters, catch basins, storm sewers or open ditches, where permitted). Culverts or sewers crossing major County roads shall be designed and approved in accordance with the requirements of the County Highways Department.
- Sediment and erosion control measures associated with the stormwater management requirements shall be identified for works to be included during the construction and for permanent measures.
- For large site developments, approximately 5% (minimum, up to what is required) of the proposed development lands should be used for stormwater retention in order to satisfy the storage and retention requirements established through the pre-consultation process. This will ideally be located in lower areas of the site.
- Use of shallow grassy swales for stormwater conveyance is recommended where it can be practically implemented.
- The impact of climate change should be considered in consultation with the Town and the Conservation Authority.

- Restoration of the SWM facilities should have regard for landscape ecology and is to be reviewed with the Town prior to plan finalization.
- The storm sewers shall be connected to the municipal storm sewer system (where feasible) or discharged to a natural watercourse as approved by the Town, Conservation Authority, and the Ministry of the Environment.
- The stormwater management system shall be designed using an approved hydrologic model. The Conservation Authority should be contacted with respect to the appropriate storm distribution and duration to be used. The Developer's Engineer shall advise the Municipal Engineer in writing as to the Authority's requirements. The design of the stormwater management system shall be in accordance with the latest version of the "Stormwater Management Practices, Planning and Design Manual", as prepared by the Ministry of the Environment.
- In general, the Rational Method shall be used for the sizing of the minor sewer system at the final design stage. Calculations based on a hydrologic simulation model (such as MIDUSS, OTTHYMO or other such methods as approved by the CVC and the Town) are required for systems serving large areas or involving treatment and/or storage systems.
- Low Impact Development methods should be incorporated into the design of the facilities as much as practical, as determined through consultation with the Town and the Conservation Authority.

Reporting Criteria

Hydrologic studies should describe the model parameters and criteria for their selection as well as input and output data. Reports shall include a section outlining the following:

Run-off Quantity Control

- Address the impact of the minor and major storm as required in these guidelines for both pre development and post development regimes.

Run-off Quality Control

- Address best management practices proposed to achieve desired treatment.
- Make reference to MOE Stormwater Management Planning and Design manual and CVC Guidelines.

Erosion and Sediment Control Plan

- Provide comments and detail on a Site Plan or a separate plan as part of the submission.

Major System/Overland Flow Routes

- Provide extent of flood for the Major Storm or Site Plan

- Show major storm route
- Comment on a right to access of major storm routes based on land ownership on adjacent lands

Maintenance Considerations

- Address ownership and obligation for maintenance
- A maintenance manual outlining maintenance tasks and frequency of maintenance activities shall be provided as part of the Stormwater Management Report process.

Facility Access

- Access to all areas of any proposed facility needs to be detailed and commented on in the report.

Monitoring

- As noted in the SWM Planning & Design Manual (Ontario Ministry of the Environment, 2003), "the consensus of opinion among practitioners is that monitoring for chemistry of biotic parameters cannot be justified for each individual facility because to have any scientific validity a large and costly sampling program is required". Where it is deemed necessary for monitoring to be completed, the program shall be developed based on the requirements of the CVC and/or the MOE.

Inspection

- Observations made during the collection of inspection data will provide an indicator of overall system performance and help identify when maintenance is required for the various components of the stormwater management system. The maintenance activities performed over the first few years will also provide the basis for recommendations of long-term maintenance schedules. In order to identify the need for maintenance, the following inspection program is recommended.
- Inspection of the facility is to be completed during and after significant rainfall events (if possible) and should include a review of the following:
    - The integrity of the basin side slopes and vegetated areas;
    - The condition of the pond inlet and overflow facilities;
    - The depth of water in the basin;
    - The colouring of the top few centimetres of the soil;
    - The depth of the accumulation in the pond bottom.

- Photographs should be taken to document the condition of the stormwater management facility and the surrounding area at the time the inspection is completed.

Maintenance:

- Maintenance requirements will be identified and scheduled based on field observations made during both scheduled and unscheduled inspections of the facility. The types of maintenance activities needed, and the frequency with which they are required, will provide the basis for scheduling long-term maintenance operations. Anticipated maintenance requirements have been categorized as: General Maintenance Operations, Sediment Removal and Disposal Operations; and Remedial Works.

- General Maintenance Operations

    - General maintenance operations are defined as minor, routine maintenance activities required to ensure that the stormwater management system provides the intended stormwater management functions. Example activities include, but are not limited to:

        - Removal of debris from the inlet swale to the facility;

        - Minor structural repairs to the overflow pipes as may be necessary;

- Sediment Removal and Disposal Operations

    - The frequency with which sediment will have to be removed will vary depending on the effectiveness of erosion and sediment control measures implemented during construction, the frequency and magnitude of winter sanding applications, the frequency and magnitude of rainfall events, and other related factors.

    - If there is a visible accumulation of sediment in the bottom of the pond or if there is standing water in the basin 24 hours after a storm event this may be an indication that the permeability of the underlying soils has decreased and sediment removal may be necessary.

    - In order to establish protocols for disposal of the excavated material, a quality evaluation of sediment deposits will be required prior to removal of the sediment. Two separate sediment samples should be collected from different locations within the SWM facility to obtain a representative cross section of the facility's sediment characteristics.

- All sediment samples are to be initially screened for contaminant levels by undertaking the bulk analysis testing of the MOE Guidelines for Use at Contaminated Sites in Ontario (GCSO). If sample contaminants exceed GCSO criteria then leachate toxicity analyses will be completed on each sample as per the requirements of the appropriate regulation of the Environmental Protection Act. Following the completion of the sample analyses, the results shall be documented together with recommendations for sediment disposal methods.

- SWM facility sediment accumulations are to be removed down to the original elevation of the facility bottom using a small rubber-tired backhoe and a dump truck. The excavated material is to be disposed of off-site in accordance with the recommendations of the sediment quality analyses.

- After the sediment has been removed and disposed of, the bottom of the pond should be tilled to maintain the infiltration potential of the soil and reverse any soil consolidation that may have occurred as a result of the sediment removal.

Remedial Works and Contingencies

- Remedial works are considered to be major maintenance activities completed to repair failed components of the stormwater management system. Example activities include, but are not limited to:

  - Structural modifications to the existing overflow piping and chamber;

  - Reconfiguration of the basin to increase storage capacity;

  - Restoration of eroded areas at the facility inlet.

  - The need for remedial works will typically be identified by structural failures in the basin, erosion sites, and sediment accumulations in the overflow chamber. If contingencies are determined necessary, the CVC and MOE would be contacted in order to involve them in the reassessment procedure.

- Any significant remedial works will require the submission of a revised engineering design for the stormwater management system to the Town, the Conservation Authority and the Ministry of Environment.

Construction Mitigation

Construction-related activities associated with project implementation have the potential to impact upon existing environmental features, the general public and construction workers. The construction of future development work should therefore include mitigation measures to ensure that operations are conducted in a manner that limits detrimental effects to the environment.

Table 8-1 outlines a series of mitigation measures that are typically incorporated into construction specifications and should be adopted and revised as necessary as part of future development proposals and related stormwater management measures.

Table 8-1: Typical Mitigation for Construction Related Activities

Construction Activity	Typical Mitigation Measure
Refuelling and Maintenance	- Identify locations for designated refuelling and maintenance areas. - Restrict refuelling or maintaining equipment near watercourses. Non-spill equipment is required within 30 m of any watercourse. Fuelled equipment shall be stored overnight not less than 30 m from the edge of water. - Avoid cleaning equipment in watercourses and in locations where debris can gain access to sewers or watercourses.
Disposal	- Dispose of all construction debris in approved locations. - Do not empty fuel or lubricants into sewers or watercourses.
Pesticides	- Co-ordinate the use of pesticides and herbicides with affected landowners and the local pesticide control officer.
Sensitive Areas	- Avoid encroachment on unique natural areas; do not disturb habitats of rare or endangered species.
Silt Control	- Silt fences shall be installed and maintained down slope from any stockpile locations or disturbed areas.
Dust Control	- Cover or wet down dry materials and rubbish to prevent blowing dust and debris. - Avoid the use of chemical dust control products adjacent to wetlands and watercourses.
Site Clearing	- Protective measures shall be taken to safeguard trees from construction operations. - Equipment or vehicles shall not be parked, repaired or refuelled near the dripline area of any tree not designated for removal. Construction and earth materials shall also not be stockpiled within the defined dripline areas. - Restrict tree removal to areas designated. - Minimize stripping of topsoil and vegetation.
Sedimentation/ Erosion Control	- Erect sediment fencing to control excess sediment loss during construction period. - Minimize removal of vegetation from sloped approaches to watercourses. - Protect watercourses, wetlands, catch basins and pipe ends from sediment intrusion. - Complete restoration works following construction. - Install straw bale check dams in ditch lines following rough grading of ditches.

8.8 Summary

The following summarizes some of the key elements related to stormwater management for the community:

- Effective stormwater management is critical to the continued health of the West Credit River including fisheries and terrestrial habitats.
- There are only a few existing, conventional (i.e., detention ponds) SW management facilities in the settlement areas and conveyance of flows are typically within a localized stormwater system such as roadside swales. Urban roads are also used to convey stormwater.
- Details on stormwater management criteria which should be used by the Town to assess any development proposals are discussed and defined above. The guidelines should be used, in conjunction with both MOE and CVC documents, to set the requirements for future development projects. LID measures should be considered carefully as part of future development proposals.
- Future development proposals should recognize the potential for climate change to contribute to the complexity of SWM.
- The Town may wish, in consultation with the CVC, to educate the public with respect to measures which can be easily implemented on private property (i.e., rain barrels, soaker hoses, downspout control, rain gardens, permeable surfaces).

There are numerous mechanisms and practices that can be incorporated into a proposed development or related project to achieve the overall objectives of a stormwater management plan (Credit Valley Conservation, 2012). It is important that consideration, during the development of a plan, be given to developing a resilient system.

Resilient systems for municipal stormwater management are systems that strengthen the treatment train approach by building in resiliency to climate change and other environmental factors.

9.0 Transportation

9.1 Existing Transportation Network

The main transportation corridors servicing the communities are County Road 22 and 24 in Hillsburgh and County Road 23, 52, and 124 in Erin.

The main corridor roads outside of the communities of Hillsburgh and Erin Village are two (2) lane rural arterial roads. This changes from a rural to urban section through the main portions of each urban centre. The posted speed limit through the downtown areas of each community is 40km/h. The remainder of the roadways in the study area, which intersect with the county roads, are considered as rural sideroads, concessions, and local residential roadways and are under the jurisdiction of the Town. In general, the communities are well serviced by the existing road network (**Figure 9-1**) as presented below

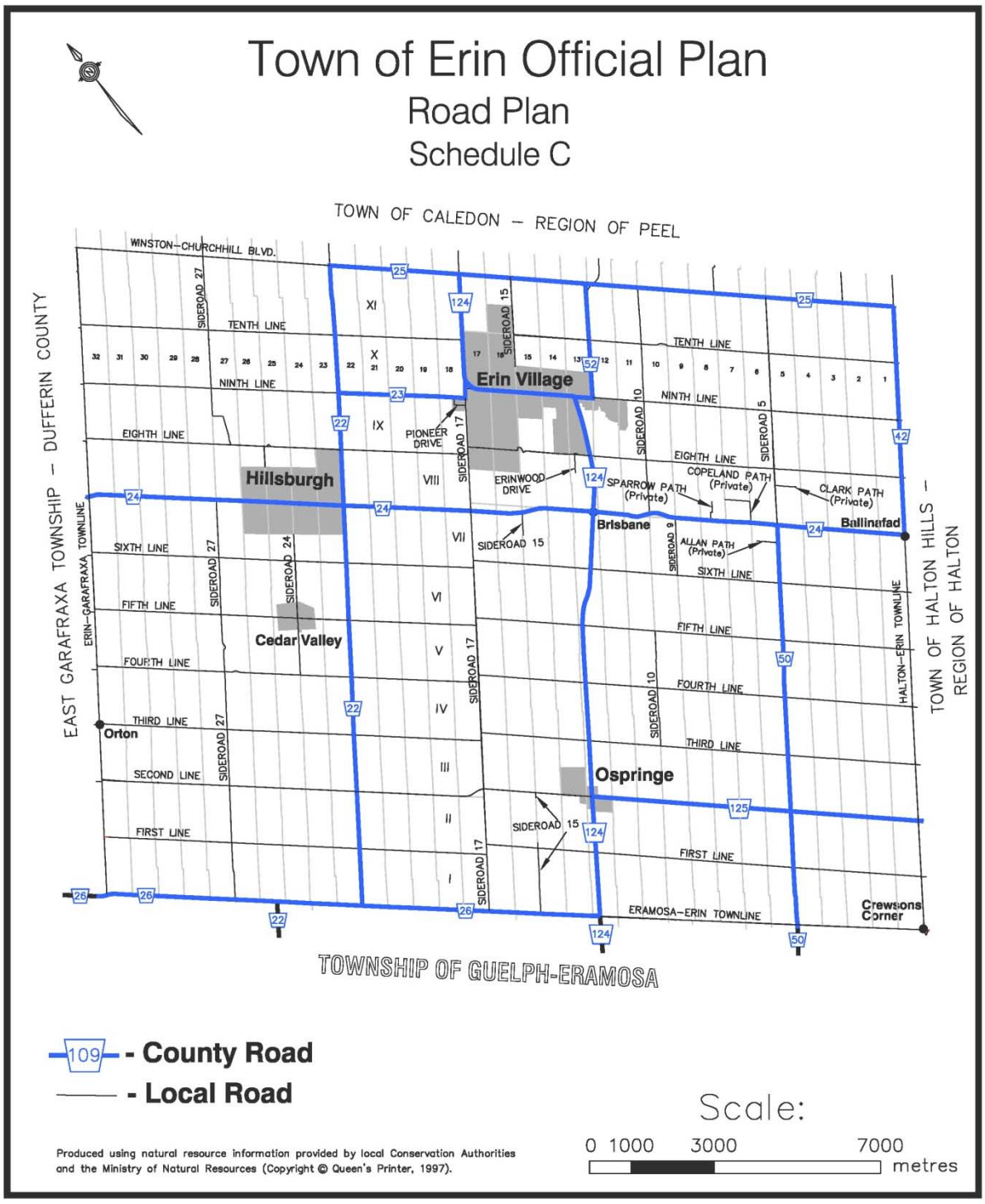
9.1.1 Road Network Inventory

The Town of Erin transportation system is classified as an Urban and Rural lower tier road system (AECOM, 2008). According to the most recent Road System Inventory and Classification, the Town of Erin has a largely rural road system with about 86% of the road sections having a rural roadside environment. The remaining 14%, are generally situated within the urban boundaries of Hillsburgh and Erin Village, is split between urban and semi-urban roadside environments, the majority being semi urban. Approximately 70% of all roads are surfaced in gravel, 11% are surfaced with low cost bitumen (tar and chip) and the remaining 19% include full asphalt surfacing.

For inventory purposes, road sections are typically defined as Urban, Semi-urban, and Rural depending on their design elements and environment. The following photographs taken within the Town of Erin are representative of the various road sections that can be found in Hillsburgh and Erin Village. For each road type (urban, semi-urban, rural) the classification is determined by length, servicing, and adjacent land use.

Urban: Are located within areas where there is curb and gutter on both sides, served with storm sewers, or curb and gutter on one side of the road, served with storm sewers, or reversed paved shoulders with, or served by, storm sewers, or for subdivisions with lot frontages less than 30 metres.

Figure 9-1 : Existing Road Plan

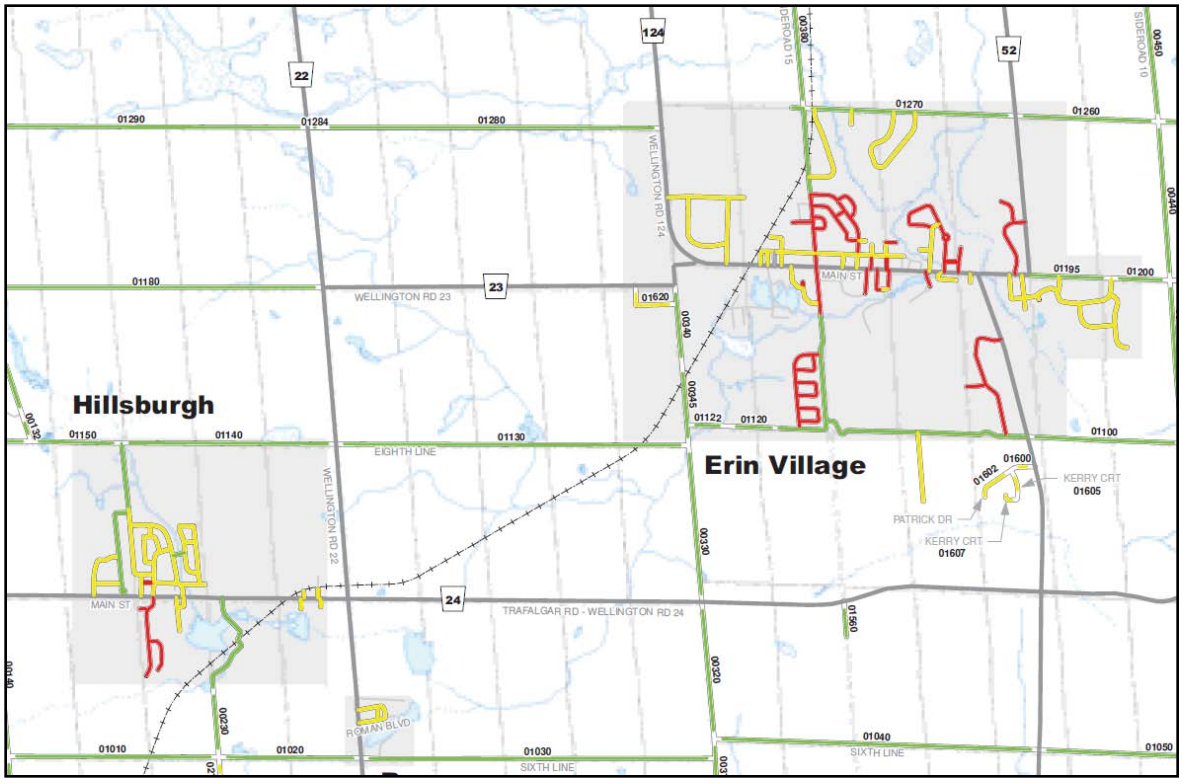


Semi-Urban: Are located within areas where development exceeds 50% of the frontage for a minimum of 300 metres on one side, or 200 metres on both sides, with no curb and gutter, with or without storm sewers (including open ditches or swales), or for subdivisions where the lot frontages are 30 metres or greater.

Rural: Are located within areas of sparse development, or where development is less than 50% of the frontage, including developed areas extending less than 300 metres on one side or 200 metres on both sides, with no curb and gutter.

Figure 9-2 provides a general illustration of the roadside environments within the communities of Hillsburgh and Erin. The red indicates an urban standard, while the yellow and green indicate semi-urban and rural roadside environments, respectively.

Figure 9-2: Road Classifications within the Urban Boundaries of Hillsburgh and Erin Village



Base Information from the Road Needs Study, Town of Erin, AECOM, 2008

It is evident in review of the above that the majority of the roads in Hillsburgh are semi-urban (i.e., no storm sewers and/or curb and gutter), while in Erin there is a split between semi-urban and urban type roadways.

9.1.2 Possible Areas of Concern

As part of the initial phase of the SSMP, participants during consultation sessions identified transportation as an issue. Some residents noted the absence of public transportation as a concern, while others suggested the lack of core parking facilities as being problematic. From a recreational perspective, participants of the planning exercises suggested that the Town's bicycle and walking trails be expanded to become a centre for various recreational activities.

Many residents expressed concerns regarding truck traffic and congestion in the downtown cores of Erin Village and Hillsburgh and suggested that opportunities to reduce truck traffic through the downtown cores could be managed via a bypass.

9.1.3 Recent Transportation Studies

Asset Management Plan, December 2013 (Watson & Associates Economists Ltd.)

In 2013, Watson & Associates Economists Ltd. (Watson) was retained by the Town to prepare an asset management plan. The plan was intended to be a tool for Town staff to use during various decision making processes, including the annual budgeting process and capital grant application processes. In general terms, the Asset Management Plan (AMP) was developed to serve as a road map for sustainable infrastructure planning going forward ((Watson and Associates Economists Ltd, 2013).

The following assets were included in the report:

- Roads;
- Bridges;
- Culverts;
- Facilities; and
- Water related (mains, facilities).

Through discussions with Town staff and review of the asset risk of failure assessment, the following road, bridge, and culvert assets were identified in the AMP as being improvement priorities to the Town and it was recommended that they should be included in the short-term capital budgets:

Roads

- Station Road (Road section ID 200);
- 17 Sideroad (Road section IDs 270-300);
- 2nd Line (Road section IDs 710-740);
- 27 Sideroad (Road section ID 160);
- Orangeville St (Road section ID 250);
- 5th Line (Road section IDs 970,974);
- Dundas St W (Road section ID 10000);
- Erin-Eramosa Boundary (Road section ID 620).

Bridges/Culverts

- Bridge (ID 2064) – Station Street;
- Culvert (ID 2045) – Fourth Line near 17th Sideroad;
- Culvert (ID 2061) – Station Street near 5th Line;
- Bridge (ID 1) – Winston Churchill near Sideroad 27 – Boundary Bridge with Caledon.

Details related to cost and extent of the proposed work for each structure are referenced in the AMP.

State of Infrastructure - Roads, August 2013 (4Roads Management)

On behalf of the Town of Erin and in support of the 2013 Asset Management Plan, 4Roads Management completed a State of Infrastructure report related to roads. The report included an inventory and review of the Town of Erin road system and also provided recommendations for budgets and road asset management (4 Roads Management, 2013).

Priority projects identified in this report were incorporated into the Town's asset management plan with the short term projects noted above.

OSIM Structure Inspections Summary Report, August 2013 (AECOM)

On behalf of the Town of Erin, AECOM prepared a summary of the recommendations resulting from the Town of Erin 2013 Ontario Structure Inspection Manual (OSIM) biennial inspection program. OSIM inspections include a complete element by element detailed visual inspection of the 49 bridge and culvert structures in the Town of Erin. OSIM inspections provide valuable information for the Town of Erin to manage this infrastructure. Summaries of replacement cost estimates and timing recommendations for maintenance, repair and rehabilitation work are included in the report.

These recommendations, combined with upcoming biennial inspections, are a tool to monitor and plan for the infrastructure needs in the Town of Erin (AECOM, 2013).

Priority projects identified in this report were incorporated into the Town's asset management plan with the short term projects noted above.

Traffic Impact Study, Mixed-Use Development – Town of Erin, 2012

LEA Consulting Limited (LEA) was retained by Solmar Development Corp. to prepare a Transportation Study for a proposed 1239.5 unit mixed-use development located in the Village of Erin. The report was prepared for the purpose of assessing the transportation impacts associated with the increased trip movements as a result of the development proposal.

The study recommended that, by year 2022, new traffic signals be installed at County Road 124 & Winston Churchill Boulevard, and at County Road 124 and Erinville Drive. By the year 2032 it was also suggested that new traffic signals be installed at the intersection of County Road 124 and Tenth Line. Further, the report suggested that as a result of increasing local and regional traffic by 2032, intersections at the north and south of the village are expected to exceed their capacity during the afternoon peak time, resulting in noticeable delays.

County of Wellington Development Charge Background Study, 2012

In 2012, Dillon Consulting Limited (Dillon) was retained by Watson & Associates Economists Ltd. on behalf of the County of Wellington to undertake an assessment of future road infrastructure to accommodate the County's current growth projections. In completing the assessment, Dillon examined the following:

- The 2031 population growth projections (Prepared by the County of Wellington);
- 2031 traffic volume forecasts based upon the population projections;
- Future capacity constraints and the resulting roadway improvement requirements;
- Estimated roadway improvement costs.

This assessment was completed as an update to a similar study completed in September 2007 by Totten Sims Hubicki. Its purpose was to reaffirm the scope of roadway infrastructure improvement requirements and to identify roadway infrastructure improvement costs related to new development as part of an update to the County's Development Charges.

In updating the study, Dillon considered traffic background growth and noted the following:

- A review of Annual Average Daily Traffic (AADT) data from 2007-2013 shows the recorded growth in traffic volume has not kept pace with population growth.
- Some corridors in the County have experienced traffic growth, other corridors have experienced declines in traffic volume.
- From 2007-2010, total traffic demands have decreased by approximately 3%, while population has increased by 4.5% (i.e., the rate of traffic increase is less than the rate of population increase).

Future trip generation forecasts were derived from residential development forecast data which provided estimates on the number of units, type and location of anticipated residential developments for towns and villages within Wellington County. Anticipated daily vehicular trip generation for population growth was calculated using standard methods. A summary of the trip generations, forecast by Dillon, are included in **Table 9-1**.

Table 9-1: Daily Trip Generation Forecast (based on population projections to 2031)

Location	Single-Semi Units	Trips	Town-house Units	Trips	Apartment Units	Trips	Total Units	Total Trips
Erin Village	433	4,144	48	279	25	165	506	4,587
Hillsburgh	258	2,469	0	0	0	0	258	2,469
Rural	462	4,421	0	0	0	0	462	4,421
Erin Total	**1,153**	**11,034**	**48**	**279**	**25**	**165**	**1,226**	**11,478**

The household trip generation outlined above takes into account trips that are made for the purposes of school, work, recreation, shopping, medical and other purposes. Total population and employment trip forecasts for the 2031 horizon are summarized in **Table 9-2**.

Table 9-2: Daily Trip Generation Forecasts (Employment) to 2031

Location	Employment Based Trip Generation	Residential Trip Generation	Total Daily Trip Generation
Erin Village	275	4,587	4,863
Hillsburgh	148	2,469	2,617
Rural	265	4,421	4,687
Erin Total	**689**	**11,478**	**12,167**

Based on the trip forecasts summarized above, Dillon undertook a capacity analysis to determine the projected 2031 PM Peak Hour volumes which were used in their preliminary assessment of roadway improvement requirements.

The preliminary assessment of roadway improvement requirements was completed based upon the assumed capacities of:

- 700 vehicles per hour per lane in urban areas;
- 900 vehicles per hour per lane in rural areas.

Based upon Dillon's preliminary assessment, the following roadway improvements were identified over the 2031 horizon, for the Erin area:

Wellington Road 124

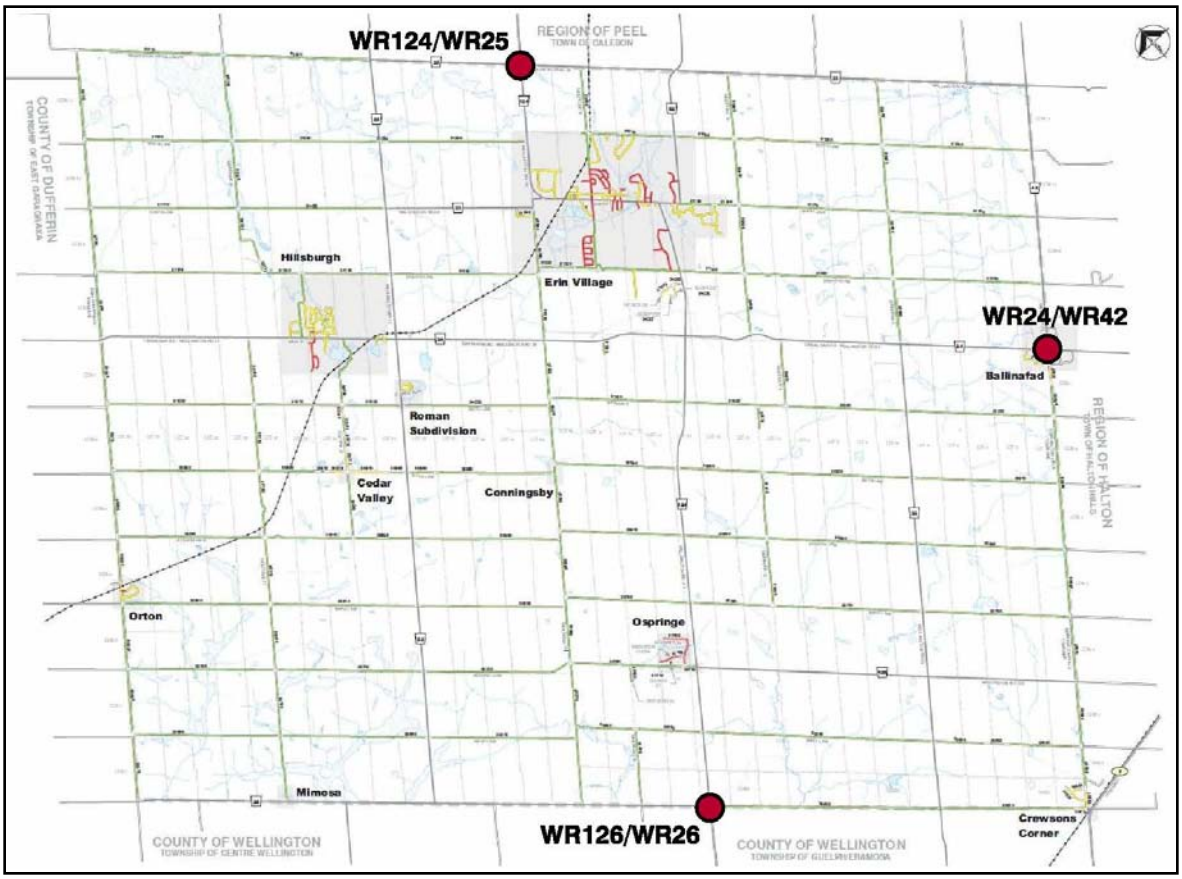
Within the Town of Erin boundary, the traffic projections along Wellington Road 124 are expected to approach the need for widening of Wellington Road 124 between the City of Guelph and the Town. The provision of two passing lanes along this section of Wellington Road 124 was previously identified as a means to help accommodate the projected growth in development traffic while maximizing the use of this existing infrastructure. Costs associated with widening this roadway to provide passing lanes were included in the current DC charge update (Watson and Associates Economists Ltd, 2012).

Within the Town of Erin, between Wellington Road 52 and Wellington Road 23, the projected growth in traffic would require widening to a four-lane cross-section by the 2031 horizon. It is recognized that widening Wellington Road 124 to a four-lane cross-section may not be feasible through Erin Village due to potential impacts on existing development primarily within the core area. Dillon suggested that an alternative solution to widening of Wellington Road 124 might be to provide a truck by-pass road along a new alignment around Erin Village. The viability of this solution could only be properly validated/confirmed through the completion of an Environmental Assessment (Watson and Associates Economists Ltd, 2012).

Intersection Improvements

In addition to the required corridor improvements, to assist in accommodating development growth, the report listed the County of Wellington intersections that are included in their improvement program. The report noted that the improvements could potentially include the installation of traffic signals or the construction of a roundabout. The intersections of Wellington Road (WR) 124 and WR26, WR24 and WR42, and WR124 and WR25 within the Town of Erin have been included in the County's improvement program (**Figure 9-3**).

Figure 9-3: Wellington County Intersection Improvements



Base Information from the Road Needs Study, Town of Erin, AECOM, 2008

Development Charges

The 2012 Wellington County Development Charges (DC) report identifies Wellington Road 124 as requiring expansion of capacity. The section between County Road 52 and Road 23 has been included in the DC report's project costs. The report suggests a gross capital cost of $6,000,000 for this portion of the WR124 improvements. The traffic projections for Wellington Road 124 are also expected to approach the need for widening between the City of Guelph and the Town of Erin. As a result, costs associated with widening the roadway to provide passing lands were included in the recent DC update in the amount of $3,080,000 (including engineering costs).

9.2 General

The transportation system in Erin provides an important part of the framework for municipal growth and development and a vital municipal service for the public. As noted in the Official Plan, the Town is committed to developing appropriate policies and standards to ensure that a high quality transportation system is available to the residents, institutions and businesses of the Town.

9.2.1 Official Plan

The Town of Erin has set the following objectives with respect to transportation:

- To meet the immediate and long term requirements of residents, institutions and businesses with respect to the safe and efficient movement of vehicles and pedestrians within & through the Town.
- To minimize adverse effects of the transportation system on the natural environment, existing residential neighbourhoods and the aesthetic character of the Town; to provide appropriate linkages between local, County and Provincial road systems which may include an Erin Village by-pass;
- To encourage the development of safe and efficient pathways and trails in the Town which promote walking/biking, reduce dependency on motor vehicles and minimize the conflict between pedestrian and vehicular traffic; and
- To provide a transportation network for pedestrians and automobiles safe from hazards such as flooding and erosion. Transportation networks should be designed to have no negative impact to flood conveyance.

9.3 Future Development

9.3.1 Wellington County Projections

In 2011, Wellington County prepared 2031 population forecast values for the Town of Erin including breakdowns for each of the main communities (i.e., Hillsburgh and Erin Village) which were included in the County Official Plan document. In early 2014, the forecast values were updated as summarized below in **Table 9-3**.

Table 9-3: 2031 Population Projections - Wellington County (2014)

Community	2011 (Existing)	2031 (Projected)
Erin	3,087	4,400
Hillsburgh	1,394	2,080
Totals	4,481	6,480

9.3.2 SSMP Population Scenarios

As developed through the assimilative capacity study completed in conjunction with the wastewater component of the SSMP, there is a population servicing potential of approximately 6,000 people between the two communities and within the urban boundaries of Hillsburgh and Erin. This equates to a growth allowance of over 1,500 people.

Through the SSMP process and as discussed elsewhere in the document, Council agreed to consider three development servicing scenarios related to the existing community and the potential growth allocation of approximately 1,500 people. The scenarios are as follows:

1. Existing Erin and Hillsburgh with future growth allocated to both communities.
2. Existing Erin and Hillsburgh with future growth allocated only to Erin Village.
3. Existing Erin and Hillsburgh with growth allocated to only Hillsburgh.

Based on the above scenarios, **Table 9-4** summarizes the allocation of the potential future population under each condition. In the case of Scenario 1, the 1,500 people of potential growth has been split equally between the communities providing an additional 750 people in Hillsburgh and an additional 750 people in Erin. In Scenario 2, the 1,500 people is allocated only to Erin Village and in Scenario 3, the 1,500 people is allocated only to Hillsburgh.

Table 9-4: SSMP Population Growth Scenarios

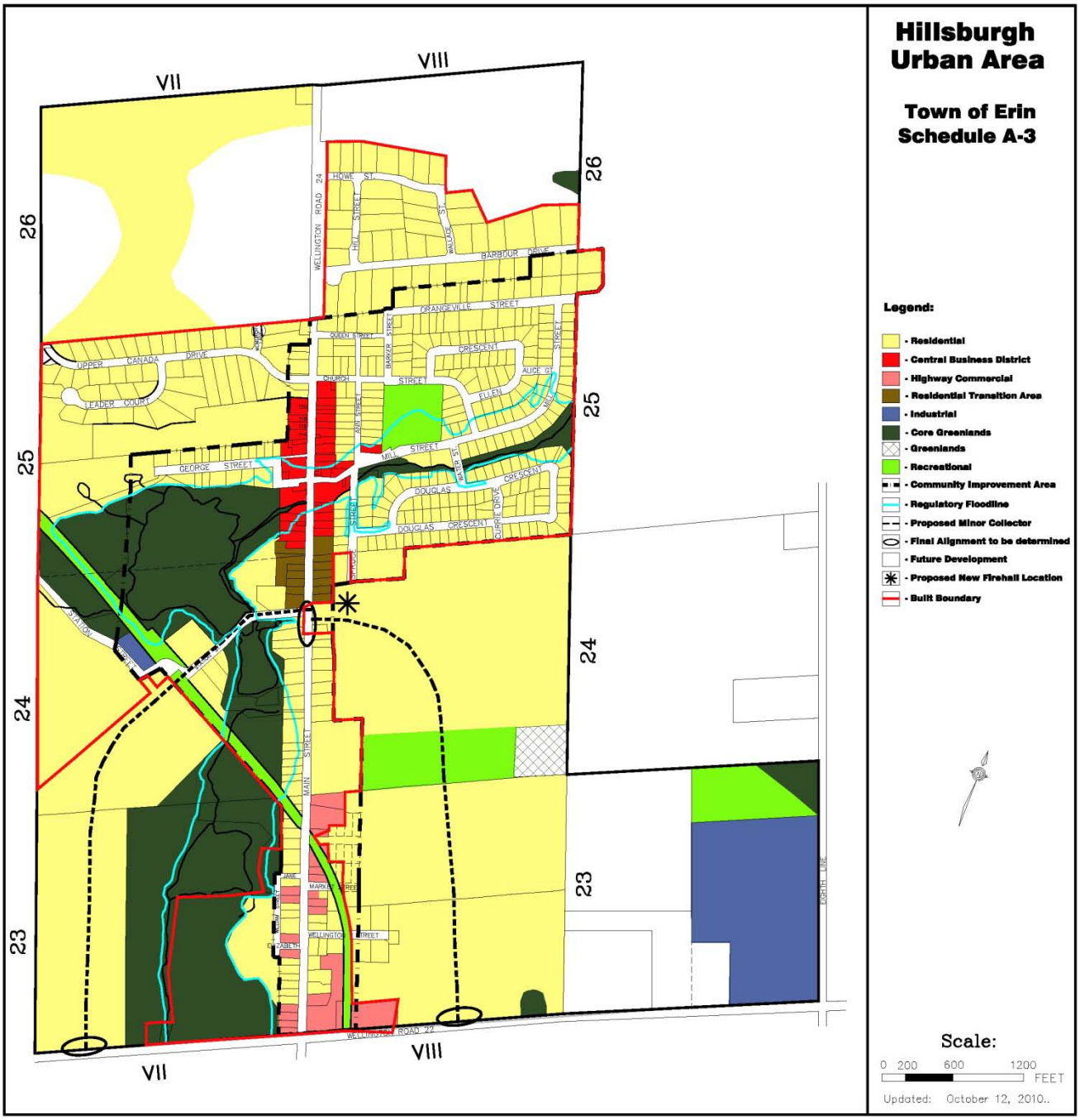
Allocation Scenario	Location		Total (Pop.)
	Hillsburgh (Pop.)	Erin Village (Pop.)	
Existing Community	1,394	3,087	4,481
Scenario 1	2,144	3,837	5,981
Scenario 2	1,394	4,587	5,981
Scenario 3	2,894	3,087	5,981

Based on a review of the above, it is evident that the 2031 population projections prepared by the County and the population growth scenarios developed through the SSMP are similar in total population numbers between the two communities of Hillsburgh and Erin Village. Given this similarity, it is suggested that the traffic projections prepared for the County's 2012 Development Charges Report remain valid and appropriate.

9.3.3 Proposed Roads and Future Development Plans

The Official Plan document includes reference to proposed arterial or collector roads as may be identified on the land use schedules for each community. At present, the Official Plan for Erin Village does not include reference to any new collector roads, however, in the case of Hillsburgh, collector roads have been shown in **Figure 9-4**:

Figure 9-4: Possible Minor Collector Roads, Hillsburgh



Depending on the development scenario considered for each community, the collector roads considered in **Figure 9-4** should be reviewed and incorporated, where appropriate, into new planning applications for the Hillsburgh community.

The Official Plan suggests the following related to the identified collector roads in Hillsburgh:

- The required right-of-way may be obtained by appropriate roads authority through dedication under the Planning Act, purchase or expropriation. The alignment of proposed roads shall be considered approximate and minor adjustments shall not require an amendment to this Plan.
- New development proposals shall not diminish the ability to develop proposed roads as identified in this Plan.
- The establishment of new local roads shall not require an amendment to this plan. New local roads will normally be established through plans of subdivision.
- To provide alternate routes to the existing pattern of concessions and sideroads, links to adjoining lands will be required within proposed developments, where appropriate.

9.3.4 Traffic Impact Studies

Where it is suspected that a development proposal will add significant volumes of traffic to the road system or it is to be located in an area with recognized deficiencies, as supported by Council, staff may require a traffic impact assessment in accordance with Section 5.16 of the Town of Erin Official Plan.

9.3.5 Road Design

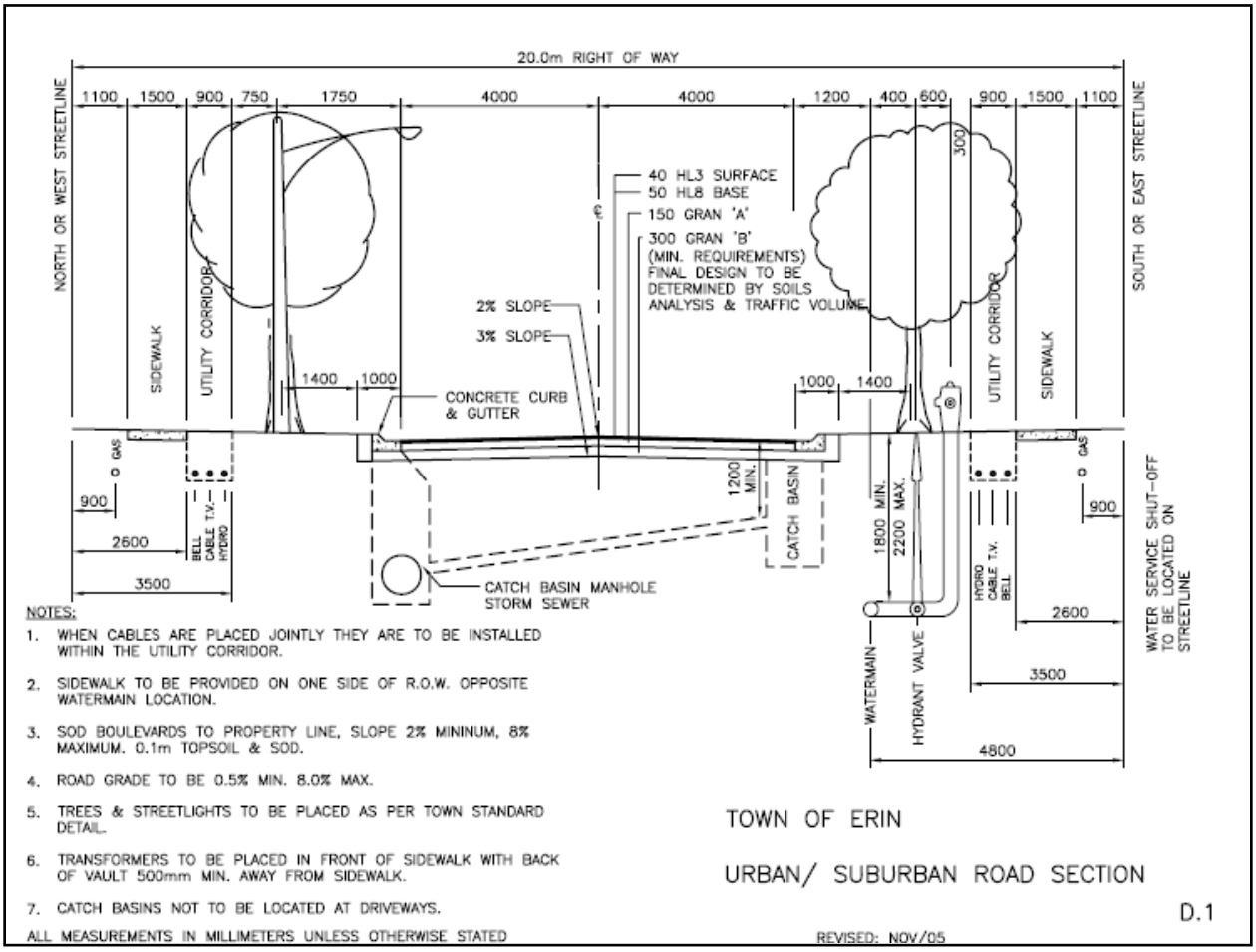
As noted in the Official Plan, the design and construction of all roads and sidewalks under or proposed to be under the jurisdiction of the Town of Erin will be guided by the standards adopted by Council. The latest version of the Municipal Servicing Standards shall apply for all new residential, commercial, and industrial development in the Town. Generally speaking residential streets are to be designed with an urban cross-section (i.e., curb and gutter with storm sewer) as shown in **Figure 9-5** and the following key elements:

- 20 m Road Allowance.
- 50 KPH Design Speed.
- 8.0 m Asphalt Surface.
- Maximum 8% Road Grade.
- Minimum 0.5% Road and Curb Grade.
- Constructed to an Urban Standard with 8.0m asphalt surface and concrete curb and gutter on both sides

- Storm Sewers and Catch basins on all streets.
- 1.5 m Sidewalk on one side of all local streets.

The design criteria for collector and or arterial roads will be reviewed at the time of the Draft Plan submission. The design speed, right-of-way width, asphalt width, road base design and sidewalk requirements will be based on the road function, projected traffic volume and use.

Figure 9-5: Typical Local Urban Cross Section



Town of Erin Municipal Servicing Standards, 2007, Triton Engineering.

Consideration by the Town, during the design process for road related reconstruction projects within the urban boundaries of each community, should be given relative to the appropriateness of upgrading semi-urban road sections to an urban standard.

It is important to note that the design, construction and transportation improvements necessitated by any new subdivision, development or re-development will be paid by the developer as determined by agreement with the Town.

9.3.6 Pedestrian Traffic and Transportation

It is the intent of the Official Plan and the Town that pedestrian traffic be encouraged and that the overall transportation system accommodate the safe movement of people who choose to walk. It is expected that this could be accommodated through the following:

- Requiring sidewalks when new development is proposed in an area not adequately served by sidewalks;
- Developing a sidewalk construction program with emphasis on providing sidewalk access to the downtown, schools, major institutions and along major streets;
- Requiring proper signage and/or traffic control devices where warranted by major pedestrian movements; and
- The development of a walking trail system within the Town making use of various natural amenities such as the West Credit River valley lands, rolling hills and other physical features and utilizing existing and future parks, the development of walking trails may be obtained by the Town through dedication under the Planning Act, purchase or expropriation.

9.4 Summary

In general, the communities are typically well serviced by the existing road network, however, many residents expressed concerns regarding truck traffic and congestion in the downtown cores of Erin Village and Hillsburgh.

County Road 124

Residents saw opportunities to reduce truck traffic through the downtown cores via a bypass. In this regard, and according to the County of Wellington Development Charge Background Study (Watson and Associates Economists Ltd, 2012), traffic projections along Wellington Road 124, within the Town of Erin, suggest that either two passing lanes, or a truck by-pass should be considered as a means to help accommodate projected traffic growth. As a result of the findings contained in the Background Study, costs associated with widening County Road 124 between Road 52 and Road 23, and between the City of Guelph and Town of Erin, were included in the DC charge update for a value of $6,000,000 and $3,080,000 respectively.

In addition to the required corridor improvements, to assist in accommodating development growth, supporting information for the Development Charge Background Study suggested improvements to a few main County Road intersections within the Erin municipal boundary. The report suggested that the intersection improvements could potentially include the installation of traffic signals or the construction of a roundabout. The intersections included in the Erin Boundary are noted as noted as WR 124 and WR 26, WR 24 and WR 42, and WR 124 and WR 25.

It is anticipated that the County Road related work that has been included in the current Wellington County Development Charges will be initiated by Wellington County. As indicated previously, the validation of the suggestions related to the widening or bypass of Wellington Road 124 would require the completion of an Environmental Assessment to confirm the suitability of the noted alternatives.

Municipal Roads

There are a number of projects identified within the 2013 asset management plan for inclusion in the short term budget including:

- Station Road (Road section ID 200);
- 17 Sideroad (Road section IDs 270-300);
- 2nd Line (Road section IDs 710-740);
- 27 Sideroad (Road section ID 160);
- Orangeville St (Road section ID 250);
- 5th Line (Road section IDs 970,974);
- Dundas St W (Road section ID 10000);
- Erin-Eramosa Boundary (Road section IDs 620);
- Station Street Bridge (ID 2064);
- Culvert (ID 2045) – Fourth Line near 17th Sideroad;
- Culvert (ID 2061) – Station Street near 5th Line;
- Winston Churchill near Sideroad 27 – Boundary Bridge with Caledon. (ID: 1)

Intersections

Based on recent traffic impact studies, should development proceed within the urban boundary of Erin Village, it is anticipated that new traffic signals will be needed at:

- County Road 124 & Winston Churchill Boulevard;
- County Road 124 and Erinville Drive.
- County Road 124 and Tenth Line.

9.5 Future Study Work

Based on the above, and as development planning proceeds for Hillsburgh and Erin Village it is suggested that future study and/or project work consider the following:

- Consult with the County of Wellington related to the investigation of the possibility of four lanes for Wellington Road 124 through Erin Village or a truck by-pass to alleviate current and future congestion.
- Consult with the County of Wellington related to the investigation of the possibility of intersection improvements of County Road 124 with Winston Churchill Boulevard, Erinville Drive, and the Tenth Line.
- Implement short term budget projects related to roads and structures as identified in the recent Asset Management Plan report.
- Recommendations contained in the Official Plan related to future development requirements including collector roads, pedestrian traffic and transportation should be incorporated into planning of development proposals.
- To assist in the regulation of private development, the Town of Erin has prepared a recommended development procedure which will act as a guide in the development process. The procedure along with the requirements of the Official Plan, are to be incorporated in the review of all private developments. Applicants must meet with the Town Staff in advance of submitting a development application to discuss design standards to be used, availability of municipal piped water supply, environmental sensitivity of surrounding land uses and requirements of supporting information needed to assess the application (Town of Erin, 2007).
- Planning for any new facilities will take into account the identified growth targets for the municipality as identified within the SSMP.
- Final EA work will need to be completed for new projects as defined in the Municipal Class EA.

10.0 Servicing Scenarios

10.1 General

Moving forward from the review of planning alternatives, the next step was to develop a servicing strategy for the SSMP. On March 14, 2014 a workshop was held with Town Council to discuss potential strategies. Information related to this is found in Appendix C. The planning alternatives in Section 5.0 were discussed, and servicing scenarios related to providing a locally based solution using the West Credit River as a receiver were reviewed. The following figures and tables (**Figure 10-1,Table 10-1, and Table 10-2**) were used as a decision matrix to arrive at servicing scenarios that could be evaluated in detail as part of the SSMP. By motion of April 01, 2014 the Town indicated which scenarios they wanted to evaluate in further detail:

> *"Council directs the consultant (BM Ross) to proceed with the report with the direction that Council will set aside assimilative capacity to service the existing populations of both villages;*
>
> *And that the future growth allocations to be examined in the next steps of the process are:*
>
> - *Allocated to both Erin and Hillsburgh*
> - *Allocated only to Erin Village*
> - *Allocated only to Hillsburgh"*

Figure 10-1: Defining Servicing Scenarios - Decision Matrix

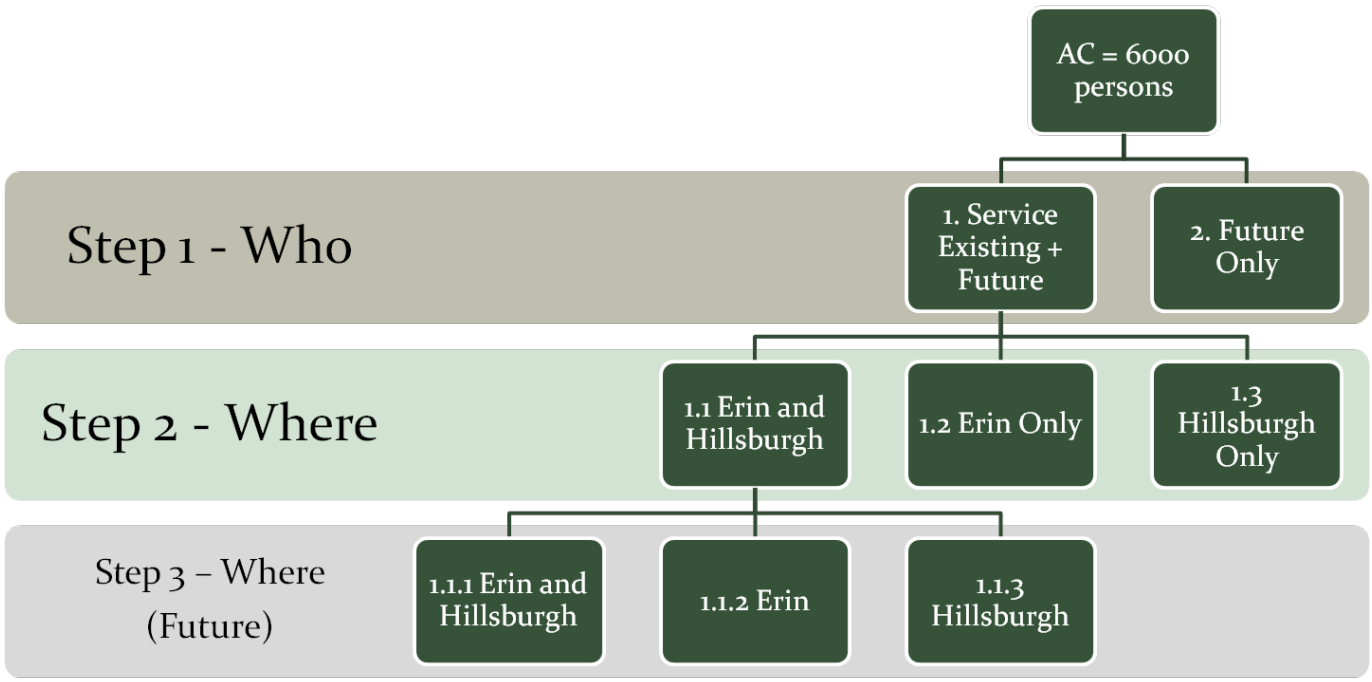


Table 10-1: Defining Servicing Scenarios

Does this option…	1. Service Existing + Future	2. Future Only	Comments
Create a vibrant and sustainable community	✓	✗	• Servicing **future only** will create an inequality in services available to new residents and the existing residents. • Servicing **future growth** only may draw businesses from the cores, impacting their long term sustainability.
Create employment opportunities	✓	✓	• The availability of servicing may attract and retain businesses, creating local job opportunities.
Allow for a range and mix of housing (e.g. seniors, starter)	✓	✓	• Will allow for smaller lots → more likely to have smaller (senior or starter) homes. • Will allow for infilling (apartments, condos).
Maintain the small town atmosphere	✓	✗	• Servicing **existing + future** limits the ultimate population to 6000. • Servicing **future only** may create a 'have and have not' atmosphere within the community.
Allow for responsible development patterns	✓	✓	• Will allow for compact development • Will allow for greater range and mix of housing • Will allow for redevelopment and infilling
Allow for responsible servicing	✓	✗	• Servicing **existing + future** addresses the existing issues related to septic systems, holding tanks in the cores, setbacks, and septage disposal. • Servicing **future only** does not address existing issues related to septic systems, holding tanks in the cores, and setbacks on small lots. • Servicing **future only** creates inequalities within the community.
Protect and preserve the natural environment	✓	✗	• Servicing **existing + future** will eliminate impacts from septic systems to the West Credit River. • Servicing **existing + future** reduces the amount of potential greenfield development. • Servicing **future only** will not address existing aging septic systems, which have the potential to impact the West Credit River in both villages.
Meet policy requirements	✓	-	• Servicing **existing + future** is consistent with population and servicing policies. • Wellington County OP 11.2.2 (Objectives) b) to deliver an adequate supply of potable water and means of sewage disposal to meet the needs of existing and future residents and businesses;

✓ Meets objects
- Partially meets objective
✗ Does not meet objective

Table 10-2: Defining Servicing Scenarios - Defining Allocation of Future Growth

Does this option…	Existing + future			Comments
	1.1 Erin and Hillsburgh	1.2 Erin Only	1.3 Hillsburgh Only	
Create a vibrant and sustainable community	✓	✗	✗	• Servicing only **one community** (Erin or Hillsburgh) will create two-tiered service level between the communities. • Businesses and community services may leave the **unserviced community**, which will impact the sustainability of the downtown core of that community. • **Unserviced community** likely to have restricted ability to redevelop vacant buildings.
Create employment opportunities	✓	✓	✓	• The availability of servicing may attract and retain businesses, creating local job opportunities.
Allow for a range and mix of housing (e.g. seniors, starter)	✓	✓	✓	• Servicing will allow for smaller lots → more likely to have smaller (senior or starter) homes. • Will allow for infilling (apartments, condos). • **Community without servicing** is not likely to obtain a better range and mix of housing and existing problems (no senior or starter homes) will remain. • Lack of a mix of housing types may impact population of **unserviced community**, as seniors (the largest population segment) move to other communities with more appropriate housing for their needs.
Maintain the small town atmosphere	✓	✓	✓	• Communities will remain small as growth will be limited by the assimilative capacity of the West Credit River.
Allow for responsible development patterns	✓	✗	✗	• **Servicing both communities** will allow for compact development, a greater range and mix of housing, and will allow for redevelopment and infilling. • **Community without servicing** may have limited development large lots (~ 1 acre) to accommodate septic systems. Large lots will increase the urban extent of the village, and decrease the overall efficiency of other infrastructure (roads, municipal water).

✓ Meets objects
- Partially meets objective
✗ Does not meet objective

Does this option…	Existing + future			Comments
	1.1 Erin and Hillsburgh	1.2 Erin Only	1.3 Hillsburgh Only	
Allow for responsible servicing	✓	×	×	• Servicing **both communities** addresses the existing issues related to septic systems, holding tanks in the cores, setbacks, and septage disposal. • Servicing **one community** does not address existing issues related to septic systems, holding tanks in the cores, and setbacks on small lots currently present in both communities . • Servicing **one community** creates inequalities between the two communities.
Protect and preserve the natural environment	✓	✓	✓	• Servicing **both communities** will eliminate impacts from septic systems to the West Credit River. • Servicing **both communities** reduces the amount of potential greenfield development. • Servicing **one community** will not address existing aging septic systems in the other community, which have the potential to impact the West Credit River.
Meet policy requirements	✓	-	-	• Servicing **both communities** will meet the population and servicing policies. • Wellington County OP 11.2.2 (Objectives) b) to deliver an adequate supply of potable water and means of sewage disposal to meet the needs of existing and future residents and businesses;

✓ Meets objects
- Partially meets objective
× Does not meet objective

10.2 Evaluation of Servicing Scenarios

The three scenarios were evaluated further with respect to the following considerations:

- What are the impacts from a financial perspective
- What other infrastructure needs would be required to provide for the expected levels of growth
- How do the scenarios relate to the Vision Statement and the Problem/Opportunity Statement that have guided the SSMP.

10.2.1 Cost of a Municipal Sanitary Sewage System

A sanitary sewage system is composed of a collection system and a treatment facility. The costs of these systems vary depending on the technologies selected, the type of construction, the characteristics of the underlying geology (i.e., rock, location of groundwater), and many other factors.

Conceptual level planning related to sewage servicing was prepared for the purpose of ascertaining the feasibility of providing collection and wastewater treatment, and a conceptual level probable cost was prepared. This cost is based on a typical collection system of mainly gravity sewers and a treatment facility that is capable of achieving the effluent quality criteria used in the development of the assimilative capacity of the receiving stream. This is best available technology that is in use in Ontario at the present time. It is quite possible that through the detailed design review of technology that will be carried out in a further phase of the Class EA process, technologies will be selected that have a different, possibly less expensive, capital cost. At this stage of the planning process it was felt that a conservative estimate was best used to compare scenarios.

Given the conceptual nature of the probable costing, estimating allowances and various contingencies have been incorporated into the total amount. It does not reflect possible grants or funding through assistance programs that may become available. **Table 10-3** summarizes the anticipated costs of the conceptual level servicing plan developed to date:

Table 10-3: Conceptual Probable Costs (Sanitary Sewage System)

Sewage System Component	Cost (Millions)		
	Erin	Hillsburgh	Total
Collection	$24.2M	$9.3M	$33.5M
Treatment	Based on Design Population of 6,000 people		$25.0M
Total Cost			$58.5M

(see Appendix E for details of estimate)

10.2.2 Financial Implications of Alternatives

Watson & Associates Economists Ltd was retained by the Town to undertake a financial review of the SSMP. This review was described in the Terms of Reference for the SSMP as follows:

- *"Develop a financial plan specific to all servicing options considered that addresses municipalities debt capacity, long term operating costs and sustainability, sources of funding and impacts on existing Sewer and Water Rates and Development Charges Bylaws;"*
- *"The Consultant is to confer with the Town's Economic Consultant, Watson and Associates Ltd., in the review of existing Water and Sewer Rate Study, Development Charges Bylaw and the development of Financial Plans specific to servicing options being considered."*

A workshop with Town Council was held on July 9, 2014 to review the financial implications of the servicing scenarios. Information regarding the scenarios is found in Appendix C. The Watson & Associates Report of August 7, 2014 is contained in Appendix F.

With respect to sanitary sewage, the approach to defining the cost of each scenario and its financial implications was based on the following:

- **Scenario 1 – Split Growth**: service existing properties in Erin and Hillsburgh and provide for 250 units of growth in both Erin and Hillsburgh.
- **Scenario 2 – Growth in Erin**: service existing properties in Erin and Hillsburgh and provide for 500 units of growth in Erin (only).
- **Scenario 3 – Growth in Hillsburgh**: service existing properties in Erin and Hillsburgh and provide for 500 units of growth in Hillsburgh (only).

For purposes of delineating the potential allocation of benefit between existing and future properties the standard of Benefitting Residential Unit Equivalent was used as an equitable comparator. For the distribution of costs the following breakdown of Residential Equivalents was used (**Table 10-4**):

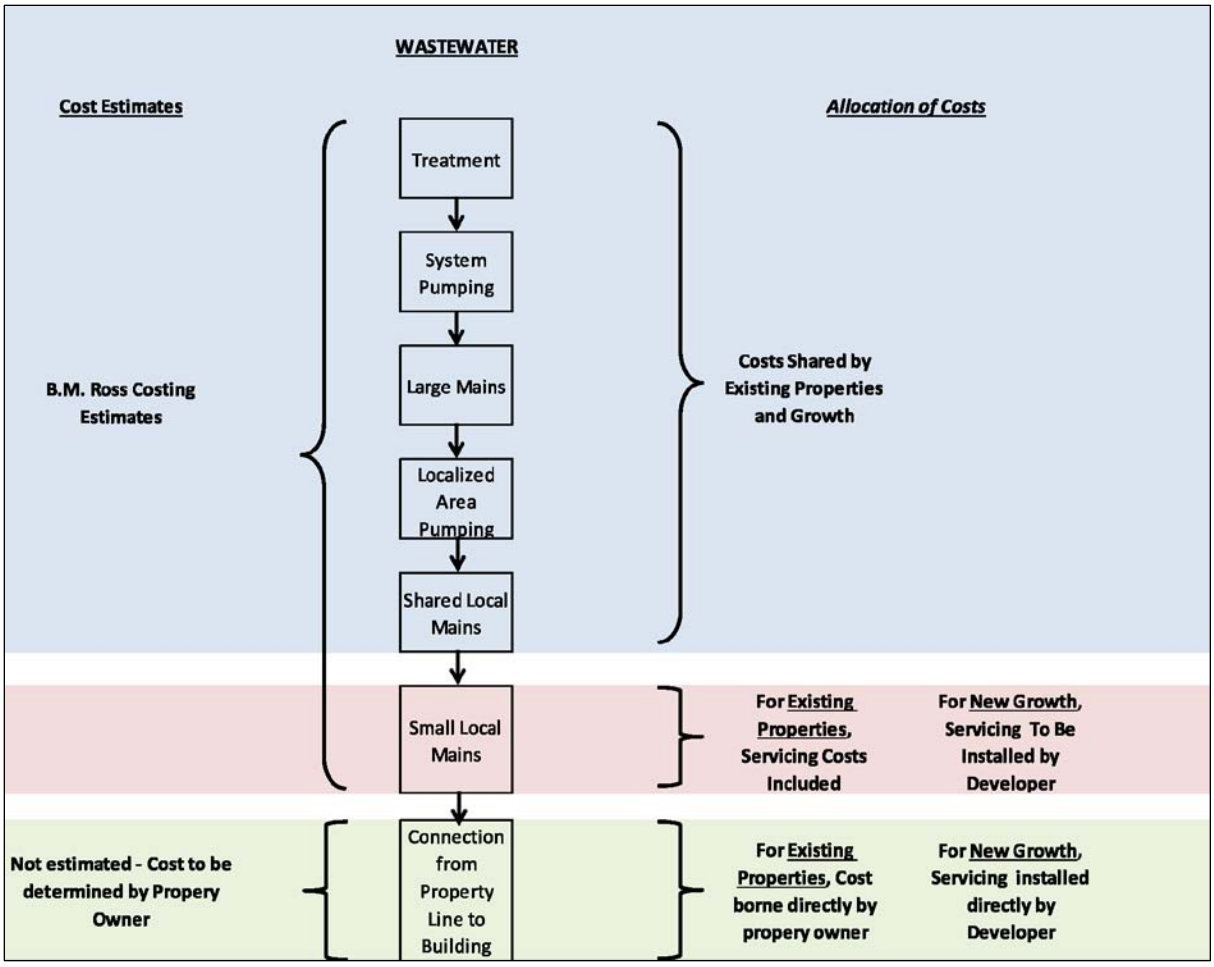
Table 10-4: Benefiting Residential Unit Equivalents for Each Servicing Scenario

Scenarios (Each Scenario Services Existing Properties)	Residential Equivalents		
	Existing	Growth	Total
1 *Split Growth*			
Erin	1,263	250	
Hillsburgh	525	250	2,288
2 *Growth in Erin*			
Erin	1,263	500	
Hillsburgh	525	-	2,288
3 *Growth in Hillsburgh*			
Erin	1,263	-	
Hillsburgh	525	500	2,288

(from Watson and Associates Economists Ltd, 2014)

Capital costs on any project would be shared between existing properties and growth, proportional to the benefit received. The following graphic (**Figure 10-2**) illustrates how costs are generally allocated.

Figure 10-2: Allocation of Costs



(From Watsons and Associates Economists Ltd, 2014)

With respect to the conceptual sewage project described in the previous section the following table provides a more detailed breakdown of servicing costs.

Table 10-5: Summary of Sanitary Servicing Costs

#	Project	Cost ($)
1	Hillsburgh Collection System	6,800,000
2	Hillsburgh Railtrail Trunk – HB to Erin (shared with Hillsburgh and Growth)	2,500,000
3	Erin Collection System	15,400,000
4	Erin Collection System (portion shared with Growth)	2,600,000
5	Erin Trunk Sewer and Main PS (shared with Hillsburgh and Growth)	6,200,000
6	Sewage Plant (shared by Erin, Hillsburgh and Growth)	$24,500,000
7	Land (shared by Erin, Hillsburgh and Growth)	500,000
	Total	**58,500,000**

(from Watson and Associates Economists Ltd, 2014,see Appendix E for details of estimate)

The allocation of capital costs amongst the three scenarios is shown in **Table 10-6**.

Table 10-6: Allocation of Sanitary Servicing Capital Cost

Benefit	Scenario (Each Scenario Services Existing Properties		
	1 – Split Growth	2 – Growth in Erin	3 – Growth in Hillsburgh
Existing	$49,430,922	$49,824,675	$50,462,306
Growth	$9,069,078	$8,675,325	$8,037,694

(from Watson and Associates Economists Ltd, 2014)

In order to compare the scenarios against each other a cost per unit was developed and is shown in **Table 10-7** below. The costs to the existing properties are tightly grouped from $27,646.00 to $28,223.00, while the costs to growth range from $16,075.00 to $18,138.00, being somewhat lower in Scenario 3, the all growth to Hillsburgh scenario. In relative terms there is not a material difference between the cost implications of any of the scenarios.

Table 10-7: Sanitary Servicing Cost Per Unit Comparison

Benefit	Scenario (Each Scenario Services Existing Properties		
	1 – Split Growth	2 – Growth in Erin	3 – Growth in Hillsburgh
Existing	$27,646	$27,866	$28,223
Growth	$18,138	$17,351	$16,075

(from Watson and Associates Economists Ltd, 2014)

10.2.3 Implications for Other Infrastructure Needs

10.2.3.1 Municipal Water Systems

Section 7.0 of this report reviewed the existing water infrastructure of the two urban systems and identified current needs and future upgrades that would be required to accommodate the growth outlined in the scenarios. At this time there are a number of properties in both communities that are not connected to the water systems. Adding these to the systems is not dependent on any scenario and should be considered regardless of the scenarios. There are also some existing deficiencies with supply and storage that if corrected would be costed back to the existing users. Beyond that there are a number of upgrades to the systems that are triggered by the additional growth in each scenario. The estimated costs of these are shown on **Table 10-8.** There is significant variation between the scenarios, largely because there are two independent systems involved. It is more cost effective from a capital perspective to allocate all new growth to either Hillsburgh or Erin, rather than dividing the growth equally between them.

Table 10-8: Allocation of Capital Costs - Water

Benefit	Scenario (Each Scenario Services Existing Unserviced Properties		
	1 – Split Growth	2 – Growth in Erin	3 – Growth in Hillsburgh
Existing	$2,816,190	$2,816,190	$2,816,190
Growth	$3,898,810	$2,578,810	$2,208,810

(from Watson and Associates Economists Ltd, 2014,see Appendix E for details of estimate)

Table 10-9 below shows a cost per unit comparison of the three scenarios. The costs to the existing population do not vary between the three alternatives. Only the cost to provide for growth differs, ranging from a cost of $4,418 per unit in an all growth to Hillsburgh scenario, to $7,798 per unit under a split growth scenario.

Table 10-9: Water Servicing Cost Per Unit Comparison

Benefit	Scenario (Each Scenario Services Existing Unserviced Properties		
	1 – Split Growth	2 – Growth in Erin	3 – Growth in Hillsburgh
Existing (connected properties)	$984	$984	$984
Existing (unconnected properties)	$4,550	$4,550	$4,550
Growth	$7,798	$5,158	$4,418

10.2.3.2 Stormwater Management

Stormwater management within the study is discussed in Section 8.0 . The levels of growth anticipated in the scenarios, and the likely spatial distribution across wide areas, would not trigger the need to consider community wide stormwater management facilities. Rather, it is expected that management of stormwater will continue to be addressed on an individual development basis. Stormwater management policies are suggested to enhance the level of treatment and flow management in new developments and across the existing developed community.

10.2.3.3 Transportation

Section 9.0 of this report discusses transportation throughout the study area and identifies any noted deficiencies. Traffic volume and congestion has been raised as an issue in the former Village of Erin and was identified in various County studies as a problem to be addressed when certain trigger levels are met. The Town of Erin Official Plan also notes that any new development has to be evaluated against the potential for traffic issues. It could be expected that the allocation of all new growth to Erin Village would contribute to the existing traffic issues and advance the need for remediation. In this instance the County of Wellington may have to initiate a Class Environmental Assessment to look at issues and mitigations, which could include a truck bypass.

In Hillsburgh, the Official Plan includes mapping showing possible locations for new collector roads through potential areas of developable lands. These would work to help alleviate any issues caused by new growth, by directing local traffic away from the downtown core.

At the levels of growth put forth in these scenarios, 500 lots in total, it can be expected that the selection of one servicing scenario over other another would not be significantly influenced by potential transportation impacts.

10.3 Relationship to the SSMP Guiding Statements

The Vision Statement for the SSMP is meant to express the unique qualities and common values of the community. The emphasis is on maintaining a small town atmosphere, surrounding rural charm, responsible development and servicing and the protection and preservation of the Town's rich natural environment. The three servicing scenarios are all limited by the available assimilative capacity in the West Credit River, and as such, have population targets of 6,000 persons. This represents a 30% increase in the existing population of the two urban areas. Certainly the small town atmosphere can be maintained at the proposed service population of 6,000. These scenarios provide for a municipal communal wastewater system which will serve to: enhance the community, address issues with current on-site treatment of sewage, and protect the natural environment. Given the availability of lands for development, no one scenario is superior to the other with respect to the Vision Statement.

The Problem/Opportunity Statement focused more on addressing the need for a comprehensive strategy for the provisions of water and wastewater servicing in the villages of Erin and Hillsburgh. The three scenarios would all address this need through the installation of a wastewater system and the addition of municipal water facilities (as required to meet the specific needs of each scenario).

None of the scenarios differ significantly with respect to transportation and stormwater management needs. The moderate growth increases will not by themselves cause a need for new transportation and stormwater infrastructure. Depending on the location and amount of new growth, it may trigger the need for an already identified Environmental Assessment at the County level.

10.4 Summary of Servicing Scenario Evaluations

The three servicing scenarios are centered on setting aside assimilative capacity in the proposed receiver stream (the West Credit River) to provide service to the existing populations of both villages. The scenarios only differ in the manner in which future growth is allocated to the villages. A review of the financial analyses of each scenario concluded that they were not materially different, based on the allocation of costs against each scenario. Each scenario triggers the need for different water supply and storage requirements, based on the allocation of growth. On a per lot basis, this revealed that Scenario 3 (all growth to Hillsburgh) was a less expensive option for new growth, but not significantly enough that it elevates this scenario over the others at this time.

All three scenarios meet the requirements of the SSMP and should all be carried forward for further review in the Class EA process. There is no need at this time to make a final decision on where growth should occur. It is expected that market forces and the Planning Act process will influence this decision at a later time.

11.0 Financial Considerations of Implementing Servicing under the Master Plan

11.1 General

There are considerable financial implications to be considered when implementing a large scale servicing project such as a new wastewater system and significant upgrades to the existing municipal water system. The cost of managing wastewater is essentially transferred from an individual responsibility (private on-site systems), to a municipal responsibility through the installation of communal works. However, it is the same person, the property owner, who pays for the service. The capital cost of a conceptual wastewater system is estimated to be $58.5 million dollars. The capital costs associated with upgrading the existing water systems to service the existing populations in Erin Village and Hillsburgh and growth (depending on where growth occurs) ranges from $2.0 million to $2.4 million dollars, and $1.75 million to $2.1 million dollars, respectively. As explained in Section 10.0, these amounts are allocated to benefitting properties, both existing and future growth, based on an equitable division. It would be expected that in order to go ahead with a project of this scale, that senior government funding would need to be secured, typically in the form of a grant. This serves to bring the cost to an individual property owner down considerably.

Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries (such as in the hamlets of Cedar Valley and Brisbane) are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.

As previously discussed, Watson and Associates Economists Ltd, undertook a financial review of the SSMP servicing strategies and also provided a review of capital cost financing alternatives. Their full report is included in Appendix F. The followings sections will discuss financing alternatives, debt capacity of the municipality, and will provide a breakdown of possible costs to the property owner for implementation of water and wastewater projects.

11.2 Financing Alternatives

11.2.1 Future Growth

To collect the growth related share of costs for projects that provide capacity for future development municipalities rely on the Development Charges Act, 1997. This Act allows municipalities to levy new growth with its cost for providing services that benefit growth. The Town of Erin has a Development Charges Bylaw in place and it is presently undergoing the mandatory five year review of the charges. At the present time, the municipality imposes development charges for water services and other services such as transportation. When new projects are in place the municipality will adjust their bylaw to recover costs for new growth. The

Development Charges Act also contains provisions that may assist in project financing including front-end financing and credits for work completed on behalf of the Town.

11.2.1.1 Municipal Share of Costs

Part XII of the Municipal Act provides municipalities with broad powers to impose fees and charges via passage of a by-law. These powers, as presented in s.391 (1) of the Municipal Act, include imposing fees or charges:

- for services or activities provided or done by or on behalf of it;
- for costs payable by it for services or activities provided or done by or on behalf of any other municipality or local board; and
- for the use of its property including property under its control." (from Watson & Associates, 2014)

Municipalities use the authority of the Municipal Act to collect capital charges from water and sewage projects. Under the Act, municipalities can charge an immediate benefit charge to those properties receiving a service and a deferred benefit to those properties who will receive a benefit at a future time. Under the Act, municipalities are permitted to pass a by-law requiring mandatory connection to the system and mandatory pay bylaws.

There are many methods available to assess and calculate a capital cost recovery rate for a project including:

- A metre frontage rate on the lands
- A hectarage rate
- A fixed charge for each parcel (flat rate)
- Or any other method Council considers fair

In recent years, since the introduction of the Municipal Act 2001, there has been a trend for municipalities to assess a flat rate per property charge for water and wastewater projects. The flat rate can vary though, based on the class of land use involved, usually calculated on an equivalent residential unit basis.

11.2.2 Grant Funding Availability

Implementation of the Master Plan servicing strategy will probably not be feasible in its entirety without some senior government level assistance. The following commentary is provided from the Watson Report, 2014:

> *'Since the early 1980's, the level of Provincial and Federal assistance toward municipal infrastructure has declined significantly. By the mid 1990's, there were very limited funds available from senior levels of government. In mid-2000, initiatives from the Provincial and Federal level were announced; providing for a new*

program (OSTAR) to assist small cities, towns and rural areas in addressing infrastructure improvements. In November 2004, another program (COMRIF) was introduced which also provided combined assistance from the senior governments until early 2007. Subsequently Federal and Provincial Funding have been made available under the Build Canada Fund and Stimulus Fund Programs. Under the specific requirements of these programs, the projects must be "shovel ready" and are allocated on a case by case basis. At present, no major programs are available however initial communications by the province anticipate that further programs may be available in the coming years."

11.2.3 Infrastructure Ontario Loans

Infrastructure Ontario is an arms-length government corporation that has been set up as a tool to offer low cost and longer term financing to municipalities to finance infrastructure. Many municipalities take advantage of this funding source to fund their share of project costs at a reasonable rate. The following interest rates were available to municipalities for the following term, based on a serial repayment schedule, as of August 1, 2014 (**Table 11-1**).

Table 11-1: Municipal Lending Rates

Lending Rates as of August 1, 2014	
Term	**Serial**
5 Year	1.91%
10 Year	2.67%
15 Year	3.09%
20 Year	3.37%
25 Year	3.55%
30 Year	3.66%

(from Watson & Associates, 2014)

11.2.4 Other Funding Sources

Municipalities can enter into a variety of P3 – Private Public Partnerships, with the private sector. These arrangements can range from simple contracts for service to complex design, build, operate and finance arrangements. The Town of Erin may wish to explore a P3 arrangement as a tool to implement the SSMP. Watson's Report provides a list of guiding principles that should be considered when exploring such an arrangement.

11.3 Debt Capacity

The financial review by Watson (see Appendix F, Section 4-4) looked at the ability of the Town to undertake the Master Plan servicing from the view of debt capacity. Municipalities are limited to the level of debt they may issue, based on their total municipal revenues. At this time Erin's debt capacity would allow a new debt issue of between $15 million (10 yr debt) and $25 million (20 yr debt). It was determined that in order to undertake the full Master Plan servicing scenario, grant

funding in the range of 55%-66% would be required unless the project was implemented in phases over time.

11.4 Financial Impact to Property Owners

From Watson & Associates, 2014:

"The Municipal Act would allow homeowners the choice to either commute (pay for) the capital costs per property upfront or pay for it over a period of time via a loan. To make a loan available to the landowner, the Town would need to debenture the costs on behalf of the landowner and have these costs recovered over a 10 or 20-year period (the term of the debentures). The landowner's per lot charge plus interest would then be remitted to the Town over the period of the debenture which would then be used to make the debt payments. The advantage of a municipal loan to the existing resident or business is that they can receive the benefit of the (often) lower interest rates which the Town may borrow at. Alternatively, the homeowner may wish to borrow the necessary amount by way of a (re)mortgage on their property. This may allow for up to a 25-year repayment schedule."

For analysis purposes, the following annual payments have been calculated based upon the two costs per property amounts (sanitary sewage and water) discussed above. The following rates are based upon those available presently (interest rates can vary over time and will depend upon the market conditions at the time the financing is undertaken. **Note that should grants be available, the below noted payments would reduce by the percentage of the grant:**

Based on the total per lot charge for wastewater of approx. $28,000 and the example rates below, the annual payment would be:

- 15 year municipal loan at 3.25% - $2,361
- 20 year municipal loan at 3.50% - $1,948
- 25 year mortgage at 3.1% - $1,607

Based on the total per lot charge for water of approx. $4,500, the annual payment would be:

- 15 yr municipal loan at 3.25% - $380 o 20 yr municipal loan at 3.50% - $313 o 25 yr mortgage at 3.1% - $258

(Note: this charge only applies to those properties that are not currently connected to the water systems)

As presented earlier in **Figure 10-2** (Allocation of Costs), there is an additional cost to the homeowner for the connection from the property line to the building. This cost will vary depending on the distance involved and the depth of the connection. These costs could range from $2,500 to $5,000, or more in some instances. These costs are not eligible for a grant subsidy. In past projects completed in other municipalities, there have been efforts to organize these connections amongst groups of homeowners, sometimes organized by the municipality. This has resulted in cost savings over an individual approach.

12.0 Implementation Strategies

12.1 Class Environmental Assessment

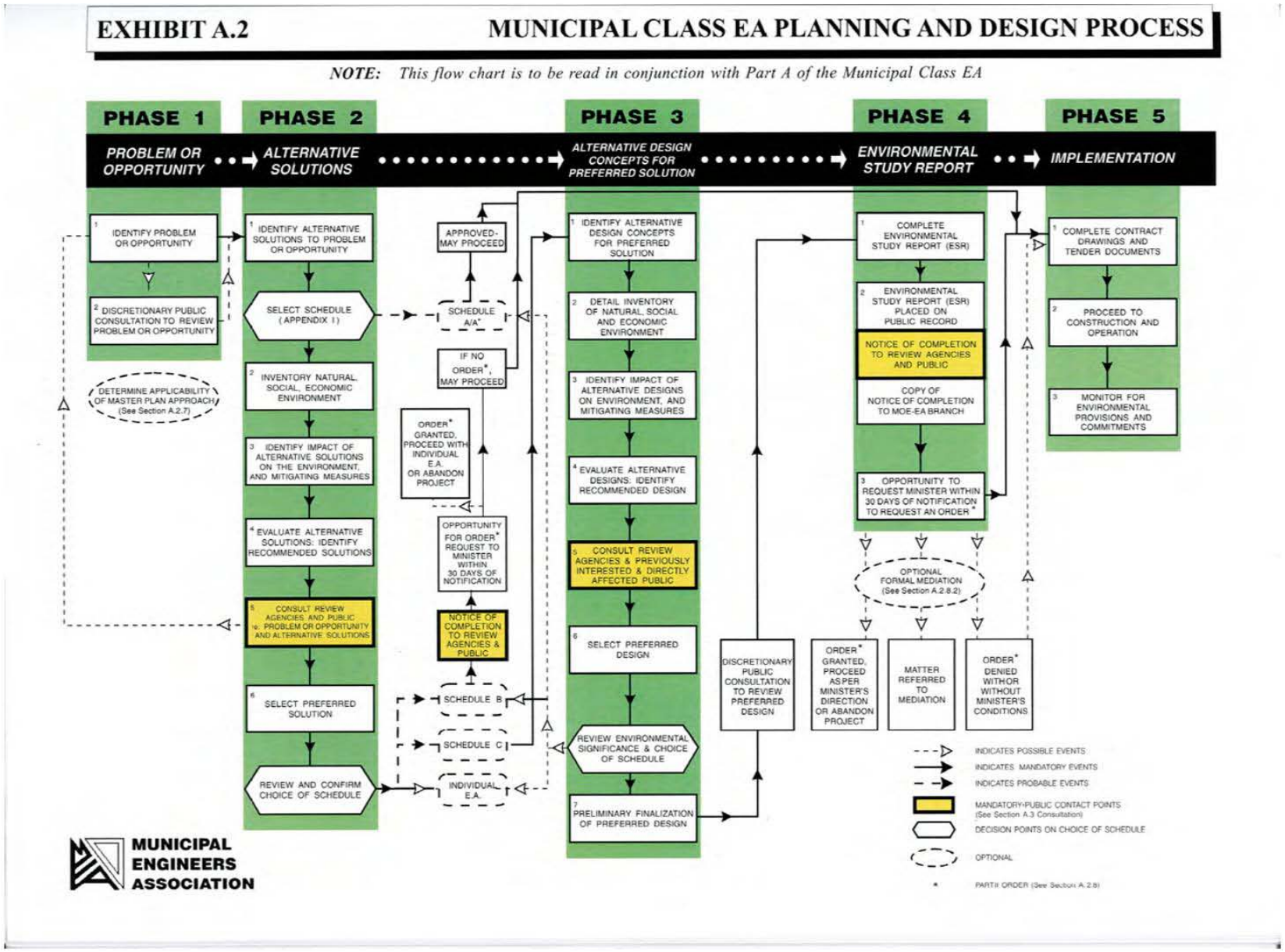
Undertakings (projects) carried by Ontario municipalities must meet the requirements of the Ontario Environmental Assessment Act. The Municipal Class Environmental Assessment (October 2000, as amended in 2007 and 2011) is an approved document that describes the process a proponent must follow for a class or group of undertakings in order to meet the requirements of the EA Act. The Municipal Class EA covers a group of project types, including municipal road, water, wastewater and transit projects. Projects are grouped into schedules based on the expected environmental impacts they may have.

The Municipal Class EA planning and design process is a five phase process, incorporating the key principals of environmental assessment planning:

- Consultation
- A reasonable range of alternatives
- Consideration of the effects of the project on all aspects of the environment
- Systematic evaluation
- Clear documentation
- Traceable decision making.

Different project schedules go through different phases of the Class EA process as shown in **Figure 12-1**. Schedule B undertakings must complete Phase 1 and 2, while Schedule C projects must complete the full five phases.

Figure 12-1 : Municipal Class EA Process



12.1.1 Class EA Categorization of Undertakings

The SSMP process was designed to follow the Master Plan process as set out in Section A.2.7. of the Class EA. Given the lack of municipal infrastructure, the large geographic area covered by the two settlement areas, and the need to define problems and opportunities it was decided to follow a Master Plan approach. Master Plans define individual projects that can then be implemented over time across a larger area. At a minimum, Master Plans address Phases 1 and 2 of the Municipal Class EA process, although for Schedule B projects it is often necessary to undertake site specific investigations and public and agency consultation, beyond the Master Plan.

A new sanitary sewage system consisting of collection and treatment components is a **Schedule C** undertaking. It will be necessary to follow the entire Class EA process in order to implement a project. The Master Plan satisfies Phases 1 and 2 of the process. Phase 3 of the process will identify and evaluate alternative methods to implement the project. This will include evaluating treatment technology, identifying sites for facilities, finalizing the size (capacity) of the project, and identifying environmental impacts and mitigation measures. This will be done through a consultation and decision making process and will culminate in the preparation of an Environmental Study Report (ESR). This report will be put into public record and is subject to a statutory review period.

Phase 5 of the EA process will follow final approval of the ESR and includes preparation of the design drawings and documents, construction and monitoring.

Through the SSMP review a number of infrastructure components were looked at. It has been identified that there are certain deficiencies with the municipal water system that need to be addressed, in addition to the need to grow the system to meet future supply and storage demands. The following is a summary of expected Class EA requirements:

- Installing watermain in Erin and Hillsburgh to connect existing unconnected properties to the existing distribution system : **Schedule A+,** establish, extend or enlarge a water distribution system and all works necessary to connect the system to an existing system or water source provided all such facilities are either in an existing road allowance or utility corridor. If all facilities are not in a road allowance or utility corridor the project is subject to **Schedule B**.

- Redeveloping the existing Bel-Erin well supply may be a **Schedule A** undertaking: install new or replacement wells or deepen existing wells or increase pumping capacity of existing wells, at an existing municipal well site, where the existing municipal yield will not be exceeded. It becomes a **Schedule B** undertaking if the existing rated yield is exceeded.

- Adding additional wells at new locations to provide for new growth is a **Schedule B** undertaking: establish a well at a new municipal well site….. . This Class EA would be looking at potential new sites with available yields and acceptable water.

- Adding new water storage facilities to support existing and new growth would be a **Schedule B** undertaking: establish new or expand/replace existing water storage facilities.

- In order to consider and possibly implement one connected water system for both villages, a Class EA process would need to be initiated. Possible routings could include county roads or the Cataract Trail system. The resultant project is probably a **Schedule B** undertaking: establish, extend or enlarge a water distribution system and all works necessary to connect the system or water source, where such facilities are not in either an existing road allowance or an existing utility corridor. This would include any water pumping stations required for pressure purposes.

- The County of Wellington may undertake a Class EA process to review improvements to traffic flow in the Erin Village area. This could include the development of a truck bypass. These projects are either **Schedule B or C** undertakings dependent on the cost of the identified solution.

12.1.2 Moving Forward with the Class EA Process

Three servicing scenarios were evaluated in Section 10.0 and because there is not much to differentiate them in terms of cost and impacts, it is recommended that they be carried forward into the next Phase of the Class EA process for wastewater servicing, a Schedule C undertaking.. The evaluation of planning alternatives and servicing scenarios has been completed in the context of defining need, and technical, environmental, and financial feasibility. Most importantly, they were compared against the Vision Statement and Problem/Opportunity Statement that were defined during the SSMP process. They reflect the values, needs and wants of the community that were identified and discussed during the extensive review and consultation process.

The Do Nothing Alternative is a fallback position kept alive in an EA process if it is not feasible to implement a project. Do Nothing is a misnomer in that it implies that the municipality would walk away from the underlying problems that were identified. Implementing a Do Nothing approach typically means that other steps are taken to minimize the problems. A Do Nothing approach for the Town of Erin has consequences that need to be understood. In the case of the Town, Do Nothing would leave the municipality facing all the identified issues regarding housing types, employment opportunities, potential impacts to waterways and issues with private sewage systems. It may also trigger a Class EA process undertaken by a developer, in order to implement a sanitary sewage solution so that private lands may be developed. This action would have associated social/cultural impacts to the community.

Given this, moving ahead with the planning and implementation of a strategy to provide a sanitary sewage system to the existing settlement areas of Erin Village and Hillsburgh and to provide for such growth that can be obtained, given the limits defined by the Assimilative Capacity Study, is a reasonable approach. The Class EA process through Phases 3 and 4 will further define unknowns, such as, the type of collection and treatment facilities, and the preferred location of pumping stations and treatments sites. This will allow for a more defined cost estimate to be prepared. It will also allow for site specific environmental concerns to be identified and addressed. The Class EA process requires active public and agency consultation to be successful. Given the extensive interest of the public in the SSMP process, it can be expected that this will continue through the next phases of the Class EA.

Defining technologies that will meet the requirements of the discharge to the West Credit River, evaluating sites for pumping stations and treatment facilities, and reviewing various methods of sewage collection can be a challenging exercise. The municipality will need to have a well-defined Terms of Reference going forward, if they intend to go through a Request for Proposals process for professional firms to continue with the Class EA process.

12.2 Financial Strategies

A full servicing approach will provide service to the existing population in the settlement areas as well as provide capacity and linkages for some future development. Generally, future development is expected to pay for internal services within developments. Under development agreements, they will install their own on-site sewers and will pay the municipality for capacity in the existing municipal system. As there is no existing capacity it is expected that the development industry will contribute either upfront to get the capacity, or through development charges, should the municipality upfront the costs.

The cost of providing services to the existing population is generally recovered from the benefiting properties. To install a new sanitary sewage system in an existing community is an expensive undertaking and can be an unreasonable burden on property owners for a considerable length of time. Typically in Ontario, these types of projects receive senior government funding assistance based on the problems they are addressing and the needs of the community. The Town needs to begin now to seek senior government funding assistance, using the SSMP as supporting documentation. It will be difficult to initiate the project without some assistance.

Phasing the project implementation could also be considered. Typically a municipality will carry the cost of a project through long term debentures and recover the cost from the benefiting properties. The potential size of this project is too large for the municipality to fund through this process. The borrowing capacity of a municipality is governed by a number of rules, and set by the province. At this time, the municipality is limited to borrowing approximately $25 million dollars for a 20 year repayment limit. This is only adequate for the anticipated municipal share of this project with senior government funding assistance.

It is not necessary to carry out all the proposed water supply projects concurrent with any wastewater project implementation. There may be advantages to installing water main to service those existing unconnected properties, in conjunction with any sewer pipe installation being undertaken. However some of the water projects can be postponed until the villages are serviced by wastewater. There will be a lag time before the full demands required by future growth are needed. The municipality needs to be aware that most of the water projects will need EA, hydrological investigations and design that could take some time, so initiating these processes should be undertaken in advance of the anticipated need.

12.3 Planning Strategies

When the Master Plan is accepted as the direction Council is going to go forward with, there will need to be some changes to overarching planning policies put into place. At the local municipal level the Town of Erin Official Plan will need to be revised to remove the references to the SSMP being required for the Urban Areas Special Policy Area. Instead there will need to be direction in the OP that the SSMP is the guiding document for wastewater and water servicing in the urban settlements of Hillsburgh and Erin Village. In rural areas outside of these boundaries, where there is already some more concentrated development on private systems, such as Brisbane and Cedar Valley, development should only be allowed on a limited, rounding out of development as allowed by the Provincial Policy Statement, and subject to meeting regulations governing on –site servicing. Given the limited availability of wastewater capacity at this time, there should be no expectation of extending services beyond the urban boundaries at this time. Within the rural areas of the SSMP study area limited residential and agricultural development can continue to occur on private services, provided they meet the appropriate regulations.

As shown in Figures 2-7 to 2-8 of this report, there are considerable lands within the urban boundaries that are not developed and could be if there were available municipal services. There is 30% potential new growth available in the urban areas, given the current assimilative capacity target of 6,000 persons. Eventually this will get taken up by new growth, whether green fields or through intensification of existing developed areas of the villages. Municipal Council may wish to set aside a specific amount of the future growth for intensification purposes and/or to ensure that there is some of the assimilative capacity available for future commercial/industrial opportunities. It has been suggested that 20% of the potential new growth be allocated for these purposes. The municipality should discuss this with the upper level planning authority, and may wish to put a target allocation within their Official Plan.

At the County of Wellington level, any new growth forecasts for the Town of Erin, or allocations of future growth to meet the County targets for Places to Grow, will need to consider the SSMP. At this time there is a population limit constrained by the assimilative capacity of the receiving stream. In the future, if there are increases in the target made possible by different technologies/approaches, these targets can be incorporated through the Official Plan review process.

13.0 Summary

13.1 General

On December 14, 2004, the County of Wellington approved the Official Plan of the Town of Erin, with modifications approved on April 5, 2012. The OP sets out a community-based process known as a Servicing and Settlement Master Plan, which is designed to address servicing, planning and environmental issues related to the urban areas of the Town of Erin in a comprehensive manner. The study area includes Hillsburgh and Erin Village, and some surrounding rural areas. This report documents the SSMP process which has taken place from 2009 -2014. This report focuses on the second phase of the SSMP process which relates to the identification and evaluation of servicing strategies to meet the needs identified in Phase 1. As such, this report should not be considered in isolation but with reference to the SSMP Background Report dated March 28, 2012, which includes the comprehensive CVC Environmental Component Report. These are included with this report as Appendices A and B.

13.2 Public Consultation

The SSMP process was designed around a significant number of consultation opportunities in order to circulate information and receive input. The Town had appointed a Liaison Committee of citizens representing various sectors of the Town's populace and interest groups. The purpose of this group was to provide input to the study consultant, the Town and the public and provide feedback from the public. The Town also set up a Core Management Team composed of government agencies, and staff to provide technical input/advice to the study. There was Council representation in both groups. Final decisions on the SSMP reside with Council.

As part of this study there have been:

- 15 Liaison Committee meetings
- 5 meetings of the Core Management Team
- 3 Public meetings
- 4 Council workshops
- 4 meetings/workshops with the public and community groups to define Community Form and Function.

Additionally there has been a study website embedded in the municipal website, poster and newsletter distribution and many feedback questionnaires received through the website and other venues.

A Vision Statement was developed by the Liaison Committee as part of the consultation process. This statement expresses the unique qualities and common values of the community and served as a guide to the development of alternative planning and servicing strategies in the Master Plan.

13.3 Population and Growth Analysis

- Recent population census showed a slight increase in the Town population. This follows a long term trend. The significantly slower rate of growth than Wellington County is probably related to lack of municipal services in the villages.

- Wellington County forecasts present a growth target forecast in the two villages of approximately 6500 persons to the year 2035. This would be approximately 2,000 persons beyond the existing population of 4,500 persons.

- The settlement areas of Hillsburgh and Erin Village are defined in planning documents and limited by provincial policies such as the Greenbelt Area. There are sufficient vacant potentially developable properties available to meet the 25 year forecast and beyond. There is no need to consider expanding the settlement areas at this time.

13.4 Problem Opportunity Statement

The Problem/Opportunity Statement for the Master Plan was derived from information gathered during the first phase of the SSMP and guided by the Vision Statement. The statement forms the basis of the Master Plan and guides the development and evaluation of alternative planning and servicing scenarios. Issues with private on-site sewage disposal have been identified over the years and this contributed to the main argument of the Problem/Opportunity Statement:

Presently, the Town of Erin lacks a long term, comprehensive strategy for the provision of water and wastewater servicing in the villages of Erin and Hillsburgh. The following limitations are associated with the current status of servicing within the Town's urban areas:

Wastewater

Wastewater is treated exclusively by private, on-site wastewater treatment systems. Within the Built Boundary of the settlement areas (Hillsburgh and Erin Village), private property investment and redevelopment is restrained by increasingly stringent setbacks required for septic systems, small lot sizes and the presence of private wells. Additionally, there are limited facilities in the area accepting septage from private systems for treatment.

The settlement areas (Hillsburgh and Erin Village) have been identified as areas of modest growth under the Places to Grow Act and by Wellington County population projections. At present, the servicing infrastructure is inadequate to meet future demand to 2035. Lots sized to include septic systems will not allow for projected future development to occur in a manner consistent with the need for smaller, less-expensive homes in the community as identified in the Vision Statement.

The Problem/Opportunity Statement also presented comments on water, stormwater, and transportation infrastructure.

13.5 Assimilative Capacity Study

An Assimilative Capacity Study of the West Credit River has been undertaken in order to define the limits of the water course to accept a future treated sewage discharge. Phosphorous and nitrate loadings appear to be the limiting criteria to future discharge capacity. Based on the completed analysis, it was evident that a surface water discharge is a viable alternative to service annual daily discharge rates in the order of 2,610 m^3/day (approximately 6,000 persons), while not negatively impacting on the stream as habitat for aquatic life.

13.6 Community Planning Scenarios

The goal of the SSMP is to development appropriate strategies for community planning and municipal servicing consistent with current provincial, county and municipal planning policies. The target year for the study is 2035. Settlement areas within the Greenbelt include Hillsburgh and Erin Village, and the Wellington County Official Plan encourages these areas to seek appropriate planning and economic development approaches which include modest growth that is compatible with the long-term role of these settlements as part of the Protected Countryside and the capacity to provide locally based sewage and water services.

Given the limits identified by the Assimilative Capacity Study, which represents the base for a locally derived wastewater servicing, four community planning scenarios were evaluated, two representing servicing all or part of the existing development and some future growth, a scenario which considered the possible of reaching outside of the local area for a sewage treatment solution, which may have provided for more future growth than a local stream based effluent solution, and finally an option that considered the status quo, which is always an option to fall back on if other approaches are deemed not to be feasible. A planning alternative which involves providing wastewater servicing to all existing development and future growth of about 500 new properties was carried forward in the SSMP.

13.7 Sanitary Sewage

- Across the whole Town existing sanitary sewage service is provided by individual private septic systems. There are a number of holding tanks in the village cores where insufficient land was available for traditional septic systems.

- Numerous studies over the years identified issues with this form of servicing within the village areas. Concerns include lot sizing, age of systems, inability to replace systems (need for holding tanks or expensive tertiary systems to meet current regulations for setbacks and bed areas).

- The environmental analysis by Credit Valley Conservation did not identify any specific data showing a direct impact from septic systems. This is not a definitive no impact statement because the water quality data must be combined with other study aspects to determine overall sensitivity of the environmental features, functions and linkages to the more densely settled areas.

- Septic systems have a finite working lifespan generally of 20-25 years. Many of the systems in the 2 settlement areas are estimated to be much older based on the historical low replacement rates. It is suspected many households have put any replacement on hold in anticipation of the SSMP recommendations.

- There is a local issue with the availability of approved lands for septage haulers to spread their pumped loads. There are not many local area sewage treatment plants that will accept septage either. This necessitates hauling septage as far as Hamilton or Collingwood, with additional cost. It is recommended that any future sewage treatment solution include facilities to accept local septage from the entire Town of Erin.

- Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries (such as in the hamlets of Cedar Valley and Brisbane) are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.

- A conceptual gravity sewer servicing plan was prepared in order to confirm limitations on routing, pipe sizes and other characteristics of a collection system. Sewage would flow from Hillsburgh to Erin Village via gravity, be collected through Erin Village and flow to a low point in the south end of the Erin Village. It is assumed that a treatment plant would be located in this general vicinity.

- A probable cost for this type of system, treated at a facility using a high level of treatment using best available technology, is $58,500, 000. Any future treatment facility should also include facilities for septage management. This assumes a 25 year design population of 6,000 persons, consistent with the planning forecast.

- The cost of the wastewater collection and treatment system would be shared between the existing households and future development. The assessment of this cost would be defined using generally accepted principles regarding benefit received, oversizing, and fair and equitable reasoning.

- The implementation of this type of system into an existing area is an expensive proposition. Traditionally in Ontario, senior government funding assistance has been granted to municipalities to help them address health and environmental issues. In order to reduce the financial impact of any project, the Town should seek out grant funding assistance. The project may need to be constructed in phases in order to be achievable. This can be investigated in the further phases of the Class EA process.

- A conceptual wastewater system was developed to evaluate feasibility and provide an estimate of possible costs. It assumed traditional construction methods and facilities and was based on providing a high level membrane filtration treatment facility in order to meet effluent requirements. A review of alternative collection systems and sewage treatment

technologies would be completed during Phase 3 of the Municipal Class EA, which concentrates on design details, siting of facilities and treatment capacity.

13.8 Water Supply, Storage and Distribution

- There are existing municipal water systems in both villages. There are still some legacy unconnected properties in both areas. Rural areas are served by private domestic wells.
- Water supply is groundwater, each urban area has two wells in service, and a number of older wells that have been removed from the system due to water quality issues.
- Given the large amounts of vacant developable land in Erin Village (approximately 270 ha) and Hillsburgh (approximately 190 ha), it is unlikely that additional service areas outside the urban boundaries (such as in the hamlets of Cedar Valley and Brisbane) are required, and services would not be extended. However, limited development in the two hamlets is allowed on private services subject to the County and Town Official Plans. Some rounding out of development in the rural areas may be allowed, subject to the Official Plans and zoning policy of the Town.
- There are adequate supplies to service the existing development although the "firm capacity" of each system is exceeded and additional system redundancy is required. This can be achieved as new supply sources are put in place to provide additional future capacity to meet new growth.
- Once existing unconnected properties are connected to the water systems there will be a supply deficit of approximately 840 m^3/day in Erin Village which will need to be addressed. When all of the existing community is connected in Hillsburgh, there will be a supply deficit of 140m^3 per day and a storage deficit of approximately 130 m^3/day. .
- To meet additional needs of future growth, additional source capacity and storage will be required in both communities. The sizing of these facilities is dependent on the rate, location and projected increase in future development.
- New facilities will require Class EA processes to define capacities and specific site locations.
- The two systems could be connected via an extension of the distribution systems. This will increase the security of ongoing supply and address redundancy issues. It may minimize the individual upgrades needed to provide for growth in either community. A Class EA process would determine if this is preferred over individual system upgrades in each community.
- Mandatory connection of all properties in the settlement areas is recommended.
- In order to reduce the financial impact of any project, the Town should seek out senior level government funding assistance.

13.9 Stormwater Management

- Effective stormwater (SW) management is critical to the continued health of the West Credit River, including fisheries and terrestrial habitats.
- There are only a few existing SW management facilities in the settlement areas and conveyance of flows is typically within a localized stormwater system. Urban roads are also used to manage/direct stormwater.
- Details on SW management criteria which should be used by the Town to assess any development proposals are discussed and defined in detail in the SSMP. The recent Stormwater Management Criteria, CVC 2012 should be used to set the requirements for both quantity and quality control. LID measures should be considered carefully as part of future development proposals
- The municipality and the CVC should recognize the potential for climate change to contribute to the complexity of SW Management. Development of resilient systems should be considered when reviewing individual applications.

13.10 Transportation

- Generally the existing road networks serve the study and settlement areas well.
- New local roads will be established through the subdivision review process. Traffic impact studies will be required.
- There were concerns expressed during the study process that large truck traffic and congestion in the downtown cores was an issue that should be looked at and a bypass considered.
- Earlier studies suggest that by the year 2035 the addition of passing lanes or a truck bypass should be considered for Wellington County Road 124.
- A Class EA process would be required to implement a bypass or other alterations. The Town should discuss the issue with the County, who would be the proponent of an EA on County Roads.

13.11 Servicing Scenarios

At the direction of Town Council, three servicing scenarios were evaluated in detail. They are variations of setting aside assimilative capacity in the receiving stream for all existing development and providing the remainder, approximately 500 homes equivalent for future growth. The scenarios differ in the manner in which the future growth is allocated to the two villages. After evaluation it was determined that all three scenarios meet the requirements of the SSMP and should be carried forward for future review in the Class EA process.

13.12 Financial Considerations of Implementing Servicing

A financial analysis of the servicing strategies identified by the Master Plan was undertaken by Watson & Associates Economists. Their report is contained in Appendix F. They outlined funding mechanisms that could be used to recover the costs of servicing from the existing development and future growth. A review of the ability of municipal debt financing concluded that, in order to undertake the full wastewater and water infrastructure that will be required under the Master Plan, senior level government grant assistance will be necessary, likely in the order of 55% to 66%. Phasing of the projects could be considered in order to finance the works within debt capacity limits.

13.13 Implementation Strategies

- The SSMP followed the Master Plan planning process of the Municipal Class EA. As such it looked at a broad range of infrastructure across a larger geographic area. The SSMP constitutes Phases 1 and 2 of the Class EA process.

- The need for sanitary sewage infrastructure was identified as a high priority, not just to accommodate new future development, but to address issues with existing development. The Vision Statement for the community recognized the need for responsible servicing to help address identified deficiencies and to help continue to make the Town of Erin a vibrant, safe and sustainable community.

- As new development is introduced to the community there will be a need to upgrade the existing water system to provide additional capacity and storage. This will be implemented as required keeping in pace with new growth and would be subject to site specific EA review.

- In order to implement a sanitary sewage servicing solution, the Town must continue through the remaining phases of the Class EA process. This would be a Schedule C undertaking. The next phases would examine and evaluate specific collection and treatment solutions, find and evaluate appropriate sites for any facilities such as pumping stations or treatment works.

- A number of upgrades to the municipal water systems will be required to provide capacity for both existing development and new growth. Individual facilities will require various levels of future Class EA investigation. The Class EA schedules for these projects are outlined.

- The Town of Erin should begin the process of seeking out senior government funding assistance for implementation of the Master Plan. The SSMP can be used as a supporting document to build a case that this undertaking would provide considerable economic, health, and environmental benefits to the Town. It is necessary to be ready to take advantage of any new funding programs that are introduced by the government.

- When the Master Plan is accepted as the direction that the Town will move forward with, it will trigger a number of changes to planning documents such as the Town and County

Official Plans. The direction of the SSMP needs to be put into the governing documents and growth forecasts should be developed accordingly. Eventually, the growth capacity as determined by the ACS will be allocated and built out and specific land use classifications may need to be adjusted to reflect the inability to develop due to servicing constraints.

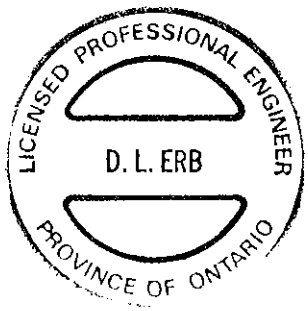
14.0 Recommendations

This report documents the SSMP process undertaken by the Town of Erin to review servicing needs in an area of the Town that encompasses the settlement areas of Hillsburgh and Erin Village. The SSMP will serve as a guide to the municipality when considering how best to serve existing residents and plan for allowing new growth with respect to major infrastructure. The highest priority need, to achieve the servicing standards necessary to provide for a healthy community that wants to build on their strengths, is the provision of a sanitary sewage system that services both existing and future development. In order to properly plan for this service it is recommended that:

- The Town of Erin move forward with the remaining phases of the Class EA process to develop an undertaking to provide a sanitary sewage collection system for the settlement areas of Hillsburgh and Erin Village based on the servicing scenarios reviewed in the report.
- That the Town of Erin initiates the process of seeking out senior government funding assistance for this undertaking. The SSMP can be used as a supporting document to build a case that this undertaking would provide considerable economic, health, and environmental benefits to the town. It is necessary to be ready to take advantage of any new funding programs that are introduced by the government.
- That the Town undertakes water servicing upgrades as defined in this report, and in accordance with the Class EA process, so that appropriate facilities are in place when required to service future growth.
- That the Town review and amend its Official Plan as needed to implement the SSMP and allocate growth within its urban boundaries. Similarly, the County of Wellington should revise its Official Plan to reflect the Town's capacity to provide wastewater service, and adjust population forecasts accordingly.
- That the Town should apply stormwater management policies, as discussed in this report, to manage new growth areas and to address deficiencies with existing stormwater management.
- That transportation issues be monitored in conjunction with the growth of the urban areas and that the Town should work with the County to implement measures to alleviate issues.
- That the Town make use of the information and data gathered during the SSMP process to further the ongoing advancement of the municipality so that it will continue to be a place that people will want to live in as defined by the Community Vision Statement:

THE TOWN OF ERIN WILL REMAIN A VIBRANT, SAFE AND SUSTAINABLE COMMUNITY, LOCATED AT THE HEADWATERS OF THE CREDIT AND GRAND RIVERS. THE TOWN WILL CONTINUE TO CAPITALIZE ON ITS PROXIMITY TO LARGE URBAN CENTRES, WHILE MAINTAINING ITS EXCELLENT COMMUNITY SPIRIT. WITH A STRONG EMPLOYMENT BASE, AND A RANGE AND MIX OF HOUSING, A HIGHER PERCENTAGE OF THE RESIDENTS WILL WORK AND CONTINUE TO LIVE WITHIN THE TOWN OF ERIN. VISITORS WILL ENJOY THE SMALL-TOWN ATMOSPHERE, UNIQUE SHOPS AND SURROUNDING RURAL CHARM. THROUGH RESPONSIBLE DEVELOPMENT AND SERVICING, THE TOWN'S RICH NATURAL ENVIRONMENT WILL BE PROTECTED AND PRESERVED.

All of which is respectfully submitted.



B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Matthew J. Pearson, MCIP, RPP

Per _____
Dale Erb, P. Eng.

15.0 References

4 Roads Management. (2013). *State of Infrastructure Report.*

AECOM. (2013). *OSIM Structure Inspections Summary Report.*

AECOM. (2008). *Town of Erin 2008 Municipal Road and Structures Inventory Condition Assessment.*

B.M. Ross and Associates Limited. (2012). *Town of Erin Servicing and Settlement Master Plan Background Report.*

Blackport Hydrogeology Inc. (2002). *Bel-Erin Municipal Water Supply GUDI Assessment, Town of Erin, Ontario.* unpublished report prepared for the Town of Erin.

Blackport Hydrogeology Inc. (2003). *Groundwater Management and Protection Strategies, Groundwater Management Study, Town of Erin.* Prepared for the Town of Erin through Funding by the Ministry of Environment.

Blackport Hydrogeology Inc. (2005). *Groundwater Management and Protection Strategies, Groundwater Management Study, Town of Erin.* Prepared for the Town of Erin.

Blackport Hydrogeology Inc. (2014). *Potential Well Locations.* Email to B.M. Ross and Associates Dated May 26, 2014.

City of Barrie. (2009). *Storm Drainage and Stormwater Management Policies and Design Guidelines.*

Credit Valley Conservation and Toronto and Region Conservation Authority. (2010). *Low Impact Development Stormwater Management Planning and Design Guide.*

Credit Valley Conservation. (2012). *Credit Valley Conservation Stormwater Management Planning and Design Guide.*

Credit Valley Conservation. (1996). *Stormwater Management Guidelines.*

Credit Valley Conservation. (1998). *West Credit Subwatershed Study: Characterization Report.*

Credit Valley Conservation, Aquafor Beech Inc., Blackport Hydrogeology Inc. (2011). *Erin Servicing and Settlement Master Plan Phase 1 - Evironmental Component - Existing Conditions Report.*

CTC Source Protection Region. (2014). *Amended Proposed Source Protection Plan: CTC Source Protection Region.*

Gambsy and Mannerow Ltd. (2013). *Hillsburgh Booster Pumping Station.*

Gamsby and Mannerow. (1984). *Municipal Waterworks System, Village of Erin.* Unpublished report prepared for the Village of Erin.

Golder and Associates. (2006). *County of Wellington Groundwater Protection Study.*

Metcalf, & Eddy. (2003). *Wastewater Engineering Treatment and Resuse.* McGraw-Hill.

Ministry of Municipal Affairs and Housing. (2014). *Provincial Policy Statement 2014.*

Ontario Ministry of the Environment. (2009). *Inspection Report.*

Ontario Ministry of the Environment. (2003). *Stormwater Management Planning and Design Manual 2003.*

Ontario Ministry of the Environment. (1999). *Water Management: Policies, Guidelines and Provincial Water Quality Objectives.*

Statistics Canada. (2012). *Erin, Ontario Census Profile. 2011 Census.* Ottawa: Statistics Canada Catalogue no. 98-316--XWE.

Statistics Canada. (2007). Erin, Ontario. 2011 Community Profiles. *2006 Census. Statistics Canada Catalogue* .

Terraqua Investigations Ltd. (1995). *Hydrogeological Assessment for Erin Sewage Works.* Prepared for Triton Engineering Services Limited.

Town of Erin. (2010, April 6). *Personal Communication* .

Town of Erin Building Departmnet. (2001). *Memo.*

Town of Erin. (2009). *PSAB Watermain Inventory.*

Town of Erin. (2007). *Town of Erin Municipal Servicing Standards.*

Triton Engineering Services Limited. (1995). *Class EA Sewage Works Study.*

Triton Engineering Services Limited. (2009). Hillsburgh/Erin Water Reserve Capacity Calculations. *Memo* .

Triton Engineering Services Limited. (2008). *Town of Erin Servicing and Settlement Master Plan Terms of Reference.*

United States Environmental Protection Agency. (2003). *Wastewater Technology Fact Sheet - Ballasted Flocculation.*

Water Environment Research Foundation. (2014). *Water Environment Research Foundation*. Retrieved July 2014, from http://www.werf.org/

Watson and Associates Economists Ltd. (2012). *County of Wellington Development Charge Background Study.*

Watson and Associates Economists Ltd. (2013). *Town of Erin Asset Management Plan, Roads, Bridges, Culverts, Facilities and Water Assets.*

Wellington County. (2014). Town of Erin 2011 Population and Housing by Area.

Wellington County. (2011). Wellington County Official Plan.

Wellington-Dufferin-Guelph Health Unit. (1995). *Village of Erin: Private Sewage System Survey.*

Wellington-Dufferin-Guelph Public Health Unit. (2010, April 8). *Personal Interview* .

West Central Region Technical Support Section - Surface Water Unit. (2005). *Town of Erin Septic Investigation.*

Young, J. C., & Edwards, F. G. (2003). Factors Affecting Ballasted Flocculation Reactions. *Water Environment Research , 75* (3), 263-272.