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Appendices

Appendix A: Species at Risk and Species of Conservation Concern with Potential to, or Confirmed Within, the Project Study Area

Appendix B: Natural Heritage Systems – Linkages, Adjacent Studies to the Randall and Breslau Drains MESP Study Area
1. INTRODUCTION

The Region of Waterloo, in association with the Grand River Conservation Authority (GRCA), the Township of Woolwich and the city of Cambridge, has initiated a Master Environmental Servicing Plan (MESP) and Secondary Plan Study for the Stage 2 Lands within the East Side Area. The Region has retained MMM Group Limited, a WSP company, to undertake the study.

The purpose of the study is to establish a framework for future development within the Stage 2 Lands of the East Side Area. The stated problem/opportunity statement, as outlined in the Terms of Reference, is “how to effectively and efficiently service and develop the Stage 2 Lands in an environmentally sustainable manner.” The Stage 2 Lands consist of lands within the city of Cambridge, in close proximity to the Region of Waterloo International Airport (the Airport), as well as lands in close proximity to Breslau, abutting the Breslau settlement boundary. This study follows a similar process for the Stage 1 Lands MESP and Community Plan. The Stage 1 Lands are located to the south of the Airport, and within the city of Cambridge. Section 2 contains maps delineating the East Side Area, the Project Study Area and the Stage 2 Lands.

1.1 STUDY PROCESS

The study represents an integrated, comprehensive approach to conducting an Environmental Assessment (EA) and Planning Act process, including detailed technical studies with regards to subwatershed planning, drainage, hydrogeology, transportation, water/wastewater servicing and land use planning. The outcome of the Study will be a MESP that addresses (at a minimum) Phases 1 and 2 of the Municipal Class EA process, along with a Secondary Plan to apply to the lands within the city of Cambridge. This involves the identification of transportation-related improvements, water/wastewater improvements, a subwatershed study for the Randall and Breslau Drains and a Master Drainage Plan. The MESP will accordingly recommend other municipal projects, such as transportation and water/wastewater infrastructure improvements, which will proceed in accordance with the Municipal Class EA process.

The MESP is being undertaken in accordance with the Municipal Class EA Process, which is a Minister-approved class of undertakings under Part II.1 of the Environmental Assessment Act. The Municipal Class EA (October 2000, amended in 2007, 2011 and 2015) outlines minimum requirements for conducting a variety of municipal infrastructure assessments, including water, wastewater, transportation and other municipal projects. The intent of the Municipal Class EA is to provide a decision-making framework that is efficient and has become familiar to municipalities and the public.

A Master Plan is defined in the Class EA as “a long range plan which integrates infrastructure requirements for existing and future land use with environmental assessment principles. At a minimum, a Master Plan addresses Phases 1 and 2 of the Municipal Class EA process.” Phases 1 and 2 refer to phases of the overall 5-phase Municipal Class EA planning process (Figure 1-1). Phase represents identification of a problem or opportunity, involving optional consultation, and Phase 2 represents identification and evaluation of alternative solutions, in which consultation is mandatory. The remaining phases would be completed for any projects that are identified to be undertaken to implement the findings of the MESP.
The Municipal Class EA does not provide an exhaustive process or checklist for undertaking a complex process, such as a Master Plan, but rather identifies principles and minimum mandatory requirements. It is intended that proponents will define an appropriate work plan. Although consultation is optional in Phase 1, initial consultation is critical to ensure understanding of the scope and purpose of the study, and to provide input into the development of alternatives as well as to reflect the public interest.

The Secondary Plan within Cambridge will be implemented as an Official Plan Amendment in accordance with the requirements of the Planning Act and the policies of the City of Cambridge Official Plan. This process represents an integrated approach under the Municipal Class EA, since this study involves integration of processes under the Planning Act and the Municipal Class EA process. It is intended that duplication should be reduced through the integrated process, by integrating meeting notifications and public consultation to address the requirements of both processes.

The study process is illustrated in Figure 1-2. The process includes four public information centres (PICs) and public consultation centres (PCCs) at key stages of the process:

- PIC #1: Project initiation and presentation of background and input on project issues/opportunities;
- PCC #2: Presentation and consultation on the Draft MESP;
- PCC #3: Presentation and consultation on the revised Draft MESP and Draft Secondary Plan; and
- PCC #4: Presentation and consultation on the Final Draft MESP and Secondary Plan (fulfills the statutory public meeting requirements under the Planning Act).
Figure 1-1 – Municipal Class EA Process (Source: Adapted from the Municipal Class EA by the Municipal Engineers Association, October 2000, as amended)

- Identify problem or opportunity to be addressed
- Determine Master Plan approach
- Consultation is discretionary
- Identify alternative solutions to the opportunity
- Inventory natural, social and economic environment
- Identify impact of alternatives and mitigating measures
- Evaluate alternatives
- Identify preferred solutions
- Consultation is mandatory
- Complete Environmental Study Report (ESR)
- Place ESR on public record
- Notice of Completion
- Opportunity for public to request order/Minister review
- Consultation is discretionary
- Complete detailed design
- Proceed to construction and operation
- Monitor for identified environmental provisions and commitments

Phases 1 & 2 are the minimum that is required to be completed through this Master Plan process. The outcome is the identification of projects that will proceed through the subsequent phases.
## 1.2 PURPOSE OF THE REPORT

The purpose of this report is to identify information gaps based on a review of relevant background information, data and reports. The Project Study Area has been subject to many other on-going and previously completed studies. Accordingly, it is critical to collate and understand this information so that work is not duplicated.

This report consists of an identification and review of relevant background material, including reports, data, studies, policies, guidelines and ongoing projects that are relevant and applicable to the development of a MESP and Secondary Plan for the Stage 2 Lands. This report identifies any gaps in data, information or technical understanding of the study areas. The understanding of gaps will be used to inform the development of a Technical Work Plan and the necessary field investigations.
1.3 STRUCTURE OF THE REPORT

This report is divided into 8 sections:

1. **Introduction**: Outlines the purpose of the study, this report as well as the structure and contents of this report.

2. **Study Area**: Includes a description of the study area (including the different levels or components of the study area), as well as the background and history of this study.

3. **Community Planning Context**: Provides the land use planning and urban design context for development in the study area, including a review of the Provincial policy framework, Regional Official Plan, local Official Plans, and other relevant documents.

4. **Servicing and Utilities**: Outlines the existing infrastructure and capacity for water, sanitary systems and utilities, as well as any on-going studies and improvement projects.

5. **Transportation**: Describes the existing transportation, understanding of current traffic conditions and the transit and active transportation context.

6. **Subwatershed Study**: Provides an integrated review of the ecological, natural heritage and water resource systems (drainage, hydrogeology, fluvial geomorphology/erosion) within the study area.

7. **Fiscal Impact**: Outlines the legislative and current municipal framework for financing the development of the Stage 2 Lands and infrastructure improvement costs.

8. **Conclusions, Summary of Gaps and Next Steps**: Includes a matrix to summarize the data and information gaps as identified throughout the report, as well as conclusions and identification of next steps to follow the completion of this report.
2. STUDY AREA

The focus of this study is within a portion of lands within the East Side Lands in the Region of Waterloo. The boundaries of the Project Study Area, including the Stage 2 Lands, as well as the East Side Lands, are illustrated in Figure 2-1. Although the ultimate purpose of this study is to result in a framework for development of just the Stage 2 Lands, it is recognized that the broader area must be considered, as it will be important to consider the broader impacts and implications of development on surrounding lands, including the subwatersheds. The study area can be considered to include the following components:

The East Side Lands refers to the broad area of approximately 4,065 hectares of land within the cities of Cambridge, Kitchener and the township of Woolwich, within the east side of the Region of Waterloo, east of the Grand River. The lands are generally bounded by the Grand River to the west, Shantz Station Road to the east, the new Highway 7 corridor alignment to the north, and as far as Maple Grove Road to the south.

The Project Study Area has been identified to be generally coincident with Randall and Breslau Drain subwatersheds. The area extends from the Grand River to the west and Shantz Station Road to the east, but only including lands as far as the rail corridor to the north and Middle Block Road to the south. These northerly and southerly boundaries are intended to be generally coincident with the boundaries of the Breslau and Randall Municipal Drain subwatersheds. A more detailed area of focus is the Stage 2 Lands, which will represent the potentially developable area.

The Stage 2 Lands (the detailed study area) consist of lands within the Project Study Area, including a portion of land in the city of Cambridge, and a portion of land in the township of Woolwich. This area consists of approximately 605 hectares of land. Lands in Cambridge are located in the vicinity of Kossuth Road, south of the Airport, at the north end of the municipality. In Woolwich, the lands abut the community of Breslau, which is subject to the Breslau Secondary Plan. The most detailed level of study will take place within the Stage 2 Lands, where future land use and development options will be considered. For lands within the city of Cambridge, a Secondary Plan (Official Plan Amendment) will also be an outcome of this study.
FIGURE 2-1
Project Study Area

Legend
- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Parcel Boundary
- Airport Lands
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody

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2.1 BACKGROUND

Consideration to develop the East Side Lands was initially identified through the Regional Growth Management Strategy (2003), which identifies lands east of the Grand River and in the vicinity of the Airport as a future greenfield development area. The area was recognized as a significant opportunity for development, requiring appropriate partnerships and coordinated approaches to land use and infrastructure planning.

In 2004, the East Side Community Scoping Study was developed to recommend an approach to planning for future development within the East Side Lands. The study recommended the development of a Structure Plan to coordinate work between the Region of Waterloo, Township of Woolwich and the Cities of Cambridge and Kitchener.

The East Side Community Structure Plan and Proposed Highway 401-97 Industrial Area Expansion (2006) was developed to identify staging for the development of the East Side Lands. The Plan evaluates a series of staging scenarios, and ultimately recommends Scenario 4, which conceptually identifies the staging of development, described generally as follows:

- Stage 1 consists of lands within the vicinity of Middle Block Road, and was identified as a priority Employment Lands area.
- Stage 2 consists of the central lands within the East Side Lands, inclusive of the Airport as well as lands to the south and to the north.
- Stage 3 consists of lands to the east and south of the community of Breslau.
- Stage 4 consists of land to the northeast of the East Side Lands.

In June 2007, Regional Council approved Regional Official Policies Plan Amendment No. 28 (ROPPA 28) to designate approximately 150 net hectares of land for large lot employment uses. As a result of an Ontario Municipal Board (OMB) Settlement, additional land west of Fountain Street and south of Allendale Road, and east of Speedsville Road were included. In June 2009, Regional Council adopted the new Regional Official Plan (ROP), approved June 15, 2015, which includes the land designated as part of ROPPA 28, plus additional land for a total of approximately acres 300 net hectares (741 net acres) as Prime Industrial Strategic Reserve (PISR).

The Stage 1 study is now complete and is briefly discussed in Section 2.2. The boundaries of the Stage 2 Lands, as being considered for urban development through this study, consists of lands in the northerly portion of Cambridge and in proximity of Breslau within Woolwich. The boundaries for the Stage 2 Lands are not based on the staging noted above, but rather has been based on the Region of Waterloo’s Official Plan policies, which requires an urban area expansion to be contemplated beginning in 2016 for these lands. This is discussed in more detail in Section 3.2.2.
2.2 STAGE 1 LANDS MESP AND COMMUNITY PLAN

The MESP and Community Plan study for the Stage 1 Lands was initiated on June 14, 2011, with issuance of the Notice of Commencement and Notice of Public Information Centre #1. The process included extensive public and stakeholder consultation, including four Public Information Centres (PICs). The MESP was inclusive of a subwatershed study for Freeport Creek and Tributary to the Grand, a Master Drainage Plan, Transportation System Assessment and Municipal Water and Wastewater Servicing Assessment. The Community Plan provided a framework for land use and community design and recommended implementation of an Official Plan Amendment. The MESP was also complemented by a Fiscal Impact Analysis Report, identifying costs and benefits associated with developing the Stage 1 Lands, and recommending financing tools. In accordance with the recommendations of previous studies and the ROP, the Stage 1 Lands were recommended to be developed for large lot employment uses. The process concluded on May 14, 2014 with the issuance of the Notice of Completion.

2.3 RELATED REPORTS AND INFORMATION

The focus of this study is on the Stage 2 Lands, located to the south of the Airport (north of the Stage 1 Lands) in the city of Cambridge, as well as lands adjacent to the community of Breslau in the township of Woolwich. However, the Project Study Area, as identified previously, is broader, and consists of much of the central portion of the East Side Lands, to be coincident with the Breslau and Randall Drain subwatersheds.

Portions of the Project Study Area have been subject to numerous other studies and assessments, and it is critical to review this information to ensure work is not being duplicated. Some of the related work includes:

- The Stage 1 Lands MESP and Community Plan, as well as on-going implementation projects and Class EAs;
- Subwatershed studies for adjacent lands, including the Hespeler West Subwatershed Study as well as the Freeport Creek and Tributary to the Grand Subwatershed Study as completed in association with the Stage 1 Lands MESP and Community Plan;
- Phase 1 subwatershed planning work for the various subwatersheds in the East Side Lands, including Freeport Creek, the Breslau Drain, Randall Drain, Hopewell Creek and Chilligo Creek).
- Transportation studies including the East Side Transportation Review (2008), the Fountain Street reconstruction/widening Class EA and associated Environmental Study Report, as well as the EA completed for Fairway Road;
- The Breslau Secondary Plan and associated studies;
- Servicing studies for the East Side Lands, including but not limited to the East Side Servicing Review Technical Memorandum (2009);
- Region of Waterloo International Airport Master Plan (on-going); and
- On-going subwatershed and groundwater monitoring data as being completed by GRCA and the Region and related studies.

The intent of this Background Report is to identify all related reports and information to determine what work needs to be undertaken. It is intended that the Technical Work Plan for this study will be formulated based on the outstanding data needs and gaps.

### 2.4 EXISTING LAND USES

A high-level review of land uses has been undertaken through a desktop review. The Project Study Area is largely rural, consisting principally of agricultural lands, dwellings and natural heritage features. A large central portion of the Project Study Area is used by the Airport. In the northwest, the existing community of Breslau consists of urban residential uses, as well as commercial and employment uses principally fronting onto Woolwich Street/Fountain Street North. Breslau is subject to a Secondary Plan study (discussed in Section 3). To the northwest, between Woolwich Street and the Grand River, is an active pit site (Breslau Pit) that is licensed for operation under the *Aggregate Resources Act*. Portions of the site are subject to ongoing rehabilitation. The licensed area consists of 110.4 hectares and there is no limit on the annual tonnage produced.\(^\text{1}\)

Existing land uses in the Stage 2 Lands are illustrated in **Figure 2-2**, based on the Region of Waterloo Official Plan, City of Cambridge Official Plan and Township of Woolwich Official Plan and a review of aerial imagery. The Stage 2 Lands are principally used for agricultural uses, with associated single detached dwellings (some severed onto their own smaller parcels). A considerable portion of the land is utilized by designated natural heritage features, including woodlots and significant valleys in proximity to the Grand River. The amount of land within each ROP land use designation is indicated as follows:

- Approximately 108 hectares of land is designated for core environmental features including significant valleys;
- Approximately 456 hectares of land is designated for agricultural and rural uses;
- Approximately 10 hectares of land is designated for the Cambridge Country Manor nursing home; and
- Approximately 20 hectares of land is designated for the Cambridge Butterfly Conservatory.

There is a small cluster of rural industrial/commercial service uses on the west side of Fountain Street North, north of Middle Block Road (designated Prime Agricultural in the Cambridge Official Plan). Other uses include Cambridge Country Manor (nursing home) at the southwest corner of Kossuth Rd. and Speedsville Road and the Cambridge Butterfly Conservatory on the south side of Kossuth Road, between Fountain Street North and Speedsville Road. The nursing home and butterfly conservatory are subject to site-specific land use designations in the City of Cambridge Official Plan. These uses, including the rural industrial/commercial uses, nursing

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home and butterfly conservatory are designated Prime Agricultural in the Region of Waterloo Official Plan and are outside the Urban Area.

There is at least one property of heritage interest within the Stage 2 Lands, in the city of Cambridge (1035 Riverbank Drive). Additionally, a portion of a property on the other side of Riverbank Drive falls within the Stage 2 Lands. There is one designated historic property at the southwest corner of Fountain Street North and Riverbank Drive that appears to be just outside the study area. There are several other properties of historic interest outside of, but adjacent to, the Stage 1 Lands.

There are currently no designated heritage properties or buildings listed for having interest or heritage potential in the Stage 2 Lands in the township of Woolwich. The Breslau Secondary Plan identifies 15 heritage sites within the Breslau Settlement Area. It is intended that these properties will be added to the Municipal Heritage Register and will be encouraged to be designated.

FIGURE 2-2
Existing Land Uses in the Stage 2 Lands

Legend
- Stage 2 Lands
- Municipal Boundary
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody

Land Use
- Prime Agricultural Area - Butterfly Conservatory (Cambridge OP - Site Specific Policy Area)
- Prime Agricultural Area - Nursing Home (Cambridge OP - Site Specific Policy Area)
- Core Environmental Features (Regional OP)
- Prime Agricultural Area (Regional OP)

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3. COMMUNITY PLANNING CONTEXT

In Ontario, land use and development is planned and managed across all three tiers of Provincial and municipal government: the Province of Ontario, the Region of Waterloo and the local municipalities (the Township of Woolwich and City of Cambridge). Additionally, the close proximity of the Stage 2 Lands to the Airport requires an understanding of Airport regulations and future plans, as there are federal regulations that may create development constraints. A new Master Plan for the Airport is currently underway. This section provides a review and understanding of the current community planning framework for the Project Study Area, focusing on the Stage 2 Lands.

3.1 PROVINCIAL LEGISLATION & POLICY

The relevant documents reviewed include the Environmental Assessment Act, which establishes the requirements for conducting an environmental assessment process, as well as the Planning Act, which establishes requirements for preparing the Official Plan Amendment for Cambridge. Relevant Provincial policy includes the Provincial Policy Statement as well as the Growth Plan for the Greater Golden Horseshoe (as governed by the Places to Grow Act), which are applicable to the Region and its local municipalities.

3.1.1 ENVIRONMENTAL ASSESSMENT ACT

The stated purpose of the Environmental Assessment Act is the “betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment” (Section 2). The Act applies to activities and projects by the Province, municipalities, agencies and some designated private corporations. The Act requires that where a proponent (e.g., a municipality) wishes to complete an undertaking (as broadly defined by the Act), the proponent must receive approval from the Minister.

The Act provides for the Minister to approve classes of undertakings under Part II.1. The Municipal Class EA, as previously discussed, has been developed and approved in accordance with this Part of the Environmental Assessment Act. Under the Act, there is an obligation to consult with persons as may be interested (Section 13.1) and the undertaking must be completed in accordance with the requirements of the applicable Class EA (Section 13(3)). The Act outlines procedures for the Minister to make an order under Part II of the Act, which would elevate a Class EA process into an individual EA (in accordance with Part II of the Act). Any person may make a Part II order request to the Minister, or the Minister may elect to make the order at their own discretion.

3.1.2 PLANNING ACT

Land use planning in Ontario is undertaken in accordance with the Planning Act. The Planning Act outlines the Provincial and municipal responsibilities for planning and regulating land use change in Ontario. The Planning Act outlines matters to which municipalities are to have regard, including ecological/agricultural protection, cultural heritage management, accessibility, safe and healthy community development, coordination of planning activities, protection of public
health and safety, provision of employment and affordable housing, appropriate growth, sustainable development and other matters.

The Official Plan Amendment for lands in Cambridge, being completed through this process, will need to be undertaken in accordance with Section 17 of the Planning Act, which applies to amendments as per sections 21(1) and Section 22(1). Accordingly, an Official Plan Amendment is subject to the requirement for a public meeting under Section 17(15), which must be held with a minimum of 20 days’ notice, in accordance with the notification and regulations. Appeal process requirements under the Act also apply.

3.1.3 PROVINCIAL POLICY STATEMENT

In accordance with Section 3(5)(a) of the Planning Act, all municipal decisions that affect a planning matter must be consistent with the policies of a Provincial Policy Statement issued under the Planning Act. The 2014 Provincial Policy Statement (PPS) became effective on April 30, 2014.

The PPS represents the Province’s vision for community building in Ontario. The document outlines policies for building strong healthy communities, managing resources and protecting public health and safety. The PPS supports community development that is sustainable, complete, efficient, resilient, cost-effective, and contributes to prosperity. The PPS seeks to protect natural heritage features and functions as a key priority. It is intended that the Official Plan will be the principal vehicle for implementing the PPS. Official Plans are to identify Provincial interests and appropriately define land use designations and policies in a manner consistent with the PPS. There may be a need to study and evaluate natural heritage features and other resources through the preparation of an Official Plan.

Settlement areas are to be the focus of growth under Section 1.1. They will be guided by a mix of densities and land uses which result in efficient infrastructure use, minimize impacts to air quality and climate change, support active transportation/transit and freight movement.

Section 1.2 of the PPS indicates that a coordinated, integrated and comprehensive approach to planning matters involving multiple jurisdictions is to be used. The comprehensive and integrated MESP and Secondary Plan process, involving multiple project partners and an extensive consultation program, is appropriate for addressing these policies.

The planning of infrastructure, including utilities, is to be provided in a coordinated and efficient manner to ensure it is financially viable and available to meet current and projected needs (Section 1.6). The intent of this process is to complete a Fiscal Impact Assessment, which will assist in ensuring this policy will be achieved. Municipal services are the preferred form of servicing for settlement areas (1.6.6). The use of private services within settlement areas is very limited by the PPS. Transportation infrastructure is similarly to be provided in an efficient and coordinated manner, and supported by land use patterns that minimize vehicle trips and support active transportation and transit (Section 1.6.7).

Section 1.6.9 provides specific policies for planning in the vicinity of Airports, which is important in this context due to the close proximity of the Airport. It is intended that land uses will protect
the long-term operation and economic role of airports, and that sensitive land uses be buffered from airports. New residential development and other sensitive land uses are prohibited above the 30 Noise Exposure Forecast/Projection (NEF/NEP) contours.

Section 2 of the PPS addresses wise management of resources. The overall intent of the PPS is to protect natural heritage features and areas and also to maintain or restore diversity and connectivity of features, functions and biodiversity. Development and site alteration is not permitted in significant wetlands. It is not permitted in other significant features (woodlands, valleylands, wildlife habitat, areas of natural and scientific interest) unless it is demonstrated there will be no negative impacts. Further, on lands adjacent to these features, development and site alteration is not permitted unless there will be no negative impacts on the feature or its ecological functions.

Development and site alteration in or near sensitive surface water features and ground water features is also restricted. Planning authorities are to use the watershed as the ecologically meaningful scale for integrated and long-term planning to understand long-term development impact. The approach being undertaken to managing natural heritage and water features is to prepare a subwatershed plan for the Breslau and Randall Drain, resulting in a framework for development constraints and supportive Official Plan policies. This overall approach is consistent with this policy.

The PPS also provides policies regarding the protection of prime agricultural areas, aggregate resources and cultural heritage and archaeology.

Section 3 of the PPS provides policies to protect humans and property from both natural hazards (e.g., flooding, erosion, etc.) and human-made hazards (e.g., mining, resource operations). Development is to be directed outside of areas considered to be hazardous lands, hazardous sites and other potentially hazardous lands due to erosion or flooding risks.

It will be important to ensure that this study is consistent with the policies of the PPS. The overall approach to undertaking this study as an integrated MESP and Secondary Plan process will best ensure consistency with the policies of the PPS. The comprehensive nature of the process, involving evaluation of natural heritage features and systems, water resources, natural hazards, and combined with evaluating options for infrastructure and land use, will ensure that the ultimate plan and recommendations will be consistent with the policies of the PPS.

3.1.4 GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

Municipal decisions affecting a planning matter must conform to the policies of the Growth Plan for Greater Golden Horseshoe, in accordance with Section 3(5)(b) of the Planning Act. The entirety of the Region of Waterloo falls within the Growth Plan. The Growth Plan for the Greater Golden Horseshoe was approved in 2006, and has been amended twice since that time. The first amendment applies specifically to the Simcoe sub-area while the second amendment provides updated population and employment forecasts to 2036. The Growth Plan operates in accordance with the Places to Grow Act, 2005.

The intent of the Growth Plan is to encourage the development of more compact, complete and
sustainable communities through redevelopment and intensification opportunities. Official Plans are the principal vehicle for implementing the Growth Plan, and the policies of an Official Plan must conform to the Growth Plan. The development of greenfield areas is intended to contribute to the creation of complete communities, provides for a diverse mix of land uses, and promotes active transportation. Section 2.2.7 provides policies for designated greenfield areas. A minimum density target of 50 persons and jobs combined per hectare is identified, to be measured over the entire designated greenfield area of the Region. It is intended that the Official Plan will implement policies to achieve this minimum target. However, the outer ring municipalities, including the Region of Waterloo, may identify an alternate target. Official Plan policies are also to address phasing to ensure the target is being achieved.

The policies of Section 3 relate to infrastructure. It is intended that infrastructure planning be coordinated with land use planning and investment. With regard to transportation infrastructure, the overall intent of the Plan is to provide for a balance of transportation choices. Policies for water and wastewater systems are intended to contribute to financially and environmentally sustainable water and wastewater solutions. Policies for community infrastructure, such as parks and affordable housing, support coordinated planning and investment and the efficient provision of community infrastructure by taking into account existing and planned infrastructure.

The policies and recommendations of this process must be in conformity with the Growth Plan.

3.1.5 PROVINCIAL PLANS REVIEW

A coordinated review of four Provincial Plans is underway, including the Growth Plan for the Greater Golden Horseshoe, Niagara Escarpment Plan, Oak Ridges Moraine Conservation Plan and Greenbelt Plan. To date, the Province has undertaken consultation and released a report by an Advisory Panel, along with a discussion paper outlining various topics under consideration. The Province released the proposed amended versions of the Provincial Plans in April 2016.

3.2 REGION OF WATERLOO OFFICIAL PLAN

The Region of Waterloo Official Plan (ROP) provides policies for managing growth in the Region over the next 20 years. The ROP identifies the location of future growth and supportive policies to guide the form of land use change and development. Local Official Plans must conform to the policies of the ROP.

3.2.1 OVERVIEW

The ROP sets forth a vision for the Region that is based on the themes of sustainability and liveability. Sustainability means maintaining, enhancing and restoring the natural environment as well as developing complete communities which have a sense of place and encourage inclusion and healthy living. Liveability means communities that are well-designed for persons at all stages of their life, with easy access to different destinations. It also refers to creating a compact, mixed-use community with a sense of character and place.

The ROP was adopted by Council in June 2009 and approved by MMAH with modifications in
December 2010. The ROP was appealed to the Ontario Municipal Board in its entirety. The Ontario Municipal Board ultimately approved modifications to the ROP that established a framework for Urban Area expansions, to facilitate the development of additional lands. The OMB approved ROP, dated June 18, 2015, is now in effect.

3.2.2 URBAN AREA POLICIES

The ROP establishes a Countryside Line, which will contain future urban growth over the long-term and protect farmland. The Countryside Line is shown on Map 7 – Countryside Area. The Stage 2 Lands are located inside the Countryside Line. Map 3a also shows an Urban Area Boundary which designates built up and future urban areas (designated greenfield areas). The Stage 2 Lands are outside of the Urban Area Boundary, as shown in Figure 3-1. It is intended that the Urban Area Boundary will accommodate the majority of growth over the horizon of the Official Plan (to 2031). Any future expansions to the Urban Area must be contained within the Countryside Line, and may only be permitted in accordance with the policies of the ROP.

An expansion to the Urban Area is required to permit urban uses within the Stage 2 Lands. An Urban Area expansion is subject to the policies of Section 2.B.3:

- Justification through a Regional Land budget as prepared by the Region through a five-year municipal comprehensive review;
- Density/reurbanization targets have been met or exceeded;
- Sufficient opportunities to accommodate forecasts through reurbanization and in designated greenfield areas are not available;
- The expansion provides sufficient lands for a time horizon not to exceed 20 years;
- Infrastructure can be provided in a financially and environmentally sustainable manner;
- The expansion can be developed as a complete community or integrated to contribute to creating a complete community; and
- Watershed studies are completed in accordance with Section 7.F prior to approval of the expansion.
FIGURE 3-1
Regional Official Plan Context
Regional Official Plan, approved June 18, 2015

Legend

- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Parcel Boundary
- Airport Lands
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody
- Countryside Line
- Urban Area
- Core Environmental Features

Coordinate System: NAD 1983 UTM Zone 17N
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For Illustrative Purposes Only
These policies also contemplate an Urban Area expansion within portions of the East Side Lands. The Plan recognizes there is justification for the designation of a maximum of 170 hectares of Urban Designated Greenfield Area for residential purposes, beyond what is designated within the Final Approved version of the Official Plan. For any expansions east of the Grand River and within the township of Woolwich and city of Cambridge (i.e., the East Side Lands), a planning process is to be undertaken to determine densities, and mix and location of land uses (i.e., an MESP/Secondary Plan process). The designation of 170 hectares consists of the following components:

- Priority consideration may be given to designate a maximum of 55 hectares of Urban Designated Greenfield Area located west of Fountain Street and north of the future Ottawa Street extension in the southern portion of the township of Woolwich to establish an appropriate medium to longer term settlement boundary. This is subject to criteria that this Urban Area designation will be considered through a future amendment to the Region’s Official Plan, commenced in 2016, and which may be considered concurrently with an amendment to the Township of Woolwich Official Plan. Further, the amendment is subject to the requirements for watershed studies and the need for an integrated planning process for the East Side Lands, as noted above. The southern edge of the Urban Area is intended to be coincident with the final alignment for the Ottawa Street extension.

- Priority consideration is to be given to designate a maximum of 115 hectares of Urban Designated Greenfield Area. This land is to be located between Speedsville Road and the Grand River in the northern portion of the city of Cambridge. This will be considered through a future amendment, which may be undertaken concurrently with a City of Cambridge Official Plan Amendment. The requirements for watershed studies and the integrated planning process for the East Side Lands is required. Priority consideration is to be first given to enhancing the size of the residential area currently designated rural residential in the City of Cambridge Official Plan (west of Fountain Street, north of Middle Block Road, and south of Fairway Road North) to create a residential cluster of sufficient size to be integrated with surrounding and future employment uses. Reconfiguration of the existing Prime Industrial/Strategic Reserve designation so as to better integrate these new residential lands. However, such a configuration is not to result in an increase in either the amount of land currently designated Prime Industrial/Strategic Reserve or the amount of additional Urban Area (maximum of 115 hectares of residential in total).

The implications of these policies on the Stage 2 Lands are identified conceptually on Figure 3-2. These policies establish the basis for some of the types of urban land uses that may be contemplated within the Stage 2 Lands.
Urban Area Expansion Policies

- Maximum of 55 ha to be designated for residential purposes in accordance with Policy 2.B.3 i) of the Region’s Official Plan (June 2015)
- Maximum of 115 ha to be designated to Urban Designated Greenfield Area in accordance with Policy 2.B.3 j) of the Region’s Official Plan (June 2015)
The next municipal comprehensive review of the Official Plan, to be undertaken by 2019, is intended to identify other lands to implement the Region of Waterloo’s Official Plan policies.

Section 2.D provides policies for the development of the Urban Area. These policies are applicable to this study, which is intended to result in lands being brought into the Urban Area. It is the intent of the ROP that these areas will be municipally serviced, contribute to the creation of complete communities, protect the natural environment, and promote energy efficient building typologies. Within Urban Designated Greenfield Areas, development is intended to meet or exceed a minimum density of 55 residents and jobs combined per hectare while areas solely serving employment functions will be planned to meet a minimum density of 40 combined jobs and persons per hectare (25 jobs per hectare for the Prime/Industrial Strategic Reserve Lands). Densities are intended to be measured over all designated urban greenfield areas. It is further intended that active transportation including trails, sidewalks, and bicycle pathways provide convenient linkages, along with any required easements. The road network will provide for direct and efficient transit routes and land uses are to be within about 450 metres of a transit stop.

3.2.3 OTHER RELEVANT POLICIES

Chapter 3 of the ROP provides more specific policies and objectives for creating liveability in the Region through housing, transportation, energy efficiency and climate change resiliency, cultural heritage conservation, archaeological conservation and social/human services. Chapter 4 of the ROP provides policies for promoting economic development, including protecting employment lands.

Chapter 5 provides policies for infrastructure planning, including roads, transit, water/wastewater, utilities, waste management and related matters. Policies 5.A.19 – 21 provide guidance regarding the Airport. It is intended that local Official Plans implement policies to protect the Airport from development that would hinder its expansion, would be incompatible or would represent a safety hazard, and to ensure conformity with Transport Canada’s Zoning Regulations for the Airport.

Chapters 6 and 7 provide policies regarding the Countryside and the Greenlands Network, respectively. It is the intent of the Plan to protect the rural character of the countryside while supporting appropriate rural development to create prosperity in rural communities.

The Greenlands Network refers to a Regional network of natural heritage features and their linkages. The Greenlands Network is illustrated on Map 4 of the ROP. Figure 3-1 of this report includes the Greenlands Network features within the Project Study Area. It is the intent of the Plan to maintain, enhance and restore a comprehensive greenlands network. The policies of Section 7.F apply to watershed planning. The finalization of a watershed study is required prior to adopting an Official Plan Amendment which permits significant development. The policies provide a framework for the types of matters to be addressed through watershed studies. As an outcome, the ROP or local Official Plans may need to be amended to implement the findings and recommendations of a watershed study. Note that watershed study is a defined term in the ROP, and includes “comprehensive scientific studies that describe how surface water and groundwater and terrestrial and aquatic ecosystems function within a defined drainage area.”
Watershed studies result in recommendations about where development can occur “to minimize flood risks, stream erosion, degradation of water quality, and negative impacts to natural heritage systems.” The recommendations may also address opportunities for ecological enhancement/restoration.

Chapter 8 provides policies regarding source water protection. It is the overall intent of the Plan to maintain and ensure that drinking water supply continues to provide a sufficient quantity and quality of water. Significant portions of the study area are located within wellhead protection areas, as shown on Map 6a. The Plan includes policies regarding the types of land uses that will not be permitted within the various protection areas. It is intended that these policies will be implemented in the local Official Plans.

Chapter 9 provides policies for aggregate resource management. It is the intent of the Plan to provide for availability of mineral aggregate resources to support growth, while minimizing their impact on water/natural heritage resources and surrounding communities. The Stage 2 Lands are not identified as being a mineral aggregate resource area or aggregate bedrock deposit. However, the existing pit operation in Breslau is permitted without the need for an Official Plan Amendment or rezoning (Policy 9.B.1).

Chapter 10 provides policies regarding the Plan’s implementation, including broad policies for consultation, which encourage collaboration between the Region and local municipalities.

3.3 LOCAL OFFICIAL PLANS

The Project Study Area is located within the northerly portion of the city of Cambridge and within the township of Woolwich. The local Official Plans for these municipalities provide local policy context that is intended to conform to the policies of the Region of Waterloo’s Official Plan. Through this process, it is intended that the City of Cambridge’s Official Plan will be amended. The Township of Woolwich Official Plan would need to be amended at a later date.

3.3.1 CITY OF CAMBRIDGE OFFICIAL PLAN

The Official Plan for the City of Cambridge was adopted in May 2012, and approved by the Region in November 2012, with modifications and deferrals. Some portions of the Plan were appealed, with modifications made by the OMB in April 2014. However, some portions continue to be under appeal. The southerly portion of the Stage 2 Lands are located within the city of Cambridge, and therefore subject to the City of Cambridge Official Plan. Kossuth Road represents the northerly boundary of the city.

Map 1A illustrates the Urban Structure. The Stage 2 Lands are located within the Countryside and outside the Urban Area Boundary. This line and supportive policy (Section 2.11) is consistent with the ROP.

Map 1B provides designations for the Countryside, and designate the Stage 2 Lands as Prime Agricultural. These lands are not contemplated by the Cambridge Official Plan to be incorporated into the Urban Area over the 20 year horizon of the Cambridge Official Plan. Urban Area expansions are not contemplated by the Plan over the 20 year horizon (Section 2.4.1). The
Plan has not yet implemented the policies of the ROP which contemplate an urban area expansion.

Further, Map 2 provides the general land use plan for the city (Figure 3-3). The Stage 2 Lands are designated Prime Agricultural and Natural Open Space System. Some lands on the west side of Riverbank Drive are designated Rural Residential. These lands are specifically referenced in the ROP as previously noted. On this Map, the Stage 1 Lands are labelled as the East Side Lands and are designated Future Urban Reserve and Natural Open Space System.

The policies for Designated Greenfield Areas are applicable to the future Stage 1 Lands. The proposed density targets, which are consistent with the ROP, are shown as deferred (Section 2.5.2). The policies generally support the creation of complete communities, natural heritage protection/restoration, integration with existing communities, active transportation, transit and a mix of land uses. It is intended that Community Plans or Secondary Plans will be prepared for new communities within the designated greenfield areas. A Secondary Plan is defined as a plan that is adopted and approved through an Official Plan Amendment. It is the intent of this process to prepare a Secondary Plan, to be implemented through an Official Plan Amendment. It is intended that the Secondary Plan will establish appropriate density ranges to various areas based on local characteristics, access to transportation and availability of amenities such as parks and schools. The policies of Section 10.2 outline considerations and contents of Secondary Plans, including the need to address land use patterns, population/employment projections, housing types and densities, development phasing, supportive commercial/institutional uses, provision of trails/parks/open space, natural features, cultural heritage, transportation network, services, opportunities for mixed use/higher density development and other matters.
Figure 3-3 – City of Cambridge – General Land Use Plan (Source: City of Cambridge Official Plan, approved November 21, 2012)
Chapter 3 provides policies for Natural Heritage and Environmental Management. Overall, the protection, enhancement and/or restoration of Cambridge’s natural environment is a priority. There are core environmental features identified on Map 9. These designations are consistent with the Core Environmental Features identified in Map 4 of the Region’s Official Plan.

Section 3.B.1 provides policies for MESPs, which are recognized as long-range plans used to integrate infrastructure requirements for future land use. It is intended that MESPs will be prepared in association with a subwatershed study. Section 3.B.2 provides policies for subwatershed planning, using the subwatershed boundaries as the basis. Subwatershed studies form the environmental basis for MESPs, and may provide further direction for Official Plan amendments or individual development applications. Other policies in the Official Plan will be relevant to the preparation of the subwatershed study for the Randall Drain and the Master Drainage Plan, including stormwater management policies (Section 3.B.3), policies for source water protection (Section 3.B.5) and policies for environmental hazards (Section 3.B.6). Additionally, Section 3.B.7 provides policies for mineral aggregates but these policies are deferred pending an outstanding appeal.

Chapter 4 provides policies for Cultural Heritage, which is relevant as there is at least one listed heritage property located within the study area. The Plan recognizes the importance of cultural heritage resources in creating community identity and economic prosperity. The Plan supports the designation of cultural heritage resources under the Ontario Heritage Act and the use of other Acts to promote their conservation, as well as cooperation with landowners and other agencies. The policies of Section 4.3 apply to listed properties. Cultural heritage impact assessments may be required in association with development proposals under Section 4.10. Section 4.13 provides policies for archaeological resources and preparation of archaeological assessments as may be required in accordance with Regional and Provincial standards and guidelines.

Chapter 5 provides policies for urban design, with the overall objective of achieving a high standard of design for all development. The policies address healthy and liveable communities, maintaining and enhancing views and vistas, public realm, gateway improvements, sustainable and accessible design and other related matters.

Chapter 6 provides policies for infrastructure, including water/wastewater, utilities storm water management, transportation and including active transportation. Section 6.14 provides policies for the Airport, including support for the Airport and prohibiting structures that could cause aviation safety hazards.

Chapter 7 provides policies for parks and open space. It is a priority of the City to protect, enhance and support acquisition for new lands to support future park demands. The policies support development of a network of parks and trails and implementation through various Master Plans, parkland dedication and other tools.

The policies of the City of Cambridge Official Plan have not been updated to integrate the approved ROP, which contemplates an urban area expansion in the future. It is the intent of this process to amend the Official Plan with a Secondary Plan for the Stage 2 Lands.
3.3.2 TOWNSHIP OF WOOLWICH

The Township of Woolwich Official Plan as well as its ongoing development of the Breslau Secondary Plan is relevant, as a portion of the Stage 2 Lands are adjacent to the settlement area boundary of Breslau.

TOWNSHIP OF WOOLWICH OFFICIAL PLAN

The Township of Woolwich Official Plan (July 31, 2012 Office Consolidation) was adopted in October 2000 and approved by the Region in May 2002. The Plan’s vision for the township (Section 4.1) references its distinct, rural and small town character, with a diverse, prosperous and thriving economy and healthy and sustainable environment. The majority of growth is to be concentrated within the urban areas, including Breslau. Section 7.16 includes policies for the Breslau Settlement Area. However, the Official Plan does not implement the policies of the ROP. Additionally, an ongoing study for the Breslau Secondary Plan is underway (discussed below).

Chapter 10 provides policies for open space, and recognizes the importance of parks, open space and other recreational facilities to create recreational opportunities for residents. The Township supports a linked network for green space, open space and trails. Parkland and open space is acquired and protected through various tools in accordance with Section 1.2.

The policies of Chapter 11 relate to aggregate resource uses, which is relevant to the Breslau Pit. The Plan recognizes the value of these uses, but the uses need to be developed in a manner to minimize undesirable impacts during their operation and to assure rehabilitation. Section 11.10 provides for the Township to cooperate with owners, the Region and Province to rehabilitate pits and quarries with the intent of minimizing hazardous conditions and bringing the site into a useful future land use.

The Official Plan provides policies for environmental stewardship in Chapter 13. The protection and stewardship of environmental features and functions is considered to be a high priority for the Township. Section 13.15 provides policies for watershed planning, and the Township’s participation in watershed studies. Amendments to the Plan are to be considered to implement recommendations of watershed studies.

Chapters 15 and 16 provide for transportation and utility infrastructure, respectively. The transportation policies include policies for the Airport (Section 15.3), which speak to monitoring further development of the Airport for impacts, protecting the Airport so that it may function and consideration of a by-law to regulate height around the Airport. The policies for utilities address water, wastewater, waste management and storm water management. It is the overall intent of the policies to promote practices and technologies that protect the environment.

BRESLAU SECONDARY PLAN

The Breslau Secondary Plan (Draft Official Plan Amendment No. 25) has been an on-going study for the Township since 2012. The Township has held several meetings and prepared reports and materials in support of the Secondary Plan’s development. The Plan was prepared
in association with an Environmental Assessment process. The Official Plan Amendment was adopted by Council on February 2, 2016.

The Breslau Secondary Plan proposes to delete Section 7.16 of the Official Plan (Breslau Settlement Area Policies) and replace the policies with a comprehensive set of policies that work within the existing policy framework of the Woolwich Official Plan. The vision for Breslau aspires the community to be attractive, complete and unique with a small-town feel (7.16.1.2). The Plan establishes a series of 8 principles to guide development, including growth that protects and restores the Grand River and its watersheds, strengthens the historic central neighbourhood, is sustainable, well-connected and is balanced with employment opportunities, for example (7.16.1.3). The Plan applies to lands within the Settlement Area Boundary (Figure 3-4). The Stage 2 Lands are located outside of this boundary, however, portions of the Settlement Area are located within the Project Study Area. Appended to the Plan are Urban Design & Architectural Control Guidelines, mapping for environmental features, cultural heritage resources and calculations of the areas of the land use designations. The environmental features mapping includes several maps of various features and 30 metre buffers outside the settlement area, including the Stage 2 Lands.
Figure 3-4 – Breslau Secondary Plan – Urban Structure Plan (Source: Breslau Secondary Plan, January 2016)
3.4 REGION OF WATERLOO INTERNATIONAL AIRPORT

The Airport is adjacent to portions of the Stage 2 Lands. The Airport is subject to federal regulation, as well as Provincial Policy to ensure land uses are compatible with Airport operations and do not constitute safety hazards. Sensitive land uses are not permitted to be located in close proximity to high noise exposure forecasts in accordance with the Provincial Policy Statement. Additionally, as identified previously, the Official Plans for Waterloo Region, Cambridge and Woolwich contain some policies to ensure that the Airport can continue to operate and expand as necessary and not be conflicted by land uses.

The federal zoning regulations for the Airport (SOR/2006-78) are dated March 19, 2009 and were last amended on February 15, 2016. The regulations are approved under the Canadian Aeronautics Act. The regulation pertains to restrictions on construction of buildings, interference with communications, restrictions on natural growth, and restrictions on activities or uses that would attract birds and create a hazard to safety. The restrictions apply to lands described in a schedule using grid coordinates. The intent of the regulations is to maintain clear airspace within the vicinity of the Airport and its approaches.

The Region is undertaking a new Airport Master Plan, which is expected to be completed in 2016. The intent of the Airport Master Plan is to establish recommendations for future airport development and improvements, and recommend capital works over the next 20 years. Accordingly, the recommendations could impact zoning regulations and policy, and hence impact future land use options and building restrictions in the vicinity of the Airport. It will be important to monitor release of the Master Plan to inform the policies and recommendations of the Secondary Plan and infrastructure improvements in the Stage 2 Lands.

3.5 CONCLUSIONS AND IDENTIFICATION OF GAPS

The integrated MESP and Secondary Planning process will help achieve Provincial, Regional and local policies for coordinated planning in a comprehensive manner. Through this process, the development of the subwatershed study for the Randall and Breslau Drains will establish a clear understanding of natural heritage constraints and opportunities for restoration. The identification of water/wastewater/utilities and transportation solutions, integrated with evaluation of land use planning and design options, will provide a clear opportunity to achieve Provincial, Regional and local policy with respect to density targets, efficient use of infrastructure and other principles. The study will be complemented by the development of a Fiscal Impact Assessment and Staging & Implementation Plan to meet policies for ensuring that development is fiscally sustainable in accordance with Provincial and municipal policy.

The Region of Waterloo’s Official Plan clearly contemplates an Urban Area expansion to bring about development of residential and other uses within the Stage 2 Lands (refer to Figure 3-2). This includes the requirement to designate a maximum of 170 hectares as Urban Designated Greenfield Area. It is intended that this designation will occur through an amendment to the ROP, which must be commenced in 2016, and which may be undertaken concurrently with the local Official Plan Amendments. This study is intended to address the Plan’s process requirements, which include the need for an integrated infrastructure/land use planning process.
and the completion of appropriate watershed studies. Through this process, the Secondary Plan for lands in Cambridge will be largely prepared concurrently (or implemented shortly thereafter). It is assumed that the Township of Woolwich will proceed with a separate process to implement the urban area expansion and recommendations of this process.

There are no specific information gaps. However, the following further tasks are identified:

- The current status of the Breslau Secondary Plan and any active development applications in the Project Study Area need to be confirmed.
- There is a need to confirm the latest Airport Zoning Schedule. Additionally, it will be important to monitor the development and recommendations of the Airport Master Plan, which may impact development potential, heights and land uses near the Airport.
- There is a need to monitor the ongoing Provincial Plans review and evaluate the proposed changes to the Growth Plan for the Greater Golden Horseshoe and its implications on this study.
4. SERVICING AND UTILITIES

4.1 INTRODUCTION

The purpose of the municipal water and wastewater servicing component of the MESP is to:

- Prepare a water servicing strategy and requirements for the Project Study Area, including operating characteristics, proposed alignment, water distribution models, required connections and identify impacts on the existing Urban Water System.
- Prepare a wastewater servicing strategy and requirements for the Project Study Area, including local collection and conveyance systems, proposed concept plan, analysis of existing external sanitary sewers, required connections and expected sewage generation.
- Identify the location, size and depth of wastewater pumping stations, if required.

The first step of this study is to understand the existing and future planned water and wastewater servicing conditions in and around the study area. We have reviewed the previously completed studies and documents that have been made available. The key steps of the MESP will include a confirmation of existing and projected water and wastewater flows for the East Side Lands from Stage 1, preparation of water and wastewater servicing plans to accommodate projected flows, tie into the existing and proposed system, identification of the Municipal Class EA schedule, and preparation of the preliminary design and cost estimates. This report documents the first step in the process, the documentation of existing and future planned infrastructure in and around the study area.

4.2 GUIDING POLICIES AND PLANS

We have reviewed and understand the implications of the current information available within the approved Master Plans; including Water and Wastewater Master Plans, Stormwater Management Strategies, Transportation Master Plan and other relevant policies, guidelines and studies in order to help shape the servicing assessment for the Stage 2 Lands Master Environmental Servicing and Secondary Plan. The following relevant documents have been reviewed for preparation of the MESP:

- Region of Waterloo 2016 Water and Wastewater Monitoring Report;
- Water Supply Master Plan Update, Stantec (March 2015);
- East Side Servicing Review Technical Memorandum, Aecom (2009) (ESR);
- Wastewater Treatment Master Plan, EarthTech/Aecom (2007) (WWTMP);
- East Side Lands (Stage 1) MESP (2013) ;
- East Side Lands (Stage 1) Water and Wastewater Servicing Requirements Assessment (2013);
- Breslau Secondary Plan Water Servicing Strategy, WSP (2015); and

The Region of Waterloo Wastewater Treatment Master Plan (WWTMP) defined a wastewater treatment strategy to ensure capacity is available to support existing and future growth. Section 6 of the WWTMP deals specifically with wastewater treatment strategies for the East Side Servicing Lands. The WWTMP identified a number of high level conceptual servicing alternatives for the East Side Lands that included major conveyance sewer alignments and potential pumping station locations for conveyance to, and treatment at the Kitchener WWTP. Alternatives outlines in Section 6 of the WWTMP include:

- Utilization of existing infrastructure;
- Trunk gravity sewer alternatives;
- Pumping stations and forcemains;
- A new wastewater treatment facility;
- Subsurface discharge;
- Upgrading and extending services from Kitchener;
- Reduce and reuse approaches; and
- Do nothing.

Section 6 of the WWTMP deals with long term strategies for wastewater treatment, but also looks at potential short term demand. One of the areas identified in the WWTMP to provide servicing in a short period of time is approximately 200 – 300 hectares of land near Maple Grove Road and Fountain Street North. Figure 6.7 of the WWTMP identifies this area.

The Region of Waterloo undertook a follow-up document to the 2007 WWTMP titled ‘East Side Servicing Review Technical Memorandum’. The purpose of this document was to address both short term and long term servicing scenarios for the East Side Lands as an update to the WWTMP. The short term scenarios of this document are intended to maximize the use of existing infrastructure and wastewater treatment plants (WWTPs) so that development can occur quickly and cost effectively. The local municipalities will determine which areas of land will be developed and how available sewage flows will be allocated to the available capacities of the WWTPs. The short term servicing scenarios of this document identify developable areas based on existing or near-future capacities of the Hespeler, Preston and Galt WWTPs. The long term servicing scenarios of this document identify a solution to direct wastewater flows to the Kitchener WWTP utilizing deep truck sewers and consolidated large pumping stations.

The Region of Waterloo Water Supply Master Plan Update (WSM PU) confirmed the capacity and identified constraints of all existing and planned water sources feeding into the integrated Urban System to provide recommendations for the next 20 and 40 year periods. Section 3.3.2.1 of the WSM PU provided recommendations relating to the future servicing of East Side Lands. Relevant recommendations include:

- consolidating pressure zones in the area of East Side Lands from Existing Kitchener
Pressure Zone (KIT) 4, Breslau South, Cambridge Pressure Zone (CAM) 2W, and KIT 2E; and

- constructing new Maple Grove Treatment Plant and installing in-line booster pump station from CAM 2E to CAM 2W.

Section 9 of the WSMPU presents the Updated WSMP strategy components that would be sufficient for the Region’s projected needs up to 2051. Cambridge East Treatment Facilities Capacity Restoration is the relevant component for servicing East Side Lands in the medium term prior to 2031 by strengthening the adjacent CAM 2E to meet demands. Figure 9-2 of the WSMPU identifies this area and facilities to be upgraded. The Central Grand River and Maple Grove Treatment Plant (TP) shown in Figure 9-4 of the WSMPU would provide a new supply facility to service the East Side Lands as needed. The project would be constructed in phases according to demand increases in the East Side Lands in the long term beyond 2031. From this list of relevant reports and studies the primary document used to provide guidance for the servicing of Stage 2 Lands are the East Side Lands (Stage 1) MESP and East Side Lands (Stage 1) Water and Wastewater Servicing Requirements Assessment.

Under the Stage 1 MESP, Option 3b: Access Through the Creekside Lands with Connection to King Street, was recommended for the East Side Lands Stage 1 Area as the preferred solution because it:

- Alleviates traffic on King Street, Maple Grove Road, Fountain Street and Riverbank Drive;
- Avoids impacts the Provincially Significant Wetland and Core Environmental Feature adjacent to the Region’s Operations Centre;
- Avoids significant physical and operational impacts to the Region’s Operations Centre;
- Provides 2 points of access and water and wastewater servicing to the Creekside Lands; and
- Provides very good network connectivity for transit and other non-auto modes and transportation.

From an infrastructure planning perspective, the preferred water and wastewater servicing option provides for logical extension of services for the East Side Lands (including both Stage 1 and Stage 2 Lands) and is based on the assumption of orderly development from the southwest portion of the East Side Lands to the north.

A combination of Regional and Municipal anticipated infrastructure projects are identified in the Stage 1 MESP to facilitate long term servicing and possible immediate servicing of Stage 1 and the East Side Lands. Currently the Region is undertaking the East Side Lands Sanitary Servicing Strategy Environmental Assessment to determine the location, size and timing of the Regional sanitary servicing option.

The long term servicing for most of the East Side Lands including the Stage 2 Lands is proposed to be through a gravity trunk sewer connected to the Region’s Sanitary Servicing
Strategy. Water servicing for the East Side Lands including Stage 2 Lands is proposed to be a combination of watermains connected to Stage 1 from the north and the existing Region based water system in Breslau. The water servicing for the Stage 2 Lands will consist of at least one connection to Stage 1 at Fountain Street North and Kossuth Road.

No plans for utility infrastructure implementation were identified for servicing of Stage 1 Lands or the East Side Lands.

4.3 EXISTING INFRASTRUCTURE

4.3.1 EXISTING WATER INFRASTRUCTURE

Figure 4-1 depicts the existing water distribution infrastructure within East Side Lands and the adjacent service areas. Relevant existing water distribution infrastructure includes:

- 450 mm Regional watermain crossing from Kitchener Zone 4 to the East Side Lands at the Grand River Bridge (Fairway Road) with an extension to Kossuth Road at Fountain Street.
- 600 mm/750 mm Regional watermain that extends along the CP rail utility easement adjacent to the Creekside development, then along Maple Grove Road to Fountain Street.
- 450 mm Regional watermain that extends along Maple Grove Road east to Hespeler Road.
- 300 mm City local watermain that extends north on Fountain Street from Maple Grove Road to Banat Road.
- 350 mm watermain that extends south from the Ottawa St extension along Woolwich/Fountain Street to service the Airport.
- Kitchener pressure zone 4 watermain across the river servicing the Airport on Fountain Street.

4.3.2 EXISTING WASTEWATER INFRASTRUCTURE

Figure 4-2 depicts the existing wastewater distribution infrastructure within the East Side Lands and the adjacent service areas. Relevant existing wastewater sewers include:

- 675mm gravity trunk sewer at the intersection of Fountain Street and Maple Grove Road.
- Existing 525mm trunk main on Cherry Blossom Road that runs from Maple Grove Road and connects to Fountain Street trunk main.
- Boxwood Pump Station and forcemain servicing Boxwood subdivision connecting to the Fountain Street trunk main.
- 450mm sewer trunk main crossing the Grand River at Victoria Street and Kitchener Pump Station #1 servicing lands in Breslau.
Kitchener Pump Station #2 west of the Grand River and south of Highway 7. The availability of the Pump Station to service planned subdivisions within East Side Lands is to be confirmed with the City of Kitchener.

Figure 4-3 (Long term servicing plan) depicts the locations of the Kitchener and Preston WWTPs. The Kitchener WWTP is planned to be utilized for the servicing of Stage 2 and the East Side Lands. The Region of Waterloo 2016 Water and Wastewater Monitoring Report concludes the Kitchener WWTP currently there is 122,700 m3/d with a remaining capacity of 40,845 m3/d available.
4.4 SUMMARY AND INFORMATION GAPS

Review of the background revealed information gaps required for the successful completion of this MESP. The next step in undertaking the master servicing and utilities portion of the MESP will be to confirm the plans for the Regional East Side Lands Wastewater Servicing Class Environmental Assessment, as it is critical infrastructure for servicing of the Stage 2 Lands. The current EA progress and update on any relevant developments to the Region’s Sanitary Servicing Strategy is required for the purposes of this study. Confirmation of the location and design details would be helpful if completed. Preliminary drawings prepared for Stage 1 Lands along with sanitary and water modelling completed in support of Stage 1 MESP servicing plans including design sheets is essential for the scope of this MESP. Topographical data for East Side Lands would be needed to confirm the viability of gravity fed wastewater for the East Side Lands stated in the MESP for the Stage 1 Lands. Updates and detailed project information for the identified anticipated projects such as the ESR for the Fountain Street Improvements as well as the works for the new water pressure zone “East Side Zone” identified in the MESP for the Stage 1 Lands is required. The proposed utility plans for the East Side Lands are to be obtained from the utility providers to determine if any distribution system improvements are required.
5. TRANSPORTATION

Transportation System Assessment represents a key component of the East Side Lands Stage 2 Lands MESP and Secondary Plan. The objectives of the Transportation System Assessment are to:

- Plan and design the internal collector and local road system and the connections to Regional Roads for the Stage 2 Lands; and
- Determine the transportation Impact of the developments and identify recommended transportation improvements and intersection controls.

The first step involves background review and gap analysis. This section of the report includes review of existing planning and transportation studies/guidelines, description of existing transportation infrastructure, identification of planned/proposed transportation improvements in the study area, discussion of information gaps and a brief overview of the next steps.

5.1 EXISTING PLANNING AND TRANSPORTATION STUDIES/GUIDELINES

The following subsections highlight the key planning and transportation policy and background documents applicable to the Project Study Area. The focus of the review is on the regional and local land use and transportation plans.

The findings of this background information will form the framework and basis of the transportation assessment and options analysis for the Stage 2 Lands.

5.1.1 WATERLOO REGIONAL OFFICIAL PLAN

The ROP contains the planning policies that direct growth and change in Waterloo Region. The ROP implements the Regional Growth Management Strategy as well as the mandated components from the Places to Grow: Growth Plan for the Greater Golden Horseshoe. The ROP identifies one of the key elements as increasing transportation choice, including the creation of a rapid transit system.

Chapter 3 of the ROP recognizes the importance of cycling and transit, accessibility by walking, as well as integrated Transportation Demand Management (TDM) programs to vibrant urban and rural communities. In specific, the Region will ensure, whenever feasible, that facilities will be provided to encourage walking and cycling and to address the needs, safety and convenience of pedestrians and cyclists for the Regional transportation facilities.

Chapter 5 of the ROP focuses on addressing the Region’s infrastructure needs with policies providing for the planning and development of cost effective infrastructure to support growth in a compact and efficient form. The transportation related objective of Chapter 5 is to: “plan and manage integrated, accessible and safe multi-modal transportation systems that provide transportation choice, and promote sustainability, a healthy population and the effective movement of goods.”
Transportation system planning policies were identified under the following main headings:

- General Policies;
- Regional Transit System;
- Walking and Cycling Networks;
- Region of Waterloo International Airport;
- Road Network;
- Regional Road Design, Construction and Operation;
- Designated Regional Road Allowances; and
- Rail Network.

These policies will provide the overarching framework for the study area. The Region also includes in the ROP collaboration with the area municipalities to implement a comprehensive TDM program. As well, the framework for the TDM program also includes incorporating the need for TDM plans within Transportation Impact Studies.

The study will develop a balanced sustainable transportation system for the study area through a combination of recommended transit, active transportation, TDM, roadway, access, goods movement strategies. The applicable ROP policies will be referred to for the assessment of each element of the transportation system.

### 5.1.2 REGIONAL TRANSPORTATION MASTER PLAN – MOVING FORWARD 2031

The Regional Transportation Master Plan (RTMP), which was completed in 2011, places greater emphasis on the role of public transit in a more balanced transportation system, reflecting the need for greater transportation choice. It also places priority on the efficient movement of people and goods both within and beyond the Region, by all modes of travel, and on shaping the community to become more vibrant, compact and sustainable.

The RTMP developed four goals for the Region:

- **Optimize the Transportation System** – preserve and maximize the use of existing transportation infrastructure and resources;
- **Promote Transportation Choice** – provide and maintain a transportation system that offers competitive choices for moving people and goods in an integrated and seamless manner while minimizing single occupancy vehicle trips;
- **Foster a Strong Economy** – provide a transportation system that supports the retention of existing businesses and attraction of sustainable economic activity; and
- **Support Sustainable Development** – provide and maintain a transportation system that supports sustainable growth in both urban and rural areas and reduce transportation contributions to climate change.

With these goals in mind, the Region has identified ambitious mode share targets for 2031.
These targets are outlined in Table 5-1.

### Table 5-1 – Regional Mode Share Targets in the RTMP

<table>
<thead>
<tr>
<th>Mode</th>
<th>2006 PM Peak Hour Mode Share</th>
<th>2031 PM Peak Hour Mode Share Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Driver</td>
<td>69.6%</td>
<td>58.0%</td>
</tr>
<tr>
<td>Auto Passenger</td>
<td>15.6%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Local Transit</td>
<td>3.8%</td>
<td>14.8%</td>
</tr>
<tr>
<td>School Bus</td>
<td>2.7%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Cycle</td>
<td>0.7%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Walk</td>
<td>7.1%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Other</td>
<td>0.4%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

While Table 5-1 reflects the Region-wide mode share targets, different areas of the Region have different targets based on future land use and level of service provided. The target PM peak transit mode share for the East Side Lands was identified to be 10% by 2031.

The RTMP also undertook mature state analysis, which focused on the long term future employment lands around the Airport (i.e., the East Side Lands) and other areas. The analysis identified that the majority of employment development occurs in outlying areas are not shown to be served by transit routes in the 2031 transportation model, and suggested that transit improvements to those areas will be required. Potential mature state transportation infrastructure needs were also recommended for the East Side Lands.

#### 5.1.3 CONTEXT SENSITIVE REGIONAL TRANSPORTATION CORRIDOR DESIGN GUIDELINES

The objective of the Context Sensitive Regional Transportation Corridor Design Guidelines (2013) is to develop design standards to respond to the variety of urban form and accommodate the various modes of transportation that can exist throughout the length of a Regional Transportation Corridor. The guidelines address how the Regional Transportation Corridor can best serve the transportation needs of the community for the movement of goods and people, including trucks, cars, transit, bikes and pedestrians.

The study aims to address several fundamentals related to regional roads. It includes developing a roadway classification system and preparing functional urban design guidelines. A decision-making framework was recommended to assist regional staff and stakeholders in the process of design and planning of regional roads. The principal guiding goals of the guidelines were developed as follows:
• Establish a well-defined and descriptive hierarchy for the Regional Transportation Corridors that acknowledges the variation and uniqueness of Waterloo Region and responds to the diversity of adjacent land uses;
• Establish guidelines for the safe, convenient and comfortable movement of goods and people, including access management;
• Provide an integrated framework for operational (road) and urban design (boulevard) components that can adapt to a variety of conditions;
• Enhance, develop, promote and integrate sustainable and active forms of transportation (public transit, cycling and walking) by the provision of a comfortable built environment; and
• Become a reference for the Region and Area Municipalities in the preparation of corridor studies, land use plans, road improvement projects, Class EAs and development proposals.

With these principles in mind, a recommended classification system was created that is descriptive in nature and to create combined road and boulevard design guidelines. The road types developed are as follows:

• Rural Connectors, including “country roads” located along historical concession rights-of-way in the rural areas or countryside;
• Rural Village – Main Streets, which are short segments of roadway that are generally contained within a village or hamlet;
• Community Connectors, that connect to 400 series highways, Conestoga Parkway, other regional connectors;
• Neighbourhood Connectors, that are typically continuous across several communities/neighbourhoods within the Region:
  ▫ Avenues have larger rights-of-way than main streets and include many opportunities for reurbanization;
  ▫ Main Streets, with buildings, lot sizes and right-of-way widths that are typically smaller; and
• Residential Connectors that are short segments of roadway typically located in built up residential areas linking Neighbourhood Connectors and Rural Connectors.

Each road type has its specific streetscape design and operational criteria, including people moving capacity, active transportation, pedestrian infrastructure, cycling infrastructure, transit, boulevard treatment, ROW width and others. These design elements will be consulted when planning, costing and recommending transit, active transportation and roadway components within the Study Area.

5.1.4 CITY OF CAMBRIDGE OFFICIAL PLAN

The City of Cambridge Official Plan (approved November 21, 2012) provides a long-range,
comprehensive land use strategy for areas located within the city of Cambridge. The Official Plan identifies the following objectives for the transportation policies:

- Provide, in partnership with the Province and Region, a safe, sustainable, effective, accessible and energy efficient transportation system, using a wide range of travel modes to move people and goods; and
- Reduce dependence on the automobile by increasing the number of people using public transit, walking and cycling.

Specific transportation policies are provided in the Official Plan related to the following:

- Hierarchy of Roads;
- Regional Road requirements;
- Truck Routes;
- Private Roads and Laneways;
- Interchanges;
- Traffic Calming and Signalization;
- Public Transit;
- Active Transportation;
- Bridges and Railways;
- Region of Waterloo International Airport; and
- Transportation Demand Management.

Transportation Demand Management policies include:

- The City will encourage the private and public sectors to implement measures, such as walking, cycling, transit, carpooling, car sharing and flexible working hours, where feasible. TDM will also be considered in the evaluation of development applications;
- A TDM plan could be considered as part of the justification for reduced parking requirements; and
- The City may prepare a comprehensive TDM plan as part of a future TMP.

The City of Cambridge Official Plan requires collector roads to have a maximum right-of-way width of 30 metres. Bicycle lanes are encouraged for collector roads.

5.1.5 TOWNSHIP OF WOOLWICH OFFICIAL PLAN

The Township of Woolwich Official Plan was adopted by the Council of the Township of Woolwich on October 24, 2000, and approved by the Regional Municipality of Waterloo on May 8, 2002 with modifications.

The Woolwich Official Plan sets forth general development policies that guide the township's
future development within the framework of those broader policies established for regional
development in the Regional Official Policies Plan. The Plan recognizes the need for an
integrated transportation system to serve the needs of the residents of the township and adopts
policies to assure an adequate road system and continued recognition of the need for public
transit in the future and the value of both rail and air services in the future transportation needs
of the area.

Chapter 15 of Official Plan identified transportation policies related to public transit, railways,
Waterloo Regional Airport, Regional and Provincial Roads, Township Roads, and noise.

Transportation policies were also adopted for the Breslau Settlement Plan area, which relate
mainly to limited direct property accesses to the Breslau By-pass (i.e. Fountain Street North)
and Highway 7, and the proposed grid pattern road system.

There are no TDM policies within the Township of Woolwich Official Plan; however, it does state
that the Township is in support of the policies and recommendations within the RTMP.
Therefore incorporating TDM into the Stage 2 Lands MESP is supported.

5.1.6 BRESLAU SETTLEMENT PLAN

The Township of Woolwich adopted Official Plan Amendment Plan No. 25 (Breslau Settlement
Plan) in February 2016 to establish a land use strategy that builds a greater sense of community
in Breslau and manages Breslau’s future growth. The Breslau Settlement Plan area includes
five residential neighbourhoods and the East industrial lands. The south industrial lands are
outside the Breslau Settlement Plan area and continue to be subject to the Official Plan.

The future development of Breslau is guided by eight main principles. Principle 5 speaks to the
need for a well-connected, multi-modal and safe Active Transportation system that promotes
walking, cycling, and transit usage, as well as providing an efficient road network for motor
vehicles. All modes of transportation will be accommodated in a direct and efficient manner. A
key component of the Settlement Plan is the design of the collector road network such that
transit routes can be implemented in a manner that minimizes walking distance and maximizes
the opportunity for people to take transit.

The proposed road system for the Breslau Settlement Plan generally reflects a modified grid
pattern. The new local and collector roads will align, where possible with existing and proposed
roads on adjacent lands. Direct access to Regional Roads from local roads is discouraged.

The Main Street of Breslau (Woolwich Street North between Fountain Street North and future
Ottawa Street extension) is identified as the historic spine of the community, which will serve
retail commercial, mixed use and residential development, and will reflect its role as a character
giving streetscape within the Breslau Settlement Area.

Four collector roads are proposed to serve the Thomasfield Homes site, with three collector
road intersections on Highway 7 and one on Shantz Station Road. Schedule C of the Breslau
Settlement Plan also identifies additional road improvements.
5.1.7 REGION OF WATERLOO INTERNATIONAL AIRPORT MASTER PLAN (IN PROGRESS)

The Region of Waterloo International Airport (ROWIA) Master Plan process began in 2013 and the Waterloo Regional Council provided interim direction to staff in 2014 to:

- Optimize the existing capacity of the ROWIA;
- Attract new air service;
- Build out the ROWIA Business Park;
- Protect for future growth;
- Increase community awareness about noise mitigation measures; and
- Develop the ROWIA in conjunction with the adjacent East Side Employment Lands.

One of the elements to be addressed in the ROWIA Master Plan is to further examine the creation of employment opportunities through the development of leased lands for aviation and aerospace related industrial and commercial undertaking in the Hangar Campus and East Side Employment Lands. For instance, in the northwest corner of the ROWIA, there is an opportunity to commercialize thirty-five acres of land, which would complement the future development of the East Side Employment Lands.

5.1.8 RAPID TRANSIT ENVIRONMENTAL ASSESSMENT STUDY

As identified in the Rapid Transit Environmental Assessment Study, the purpose of the rapid transit system will add transportation system capacity and accommodate increasing travel demand in the Region’s most heavily used corridor and to stimulate re-urbanization in the Central Transit Corridor, while providing greater transportation choice to the Region’s residents, businesses, and institutions within and among the Region’s major urban areas.

The preferred rapid transit technology, route, station locations, and staging plan were identified to connect the urban centres of Cambridge, Kitchener, and Waterloo:

**Stage 1** - Light Rail Transit (LRT) from Conestoga Mall in Waterloo to Fairview Park Mall in Kitchener and adapted Bus Rapid Transit (aBRT) from Fairview Park Mall to the Ainslie Street transit terminal in Cambridge; and

**Stage 2** - continuing LRT from Fairview Park Mall to the Ainslie Street Transit Terminal in Cambridge. It is recognized that the Region is currently undertaking the Stage 2 ION study to evaluate the Stage 2 LRT alternative route options and to recommend preferred route and stop locations.

5.1.9 GRAND RIVER TRANSIT BUSINESS PLAN TO 2014

The Grand River Transit (GRT) Business Plan to 2014 was prepared to guide the implementation of transit service improvements and fare strategies from 2011 to 2014 to achieve the goals of the 2010 Region TMP.
The 2021 Express Corridor Strategy includes a spine service with Rapid Transit in the central north-south corridor between Cambridge and Waterloo and a network of up to eight Express corridors (iXpress routes) that provide connectivity to the Rapid Transit corridor and key destinations in the Region. The Mid-Region Express is proposed to serve the Stage 1 Lands along Maple Grove Road by 2017, subject to future re-evaluation after 2014.

Consideration is also given to establishing semi-express routes to connect the existing GRT network to the Breslau residential area, where residential growth is significant. The service is designed to serve regular commuters from Breslau destined to work and school locations in the GRT network.

5.1.10 TRANSPORTATION IMPACT STUDY (TIS) GUIDELINES

The Transportation Impact Study Guidelines outline the Region’s requirements and typical process for Transportation Impact Studies submitted to the Region. The TIS Guidelines detail the criteria for identifying “critical” intersections and movements for signalized and un-signalized intersections. In addition to new traffic signals, other alternative traffic control modes need to be considered. A roundabout must be considered as an alternative means of traffic control when traffic signals are warranted and proposed, or when road improvements, such as additional dedicated turning lanes, or additional through lanes are being considered to address a safety or capacity deficiency.

The Region also established a procedure to determine the feasibility of a roundabout, including the Initial Screening tool, Traffic Flow Sheet forms, as well as the more detailed Intersection Control Study. The Guidelines also reference the Region of Waterloo TIS Requirements for Capacity Analysis, Roundabouts, and Signal Warrants that detail the parameters and assumptions to be used for the Intersection Control Study.

The Transportation Impact Study guidelines provide a thorough description of the requirements related to TDM as well as a Parking Reduction Checklist. The requirement of a TDM Plan within the TIS will need to demonstrate the opportunities for active and sustainable travel use and how the occupancy rates will be improved. To assist developers, a TDM checklist has been developed.

5.1.11 EAST SIDE AREA (STAGE 1) TRANSPORTATION ASSESSMENT

The MESP and Community Plan for the Stage 1 Lands of the East Side Lands was initiated in 2010 and completed in 2014. The associated Transportation Assessment was completed as part of the MESP and Community Plan to identify the required transportation infrastructure to support the development in the Stage 1 Lands.

Based on the transportation assessment and alternative evaluation, the following general roadway improvements were identified to accommodate auto traffic, transit, bicycles and pedestrians:

- A north-south crossing of Freeport Creek is preferred to provide alternative access for the Stage 1 development;
- An east-west collector road connection (2 lanes in each direction) from Maple Grove Road to King Street (Cherry Blossom Road extension);

- A north-south collector road located approximately mid-block between Riverbank Drive and Maple Grove Road, including the preferred crossing of Freeport Creek. A 2-lane roadway is recommended but protection of right-of-way for a 4-lane cross-section is required for the long term;

- Improvement of the Middle Block Road to meet urban design standards. The Middle Block Road segment east of Fountain Street was recommended to be upgraded and potentially expanded to accommodate 2 lanes in each direction; and

- Improvement of the Allendale Road to meet urban design standards. If Freeport Creek crossing is not provided, the Allendale Road segment between Fountain Street and the new north-south collector road was recommended to be upgraded and potentially expand to accommodate 2 lanes in each direction.
5.2 EXISTING TRANSPORTATION INFRASTRUCTURE

The existing transportation condition within the study area was reviewed to develop an inventory of existing transportation infrastructure and to identify opportunities and constraints that need to be considered when developing the future transportation network.

The high-level assessment of the existing transportation infrastructure included a review of road network characteristics, transit services in the area, active transportation infrastructure, travel demand management strategies, and goods movement options.

5.2.1 STUDY AREA

The Project Study Area is located immediately north of the Stage 1 Lands and is largely composed of greenfield lands. The Project Study Area includes lands within both the township of Woolwich and the city of Cambridge. The Region of Waterloo International Airport (ROWIA) is situated within the Project Study Area and is located north of the southerly portion of the Stage 2 Lands.

The southwestern portion of the Breslau Settlement Plan area extends into the northwestern portion of the Project Study Area. In specific, the Elroy Acres and Central Breslau residential neighbourhoods within the Breslau Settlement Plan, as well as the future South Breslau Industrial Area are located adjacent to the northerly portion of the Stage 2 Lands.

The Project Study Area is currently primarily served by rural roads. Transit services are not available in the area. The existing transportation network in the Project Study Area currently accommodates the transportation requirements associated with the existing local uses in the Project Study Area and the neighbouring Breslau Settlement Plan area, as well as the Region of Waterloo International Airport.

5.2.2 ROADS

The existing roads within the Project Study Area include regional roads, collector roads, as well as a series of local roads running through rural areas and providing connections to the key land uses in the area. A summary of Project Study Area roads and their characteristics is illustrated on Figure 5-1. The following highlights the regional, arterial and collector roads within the Project Study Area.

**Fairway Road North** is a neighbourhood connector under the jurisdiction of Region of Waterloo. It has a four-lane cross-section within the Project Study Area. Its intersection with Fountain Street North and Kossuth Road is under a two-lane roundabout control.

**Fountain Street North** is a rural connector between Menno Street and Kossuth Road, and a neighbourhood connector north of Menno Street and south of Kossuth Road, under the jurisdiction of Region of Waterloo. It has a two-lane cross-section within the Project Study Area. Its intersection with Kossuth Road and Fairway Road North is under a two-lane roundabout control. The north terminus of Fountain Street North is at the signalized intersection with Victoria Street North. Stop controls are in place for side streets at all other intersections along Fountain
Street North in the Project Study Area.

**Kossuth Road** is a rural connector under the jurisdiction of Region of Waterloo. It has a two-lane cross-section within the Project Study Area. Its intersection with Fairway Road North and Fountain Street North is under a two-lane roundabout control. Stop controls are in place for side streets at all other intersections along Kossuth Road in the Project Study Area.

**Shantz Station Road** is a rural connector under the jurisdiction of Region of Waterloo. It has a two-lane cross-section within the Project Study Area. The south terminus of Shantz Station Road is at its intersection with Kossuth Road. Stop controls are in place for side streets at all other intersections along Shantz Station Road in the Project Study Area.

**Menno Street** is a collector road under the jurisdiction of Township of Woolwich. It has a two-lane cross-section. Menno Street begins at Shantz Station Road and terminates at Woolwich Street South.

**Middle Block Road** is a collector road between Fountain Street North and Speedsville Road under the jurisdiction of the City of Cambridge. It has a two-lane cross-section. Middle Block Road becomes a local road west of Fountain Street North and east of Speedsville Road.

**Riverbank Drive** is a collector road between King Street East and Allendale Road under the jurisdiction of the City of Cambridge. It has a two-lane cross-section. Riverbank Drive becomes a local road north of Allendale Road.

**Speedsville Road** is a collector under the jurisdiction of the City of Cambridge. It has a two-lane cross-section. Speedsville Road begins at Kossuth road and becomes Concession Road at its intersection with Eagle Street North.

**Woolwich Street South** is a collector road under the jurisdiction of the Township of Woolwich. It has a two-lane cross-section. Woolwich Street South beings at Fountain Street North and terminates at its intersection with Victoria Street North and Ebycrest Road.

### 5.2.3 TRANSIT

No public transit services are currently available in the Project Study Area.

### 5.2.4 ACTIVE TRANSPORTATION

“Walk Cycle Waterloo Region” February, 2014 contains the Region’s vision for active transportation. Walk Cycle Waterloo Region recognizes the health, economic, environmental and transportation benefits associated with active transportation. The plan seeks to make it easier to walk and cycle throughout the Region and increasing the cycling mode share for PM peak hour trips from 7.8% to 12% by 2031. This target mode share will be achieved through a combination of infrastructure improvements, signage, facility maintenance, behavioral shifts and changes, performance monitoring and policy updates.

Neighbouring municipalities also support active transportation through policy plans and implementation of infrastructure. The City of Cambridge Bikeway Network Plan (2008) includes
a comprehensive network of existing and proposed facilities. Connections are provided from Cambridge along Fountain Street and Speedsville Road. Similarly, the City of Kitchener Cycling Master Plan for the 21st Century and the Multi-use Pathways and Trails Master Plan include some existing connections to the Project Study Area (e.g. along Fairway Road) and a significant density of on road cycling facilities, off-road trails and sidewalks throughout the city.

Currently there is no master plan for cycling and trails in Woolwich other than what is articulated within Walk Cycle Waterloo Region.

Existing active transportation facilities within and connecting to the Project Study Area include:

- Bike lanes on Fairway Road North to the roundabout which provides a key connection to Kitchener by way of the new bridge across the Grand River;
- Partial paved shoulders on Fountain Street south of the roundabout (approximately 1.0m of asphalt beyond the edge) with a wide gravel shoulder beyond the edge line;
- Partial paved shoulders on Kossuth Road heading east from the roundabout (approximately 1.0m of asphalt beyond the edge line) with a wide gravel shoulder beyond the edge line. Approximately 400m west of Cober Road the partial paved shoulder transitions to a wide paved shoulder to the Project Study Area limit;
- With the exception of some short segments, generally wide paved shoulders on Fountain Street North heading north from the roundabout to Woolwich Street South. This includes marked bike lanes for transitions through right-turn lanes (e.g. at the entrance to Waterloo Regional Airport);
- Partial paved shoulders on Fountain Street North (approximately 0.75m of asphalt beyond the edge line) with a wide gravel shoulder from Woolwich Street South to the north limit of the Project Study Area;
- Other main roads do not currently have facilities for active transportation. These include:
  - Menno Street, with a narrow platform 2-lane road with no additional shoulder (shared space);
  - Shantz Station Road which has a narrow partial paved shoulder beyond the edge line (varies- from 0.3m to 0.5m) and little to no available gravel shoulder beyond the paved section of the shoulder; and
  - Apart from some sections of shoulder paving at commercial entrances, Woolwich Street South generally has no asphalt beyond the edge line, with a varying width gravel shoulder;
- A narrow sidewalk along portions of the west side Woolwich Street South, heading north from Menno Street to the north limit of the Project Study Area;
- A wider sidewalk has been added along the west side of Woolwich Street in association with the new Riverland neighbourhood development. This also includes sidewalks along streets within the development (e.g. Andover Drive, Starlight Avenue, Fireside Drive);
- Existing trails in the Hopewell Heights neighbourhood immediately north of the Project Study Area.
5.2.5 TRANSPORTATION DEMAND MANAGEMENT

The Region of Waterloo is a leader in the development of TDM programs and the provision of TDM services. Many of the programs and services fall within the Travel Wise program which was established to encourage the use of sustainable transportation modes for commuting to and from work. The Region also established a supplement to the grade three curriculum to educate children about sustainable travel options.

As part of the update to the Regional Transportation Master Plan (RTMP), a review and analysis of the Travel Wise program was undertaken. Several observations and recommendations resulted. The work included a review of a number jurisdictions which highlighted a few key lesson, including: providing choice for commuters and other travelers; integration of land use and transportation to create transit and pedestrian friendly communities; and targeted programs (such as individualized travel planning) that focus on the users and provide services in meaningful ways.

A number of recommendations were put forward that would increase the effectiveness of TDM programs and engrain them within policies at both the local and regional levels. The development of a regional TDM Plan was suggested as a means to increase return on investment as a result of regional coordination and achieve a number of planning goals that have been established by the Region. Targets for shifts in modal shares were highlighted, indicating that a number of factors can impact modal choice and travel behaviour beyond TDM programs; however, they can also be more readily established through a regional approach to managing travel demand.

The Region has a number of TDM related programs, primarily the Travel Wise program and the inclusion of TDM requirements within Transportation Impact Studies.

The TravelWise program (TravelWise@work) focuses on the reduction of single-occupant vehicle travel, primarily through working with area employers and collaborating with area municipalities, Sustainable Waterloo Region and other stakeholders. The current business plan provides a number of recommendations for moving forward and enhancing the program. These recommendations include: a roadmap for members, making changes to the delivery of the program, further developing partnerships and enhancing the overall value of the program.

Other programs available in the Region include:

- Through TravelWise, an online tool is available for ride matching and tracking travel. It is called “gotravelwise.ca”
- “Where can I walk today” – a program of the Waterloo Region Public Health

The Transportation Impact Study guidelines provide a thorough description of the requirements related to TDM. The requirement of a TDM Plan within the TIS will need to demonstrate the opportunities for active and sustainable travel use and how it occupancy rates will be improved. To assist developers, a TDM checklist has been developed.

There are no programs provided by the Township of Woolwich.
5.2.6 GOODS MOVEMENT

Efficient goods movement in the Project Study Area is critical to the local industrial uses, as well as the Region of Waterloo International Airport. According to the RTMP, the arterial road system provides sufficient capacity and Project Study Area intersections are operating at acceptable levels of service overall. The East Side Lands are also situated near Highway 401, Highway 8 and Highway 7, which serve to provide good access for goods movements.

The Transportation Assessment conducted for the Stage 1 Lands indicated that heavy vehicles generally represent a significant proportion of the traffic stream in the Project Study Area. The data shows that large vehicle traffic (heavy vehicles + trucks) composes about 7% to 10% of the traffic on Fountain Street on a typical day. This is significantly higher than what is typically experienced (3-4%) on other Regional Roads.

5.3 PLANNED/PROPOSED INFRASTRUCTURE IN THE AREA

Planned or proposed roadway and transit improvements within the Project Study Area are discussed in this section. These infrastructure improvements in the area are expected to provide additional capacities and opportunities for traffic associated with the Stage 2 Lands planned development.

5.3.1 REGION ROADWAY IMPROVEMENTS

The RTMP developed a road network plan that identifies road improvements required to support transit, to support goods movement, and to accommodate forecast growth in traffic that reflects the regional transit mode share targets. Figure 5-2 illustrates the recommended regional roadway improvements for the Project Study Area. The RTMP recommended regional road improvements are shown by horizon period and scenarios:

- Regional Roadway Improvements by 2031;
- Regional Roadway Improvements beyond 2031;
- Regional Roadway Improvements under the Mature State Scenario.

REGIONAL ROADWAY IMPROVEMENTS BY 2031

Fountain Street North is proposed to be widened in the RTMP. The Class Environmental Assessment Study for the Fountain Street North widening completed in 2015 recommended a 4-lane cross-section from the existing 2-lane cross-section between Maple Grove Road and Kossuth Road, as well as the following:

- Construct a new multi-use trail on each side of Fountain Street from Kossuth Road to Cherry Blossom Road;
- Retain, initially, the 2-way stop-controlled intersection at Fountain Street and Middle Block Road as part of the currently planned construction. Monitor and construct, when warranted by future traffic volumes on Fountain Street and Middle Block Road, either a new two-lane roundabout (designed to accommodate future expansion to three lanes);
or a new signalized intersection; and

- Construct a new two-lane roundabout at the intersection of Fountain Street and Maple Grove Road, designed to accommodate future expansion to three lanes if required beyond 2028.

Completion of construction is scheduled for 2019 with final surface asphalt targeted for 2020.

It is also our understanding that an Environmental Assessment related to the north-south crossing of Freeport Creek is underway.

Beyond the Project Study Area, the following regional roadway improvements by 2031 are also proposed or identified, including:

- A new 4-lane controlled access freeway (new Highway 7 corridor) between Kitchener-Waterloo to Guelph: the provincial Environmental Assessment Study for this new corridor was completed and approved;
- Widening of Maple Grove Road between Fountain Street North and Hespeler Road; and
- Widening of Speedsville Road between Maple Grove Road and Eagle Street North.

REGIONAL ROADWAY IMPROVEMENTS BEYOND 2031

Beyond the 2031 horizon, the following road improvement projects in the Project Study Area were included in the RTMP for the purpose of corridor protection:

- Ottawa Street Extension between Forwell Road and Fountain Street, including a new crossing over the Grand River;
- Widening of Fountain Street North between Kossuth Road and Victoria Street; and
- Widening of Kossuth Road between Fountain Street and Hespeler Road.

The transportation assessment and recommendations for the Stage 2 Lands will be coordinated with these regional roadway improvements. The intent is to maximize the use of existing and planned transportation infrastructure in the area.

REGION ROADWAY IMPROVEMENTS UNDER MATURE STATE SCENARIO

The RTMP also assessed the regional road network under a “mature state scenario” using the Region’s 2031 transportation model. The mature state represents a land use condition beyond 2031 that may occur if all developable lands identified in the ROP were developed according to the policies in the ROP and using the existing zoning by-law. According to the RTMP, it does not constitute a valid land use scenario since it is not bound by the existing demographic trends such as local labour force participation rate. Nonetheless, the assessment results can be used to identify potential long term network deficiencies, since it took into account the long term future development at the East Side Lands.

The mature state analysis results indicate that large increases in traffic and delays in the East Side Lands are expected. Sections of Fountain Street, Shantz Station Road, and Kossuth Road
are forecast to experience significant increase in traffic and delays. The proposed long term improvements for the East Side Lands under the mature state are shown in Table 5-2. It is noted that some of the long term improvements under the mature state were already recommended as regional roadway improvements beyond 2031.

Table 5-2 – RTMP Recommended Roadway Improvements under Mature State Scenario

<table>
<thead>
<tr>
<th>Road Name</th>
<th>From</th>
<th>To</th>
<th>Description</th>
<th>Anticipated Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fountain Street</td>
<td>New Highway 7</td>
<td>Maple Grove Road</td>
<td>Widening</td>
<td>Beyond 2031</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potential transit service improvements</td>
<td>N/A</td>
</tr>
<tr>
<td>Shantz Station Road</td>
<td>New Highway 7</td>
<td>Kossuth Road</td>
<td>Interchange with new Highway 7</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Realignment of Shantz Station Road and Kossuth Road intersection to align</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>with Speedsville Road</td>
<td></td>
</tr>
<tr>
<td>Kossuth Road</td>
<td>Fountain Street</td>
<td>Hespeler Road</td>
<td>Widening</td>
<td>Beyond 2031</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potential Realignment of Kossuth Road and Shantz Station Road intersection</td>
<td>N/A</td>
</tr>
<tr>
<td>Speedsville Road</td>
<td>Maple Grove Road</td>
<td>Kossuth Road</td>
<td>Realignment of Speedsville Road and Kossuth Road intersection to align with</td>
<td>Beyond 2031</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shantz Station Road</td>
<td></td>
</tr>
<tr>
<td>Ottawa Street</td>
<td>Forwell Road</td>
<td>Shantz Station Road</td>
<td>Extension and bridge to Fountain Street</td>
<td>Beyond 2031</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Improvements to Fountain Street – Shantz Station Road section using existing</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Menno Street alignment</td>
<td></td>
</tr>
<tr>
<td>Middle Block Road</td>
<td>Fountain Street</td>
<td>Hespeler Road</td>
<td>Extension</td>
<td>N/A</td>
</tr>
</tbody>
</table>

5.3.2 BRESLAU SETTLEMENT PLAN ROADWAY IMPROVEMENTS

As recommended in the Breslau Settlement Plan, the following improvements to the Township road network in addition to the region roadway improvements will be required to support the envisioned residential and employment developments in the Breslau Settlement Plan:

- Proposed collector road extension of Dolman Street to the east of Woolwich Street South through to Fountain Street;
- A potential connecting corridor extending from Dolman Street through Fountain Street North to the area near Greenhouse Road, for which an EA is to be conducted in the near future;
- Andover Drive extension and Shallow Creek Road extension to the future east-west Regional Corridor as a result of the Ottawa Street extension.
The recommended improvements in the Breslau Settlement Plan road network are shown in Figure 5-2.
5.3.3 TRANSPORT IMPROVEMENTS

IXPRESS CORRIDORS

The Grand River Transit Business Plan to 2014 proposes a series of eight iXpress routes throughout the Region to build ridership along major corridors and in between major destinations. The Mid-Region Express that is proposed to run along Maple Grove Road between Hespeler Town Centre and Fairview Park Mall is the closest iXpress route to the Project Study Area.

The Mid-Region Express is proposed to begin service in 2017. However, these transit service improvements are subject to budget approval and timing may change. All iXpress corridors are anticipated to be in place by 2031.

Figure 5-3 illustrates the rapid transit alignment and the proposed iXpress routes. As noted, the Region is currently undertaking the Stage 2 ION study to evaluate the Stage 2 LRT alternative route options and to recommend preferred route and stop locations.

Figure 5-3 – Rapid Transit Alignment and Proposed iXpress Routes (Source: Grand River Transit)
GO TRANSIT SERVICES

GO Train service current provides service from Kitchener through Guelph, Georgetown, and Brampton to Downtown Toronto on the Georgetown GO rail line. Today, the only station in the Region is in Downtown Kitchener at the existing VIA Station and the GO Train service provides two AM peak runs to Toronto and two PM peak runs to Kitchener. Future plans for expansion include more frequent peak period services and a potential second GO Train station in Breslau just west of the Greenhouse Road extension, just north of the Project Study Area. However, timing has not yet been confirmed.

GO bus services are also available in the City of Kitchener at the Sportsworld GO station.

The future transit services and route selection in the Project Study Area would need to consider potential connection opportunities to GO transit and bus services, as well as connections to the GRT transit network. Potential transit corridors and connecting routes include Victoria Street / Highway 7, the proposed Ottawa Street extension, and Fountain Street via Maple Grove Road.

5.3.4 ACTIVE TRANSPORTATION

Active transportation improvements need not only consider routes within the Project Study Area but also how these will connect with the surrounding area. As noted earlier in Section 5.2, the Township of Woolwich does not have a comprehensive active transportation, trail or cycling master plan. Key route improvements within and immediately surrounding the Project Study Area are described in Walk Cycle Waterloo Region. The recommended Woolwich Cycling Network taken from Walk Cycle Waterloo Region (Figure 5-4) includes improvements on Kossuth Road and Fountain Street beyond 2031. Similarly Shantz Station Road north of Menno Street, which is located on the northeast corner of the Project Study Area is also scheduled for upgrades in the “beyond 10 year term” As a minimum these upgrades should include wider paved shoulders and / or bike lanes. These improvements should also consider the evolution of active transportation facility design, and incorporate new and appropriate facility designs that are not part of today’s suite of facility types.

The Recommended Cambridge Cycling Network in Walk Cycle Waterloo Region (Figure 5-5) recommends boulevard multi-use trails on both sides of Fountain Street North from Maple Grove Road to the south limit of the Project Study Area at Kossuth Road. Consideration should be given to extending boulevard multi-use trails north along Fountain Street North.
Figure 5-4 – Recommended Woolwich Cycling Network (Source: Walk Cycle Waterloo Region, 2014)
The Breslau Settlement Plan (as adopted by Township Council in 2016) area is located immediately north and west of the Project Study Area. Principle 5 of this plan envisions a “well-connected, multi-modal and safe active transportation system that promotes walking, cycling and transit usage, as well as providing an efficient road network for motor vehicles”. It also recommends that pedestrian and bicycle routes be permitted in designated Open Space lands, and these be connected / integrated with routes within the broader Natural Heritage Framework. In addition it suggests that the future Ottawa Street extension will pass through the north part of the Project Study Area and provide a connection to the proposed GO Rail Station.
This route should include appropriate active transportation facilities that will ultimately create an important active transportation connection west to Kitchener and complement the existing connection on Fairway Road. Figure 5-6 illustrates the conceptual trails and pathway system, and other key transportation links in the Breslau Settlement Plan area immediately north and west of the Project Study Area.

Figure 5-6 – Schedule C-Transportation Network (Source Breslau Settlement Plan, 2016)
5.3.5 GOODS MOVEMENT IMPROVEMENTS

The ROP recognizes the importance of goods movement and the necessity for including it as a consideration in transportation planning. Five key RTMP policies related to goods movement are as follows:

- Plan for effective goods movement facilities and systems that minimize impacts and provide direct access;
- Improve transportation connections to Highway 401 in southwest Kitchener to support goods movement and future employment growth areas;
- Consider goods movement as a key performance indicator in assessing corridor improvement requirements;
- Work with the Province, local municipalities and major industries/businesses to develop a strategic goods movement network; and
- Ensure the transportation system supports development and land use, recognizing the need for effective movement and interaction of people and goods.

As recommended by the RTMP, the Region should develop a goods movement priority network to provide connections to and through the Region’s urban areas and existing and planned Employment Lands, as well as to the existing and potential future rail inter-modal facilities.

5.4 IDENTIFICATION OF DATA AND INFORMATION GAPS

5.4.1 ROADS

Most existing traffic data (i.e., turning movement counts and ADT) have been requested and received from the Region and the local municipalities. The information will be used to analyze the existing traffic condition within the Project Study Area on a screenline basis. The existing constraints in the Region road network will be identified.

To establish traffic forecasts for the Project Study Area in the future horizon, the Region of Waterloo Traffic Forecasting Model will be required, which reflects the future population and employment growth envisioned by the Region. Once the model is available, the assumptions and rationales related to the Region Traffic Forecasting Model need to be clarified and verified. It is the expectation that the model will form the basis of assessment of traffic impacts related to the Stage 2 Lands, and identification of any required road and intersection improvements.

Distinction needs to be made between the Stage 2 Lands requirements and the remainder of the Project Study Area.

5.4.2 TRANSIT

There is currently no public transit service in the Project Study Area. Opportunities exist in establishing transit corridors and connecting transit routes to key existing and future transit infrastructures in the vicinity of the Project Study Area, such as the potential Breslau GO station.
to the north, Mid-Region Express route to the south, as well as the Victoria/Highland Express and Ottawa Express to the east across the Grand River. The introduction of transit services in the Project Study Area is an important component of the overall transportation network that accommodates growth and contributes to the region-wide transit mode share objectives.

The Region’s Context Sensitive Regional Transportation Corridor Design Guidelines will be consulted to identify potential transit routing along the Region’s arterial connectors that can serve the surrounding communities and key destinations in a manner that minimizes walking distance and maximizes the opportunity for people to take transit. Any available Grand River Transit design guidelines will also need to be obtained.

5.4.3 ACTIVE TRANSPORTATION

As noted above, traffic data (ADT) both current and forecast will be used to develop recommendations for future on-road cycling facilities. Additional data (if available) informing recommendations for active transportation facilities should include:

- City of Cambridge and Township of Woolwich sidewalk policies for new neighbourhoods, and any forecasts indicating which existing roads are scheduled to receive sidewalks; and
- Capital forecasts for improvements to City of Cambridge and Township of Woolwich roads (e.g. resurfacing, widenings, upgrades from rural to urban cross sections).

5.4.4 TRAVEL DEMAND MANAGEMENT

There are some data gaps that need to be addressed. There is little data (from MMM’s research) that provides insight into the effectiveness of the TDM programs. In particular, the impacts on the long-term behaviour change for commuters and other travelers. As well, there is little recognition for the importance of providing programs to residential areas to decrease the dependence on single-occupant vehicle (SOV) travel within the Region and how directing efforts within new areas could reduce SOV travel and increase the use of more sustainable modes.

Both the Township of Woolwich and the City of Cambridge should provide more guidance with regards to TDM policy and program implementation and indicate how they will work with the Region to achieve their goals.

Finally, school travel should be addressed as part of community planning as the location of schools and related infrastructure plays a role in how children travel to school. The development of a plan to ensure that workplace travel in the Project Study Area is incorporated into the overall plan is necessary as are linkages to the ION service and other sustainable modes of travel (throughout the Project Study Area).

5.4.5 GOODS MOVEMENT

The goods movement needs related to the Project Study Area will be evaluated qualitatively. Regional roads with high heavy truck usage will be identified where traffic data are available. Consideration will be given to maintain logical connections from the existing and future industrial
areas and the Region of Waterloo International Airport such that efficient goods movements are maintained through the Project Study Area. Any recommended intersection and road improvements will be designed to accommodate truck movement, where appropriate.
6. SUBWATERSHED STUDY

6.1 INTRODUCTION

The Randall and Breslau Drains subwatershed study is one of several technical studies required to fulfill the MESP process in providing direction for land use planning and decision making within the Region of Waterloo. A subwatershed study is a comprehensive inventory and assessment of the interactions between groundwater, surface water and natural heritage features (terrestrial and aquatic) and the functions that they collectively perform; it is a systems-based approach. The objective of the subwatershed study is to assess the form and function of our natural heritage and provide guidance for sound and sustainable land use planning that will maintain significant and supporting features, their ecological functions and processes and the connections and linkages between them that are vital to their long-term viability.

The Randall and Breslau Drains subwatershed study will provide a comprehensive overview of existing conditions including significant environmental features, functions, and sensitivities, and will assess opportunities for and constraints to development within the context of the applicable objectives and policies of the Province, the Region, the City, the Township and the GRCA. The contents of the subwatershed study will provide guidance for sustainable land use planning that protects, and where possible restores or enhances the natural heritage system(s), features and functions present within the subwatershed. Additionally it will provide adaptive management strategies and recommendations that will guide future development processes (e.g. buffers, monitoring, etc.).

This chapter provides a preliminary characterization of the Project Study Area based on the review of available background information and will be used to refine the objectives of the subwatershed study and identify data gaps and requirements for the study. Gaps identified through the background review will be used to refine the detailed subwatershed study work plan.

A comprehensive four-season suite of field surveys were undertaken in 2015 and early 2016 to facilitate the desired timeline to complete the MESP. These surveys were completed in support of the current study; they do not represent previously existing information within the Project Study Area. As such, results of these studies are not discussed in this report; they will be presented and analysed as part of the Subwatershed Study, Comprehensive EIS and Master Environmental Servicing Study.

6.2 POLICY REVIEW

The subwatershed study process and outcomes are guided by a natural heritage policy framework defined through designations, guidelines and recommendations at the provincial, regional and municipal level. Key documents include the Provincial Policy Statement (PPS) and related guidance documents, Official Plans for the Region, City and Township and policies and regulations of the Grand River Conservation Authority. These documents will be reviewed and the policies and designations contained within will be used to guide the review and assessment of natural heritage features within and adjacent to the Project Study Area, as well as any
recommendations made within the subwatershed study. A discussion of relevant natural heritage legislation and policies for the Project Study Area is presented below.

### 6.2.1 PROVINCIAL POLICY STATEMENT (2014)

Key policies of the Provincial Policy Statement (PPS), 2014, applicable to the subwatershed study and natural heritage are discussed below.

Per Section 2.1.4 of the PPS, development and site alteration shall not be permitted in:

1. *significant wetlands* in Ecoregions 5E, 6E and 7E1; and
2. *significant coastal wetlands*.

Per Section 2.1.5 of the PPS, development and site alteration shall not be permitted in the following features unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

1. *significant wetlands* in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;
2. *significant woodlands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
3. *significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
4. *significant wildlife habitat*;
5. *significant areas of natural and scientific interest*; and
6. *coastal wetlands* in Ecoregions 5E, 6E and 7E1 that are not subject to policy 2.1.4(b)

This list is reflective of the features noted in the PPS; not all of the above-noted natural features are present within the Project Study Area or Stage 2 Lands.

Per Section 2.1.6 of the PPS, “Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.”

Per Section 2.1.7 of the PPS, “Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.”

Per Section 2.1.8 of the PPS, “Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.”
With respect to stormwater planning, design and safety, Section 1.6.6.7 states that “Planning for stormwater management shall:

a) minimize, or, where possible, prevent increases in contaminant loads;

b) minimize changes in water balance and erosion;

c) not increase risks to human health and safety and property damage;

d) maximize the extent and function of vegetative and pervious surfaces; and

e) promote stormwater management best practices, including stormwater attenuation and re-use, and low impact development.”

6.2.2 ENDANGERED SPECIES ACT (2007)

Species designated as Threatened or Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO), otherwise known as Species at Risk in Ontario (SARO), and their habitats (e.g. areas essential for breeding, rearing, feeding, hibernation and migration) are automatically afforded legal protection under the Endangered Species Act (ESA) (Government of Ontario 2007). The ESA (Subsection 9(1)) states that:

“No person shall,

(a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,

(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,

(ii) any part of a living or dead member of a species referred to in subclause (i),

(iii) anything derived from a living or dead member of a species referred to in subclause (i); or

(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).”

Clause 10(1)(a) of the ESA states that:

“No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species.”

The ESA also calls for the development of species-specific Recovery Strategies and Habitat Regulations. Unlike the general habitat of a species, regulated habitat may include areas that are currently unoccupied by the species. These areas are commonly referred to as “recovery habitat.”
In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

### 6.2.3 TECHNICAL GUIDE – RIVER & STREAMS SYSTEMS: EROSION HAZARD LIMIT

This technical guide, published by the Ministry of Natural Resources and Forestry Water Resources Section (2002), provides guidance on the provincial policies, standards, assessment practices and design for flooding and erosion control within river and stream systems in Ontario. This guidance document is a primary reference and guiding document for works associated with floodplain and hydraulic assessments and fluvial geomorphological assessments of watercourses within the Project Study Area.

### 6.2.4 REGION OF WATERLOO OFFICIAL PLAN (2015)

The ROP identifies a ‘Greenlands Network’ of environmental features and linkages among them. Policies of the Plan have the goal of maintaining, enhancing, or where feasible restoring the Greenlands Network. The Greenlands Network is a layered approach to environmental protection comprised of Landscape Level Systems, Core Environmental Features (CEF), Fish Habitat, Supporting Environmental Features and the linkages between them. Each layer contains policies that provide appropriate protection to areas of environmental significance. These features are shown on Map 4 - Greenlands Network within the ROP.

**LANDSCAPE LEVEL SYSTEMS**

Landscape Level Systems are recognized within the Greenlands Network as large-scale environmental features or as significant concentrations of environmental features. Landscape Level Systems are designated in accordance with Policies 7.B.1 to 7.B.26 and apply to lands that meet the criteria as:

1. Environmentally Sensitive Landscapes (Policies 7.B.4 through 7.B.19)
4. Provincial Greenbelt Natural Heritage System (Policies 7.B.26)

**CORE ENVIRONMENTAL FEATURES**

Section 7.C.1 of the ROP states that the Core Environmental Features designation applies to lands / features that have been identified as being either provincially significant or regionally significant. These features are the most significant elements of the regional landscape in terms of maintaining, protecting and enhancing biodiversity and important ecological functions. Core Environmental Features (CEFs) are shown on ROP Map 4 (Greenlands Network), as defined in accordance with Policies 7.C.3 to 7.C.7 and apply to lands that meet the criteria as:
1. Significant Habitat of Endangered or Threatened Species
2. Provincially Significant Wetlands (PSW)
3. Environmentally Sensitive Policy Areas
4. Significant Woodlands
5. Environmentally Significant Valley Features, and
6. Significant Areas of Natural and Scientific Interest

Development or site alteration is generally not permitted within CEFs and development or site alteration is not permitted adjacent to CEFs (per policies 7.C.9 through 7.C.13) unless an EIS prepared in accordance with relevant policy (7.G) demonstrates no adverse impact to CEF features and ecological functions.

**FISH HABITAT**

Development or site alteration will not be permitted within fish habitat, except in accordance with Provincial and Federal requirements to the satisfaction of the DFO, or its delegate (per policy 7.D.1). Fish Habitat, as defined in the Fisheries Act, is comprised of the spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

**SUPPORTING ENVIRONMENTAL FEATURES**

Supporting Environmental Features (policies 7.E.1 through 7.E.5) are those features that do not meet criteria to be recognized as regionally significant, but play an important role in maintaining the ecological functions provided by the Greenlands Network. Specifically, Supporting Environmental Features are identified as:

1. Environmentally Significant Discharge Areas and / or Environmentally Significant Recharge Areas
2. Areas Regulated by the Grand River Conservation Authority

**LINKAGES**

The ROP also recognizes the value of linkages and requires that linkages be identified through watershed studies, Natural Heritage Inventories, Environmental Impact Studies or other appropriate studies, and that they be incorporated into the design of new development to maintain, enhance or, wherever feasible, restore these linkages (Policy 7.E.6 through 7.E.8).

**NATURAL HAZARDS**

Natural hazards (i.e. hazard lands) are identified by the Grand River Conservation Authority and reflected in the ROP through appropriate land use designations. Regulations for any
development or site alteration within hazard lands are subject to the policies and guidelines of the Grand River Conservation Authority through Ontario Regulation 150/06, which is discussed in further detail in 6.2.7 below.

SOURCE WATER PROTECTION

Section 8 of the ROP addresses source water protection within the regional context. This section contains policies for the protection and conservation of the Region’s drinking-water resources. The policies will be carried out by managing land use activities within designated Source Water Protection Areas. The Source Water Protection Areas designated in this Plan include: Wellhead Protection Sensitivity Areas; wells that obtain their water from Groundwater Under the Direct Influence of surface water (GUDI wells); Surface Water Intake Protection Zones; and Regional Recharge Areas.

6.2.5 CITY OF CAMBRIDGE OFFICIAL PLAN (2012)

The updated City of Cambridge Official Plan was adopted by the Cambridge City Council on May 7, 2012 and approved by the Region of Waterloo on November 21, 2012. The Official Plan was appealed to the OMB later that same year (2012) with some sections of the Plan still under appeal and not yet in effect. Within the Official Plan, a Natural Heritage System consisting of Landscape Level Systems (LSLs), CEF’s, Locally Significant Natural Areas (LSNAs), and Fish Habitat has been identified. The NHS and associated policies provide direction for the protection and enhancement of natural heritage features within the city.

The policies and definitions for features in the Plan are generally consistent with the ROP’s policies for LSLs and CEFs. LSNAs are specific to the City of Cambridge; criteria for the identification of LSNAs are provided in Section 3.A.4 of the Plan.

The LSNA designation under the City of Cambridge Official Plan affords protection for features identified as playing an important role in maintaining the ecological functions provided by the Natural Heritage System but are not captured under the policies and designations of the ROP. To qualify for recognition as a LSNA, a natural feature must be:

1. A GRCA regulated wetland that does not qualify as a Core Environmental Feature under the ROP;
2. A wooded area identified by the MNRF but not identified as a Core Environmental Feature under the ROP;
3. Significant Wildlife Habitat;
4. A perennial or intermittent watercourse(s);
5. An Environmentally Significant Groundwater Discharge and Recharge Area.

City policy in regards to infrastructure within and adjacent to these features generally aligns with the Region.
The stormwater management policies within the City of Cambridge Official Plan are consistent with the Regions policies. The City encourages the use of innovative low impact development design and technologies in new development and redevelopment in addition to the required stormwater management quantity facilities.

Natural Hazard policies (floodplain mapping) are consistent with the GRCA policies.

The Section 3.B.3 states the goals of stormwater management, which are to maintain the natural hydrologic cycle, prevent an increased risk of flooding, prevent undesirable stream erosion, and protect water quality. MESPs, master drainage plans or subwatershed studies will provide guidance for implementation of the City of Cambridge Stormwater Management Policies and Guidelines.

Section 3.B.6.11 D identifies major floodplains as approved by GRCA and One-Zone and Two-Zone Floodplain Policy Areas.

6.2.6 TOWNSHIP OF WOOLWICH OFFICIAL PLAN (2007)

The Township of Woolwich Official Plan provides direction on the protection of natural heritage features and functions through Section 13 of the plan. Policies in this section of the plan provide direction to support the identification and protection of a Natural Habitat Network (NHN). The policies and definitions for most features that comprise the NHN in the Plan are generally consistent with the ROP. Features identified as having significant natural heritage value to the Township that are not captured under the policies and designations of the ROP are designated as Locally Significant Natural Features (LSNF); criteria for identification as a LSNR are listed in section 13.9.4 of the Plan.

As noted in Policy 13.2.3, where development is proposed on or contiguous to lands that have not been adequately evaluated or classified to identify components of the NHN, a Natural Habitat Network Inventory, in accordance with the ROP Policy 4.1.12, will be required.

The township requires management of stormwater run-off from urban and rural areas and discharge from municipal drains, tile drains and joint farm drains to reduce the possibility of downstream flooding or flooding of adjacent lands, and that the discharge of stormwater into existing watercourses, streams or rivers will not add substantially to the pollution or channel degradation of those watercourses.

6.2.7 GRAND RIVER CONSERVATION AUTHORITY

The Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 150/06), is a regulation issued under the Conservation Authorities Act, R.S.O. 1990. Through this, GRCA has the responsibility to regulate activities in natural and hazardous areas (e.g., areas in and near rivers, streams, floodplains, wetlands, slopes and shorelines). The GRCA policies for the administration of Ontario Regulation 150/06 are outlined in Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation (GRCA 2015)
Permitting under Reg. 150/06 is required for any site alteration within regulated areas. In addition, development proposed within the area of interference of a wetland (within 30 metres of a non-Provincially Significant Wetland (PSW) less than 2 hectares or within 120 metres of a wetland greater than 2 hectares or a PSW) may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 (GRCA 2015), and where an EIS demonstrates that there will be no negative impacts on the identified natural feature or on its ecological functions, as described under Reg. 150/06.

Section 8.1 River or Stream Valleys - Riverine Flooding Hazards speaks to specific requirements in the identification of Flood Hazard areas and areas regulated by the Conservation Authority (Regulated Areas). Specifically, it speaks to the requirements for identifying the Regulatory Flood limit under conditions with sufficient modelling and insufficient modelling to ensure appropriate identification of hazards.

6.3 REVIEWED BACKGROUND DOCUMENTS

Background information relating to the broader Project Study Area, the general subwatershed boundaries of Randall and Breslau Drains and the intervening lands that drain to the Grand River, and the Detailed Study Area known as the Stage 2 Lands were reviewed. Sources of background information included:

DIRECTLY RELATED TECHNICAL REPORTS (COMPLETED OR ONGOING)

- East Side Lands (Stage 1 Lands) MESP (including the MESP document, Community Plan, Fiscal Impact Analysis Report and Appendices - Freeport Creek and Tributary to the Grand Subwatershed Study, Master Drainage Plan, Transportation System Assessment and Municipal Water and Wastewater Servicing Requirements Assessment, Dillon et al. (2014)
- Breslau Secondary Plan and supporting documentation (on-going).
- Hespeler West Subwatersheds Study and Appendices (September, 2004)
- Environmental Study Report for the Fountain Street Improvements (Fairway Road/Kossuth Road to Cherry Blossom Road) Municipal Class Environmental
Assessment.

- Drainage Investigation Along Regional Road 17 Middleblock Road to Kossuth Road (KSmart, 2003)
- Floodplain Mapping for Breslau Drain and Hopewell Creek, Breslau Settlement Plan (SCS Consulting, 2015)
- Region of Waterloo International Airport SWM Report (Stantec, 2003)
- Greenlands Network Implementation Guideline, Region of Waterloo
- Water Supply Study for the Fountain Street and Maple Grove Area Class Environmental Assessment, Final Environmental Study Report (MTE, 2014)
- Waterloo International Airport Master Planning Study (MMM Group Limited, 2014)
- Empire Riverland Area 2 Scoped EIS Addendum (MMM Group Limited, 2016)

BACKGROUND / POLICY DOCUMENTS

- Regional Official Plan (2015)
- Regional Official Policies Plan (1995)
- City of Cambridge Official Plan (2012)
- Township of Woolwich Official Plan (consolidated, 2012)
- Region of Waterloo East Side Community Structure Plan (2006)
- Region of Waterloo International Airport Master Plan
- Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Ontario Regulation 150/06. (GRCA, 2006)
- Policies for the Administration of the Development, Interference with Wetlands and
Alterations to Shorelines and Watercourses Regulation (GRCA, 2015)


**COMPLETED OR ONGOING EAs**

- Fairway Road EA (completed);
- Region of Waterloo Rapid Transit EA (completed).

**OTHER**

- Aerial photography;
- GIS data (LIO, GRCA);
- Hydrologic and floodplain models;
- Ontario Ministry of the Environment and Climate Change Water Well Records; and
- Monitoring well information provided by the Region of Waterloo in their WRAS+ Database.

These reports and data were reviewed in order to provide a description of the existing environmental conditions within the Project Study Area (Section 6.4). The Gap Analysis and Technical Work Plan will be based on the results of this background review.

**6.4 EXISTING ENVIRONMENTAL CONDITIONS**

**6.4.1 AREA CONTEXT AND HISTORY**

The Project Study Area is located within the eastern edge of Waterloo Region in Ecodistrict 6E-1 near the boundary of the Carolinian Zone and the Lake Simcoe – Rideau Ecoregions (Henson and Brodribb, 2005). Approximately 16% of this Ecodistrict remains as natural cover, with till moraine and till plain forest complexes and swamp wetlands dominating (Henson and Brodribb, 2005).

Waterloo Region was settled by European immigrants for agricultural uses by the early 1800s (Chapman and Putnam 1984). A review of available historical aerial photography indicates the current agriculture-dominated landscape was in place by at least 1945 and the majority of existing natural features are generally recognizable in shape by that time, with some disturbance, maturation, regeneration, and removals having occurred in the intervening decades.

**6.4.2 EXISTING LAND COVER**

The Project Study Area (PSA) encompasses approximately 1,732 hectares of land within the Region of Waterloo with portions located within the city of Cambridge and the township of Woolwich. Using SOLIS v2 land cover data (a provincial land cover database), tilled agricultural lands represent the largest land use within the Project Study Area (PSA), representing 40.6% (704.1 ha) of the total land area. The ‘Undifferentiated’ category of SOLRIS represents the next
largest land use (25.2%); this category encompasses non-tilled agricultural land uses such as hay/pasture, orchards, vineyards, nurseries, rural properties and farmland not currently in production as well as edges of transportation corridors, upland thicket and regenerating areas. The majority of the ‘Undifferentiated’ lands within the PSA are representative of managed areas within the Airport, additional areas include fallow or un-managed areas and rural residential yards (mowed areas). Natural Land Cover Categories represent 19.9% (345 ha) of the total land area within the PSA. Table 6-1 provides a summary of land cover distributions within the PSA.

**Table 6-1 – Land Cover Classification within the Project Study Area**

<table>
<thead>
<tr>
<th>Land Cover Class</th>
<th>Land Area (ha)</th>
<th>Land Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh</td>
<td>14.9</td>
<td>0.9%</td>
</tr>
<tr>
<td>Treed Swamp</td>
<td>204.7</td>
<td>11.8%</td>
</tr>
<tr>
<td>Thicket Swamp</td>
<td>23.7</td>
<td>1.4%</td>
</tr>
<tr>
<td>Forest</td>
<td>1.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Coniferous Forest</td>
<td>2.5</td>
<td>0.1%</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>56.8</td>
<td>3.3%</td>
</tr>
<tr>
<td>Open Water</td>
<td>27.9</td>
<td>1.6%</td>
</tr>
<tr>
<td>Hedge Rows</td>
<td>13.4</td>
<td>0.8%</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilled</td>
<td>704.1</td>
<td>40.6%</td>
</tr>
<tr>
<td><strong>Other Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-Up Area - Impervious</td>
<td>95.1</td>
<td>5.5%</td>
</tr>
<tr>
<td>Built-Up Area - Pervious</td>
<td>4.2</td>
<td>0.2%</td>
</tr>
<tr>
<td>Extraction - Aggregate</td>
<td>36.4</td>
<td>2.1%</td>
</tr>
<tr>
<td>Transportation</td>
<td>111.4</td>
<td>6.4%</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>436.3</td>
<td>25.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1732.5</td>
<td>100%</td>
</tr>
</tbody>
</table>

The Stage 2 Lands are divided into two distinct areas, correspondingly, land cover is reported for each area independently below. Stage 2 Lands - Breslau encompasses 64 hectares of land area within the PSA within the Breslau settlement area and the Breslau Drain subwatershed. Stage 2 Lands – Randall encompasses approximately 542 hectares of the land area within the PSA at the southern limit of the study area, within the Randall Drain subwatershed.

Within the Breslau portion of the Stage 2 Lands, the major land use classification is tilled agriculture, comprising 50.8% (39.4 ha). ‘Undifferentiated’ land use represents 30.4% (~23.6) of the land area and primarily represents un-managed / un-tilled and regenerating land areas and a rural residential property. Natural Cover represents 13% (10.0 ha) of the land area in this portion of the Stage 2 Lands. A summary of land cover distribution is provided in Table 6-2 below.
Table 6-2 – Land Cover Classification within the Stage 2 Lands (Breslau)

<table>
<thead>
<tr>
<th>Land Cover Class</th>
<th>Land Area (ha)</th>
<th>Land Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh</td>
<td>2.3</td>
<td>2.9%</td>
</tr>
<tr>
<td>Treed Swamp</td>
<td>6.8</td>
<td>8.7%</td>
</tr>
<tr>
<td>Thicket Swamp</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Forest</td>
<td>0.3</td>
<td>0.4%</td>
</tr>
<tr>
<td>Coniferous Forest</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>0.6</td>
<td>0.8%</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Hedge Rows</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilled</td>
<td>39.4</td>
<td>50.8%</td>
</tr>
<tr>
<td><strong>Other Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-Up Area - Impervious</td>
<td>1.2</td>
<td>1.5%</td>
</tr>
<tr>
<td>Built-Up Area - Pervious</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Transportation</td>
<td>3.3</td>
<td>4.3%</td>
</tr>
<tr>
<td>Extraction - Aggregate</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>23.6</td>
<td>30.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>77.6</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Within the Randall Drain portion of the Stage 2 Lands, the major land use classification is tilled agriculture, comprising 51.1% (~263.9 ha). ‘Undifferentiated’ land use represents 22.8% (~118 ha) of the land area and generally represents un-managed / un-tilled and regenerating land areas and rural residential properties. Natural Cover represents 22% (115.4 ha) of the land area in this portion of the Stage 2 Lands. A summary of land cover distribution is provided in Table 6-3 below.
Table 6-3 – Land Cover Classification within the Stage 2 Lands (Randall Drain)

<table>
<thead>
<tr>
<th>Land Cover Class</th>
<th>Land Area (ha)</th>
<th>Land Area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Natural Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marsh</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Treed Swamp</td>
<td>81.6</td>
<td>15.8%</td>
</tr>
<tr>
<td>Thicket Swamp</td>
<td>2.7</td>
<td>0.5%</td>
</tr>
<tr>
<td>Forest</td>
<td>0.8</td>
<td>0.2%</td>
</tr>
<tr>
<td>Coniferous Forest</td>
<td>0.3</td>
<td>0.1%</td>
</tr>
<tr>
<td>Deciduous Forest</td>
<td>25.3</td>
<td>4.9%</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.3</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hedge Rows</td>
<td>4.4</td>
<td>0.8%</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilled</td>
<td>263.9</td>
<td>51.1%</td>
</tr>
<tr>
<td><strong>Other Cover</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-Up Area - Pervious</td>
<td>0.0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Built-Up Area - Impervious</td>
<td>1.5</td>
<td>0.3%</td>
</tr>
<tr>
<td>Transportation</td>
<td>17.6</td>
<td>3.4%</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>118.0</td>
<td>22.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>516.4</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

6.4.3 PHYSIOGRAPHY AND SURFICIAL GEOLOGY

The physiographic regions within the Project Study Area, as described by Chapman and Putman (1984), are presented below. The East Side Lands are located within the Guelph Drumlín Field physiographic region of Southern Ontario (GRCA 2014). This region consists of broad oval-shaped till drumlins or groups of drumlins fringed by gravel terraces and separated by swampy valleys. Tributaries of the Grand River flow through these valleys. Stone-rich tills are the primary sediment type throughout this area.

Glacial spillways developed as the glaciers in the area melted. Flowing meltwater from the glaciers cut channels into the land, creating outflow valleys or glacial spillways. This water carried enormous amounts of silt, sand and fine gravel which, as the water slowed was deposited in layers along the banks.

As per GRCA (2014), the surficial geology of the Project Study Area has been largely influenced by the events of the last glaciation which ended approximately 10,000 years ago (Figure 6-2). The Quaternary record preserved within the Project Study Area is characterized by repeated glacial ice lobe advances originating from the Lake Huron-Georgian Bay and the Erie-Ontario basins (Bajc & Karrow, 2004). Subsequent erosion and geomorphologic processes relating to the Grand River and its tributaries have also played a role in shaping the landscape.

The Port Stanley tills are located within the Project Study Area. The Port Stanley till is a sandy-silt to clayey-silt till that is occasionally stony. This unit is often interbedded with sand and gravel and is coarse-grained and loose natured. These isolated outwash sand and gravel
deposits are typically found within river valleys associated with area watercourses and may function as small, localized aquifers.

Within the East Side Lands, topography is relatively flat with small relief features in comparison to other areas within the Region (refer to Figure 6-1); the surficial sand and gravel deposits become more regional in nature, and become the dominant surficial geologic unit (refer to Figure 6-2). This includes lower portions of Chilligo Creek and the majority of Randall Drain. These deposits are larger and more continuous in nature then the sand and gravel deposits in the northern portion of these subwatersheds. Within the west side of Hopewell and Chilligo creek watersheds, Breslau and Randall Drains, and Freeport Creek, with overburden thicknesses ranging between 40 and 60 m. Overburden on the west side of Hopewell Creek is the thickest in the East Side Lands and coincides with the drumlins located in this area.

The uppermost bedrock unit within the East Side Lands is the middle Silurian-aged Guelph Formation, which occurs at depths ranging between 0 to 65 metres below ground surface (mbgs) (GRCA 2014). The Guelph Formation is underlain by the Gasport Formation. The Guelph Formation consists of two members, the lower Hanlon and upper Wellington members. The formation consists of medium to thickly bedded crinoidal grainstones and wackestones, and reefal complexes (Brunton, 2009). It is cream-coloured and fossiliferous. The largest groundwater yields from this formation are from the upper portion of the bedrock which exhibits a higher secondary porosity (typically more weathered and fractured) than lower sections.
FIGURE 6-1
Topography and Natural Features

Legend
- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Airport Lands
- Contour (5m)
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody
- Wooded
- Wildlife Wintering
- Wildlife Nesting Site
- ANSI

Wetlands (MNRF)
- Unevaluated Wetland
- Evaluated Wetland
- Provincially Significant Wetland

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Figure: 6-1
Project No.: 1416006
Date Created: 14 April 2016 Date Modified: 14 June 2016
Coordinate System: NAD 1983 UTM Zone 17N
For Illustrative Purposes Only
FIGURE 6-2
Surficial Geology

Legend

- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Existing Roads
- Future Roads
- Railway Track
- Watercourse

Surficial Geology
- Clay, silt, sand, gravel
- Diamicton
- Gravel
- Organic deposits
- Sand

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6.4.4 HYDROGEOLOGY AND GROUNDWATER

The depth to the top the shallow perched groundwater, is quite variable across the Stage 2 Lands “table land” study areas, from reportedly at or near surface to 2 to 3 metres below ground surface and appears to be correlated to the presence or absence of shallow near surface granular outwash deposits. This characterization needs to be verified.

West of the Stage 2 Lands located across from the Grand River in Kitchener is found the alluvial aquifer flood plain aquifer within the valley lands and is a separate distinct hydrogeological system which, while in direct connection to the Grand River is not in connection to the topographically high Stage 2 table land areas.

It is interpreted from available background sources (GRCA 2014, MTE 2014), that the creeks and wetlands in the study area are highly influenced by groundwater, due to the generally high permeability of near-surface deposits, where outwash sediments are present. It is also interpreted, as per MTE (2014), the intervening 20m+ thick sequence of glacial till, between the glaciofluvial outwash deposits, isolates groundwater flow from the underlying bedrock aquifer, resulting in strong downward gradients, as well as isolates the shallow aquifer from the influence of pumping of municipal production wells completed in the deeper bedrock aquifer, in the East Side Lands.

There is no established ground water monitoring well network available to be accessed or used for this study.

DATA GAPS

Based upon a review of the available published information and in recognition of recent Stage 2 Lands land parcel hydrogeological reconnaissance field inspections by MMM staff, it has been determined that supplemental shallow groundwater and surface water monitoring stations will need to be established. In particular, the lower Randall Drain has been identified as a potential area of significant groundwater discharge. These monitoring stations are required to further characterize subsurface conditions, the direction and rate of shallow groundwater flow, the delineation of groundwater dependent natural areas and groundwater /surface water interactions for this sub-watershed study. For contextual information to be considered in establishing the monitoring locations, Figure 6-3 illustrates Source Water Protection Areas and Figure 6-4 illustrates the Ministry of the Environment and Climate Change’s Water Well Record.
FIGURE 6-3
Source Water Protection Areas

SCALE AS SHOWN

Figure: 6-3
Project No.: 1416006
Date Created: 14 April 2016
Date Modified: 30 June 2016
Coordinate System: Region of Waterloo

Source: Region of Waterloo
FIGURE 6-4
MOECC Water Well Record

Legend

- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody

MOECC WWR, Depth Class
- Deep
- Intermediate
- Shallow

MOECC WWR, Use
- Abandoned
- Commercial
- Domestic
- Farm
- Industrial
- Industrial/Fire Protection
- Irrigation
- Monitoring
- Municipal
- Test Hole
- Water Supply
- Unknown

For Illustrative Purposes Only

Figure: 6-4
Project No.: 1416006
Date Created: 14 April 2016  Date Modified: 14 June 2016
Coordinate System: NAD 1983 UTM Zone 17N
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6.4.5 HYDROLOGY AND HYDRAULICS

The general study area is generally comprised of drainage areas (subwatersheds) for two municipal drains: Breslau Drain in the northwest portion of the Project Study Area (PSA) and the Randall Drain in the eastern and southern portion of the PSA. A portion of the PSA along the east bank of the Grand River Valley contains small tributaries to the Grand River and drain directly to the Grand River. Additionally, a very small portion of the PSA at the southern limit falls within the Hespeler West subwatershed area. By area, Randall Drain is the largest catchment area and occupies the majority of the PSA. The subwatersheds are shown on Figure 6-5 and described below. Note that the watercourse delineation is based on original GRCA delineation with modifications completed by MMM based on ecology field investigations. The final watercourse delineation will be based on detailed survey and will be reviewed by GRCA.

BRESLAU DRAIN

Breslau Drain has a watershed area of 4.0 km² and a total stream length of 4.2 km. Breslau Drain is a 2nd order system and it has 52% of its length at its headwater as a 1st order stream (intermittent in nature). In general, the entirety of the Breslau drain contains seasonal / non-permanent flow.

The Breslau Drain watershed is mainly rural and agricultural in nature (refer to Section 6.4.2 for additional land use information). The majority of the natural areas within its watershed are wetlands with some forest units associated with these features. At the downstream end there is an active gravel pit which occupies a relatively large area near the outlet of this drain.

Results of water quality monitoring for Breslau Drain show high nitrogen and phosphorous levels near Woolwich Street. Additional information on water quality monitoring and information available for the PSA in Section 6.4.4.

The existing hydrology models and monitoring data for Breslau Drain include:

- Preliminary Visual Otthymo (VO) hydrologic model (available in hard copies);
- Water Quality monitoring at Menno Street and Woolwich Street. Sample parameters include field testing (Temperature, pH Conductivity and DO) and lab analysis (incl. TSS, Phosphorus, Chloride); and
- There are no flow monitoring gauges located on Breslau Drain.
The existing hydrology models and monitoring data for Randal Drain include:

- Preliminary Visual Otthymo hydrologic model. The existing VO model (available in hard copies from GRCA / Municipal Partners).
- Water Quality monitoring was carried out at several locations including: Randall Drain at KW Airport, East Branch, Lonsdale Rd, upstream of Menno St., and upstream of Riverbank Rd. Sample parameters include field testing (Temperature, pH Conductivity and DO) and lab analysis (incl. TSS, Phosphorus, Chloride).
- Two continuous flow monitoring gauges and one continuous level logger are located at:
  - Randall Drain at Riverbank - continuous flow monitoring gauge operating since 2005;
  - Randall Drain at Airport - continuous flow monitoring gauge operating since 2008; and
  - Randall Drain SWM pond at Airport - continuous level logger operating since 2013.

A weather station including a precipitation gauge is located near the Waterloo Airport.

**FLOODPLAIN MAPPING FOR BRESLAU DRAIN AND RANDAL DRAIN**

Estimated floodlines have been generated by the GRCA for both drains with limited detailed mapping and analysis. These floodlines were estimated based on site level analysis, which provide a general sense of flood limits, but do not meet the engineering design standards for engineered floodlines.

The existing event flood hydrology for the Breslau and Randal Drains will be revised. Breslau Drain hydrology completed by SCS Consulting is considered very conservative. As part of this study MMM will review and update the SCS flows and update the 2003 Stantec hydrology (Visual Otthymo model).

**DATA GAPS & EXISTING DRAINAGE ISSUES**

There is an existing flooding issue on the boundary between the Hespeler West and Randall Drain watersheds in the area between Middle Block Road and Kossuth Road. This issue requires a special study. The study findings may affect floodplain mapping for Middle Creek. Based on filed observations it seems that the flow is going to the north while the overflow is going to the west. Flooding in this area may be attributed to a blocked culvert. One of the options to be considered is increasing the culvert opening.

In order to provide engineered floodlines for both the Randall and Breslau Drains more detailed hydrology for flood events and more detailed topographic mapping are required. MMM is looking to GRCA obtain LiDAR mapping for the purpose of floodline delineation for each watercourse. The LiDAR files are currently under GRCA review. At a minimum some field channel cross section survey defining the low flow channel and existing structures will be required.
Rehabilitation plans for the gravel pit at the downstream end of the Breslau Drain will be required to produce final floodlines at this location.

6.4.6 STREAM GEOMORPHOLOGY

It is well known that watercourses are a product of processes within their catchments and are particularly sensitive to changes in the watershed due to urbanization. Controlling influences includes climate (precipitation) and geology while modifying influences include riparian vegetation, channel modifications and land use. The length of time it takes for a reach to respond to a disturbance varies dramatically according to the magnitude and number of the disturbances and the current stability of the watercourse. The use of applied fluvial geomorphology is necessary to understand these processes that operate at different spatial and temporal scales and to make recommendations to mitigate the impact of urbanization on the form and function of the watercourses.

The East Side Lands and refers to an area of land on the east side of the Grand River in the northern portion of the city of Cambridge and the southern portion of the township of Woolwich. There are two watersheds that drain these lands; namely Breslau Drain and Randall Drain. A review of background information was completed to gain an understanding of the availability of necessary data sets to describe the existing conditions of these watersheds and to determine additional data that is required to complete the fluvial geomorphic assessment. Considerable work has been completed between 2008 and 2010 by various groups and is summarized in reports from Waters Edge and AquaResource.

DRAINAGE BASIN & DRAINAGE NETWORK CHARACTERISTICS

The Randall and Breslau Drains have catchment areas of approximately 11 km² and 2.5 km² respectively with total watercourse lengths of 11 km and 4.2 km respectively. These watershed metrics may be used to describe the drainage density which is defined as the efficiency of the watershed in draining runoff from the catchment. Interestingly, the drainage density for Breslau Drain (1.68) is higher than that of Randall Drain (1.02). The predominant land use in both watersheds currently comprises agriculture (Randall - 71%, Breslau - 59%), urban (Randall – 13%, Breslau – 11%) and swamp (Randall – 13%, Breslau – 17%). The lower reaches of both watersheds comprise glaciofluvial sand while the headwaters comprise a silt-to-sandy silt till (Port Stanley Till).

HISTORIC INFLUENCES AND RESPONSES

Historical aerial photography indicates this area was dominated by agricultural and treed/swamp land use. As noted above, the land use distribution has shifted recently and now includes slightly greater than 10% urban area. Typical channel responses to land use alternations include increased sediment load and flashier flows which combined often lead to unstable channels. Similarly, channels are often shortened and straightened in agricultural areas to improve field drainage. These activities can result in unstable channels due to faster flows causing bank and bed erosion and ultimately adding more sediment than what the channel can transport. Straightened channels often work to regain a meandering alignment over time.
CHANNEL CONDITIONS

Considerable work has been recently completed on the channel conditions of Randall Drain but limited work has been completed on the Breslau Drain. The field work included measurements of channel geometry (slope, cross-section, plan form), sediment and stream flow.

Randall Drain has a predominant slope of 0.29% characterized by steeper slopes in the upper and lower reaches with a milder slope in the middle reach; not atypical of glacially conditioned watersheds. The bankfull width is approximately 7m and the bankfull flow is approximately 3.1 m$^3$/s. The flow distribution along the watercourse was measured on October 14, 2014 and ranged from 0.029 m$^3$/s to 0.118 m$^3$/s. The GRCA has established a stream gauge on Randall Drain at Riverbank Drive in April 2005. Analysis of the first five years of flow record determined that the 2-yr return period flow was 2.8 m$^3$/s. The substrate characteristics were defined as having a d50 of 75mm and a gradation ratio (d84/d16) of 11.

Breslau Drain has a predominant slope of 0.50% that is slightly steeper than that of the Randall Drain but also has a similar longitudinal profile. A preliminary estimates, based on limited data, of the bankfull width is approximately 3.3 m$^3$/s and a bankfull flow of approximately 1.1 m$^3$/s. There are no stream flow gauges on Breslau Drain. The substrate characteristics were defined as having a d50 of 25mm and a gradation ratio (d84/d16) of 29, which is quite different than the characteristics of Randall Drain.

DATA GAPS

After review of the background data, summarized above, various gaps in the data have been identified. The following data should be collected to supplement existing data sets in order to gain a thorough understanding of the form and function of the watercourses of the Randall and Breslau Drains:

- Ortho-rectified historical aerial photography from the period of record that should be analyzed using standard photogrammetric techniques to located relevant fluvial geomorphic features;
- Topographic survey of the primary channel of each watercourse suitably defining the bed and banks;
- Analysis of the most recent stream flow record of Randall Drain at Riverbank;
- Establish additional short-term stream flow gauges in Randall Drain (see Hydrology);
- Establish a long-term stream flow gauge of Breslau Drain immediately upstream of the confluence with the Grand River;
- Establish additional short-term stream flow gauges in Breslau Drain;
- Collect pavement and sub-pavement sediment samples and submit for grain size analysis;
- Establish monumented cross-sections at three locations within both watercourses to monitor change in geometry over time;
- Conduct in-situ bedload and suspended load sampling during storm events;
- Establish erosion pins at selected locations along the primary channel of each watercourse; and
- Identify sediment sources and sinks in both watersheds.

### 6.4.7 DESIGNATED NATURAL HERITAGE FEATURES

#### PROVINCIA LLY DESIGNATED FEATURES

Based on background information review, a brief summary of each feature listed under section 2.1 of the PPS is provided below:

**Significant Wetlands (PSW):** Three Provincially Significant Wetlands (PSWs) are present within the Project Study Area: the Breslau Wetland Complex, Kossuth Wetland Complex, and Maple Grove Wetland Complex. Provincially significant wetlands (per Land Information Ontario [LIO]) is presented on Figure 6-6.

**Significant Coastal Wetlands:** None present within the Project Study Area.

**Significant Woodlands:** All woodlands greater than 4 ha within the PSA are identified as Regionally Significant Woodlands; these areas generally have one or more additional overlapping natural heritage designations (e.g., PSW). Significant Woodlands are illustrated in Figure 6-9 included at the end of this section.

**Significant Valleylands:** The Grand River valley is designated as a significant valley (per Map 4 of the ROP).

**Significant Wildlife Habitat (SWH):** Record of a heronry within a woodland north of Menno Street was identified through background review (Plan B Natural Heritage 2014). No other confirmed SWH has been identified by planning authorities or background studies within the Project Study Area; however, potential for Significant Wildlife Habitat occurs in association with the large habitat blocks present throughout the study area and the adjacent Grand River.

**Areas of Natural and Scientific Interest (ANSI):** No ANSIs are present within the Project Study Area. Two areas designated as ANSIs are located west of the Grand River (Figure 6-6), outside the PSA.

**Fish Habitat:** Both Randall and Breslau Drains support direct fish use and are considered fish habitat. It is unknown whether the Tributaries to the Grand River support direct fish use or provide indirect habitat to downstream reaches in the form of allochthonous and baseflow contributions to the Grand River.

**Endangered or Threatened Species:** Several SAR are known to occur or potentially occur within the Project Study Area. Refer to Section 6.4.8 for additional information.
REGION OF WATERLOO GREENLANDS NETWORK

The Region of Waterloo Greenlands Network is shown on Figure 6-7. Based on background information review, a brief summary of Greenland Network features within the Project Study Area (PSA) is provided below:

**Landscape-Level Systems:** No Environmentally Sensitive Landscapes as defined in the ROP are present within the PSA. The Grand River runs along the western limit of the PSA, defining its boundary, and is a Significant Valley under the ROP Landscape Level Systems. No Regional Recharge Areas or features associated with the Provincial Greenbelt Natural Heritage System are not within the PSA.

**Core Environmental Features:** These features are generally consistent with the PPS designations and are discussed in the preceding section. Core Environmental Features are present in the PSA largely as woodlands and PSW features that occur throughout. One Environmentally Sensitive Policy Areas (ESPA) is partially contained within the PSA, ESPA 21 (Breslau Heronry), near the northeast corner of the study area. ESPA 22 (Kossuth Swamp) is contiguous to the study area at the southeast edge of the PSA. ESPA 24 (Natchez Hills) and ESPA 25 (Lackner Woods) are located in close proximity to the PSA, on the west side of the Grand River.

**Fish Habitat:** Both Randall and Breslau Drains within the PSA support direct fish use and are considered fish habitat. The MNRF does not have fish records within these tributaries and it is unknown whether the Tributaries to the Grand River support direct fish use or provide indirect habitat to downstream reaches in the form of allochthonous and baseflow contributions to the Grand River.

**Supporting Environmental Features:** No environmentally significant discharge or environmentally significant recharge areas were identified within the PSA through background review. Large areas within the PSA are regulated by the GRCA under O. Reg. 150/06. Regulated areas are predominantly associated with wetlands within the PSA, as well as areas surrounding the Randall and Breslau drains and their tributaries. GRCA regulated areas are shown on Figure 6-8.

**Linkages:** Adjacent Greenlands / Natural Heritage Systems and/or recommendations identified in available detailed studies include those from the Hespeler West Subwatersheds Study (PEIL 2004), the Breslau Comprehensive Environmental Overview Breslau Secondary Plan (Plan B Natural Heritage 2014), and the East Side Lands (Stage 1 Lands) MESP (Dillon et al. 2014). These are generally associated with riparian / stream corridors, the Grand River valleyland, woodlands, and wetland features in the surrounding landscape, and enhancement or linkage areas for connection to the Stage 2 Lands are identified in various locations. Refer to Appendix “A” for details. No Linkages were identified within the PSA through background review.
FIGURE 6-7
Regional Official Plan

Legend
- Project Study Area
- Stage 2 Lands
- East Side Lands
- Municipal Boundary
- Parcel Boundary
- Airport Lands
- Existing Roads
- Future Roads
- Railway Track
- Watercourse
- Waterbody

Environmentally Sensitive Policy Areas
Core Environmental Features

* Environmentally Significant Landscapes do not appear in data frame

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CITY OF CAMBRIDGE NATURAL HERITAGE SYSTEM

All MNRF mapped woodlands are considered LSNAs within the city of Cambridge. These features are not mapped in the City of Cambridge Official Plan, and are not mapped in this report; their significance within the city is noted and will be considered through subwatershed analyses.

TOWNSHIP OF WOOLWICH NATURAL HERITAGE SYSTEM

No LSNFs were identified within the PSA through reviewed background material. The Township Official Plan speaks to field investigations to assess local significance; works associated with this study may identify LSNFs through its analyses.

GRCA REGULATED AREAS

GRCA Regulated Areas are shown on Figure 6-8. It should be noted that these areas are not considered static and are subject to revisions. These areas are not all inclusive and are likely to change based on the results of the Subwatershed Study.

6.4.8 TERRESTRIAL ECOLOGY

FLORA

Within surrounding lands, various background documents have noted the presence of flora typical of the region, consisting of common native and non-native flora, as well as the presence of sensitive flora species (SAR / SCC, provincially and regionally rare species). Field effort varied by location / study; comprehensive surveys were carried out in Stage 1 Lands (3 season), Hespeler West Subwatersheds Study (1 – 2 seasons), in support of the Waterloo International Airport Master Planning Process, and as part of the EIS addendum for the Empire Riverland Area 2 lands. The Breslau Secondary Plan area was primarily desktop-review. A total of 437 species, 428 species and 264 species were reported respectively for the Hespeler West Subwatersheds Study, Stage 1 Lands study and Waterloo International Airport Master Planning Study. Based on field work completed in 2013 and 2015, 222 species were recorded on the Riverland Area 2 property. Both the Hespeler West and Stage 1 Lands study reported the presence of 23 regionally significant species and 1 SAR (Butternut). The Riverland Area 2 EIS addendum recorded 11 species of conservation concern and one SAR (butternut). The Waterloo International Master Planning Study reported six regionally significant species and no SAR. Conditions are expected to be similar within the Stage 2 Lands due to similar land-use histories and landscape.

Species lists and information from immediately adjacent studies, including the Stage 1 Lands MESP (Aquafor Beech, 2013), the Hespeler West Subwatershed Study (PEIL, 2004), the Waterloo International Airport Master Planning Study and Riverland Area 2 EIS addendum will be used to compare relative diversity of features within the Stage 2 Lands Subwatershed Study and MESP.
VEGETATION COMMUNITIES

A variety of natural and cultural communities are present within the PSA and surrounding lands interspersed within the rural / agricultural landscape. Vegetation communities present in surrounding lands are a mix of cultural, forested, and wetland types. Within the Hespeler West Subwatersheds Study, swamps were the most abundant type followed by forests. The Stage 1 Lands consist of swamps, marshes, open and shallow aquatic wetlands, forests, and cultural woodland, plantation and meadows. The Waterloo International Airport Master Planning Study area consisted of vegetation communities predominantly composed of wetlands and included swamp, marsh, meadow marsh and shallow open aquatic communities associated with Kossuth PSW Complex and Breslau PSW Complex. One provincially rare community type was reported – Bur Oak Mineral Deciduous Swamp (outside the Stage 2 Lands PSA). Within the PSA, the dominant natural features are several large woodland patches consisting primarily of swamp and forest communities. Woodlands and wetlands cover 3.8% (63.9 ha) and 12.5% (209.8 ha) of the Project Study Area, respectively (from SOLRIS v2 dataset). Wetlands within the Project Study Area generally belong to three Provincially Significant Wetland complexes, with the majority of wetland units associated with the Breslau Wetland Complex and Kossuth Wetland Complex, and a small portion of the Maple Grove Wetland Complex occurring at the southwest edge of the Project Study Area. Several small unevaluated wetland patches are also present in the Project Study Area.

FAUNA

Comprehensive studies identifying characteristic species and important habitats have been conducted for lands in the vicinity of the PSA and include the following (discussion of known and potential wildlife SAR is provided in the next section):

a) (Stage 1 Lands MESP (including the MESP document, Community Plan, Fiscal Impact Analysis Report and Appendices - Freeport Creek and Tributary to the Grand Subwatershed Study, Master Drainage Plan, Transportation System Assessment and Municipal Water and Wastewater Servicing Requirements Assessment (Dillon et al., 2014))

b) Breslau Comprehensive Environmental Overview (Plan B Natural Heritage, 2014)

c) Hespeler West Subwatersheds Study (PEIL, 2004)


e) Empire Riverland Area 2 EIS addendum (MMM Group Limited, 2016)

Comprehensive surveys for amphibians, reptiles, avifauna, and mammals were carried out in the spring, summer, and fall throughout the Project Study Area for Stage 1 Lands according to applicable standard protocols. Surveys consisted of vernal pool assessments and salamander trapping (April), amphibian calling (April – June), road mortality surveys for reptiles (fall), natural cover surveys (September - October), raptor wintering (March), Red-shouldered Hawk and
Woodpecker (May), breeding birds and crepuscular surveys (June – July), fall waterfowl staging, overwintering Bald Eagle surveys (February – March), and deer yard and wildlife movement surveys (March). A total of 119 species were reported by Aquafel Beech (2013) in the Stage 1 Study Area, consisting of amphibians, reptiles, birds, mammals, and insects. Several SAR / SCC and 22 regionally significant species were recorded. A variety of area sensitive birds were recorded, consisting of open country, forest, and marsh birds.

Within the Hespeler West Subwatersheds Study, faunal surveys were conducted in 2002 throughout late winter (March) to summer (July). Survey types included winter mammals and bird surveys, amphibian calling, vernal pond checks for salamander species, breeding birds, natural cover searches, and incidental recording of insect, reptile, and mammal species. A total of 144 species were recorded, and of these 35 are regionally significant amphibians, birds, and mammals. Recorded avifauna were predominantly forest associates, with some marsh and open country species. Several forest interior and area sensitive species were also recorded. Many faunal status ranks reported in the HWSS are out of date; status of SAR / SCC and regionally significant records for comparative purposes with the Stage 2 Lands will be confirmed for study completion.

Surveys within Breslau Secondary Plan area were carried out in 2012 by Plan B Natural Heritage and included breeding bird point counts (June – July), amphibian calling (April – June), and wildlife corridor surveys (July). 54 species of birds were recorded, of these, most are common/habitat generalist species, but some wetland and grassland obligate species were also present. Amphibians recorded included spring peeper, American toad, northern leopard frog, gray tree frog, bullfrog and green frog, and a variety of common mammals were observed.

Surveys completed for the Waterloo International Airport Master Planning Study included breeding bird point counts (June-July 2014), breeding amphibian surveys (April-June 2014), winter wildlife and habitat surveys (March-April 2014), and general wildlife / habitat assessments (conducted coincidently with other surveys. A total of 60 bird species were recorded, including four threatened SAR in Ontario (Bank Swallow, Barn Swallow, Bobolink, Eastern Meadowlark) and two Special Concern species (Eastern Wood Pewee and Wood Thrush). In addition to these SAR bird species, 15 regionally rare bird species were observed. Six breeding amphibian species were recorded, all considered widespread and common. No regionally significant mammals, herpetofaunal or insects were recorded.

Surveys completed for the Riverland Area 2 EIS addendum included targeted breeding bird surveys (May-July 2013), Bobolink, Eastern Meadowlark and Common Nighthawk surveys (June-July 2013), breeding amphibian surveys (spring 2013-2014), turtle habitat and basking surveys (spring / summer 2014-2015), bat maternity habitat assessment (summer 2015) and snake hibernacula habitat assessment (summer / fall 2015). A total of 78 bird species were recorded, the majority of which (72 species) are considered ‘breeding’ species within the Project Study Area. Of the 72 breeding species, two are designated as threatened in Ontario (Barn Swallow, Chimney Swift) and two designated as Special Concern (Eastern Wood Pewee, Wood Thrush). In addition to these SAR species, 21 species are considered regionally rare. Thirteen (13) herpetofauna species were recorded during field surveys in 2013-2014, including Snapping Turtle, designated as Special Concern in Ontario.
Detailed information on wildlife in the PSA is limited. It is expected that species within the Stage 2 Lands will be generally consistent with those observed through adjacent land use studies. Species lists and information from immediately adjacent studies, including the Stage 1 Lands MESP (Aquafor Beech, 2014), the Hespeler West Subwatershed Study (PEIL, 2004) and Waterloo International Airport Master Planning Study (MMM Group, 2014) will be used to compare relative diversity of features within the Stage 2 Lands Subwatershed Study and MESP.

SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN

For the purposes of this report, Species At Risk (SAR) are defined as species listed as Endangered or Threatened under the ESA, while Species of Conservation Concern (SCC) are those that are federally listed under SARA, Special Concern under the ESA, and those that are provincially rare (i.e., with S-ranks of S1-S3). Several SAR and SCC have been identified within lands adjacent to the PSA in other detailed studies, including Butternut, Barn Swallow, Bank Swallow, Grasshopper Sparrow, Bobolink, Eastern Meadowlark, Bald Eagle, Rusty Blackbird, Eastern Wood-pewee, Wood Thrush, Western Chorus Frog (Great Lakes/St. Lawrence Population), Snapping Turtle, Milksnake, and Monarch. A search of available background material identified several SAR and SCC that are known to occur or have potential to occur within the PSA or adjacent lands and are provided in Appendix A.

SIGNIFICANT WILDLIFE HABITAT

Detailed studies carried out in lands surrounding the PSA have identified several types of Significant Wildlife Habitat within many of the larger features present in the landscape and in association with the Grand River corridor. Aquafor Beech (2013) reported the following types of SWH within remaining large natural features (generally woodland / swamp habitats and other wetlands) in the Stage 1 Project Study Area:

- Seasonal Concentration Areas: Deer Yards, Colonial Bird Nesting Sites, Turkey Vulture Summer Roosting Habitat
- Specialized Habitats for Wildlife: Habitat for Area Sensitive Species, Forest Providing a High Diversity of Habitats, Foraging Areas With Abundant Mast, Amphibian Woodland Breeding Ponds, Turtle Nesting Habitat, Specialized Raptor Nesting Habitat
- Habitats of Species of Conservation Concern, and
- Regional Animal Movement Corridors (Grand River valley corridor)

Significant Wildlife Habitat (i.e., a heronry) has been identified in the PSA north of Menno Road (Plan B Natural Heritage 2014) within the PSA. No other confirmed SWH has been identified in available background studies within the PSA; however, as in surrounding lands, it has potential to occur in association with the large habitat blocks present and the Grand River valley.

DATA GAPS

No detailed surveys have been conducted within the Project Study area or the Stage 2 Lands that could be identified through available background information. As such, a comprehensive field program and associated analyses are required to characterize the Stage 2 Lands and
general characterization of the Project Study Area in support of the Subwatershed Study. These include:

- Ecological Land Classification and botanical inventory of Stage 2 Lands and general characterization of the Project Study Area (air photo interpretation)
- Complexing assessment for unevaluated wetlands within the Stage 2 Lands per OWES to assess inclusion within existing designated PSWs
- Assessment of unevaluated wetlands within the Stage 2 Lands per GRCA wetlands policy
- Assessment of the interactions between terrestrial feature and surface and groundwater systems within the Project Study Area
- Wildlife habitat assessment and wildlife inventory of Stage 2 Lands (e.g. breeding bird surveys, winter wildlife)
- Significant Wildlife Habitat evaluation
- Screening assessment for SAR species and species-specific surveys if / as required to assess potential presence within the Stage 2 Lands
- Evaluation of feature significance and constraint analysis for Greenland Network recommendations (e.g. core environmental features, linkages, buffers, enhancement areas) within the Stage 2 Lands and the Project Study Area

As noted in the introduction, a comprehensive four-season field program was undertaken in 2015 and early 2016. This field program addresses the field inventory (e.g. ELC, breeding bird surveys, etc.) data gaps identified above. Analyses to assess significance (e.g. Significant Wildlife Habitat, wetland complexing) will be completed through the subwatershed study and comprehensive EIS.

6.4.9 AQUATIC ECOLOGY

SURFACE WATER QUALITY

To characterize and benchmark the chemical, physical and biological aspects of the water quality within the East Side Lands, a monitoring program has been developed and implemented by the GRCA from 2005 to present to provide comprehensive baseline data prior to significant land use changes. In addition, three years of winter water quality baseline data were collected at various sites after publication of the Subwatersheds Characterization Report (2005-2010 data set). Within the Project Study Area for the Stage 2 Lands, surface water quality (including general chemistry, water temperature, conductivity and turbidity) has been monitored at five (5) sites within the Randall Drain subwatershed since 2005. Water quality monitoring within Breslau Drain was initiated at one site in 2007; a second site was added in 2011 and has continued to the present. There are no historic or present water quality monitoring stations in any of the Tributaries to the Grand River. Monitoring station locations within and in close proximity to the PSA are shown on Figure 6-8. It should be noted that sampling sites and parameters varied from year to year.
FIGURE 6-8
Grand River Conservation Authority

Legend

Project Study Area
Stage 2 Lands
East Side Lands
Municipal Boundary
Parcel Boundary
Airport Lands
Existing Roads
Future Roads

Railway Track
Watercourse
Waterbody
GRCA Wetlands
Rain Gauge Station
Water Flow Gauge
Water Quality Monitoring Site

Natural Hazards
GRCA Regulatory Floodplain (Under Review)
Steep Slope
Oversteep Slope

For Illustrative Purposes Only

Figure: 6-8
Project No.: 1416006
Date Created: 14 April 2016   Date Modified: 14 June 2016
Coordinate System: NAD 1983 UTM Zone 17N
Source: Region of Waterloo, ©Queen's Printer for Ontario, 2016,
Produced using information under License with the GRCA.
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GENERAL CHEMISTRY MONITORING

The following general chemistry parameters have been collected as part of the surface water quality monitoring program (GRCA 2014).

**TABLE 6-4 – WATER CHEMISTRY PARAMETERS AND RELATED DETECTION LIMITS (GRCA 2014)**

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<thead>
<tr>
<th>Parameter</th>
<th>Detection Limit</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>Total Dissolved Solids</td>
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</tr>
<tr>
<td>Total Suspended Solids</td>
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</tr>
<tr>
<td>Orthophosphate (P)</td>
<td>0.01 mg/l</td>
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<tr>
<td>Total Phosphorus</td>
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</tr>
<tr>
<td>Dissolved Sulphate (SO₄)</td>
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</tr>
<tr>
<td>Dissolved Chloride (Cl)</td>
<td>1 mg/l</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen (TKN)</td>
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</tr>
<tr>
<td>Nitrate (N)</td>
<td>0.1 mg/l</td>
</tr>
<tr>
<td>Nitrite (N)</td>
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**YSI Parameters**

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<th>Parameter</th>
<th>Accuracy</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>Conductivity</td>
<td>+/- 0.5%</td>
</tr>
<tr>
<td>pH</td>
<td>+/- 0.02</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>+/- 0.2 mg/l or 2% whatever is greater</td>
</tr>
</tbody>
</table>

WATER TEMPERATURE, TURBIDITY AND CONDUCTIVITY MONITORING

To measure water temperature, turbidity and conductivity, loggers were deployed at various locations within the subwatersheds from 2006 to present. Both site location and parameters measured varied from year to year (for example, conductivity loggers were not deployed prior to 2013; turbidity loggers were not deployed in 2008). Turbidity loggers have never been deployed in Breslau Drain.

BASELINE CHARACTERISTICS INFERRED FROM MONITORING RESULTS

The following preliminary surface water quality characteristics were inferred from monitoring program results between 2005-2010 and presented in the Subwatersheds Characterization Report (GRCA 2014):

**Randall Drain:** Water quality conditions within Randall Drain have been assessed as poor to fair. Conditions are highly impaired below Lonsdale Road and improve towards the mouth of the subwatershed.

- Concentrations of nutrients and chloride below Lonsdale Road were very high and some parameters (e.g. nitrate, chloride) exceeded recommended values by as much as an order of magnitude.
- Water temperature monitoring suggests warm water conditions in Randall Drain near Lonsdale Road and cool to warm further downstream, suggesting groundwater inputs...
within the system.

- Periodic measurements suggest decreases of dissolved oxygen during the summer months may reach concentrations harmful to warm water biota.

- Sites in Randall Drain had relatively high median TDS values, with a strong gradient decreasing in the downstream direction.

- Data describe a linear relationship between TDS and chloride at all sites, suggesting an upstream source of TDS and chloride, diluting towards the mouth of the drain.

- Approximately 11% of the samples within Randall Drain had TSS concentrations greater than 25 mg/L, the benchmark at which there is no evidence of harmful effects on fish or fish habitat. There was no consistent trend in TSS from headwaters to mouth in the subwatershed.

**Breslau Drain:** Water quality conditions within Breslau Drain are undetermined, possibly due to intermittent flow conditions during the summer and fall.

- Monitoring near Woolwich Street indicated a high level of enrichment of nitrogen and phosphorus.

- Monitoring of water temperatures near Woolwich Street suggest cool to cold water conditions, suggesting groundwater discharge within the system.

- Periodic measurements suggest decreases of dissolved oxygen during the summer months may reach concentrations harmful to warm water biota.

- The highest measured concentration of TSS was measured in Breslau Drain (160 mg/L), well above the benchmark of 25 mg/L where there is no evidence of harmful effects on fish or fish habitat. There was no consistent trend in TSS from headwaters to mouth in the subwatershed.

**Benthic Invertebrates**

Benthic invertebrate communities within Randall and Breslau Drain subwatersheds have been collected as part of a monitoring program developed and implemented by the GRCA from 2005 to present to provide an understanding of the integrity of the aquatic ecosystems, as the presence or absence of these organisms provide an indication of the long-term, overall quality of surface water and aquatic habitat. Within the Project Study Area for the Stage 2 Lands, benthic invertebrates have been collected at four (4) sites within the Randall drain subwatershed since 2005. Benthic invertebrate monitoring within Breslau Drain was initiated at one site in 2010; a second site was added in 2011 and has continued to the present. There are no historic or present benthic invertebrate monitoring stations in any of the Tributaries to the Grand River. Monitoring station locations within and in close proximity to the PSA are shown on Figure 6-8.

Benthic invertebrates were collected twice a year (spring and summer) in accordance with the Ontario Benthos Biomonitoring Network (OBBN) protocol using the traveling kick-and-sweep method of collection. Three sub-samples were collected at each site with an attempt to sample various habitats. In addition, habitat characteristics for the areas surveyed were summarized on
the OBBN field sheets. Samples were enumerated and identified to genus level and when possible, species level.

The diversity in the benthic community in Randall Drain was relatively high in sampled reaches, with the exception of the reach nearest the airport. The proportion of sensitive species was highest at the site farthest downstream. Despite very high concentrations of nitrate and chloride, species known to be sensitive to water quality were present at the site below Lonsdale Drive, potentially due to the presence of localized groundwater seeps (GRCA 2014). Analysis of benthic macroinvertebrate sampling data in Breslau Drain has not yet been completed as sampling did not begin until 2010 and those data were not included in the Subwatersheds Characterization Report (GRCA 2014).

AQUATIC HABITAT AND FISHERIES

From 2005 to present, fish communities within Randall and Breslau Drains were surveyed by the GRCA in partnership with the Region of Waterloo in accordance with the Ontario Stream Assessment Protocol (OSAP) fish sampling procedures. Within the Project Study Area for the Stage 2 Lands, sampling has occurred at ten (10) sites within the Randall Drain subwatershed since 2005. Fish sampling within Breslau Drain was initiated at one site in 2010; a second site was added in 2011 and has continued to present. It should be noted that all sites were not sampled every year of monitoring. To date, there have been no aquatic habitat or fish community sampling sites within the Tributaries to the Grand River as part of the GRCA East Side Lands monitoring program. The MNRF does not have any historical fish community sampling sites within these Tributaries.

A total of 15 species representing 11 genera were recorded in Randall Drain between 2005 and 2010, with most species being recorded at the mouth of the Drain. Most species sampled (11 out of 15 or 73%) prefer cool water. Cool water species also accounted for 70% or more of the species sampled at each sampling site. Blacknose Dace, a cool water species, was found to be most abundant. All species collected are considered to be common and widespread in Ontario. A single species, Brook Stickleback, was sampled at the Menno Street site, located further upstream relative to all other locations and appears to lack suitable direct fish habitat. Adjacent land used (airport, agriculture) may negatively affect fish habitat in the upstream reaches of this Drain. Abundant barriers to fish movement and drain maintenance activities could also account for the scarcity of fish in the upper reaches of Randall Drain.

Breslau Drain was sampled in 2010, 2011 and 2013. A total number of three (3) species representing two (2) genera were recorded during these three years of sampling. Two of the three species (Fathead Minnow and Bluntnose Minnow) prefer warmwater, while the other species captured (Brook Stickleback) prefers cooler water. All species are considered relatively tolerant, common and widespread in Ontario. Breslau Drain is considered ephemeral and thus provides limited fish habitat throughout its length.

As part of the Airport Master Planning Study, MMM Group Limited characterized the aquatic habitat of Randall Drain through the Airport lands and to the south through the Kossuth PSW Complex, finding a primarily channelized / straightened watercourse with little diversity or riparian cover. South of the Airport, Randall Drain displays more natural channel characteristics
and habitat diversity. Fish captured in minnow traps during this study included: Creek Chub, Blacknose Dace, Northern Redbelly Dace and Brook Stickleback, all considered common and widespread in Ontario.

DATA GAPS

Detailed information is available for the Randall and Breslau Drains subwatersheds for surface water quality, benthic invertebrates and fish communities. No further characterization work is required in these areas. Gaps identified through the background review, include:

- Surface water quality sampling, benthic invertebrate collection and fish community / habitat inventories for Tributaries to the Grand River;
- Mapping of known fish barriers within the Project Study Area; and
- Watercourse mapping updates. There is a discrepancy between the current GIS layers and air photo interpretation of Randall Drain, particularly within the Airport grounds where channel realignment has recently occurred.

As noted in the introduction, a comprehensive four-season field program was undertaken in 2015 and early 2016. This field program included a survey of existing watercourses within the PSA and an assessment of barriers to fish movement. Incorporation of background data and further analyses will be completed through the subwatershed study and comprehensive EIS.
7. **FISCAL IMPACT**

The Stage 2 Lands MESP and Secondary Plan process includes the development of a Fiscal Impact Analysis. Specifically, the fiscal impact assessment will:

- Provide preliminary servicing construction cost estimates for all servicing infrastructure recommended to develop the lands in the Project Study Area;
- Evaluate preferred alternatives;
- Evaluate a servicing strategy; and
- Identify cost sharing scenarios and recommend specific tools to off-set costs.

7.1 **EXISTING CONTEXT**

The development of Stage 2 Lands of the East Side Lands will generate the need for additional city of Cambridge, Township of Woolwich and Region of Waterloo infrastructure, including new and expanded roads, pumping stations, sewer and water collectors, trunks and mains, as well as stormwater management facilities.

To normalize the ability of the municipalities to fund growth and secure contribution for major capital works that would be triggered by development and growth, Ontario has a *Development Charges Act, 1997* (DCA) and its associated regulation (O.Reg. 82/98). The DCA clearly identifies the parameters for recovering costs through development; it identifies possible options available to the municipality including provisions and conditions that must be met prior to entering into front-ending financing agreements and identifies mandatory exemptions under the DCA.

Growth-related capital costs are allocated to either one of two categories - Local Service Capital Costs or Oversizing Costs. The purpose in establishing these definitions is to determine the eligible capital costs that will be collected through development charges and those costs that will be collected through local charges. The term “Oversizing” refers to capital infrastructure costs whose size has been increased (over-sized) beyond the size of a local service which should be defined in Development Charge (DC) Background Studies.

In an optimal environment, there is alignment of the revenues generated from DCs to fund the priorities identified in the capital plan and the underlying development on a timely basis. However, circumstances may arise where there are insufficient funds available to pay for the capital costs to meet service costs at a point in time. This may be due to timing of the revenues generated through DCs.

The DCA includes provisions for the City, Township and Region to enter into front-ending agreements. Typically in these circumstances, agreements are structured such that the developer agrees to finance the works at the “front end” and recover their costs from the City and Region at a later date from future developers with the initial developer taking on the risk that subsequent development is sufficient to repay the front-ender and the risk associated to the timing of development.
The key provisions contained in the legislation include:

- Requires that a DC by-law be in force in a municipality and that the by-law cover the area to which the front-ending agreement applies.
- Allows entire front-ending obligation to be "tiered" or sequenced from one major front-end developer to another.
- Permits front-ending developers and municipalities to commence projects covered by a front-ending agreement prior to the day the agreement is made (to ensure time taken in any appeals does not unfairly affect front-ending).
- Clarifies municipal responsibilities and accountability for receiving payments from third parties under front-ending agreements and making corresponding reimbursements to the front-end developer.
- Provides notice and appeal provisions where there are objections from other land owners in the area affected and provides that, where any subsequent appeals are successful, the front-end developer assumes the risk of not being able to recover costs from future benefiting owners.

WATERLOO REGION DEVELOPMENT CHARGE BACKGROUND STUDY (JUNE 2014 BY HEMSON CONSULTING LTD).

The DCA permits the Region to designate, in its by-laws, the areas within which development charges shall be imposed. The charges may apply to all lands in the Region or to other designated development areas as specified in the by-laws. A widely accepted method for sharing the growth-related capital costs for such services is to apportion them over all new growth anticipated in the Region. According to the Region’s development charge by-law (By-Law Number 14-046), DCs would be imposed uniformly against all new development everywhere in the Region with the exception of the Regional Library and Transit services, which would be imposed on development in the townships and urban areas respectively. The DC by-law would have to be amended if the Region wanted to impose an area specific charge to the East Side Lands.

CITY OF CAMBRIDGE DEVELOPMENT CHARGE BACKGROUND STUDY (APRIL 2014)

Cambridge’s DC By-law states that infrastructure charges shall be calculated and collected for all land (uniform) as identified in Schedule B in their by-law.

TOWNSHIP OF WOOLWICH 2014 DEVELOPMENT CHARGES BACKGROUND STUDY (JUNE 2014 BY WATSON AND ASSOCIATES)

Woolwich’s DC By-law states that infrastructure charges shall be calculated and collected for all land (uniform) for all municipal services, except for water and wastewater services. The Township’s DCs for water and wastewater services are imposed in the municipal serviced area only (including Breslau). The Township continues to impose an additional area-specific development charge for the defined Breslau Sanitary Servicing Area (from the City of Kitchener).
7.2 SUMMARY AND INFORMATION GAPS

There are a variety of observations that can be made based on the review of existing conditions discussed above. A brief summary of these findings is outlined below.

CALCULATION OF THE DEVELOPMENT CHARGES

Calculation of the DC infrastructure costs by service will be analyzed to identify the costs that are eligible, direct developer responsibility and non-DC eligible in accordance with the Region, City and Township’s DC policy guidelines. The Region, City and Township DC by-laws allow for the collection of roads, water, wastewater and stormwater drainage to be collected at subdivision approval.

UNIFORM VERSUS AREA SPECIFIC CHARGES

The DCA permits the Region to designate, in its by-laws, the areas within which development charges shall be imposed. The charges may apply to all lands in the Region or to other designated development areas as specified in the by-laws. A widely accepted method for sharing the growth-related capital costs for such services is to apportion them over all new growth anticipated in the Region. According to the Region’s development charge by-law, DCs would be imposed uniformly against all new development everywhere in the Region with the exception of the Regional Library and Transit services, which would be imposed on development in the Townships and urban areas respectively. The DC by-law would have to be amended if the Region wanted to impose an area specific charge for the East Side Lands.
8. **CONCLUSIONS, SUMMARY OF GAPS AND NEXT STEPS**

Development of the Stage 2 Lands will require an urban area expansion in the ROP. This expansion is clearly intended by the policies of the Plan, subject to criteria. Through this process, the development of an MESP integrated with the Secondary Plan process for lands in the city of Cambridge is an appropriate method for identifying future land use, infrastructure needs and natural heritage constraints. Provincial, Regional and local policy will need to be considered through the development of the recommended solutions.

There is a significant amount of study that has been undertaken within the Project Study Area. This report has included a review of available information and identification of gaps in information, which will form the basis for developing a Technical Work Plan to ensure there will be no overlap in the level of effort and data collection. The gaps identified are summarized in **Table 8-1**.

**Table 8-1 – Summary of Gaps**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Community Planning (refer to Section 3.5)</strong></td>
</tr>
<tr>
<td>2.</td>
<td>Confirm zoning for the Airport.</td>
</tr>
<tr>
<td>3.</td>
<td>Confirm any outcomes from the ongoing Provincial Plans review.</td>
</tr>
<tr>
<td></td>
<td><strong>Servicing and Utilities (refer to Section 4.4)</strong></td>
</tr>
<tr>
<td>4.</td>
<td>Confirm the plans for Regional East Side Lands Wastewater Servicing Class Environmental Assessment.</td>
</tr>
<tr>
<td>6.</td>
<td>Updates and detailed project information for the identified anticipated projects such as the ESR for the Fountain Street Improvements as well as the works for the new water pressure zone “East Side Zone” identified in Stage 1 Lands MESP is required.</td>
</tr>
<tr>
<td>7.</td>
<td>Obtain proposed utility plans from the utility providers.</td>
</tr>
<tr>
<td></td>
<td><strong>Transportation (refer to Section 5.4)</strong></td>
</tr>
<tr>
<td>8.</td>
<td>Obtain the Region of Waterloo’s traffic forecasting model.</td>
</tr>
<tr>
<td>9.</td>
<td>Verify assumptions and rationales related to the traffic forecasting model, once obtained.</td>
</tr>
<tr>
<td>10.</td>
<td>Confirm methodology for transportation/traffic analysis for the Stage 2 Lands versus the overall Project Study Area.</td>
</tr>
<tr>
<td>11.</td>
<td>Confirm implications on the Region’s Context Sensitive Regional Transportation Corridor Design Guidelines.</td>
</tr>
<tr>
<td>12.</td>
<td>Confirm availability of and obtain any Grand River Transit design guidelines.</td>
</tr>
<tr>
<td>No.</td>
<td>Description of Gap</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
</tr>
<tr>
<td>13.</td>
<td>• Identify Township sidewalk policies for new neighbourhoods and any forecasts indicating which existing roads are planned to receive new sidewalks.</td>
</tr>
<tr>
<td>14.</td>
<td>• Identify capital forecasts for Township road improvements.</td>
</tr>
<tr>
<td>15.</td>
<td>• Confirm availability of any data regarding any applicable TDM programs.</td>
</tr>
<tr>
<td>16.</td>
<td>• Identify any planned initiatives between the Region and local municipalities to advance TDM policies and programs and partnerships.</td>
</tr>
<tr>
<td>17.</td>
<td>• Identify Regional roads with high levels of truck traffic, based on available data.</td>
</tr>
<tr>
<td></td>
<td>Hydrogeology and Groundwater (Refer to Section 6.4.4)</td>
</tr>
<tr>
<td>18.</td>
<td>• Identify supplemental groundwater and surface water monitoring stations to characterize subsurface conditions, the direction and rate of shallow groundwater flow, the delineation of groundwater dependent natural areas and groundwater/surface water interactions.</td>
</tr>
<tr>
<td></td>
<td>Hydrology, Hydraulics and Geomorphology (Refer to Sections 6.4.5 and 6.4.6)</td>
</tr>
<tr>
<td>19.</td>
<td>• Ortho-rectified historical aerial photography from the period of record that should be analyzed using standard photogrammetric techniques to located relevant fluvial geomorphic features</td>
</tr>
<tr>
<td>20.</td>
<td>• Topographic survey of the primary channel of each watercourse suitably defining the bed and banks</td>
</tr>
<tr>
<td>21.</td>
<td>• Analysis of the most recent stream flow record of Randall Drain at Riverbank</td>
</tr>
<tr>
<td>22.</td>
<td>• Establish additional short-term stream flow gauges in Randall Drain</td>
</tr>
<tr>
<td>23.</td>
<td>• In order to provide engineered floodlines for both the Randall and Breslau Drains more detailed hydrology for flood events and more detailed topographic mapping are required. MMM is looking to GRCA obtain LiDAR mapping for the purpose of floodline delineation for each watercourse. The LiDAR files are currently under GRCA review. At a minimum some field channel cross section survey defining the low flow channel and existing structures will be required.</td>
</tr>
<tr>
<td>24.</td>
<td>• Rehabilitation plans for the gravel pit at the downstream end of the Breslau Drain will be required to produce final floodlines at the above noted location.</td>
</tr>
<tr>
<td>25.</td>
<td>• Establish a long-term stream flow gauge of Breslau Drain immediately upstream of the confluence with the Grand River</td>
</tr>
<tr>
<td>26.</td>
<td>• Establish additional short-term stream flow gauges in Breslau Drain</td>
</tr>
<tr>
<td>27.</td>
<td>• Collect pavement and sub-pavement sediment samples and submit for grain size analysis</td>
</tr>
<tr>
<td>28.</td>
<td>• Establish monumented cross-sections at three locations within both watercourses to monitor change in geometry over time</td>
</tr>
<tr>
<td>29.</td>
<td>• Conduct in-situ bedload and suspended load sampling during storm events</td>
</tr>
<tr>
<td>30.</td>
<td>• Establish erosion pins at selected locations along the primary channel of each watercourse</td>
</tr>
<tr>
<td>No.</td>
<td>Description of Gap</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
</tr>
<tr>
<td>31.</td>
<td>Identify sediment sources and sinks in both watersheds</td>
</tr>
</tbody>
</table>

**Terrestrial Ecology (Refer to Section 6.4.8)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.</td>
<td>Conduct Ecological Land Classification and botanical inventory of Stage 2 Lands and general characterization of the Project Study Area (air photo interpretation)</td>
</tr>
<tr>
<td>33.</td>
<td>Conduct a complexing assessment for unevaluated wetlands within the Stage 2 Lands per OWES to assess inclusion within existing designated PSWs</td>
</tr>
<tr>
<td>34.</td>
<td>Assess unevaluated wetlands within the Stage 2 Lands per GRCA wetlands policy</td>
</tr>
<tr>
<td>35.</td>
<td>Assess the interactions between terrestrial feature and surface and groundwater systems within the Project Study Area</td>
</tr>
<tr>
<td>36.</td>
<td>Complete Wildlife habitat assessment and wildlife inventory of Stage 2 Lands (e.g. breeding bird surveys, winter wildlife)</td>
</tr>
<tr>
<td>37.</td>
<td>Undertake Significant Wildlife Habitat evaluation</td>
</tr>
<tr>
<td>38.</td>
<td>Conduct Screening assessment for SAR species and species-specific surveys if / as required to assess potential presence within the Stage 2 Lands</td>
</tr>
<tr>
<td>39.</td>
<td>Evaluation of feature significance and constraint analysis for Greenland Network recommendations (e.g. core environmental features, linkages, buffers, enhancement areas) within the Stage 2 Lands and the Project Study Area</td>
</tr>
</tbody>
</table>

**Aquatic Ecology (Refer to Section 6.4.9)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.</td>
<td>Surface water quality sampling, benthic invertebrate collection and fish community / habitat inventories for Tributaries to the Grand River</td>
</tr>
<tr>
<td>41.</td>
<td>Mapping of known fish barriers within the Project Study Area</td>
</tr>
<tr>
<td>42.</td>
<td>Watercourse mapping updates. There is a discrepancy between current GIS layer and air photo interpretation of Randall Drain, particularly within the Airport grounds where channel realignment has recently occurred</td>
</tr>
</tbody>
</table>
The next steps following development of this draft report include:

- Development of the Technical Work Plan in consideration of reviewed materials and known information gaps;
- Reviewing and confirming information gaps and the Technical Work Plan with the Region/City/GRCA/Township and other agencies;
- Issue the Notice of Commencement; and
- Hold Public Information Centre #1 to present the background review, study purpose and seek input on issues and background information.
APPENDIX A

SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN WITH POTENTIAL TO, OR CONFIRMED WITHIN, THE PROJECT STUDY AREA
Appendix A: Species at Risk and Species of Conservation Concern with Potential to, or Confirmed within, the Project Study Area

<table>
<thead>
<tr>
<th>Species</th>
<th>ESA Status</th>
<th>SARA Status</th>
<th>S-Rank</th>
<th>Recorded in PSA</th>
<th>Recorded in Adjacent Lands</th>
<th>ESA Protection</th>
<th>Source of Record</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jefferson Salamander (Ambystoma jeffersonianum)</td>
<td>END</td>
<td>THR</td>
<td>S2</td>
<td></td>
<td></td>
<td>Species Protection and Habitat Regulation</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Western Chorus Frog (Pseudacris triseriata) (Great Lakes / St. Lawrence population)</td>
<td>NAR</td>
<td>THR</td>
<td>S3</td>
<td>x</td>
<td>N/A</td>
<td></td>
<td>Aquafor Beech (2013)</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acadian Flycatcher (Empidonax virescens)</td>
<td>END</td>
<td>END</td>
<td>S2S3B,SZN</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Bald Eagle (Haliaeetus leucocephalus)</td>
<td>SC</td>
<td>NAR</td>
<td>S4B,SZN</td>
<td>x</td>
<td>N/A</td>
<td></td>
<td>Aquafor Beech (2013) / MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Black Tern (Chlidonias niger)</td>
<td>SC</td>
<td>NAR</td>
<td>S3B</td>
<td></td>
<td></td>
<td></td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Canada Warbler (Cardellina canadensis; formerly Wilsonia canadensis)</td>
<td>SC</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td></td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Cerulean Warbler (Setophaga cerulea; formerly Dendroica cerulea)</td>
<td>THR</td>
<td>SC</td>
<td>S3B</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014) / NHIC</td>
</tr>
<tr>
<td>Chimney Swift (Chaetura pelagica)</td>
<td>THR</td>
<td>THR</td>
<td>S4B,S4N</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Common Nighthawk (Chordeiles minor)</td>
<td>SC</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td></td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Grasshopper Sparrow (Ammodramus savannarum)</td>
<td>SC</td>
<td>No Status</td>
<td>S4B,SZN</td>
<td>x</td>
<td>N/A</td>
<td></td>
<td>PEIL (2004)</td>
</tr>
<tr>
<td>Golden-winged Warbler (Vermivora chrysoptera)</td>
<td>SC</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td></td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Species</td>
<td>ESA Status</td>
<td>SARA Status</td>
<td>S-Rank</td>
<td>Recorded in PSA</td>
<td>Recorded in Adjacent Lands</td>
<td>ESA Protection</td>
<td>Source of Record</td>
</tr>
<tr>
<td>-------------------------------</td>
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<td>----------------------------------------</td>
</tr>
<tr>
<td>Henslow’s Sparrow (Ammodramus henslowi)</td>
<td>END</td>
<td>END</td>
<td>SHB</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Least Bittern (Ixobrychus exilis)</td>
<td>THR</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Loggerhead Shrike (Lanius ludovicianus)</td>
<td>END</td>
<td>END</td>
<td>S2B,S2Z</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Regional list online</td>
</tr>
<tr>
<td>Louisiana Waterthrush (Seiurus motacilla)</td>
<td>SC</td>
<td>SC</td>
<td>S3B</td>
<td></td>
<td></td>
<td>N/A</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Northern Bobwhite (Colinus virginianus)</td>
<td>END</td>
<td>END</td>
<td>S1S2</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Peregrine Falcon (Falco peregrinus)</td>
<td>SC</td>
<td>No Status</td>
<td>S3B</td>
<td></td>
<td></td>
<td>N/A</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Red-Headed Woodpecker (Melanerpes erythrocephalus)</td>
<td>SC</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td>N/A</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Rusty Blackbird (Euphagus carolinus)</td>
<td>N/A</td>
<td>SC</td>
<td>S4B</td>
<td></td>
<td></td>
<td>N/A</td>
<td>Aquafor Beech (2013)</td>
</tr>
<tr>
<td>Short-eared Owl (Asio flammeus)</td>
<td>SC</td>
<td>SC</td>
<td>S2N,S4B</td>
<td></td>
<td></td>
<td>N/A</td>
<td>MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Wood Thrush (Hylocichla mustelina)</td>
<td>SC</td>
<td>No Status</td>
<td>S4B</td>
<td></td>
<td>x</td>
<td>N/A</td>
<td>Aquafor Beech (2013) / MNRF Waterloo Region List (2014)</td>
</tr>
<tr>
<td>Whip-poor-will (Cisturnulus voousenus)</td>
<td>THR</td>
<td>THR</td>
<td>S4B</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
<td>MNRF Waterloo Regional list online</td>
</tr>
<tr>
<td>Yellow-breasted Chat (Icteria virens)</td>
<td>END</td>
<td>SC</td>
<td>S2B</td>
<td></td>
<td></td>
<td>Species and General Habitat Protection</td>
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<td>Carolina Vetch (Vicia caroliniana)</td>
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**Reptiles**

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<th>ESA Protection</th>
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APPENDIX B

NATURAL HERITAGE SYSTEMS – LINKAGES: ADJACENT STUDIES TO THE RANDALL AND BRESLAU DRAINS MESP STUDY AREA
**EAST SIDE LAND MESP AND COMMUNITY PLAN**

**FREEPORT CREEK AND TRIBUTARY TO THE GRAND SUBWATERSHED STUDY**

**FIGURE 4.1.8 GREENLANDS NETWORK**

- **Highway**
- **Regional Roads**
- **Local Roads**
- **Stage 1 Study Area**
- **Municipal Boundary**
- **Region of Waterloo International Airport**
- **Detailed Subwatershed Study Area**
- **Watersheds**
- **Streams**

**Ecological Land Classification**

- **Greenlands Network**
- **Significant Valley**
- **Core Environmental Features**
- **Supporting Environmental Feature**
- **Linkage**
- **Linkage/Wildlife Movement Corridor**

*The core environmental features shown on this map are comprised of a combination of core environmental features obtained from the regional official plan, and natural heritage feature investigations completed by Aqufor Beech Limited.*

† Features have been removed since the completion of the natural features inventory.

---

**File Location:**
C:\Projects\65107-EastSideLands\GIS\MXD\Final-June12-2013\Figure-4.1.12-GreenlandsNetwork.mxd

**Date:** June 12, 2013

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**Note:**
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FIGURE 4.1.9  GREENSPACE PLAN AREA "A"

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File Location: C:\Projects\65107-EastSideLands\GIS\MXD\Final-June12-2013\Figure-4.1.8-Greenspace-ZoneA.mxd
Date: June 12, 2013
FIGURE 4.1.10
GREENSPACE PLAN
AREA "B"

BASE DATA PROVIDED BY THE MINISTRY OF NATURAL RESOURCES:
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FILE LOCATION:
C:\PROJECTS\65107-EAST_SIDE_LANDS\GIS\MXD\FINAL-JUNE12-2013\Figure-4.1.9-GreenSpace-ZoneB.mxd

DATE: JUNE 12, 2013

1 FEATURES HAVE BEEN REMOVED SINCE THE COMPLETION OF THE NATURAL FEATURES INVENTORY.
GRAND RIVER
MIDDLE BLOCK RD
RIVERBANK DR
ALLENDALE RD
BANAT RD
C6
C4
C3
C2
C0c
C0a
C5
C7
ALLENDALE CREEK
ALLENDALE CREEK
HR-C6
HR-C4
HR-C7
HR-C2
HR-C5
HR-C3
HR-C1
HR-C7
RIVERBANK DR
MIDDLE BLOCK RD
BANAT RD
ALLENDALE RD
EAST SIDE LAND MESP AND COMMUNITY PLAN
FREEPORT CREEK AND TRIBUTARY TO THE GRAND SUBWATERSHED STUDY
FIGURE 4.1.11 GREENSPACE PLAN AREA "C"
BASE data provided by the Ministry of Natural Resources
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File Location: C:\Projects\65107-EastSideLands\GIS\MXD\Final-June12-2013\Figure-4.1.10-Greenspace-ZoneC.mxd
Date: June 12, 2013
Figure 4.1.12: Greenspace Plan Area "D"

East Side Land MESP and Community Plan
Freeport Creek and Tributary to the Grand Subwatershed Study

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File Location:
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Date: June 12, 2013

† Features have been removed since the completion of the Natural Features Inventory.
Forest interior habitat is desirable here; but, ultimate size is to be determined at time of community plan.

Potential enhancement land use remains if wetland stays PSW and is > 0.5 ha and house is no longer there.

Opportunities to integrate creek at time of community plan with wetland corridor to the east.

**Green Space Strategy**

- Located within existing aggregate resource areas designated for future development.
- The Green Space Strategy is not fully implemented as shown within Enhancement Areas.
- PSW/LSW buffer - no development within 10 m without six at time of development application.
- Regional EEAC for contiguous land.
- Floodlines.
- Streams.
- Significant Natural Heritage Features.
- Potential ESPA buffer determined by regional EEAC for contiguous land.
- Stream buffer 15 metres.
- Buffer deferred to community plan.
- Buffer located in floodplain.
- Regional boundaries, Cambridge City Limits, Enhancement Areas.

---

**Hespeler West Subwatersheds Study**

File No: D03.01.09 Figure: C 3.3.1 (2004)

Scale: 1:17250 Date: September, 2004

THE CORPORATION OF THE CITY OF CAMBRIDGE