

# Peel Synthesis Report

Compilation of Conservation Authority  
Existing Watershed Plans and Related Studies  
(Part A)

November 2019



Prepared for:



*This technical summary report (including any attachments) has been prepared using information current to the report date. It provides an assessment of provincial policy conformity requirements, recognizing that Provincial plans and policies were under review and are potentially subject to change. The proposed direction contained in this technical summary report will be reviewed to ensure that any implementing amendments to the Regional Official Plan will conform or be consistent with the most recent in-effect provincial policy statement, plans and legislation. Additional changes will not be made to the contents of this technical summary report.*

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## List of Acronyms & Abbreviations

AOC	AREA OF CONCERN
BMPS	BEST MANAGEMENT PRACTICES
BUI	BENEFICIAL USE IMPAIRMENTS
CA	CONSERVATION AUTHORITY
CTC	CREDIT VALLEY, TORONTO REGION, AND CENTRAL LAKE ONTARIO
CVC	CREDIT VALLEY CONSERVATION AUTHORITY
ESGRA	ECOLOGICALLY SIGNIFICANT GROUNDWATER RECHARGE AREA
GHG	GREENHOUSE GAS
HVA	HIGHLY VULNERABLE AQUIFER
LAMP	LAKE WIDE MANAGEMENT PLAN
LID	LOW IMPACT DEVELOPMENT
LSRCA	LAKE SIMCOE REGION CONSERVATION AUTHORITY
MEA	MUNICIPAL ENGINEERS ASSOCIATION
MCR	MUNICIPAL COMPREHENSIVE REVIEW
NHS	NATURAL HERITAGE SYSTEM
NVCA	NOTTAWASAGA VALLEY CONSERVATION AUTHORITY
PCCP	PEEL CLIMATE CHANGE PARTNERSHIP ACTION PLAN
PPS	PROVINCIAL POLICY STATEMENT
RAP	REMEDIAL ACTION PLAN
SGRA	SIGNIFICANT GROUNDWATER RECHARGE AREA
SGBLS	SOUTH GEORGIAN BAY – LAKE SIMCOE
SNAP	SUSTAINABLE NEIGHBOURHOOD ACTION PROGRAM
SSWCA	SIGNIFICANT SURFACE WATER CONTRIBUTION AREAS
SWM	STORMWATER MANAGEMENT
TRCA	TORONTO AND REGION CONSERVATION AUTHORITY
WRS	WATER RESOURCE SYSTEM
WHPA	WELLHEAD PROTECTION AREA

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## 1. Purpose

The Regional Municipality of Peel (the Region) is undertaking a review and update of their Regional Official Plan – *Peel 2041: Regional Official Plan Review*. The Ontario *Planning Act* requires municipalities to update their Official Plan every five years in order to ensure Official Plan policies stay current and are consistent with provincial policy statements and conform to provincial plans. To help facilitate parts of this process, the Region asked its five local conservation authorities (CAs) to identify and summarize the available watershed planning information and associated studies that have already been undertaken so that the Region can make informed decisions as part of the Region’s Official Plan process. Additionally, this information will support the Region with its Municipal Comprehensive Review (MCR) as required by the *Growth Plan for the Greater Golden Horseshoe 2019* (Growth Plan). Policies within the Growth Plan require municipalities to undertake watershed planning to inform various land use and infrastructure decision-making processes. The Growth Plan allows for equivalent studies to demonstrate conformity with these policy requirements.

This report summarizes the available information related to watershed planning for the Region to help demonstrate Growth Plan policy conformity. The report is divided into two parts: Part A, a high-level summary of the key watershed planning documents, strategies, and policies; and Part B – Appendices, listing other available information (e.g. more detailed information such as subwatershed studies). The documents in this report, as well as in the appendices, have been selected as being representative, or “equivalent”, to components for watershed studies. Municipalities are required to demonstrate conformity with the Growth Plan through official plan updates by 2022.

### 1.1 Policy Background

Ontario has a comprehensive provincial planning framework designed to manage growth, build complete communities, and protect the natural environment in the Greater Golden Horseshoe region of southern Ontario. In addition to the Provincial Policy Statement (2014)<sup>1</sup>, the provincial plans that guide planning and infrastructure decisions in this region are the Growth Plan, the *Greenbelt Plan*, the *Oak Ridges Moraine Conservation Plan*, the *Niagara Escarpment Plan* and the *Lake Simcoe Protection Plan*.

On February 6, 2018, the Province also released a draft watershed planning guidance document, *Watershed Planning in Ontario: Guidance for Land Use Planning Authorities* (the Guidance), for a 60-day review period on the Environmental Registry. The Guidance is intended to provide direction to municipalities and other land use planning authorities on how watershed and subwatershed planning should be undertaken to satisfy provincial plans. While the draft Guidance has not yet been finalized by the Province, the document sets out the general scope of work required as part of watershed planning.

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<sup>1</sup> The provincial government released proposed revisions to the Provincial Policy Statement in July 2019. The proposed changes to relevant watershed planning policies do not affect the information in this report.

## 1.2 Conservation Authorities in Peel Region

The watersheds in Peel Region are managed by five conservation authorities: Toronto and Region Conservation Authority (TRCA), Credit Valley Conservation Authority (CVC), Conservation Halton, Lake Simcoe Region Conservation Authority (LSRCA), and Nottawasaga Valley Conservation Authority (NVCA). The Region covers portions of seven different watersheds (Table 1.1) with most of the watersheds (approximately 98% of total area of the Region) managed by either TRCA (54%) or CVC (44%). The watersheds managed by Halton Conservation, NVCA, and LSRCA collectively comprise less than 2.4% of the total area of the Region.

**Table 1.1: Watersheds in Peel Region**

Conservation Authority	Watershed	Total Area (km <sup>2</sup> )	Approximate Area in Peel Region <sup>1</sup>	
			km <sup>2</sup>	%
<b>CVC</b>	Credit River	869	522	44.1
<b>TRCA</b>	Humber River	906	389	32.8
	Etobicoke Creek	212	198	16.7
	Mimico Creek	77	48	4.1
<b>Conservation Halton</b>	Sixteen Mile Creek	372	13	1.1
<b>NVCA</b>	Nottawasaga River	3147	11	1.0
<b>LSRCA</b>	West Holland River	358	4	0.3

1: It should be noted that percentages add up to 100.1%. TRCA total area equals 53.6% and CVC 44.1%; totaling 97.7% of Peel Region watersheds

Source: Peel Region 2019, pers. comm.



## 2. Watershed Plans

Conservation Authorities (CAs) have been undertaking watershed and subwatershed planning for decades as part of their mandate to study their watersheds under the *Conservation Authorities Act*. CAs have generated a wealth of watershed planning information and studies that can be referenced to inform Peel Region's land use and infrastructure planning decision-making as part of its MCR process.

### 2.1 Existing Watershed Plans in Peel Region

Watershed plans have been created for all seven watersheds in Peel Region. Except for Sixteen Mile Creek, which only comprises 1% of the region, all watershed plans have been created within the last 12 years. Brief descriptions of the most recent watershed plan (or equivalent) are provided below. More detailed information on additional plans, reports and studies can be found in the appendices.

**Table 2.1: Peel Region Watersheds and their Most Recent Watershed Plan**

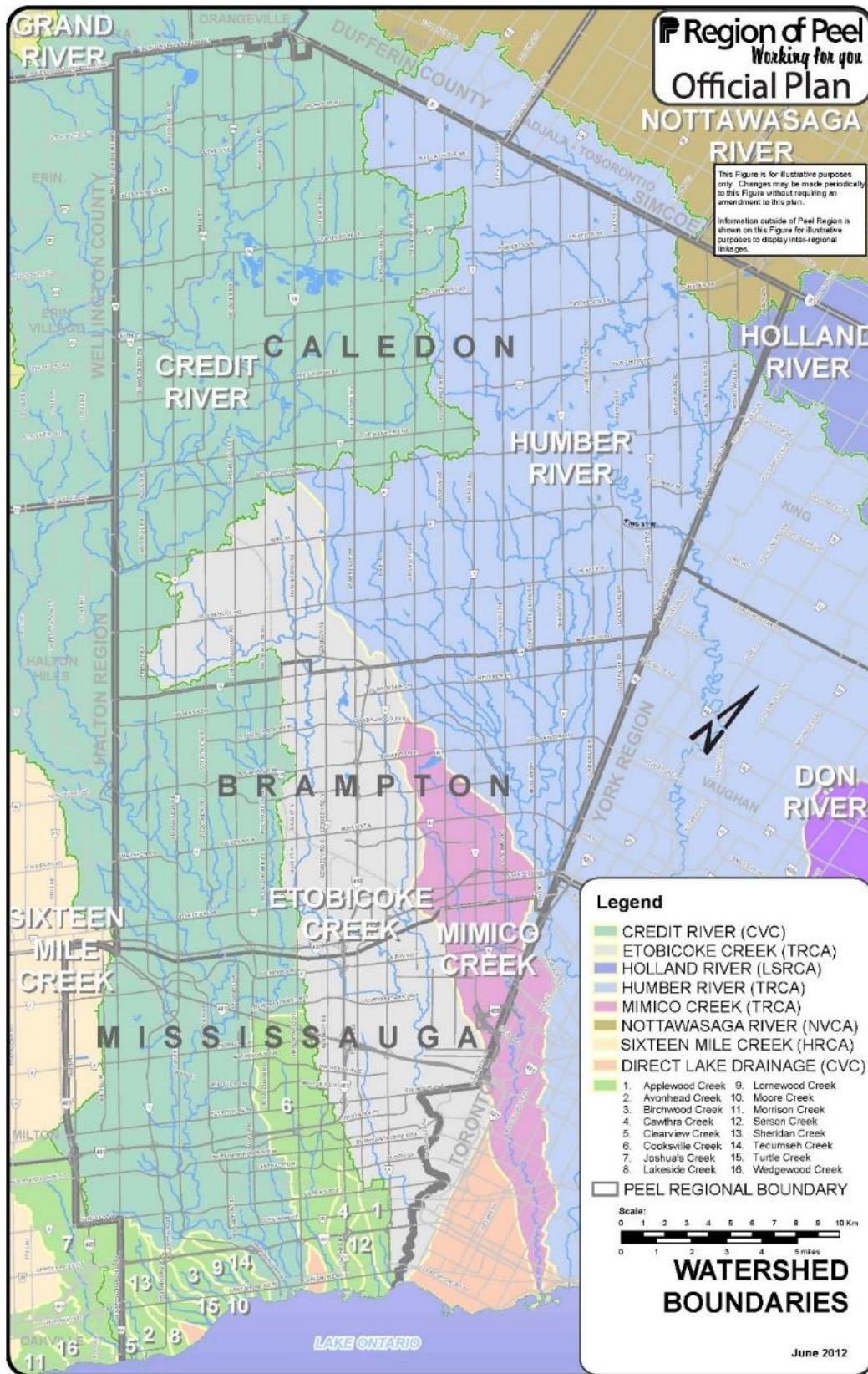
Conservation Authority	Watershed	Area Within Peel Region	Watershed Plan or Equivalent
CVC	Credit River	44.1%	Credit River Water Management Strategy Update (2006) <sup>1</sup>
TRCA	Humber River	32.8%	Humber River Watershed Plan: Pathways to a Healthy Humber (2008) & Humber River Hydrology Study (2015)
	Etobicoke Creek	16.7%	Etobicoke and Mimico Creeks Watersheds Technical Update Report (2010)
	Mimico Creek	4.1%	
Conservation Halton	Sixteen Mile Creek	1.1%	Sixteen Mile Creek Watershed Plan (1996) & Ninth Line Lands Scoped Subwatershed Study (Amec 2015 & 2017) <sup>2</sup>
NVCA	Nottawasaga River	1%	Watershed Plan Strategic Review and Update 1996-2015 (2006)
LSRCA	West Holland River	0.3%	Lake Simcoe Protection Plan (2009) <sup>3</sup>

1: Credit River Water Management Strategy Update should be read and implemented in conjunction with the Natural Heritage System Strategy (CVC 2015).

2: Phase 3 of the Scoped Subwatershed Study is currently in progress.

3: The Lake Simcoe Protection Plan applies to the entirety of the Lake Simcoe watershed in accordance with the Lake Simcoe Protection Act, which differs from other listed 'watershed plans'. See Part B of the Synthesis Report for the West Holland River Subwatershed Plan (2010).

Figure 2.1: Watersheds within Peel Region



### 2.1.1 Credit River Water Management Strategy

The *Credit River Water Management Strategy Update* (CVC 2006) is a plan of action to ensure “abundant, clean, and safe water for environmentally, socially, and economically healthy communities”. The objectives of the strategy are to protect and restore the natural features and functions of the watershed and inform decisions on growth and development, such as stormwater management (SWM). More specifically, objectives of the strategy are to maintain or restore the natural hydrological cycle, natural stream processes, flow, and sediment transport to reduce erosion and flooding risks; to maintain groundwater and baseflow levels to sustain watershed functions and human uses; to maintain or enhance water and sediment quality for ecological integrity, drinking water, recreation, and aesthetics; and to protect or restore ecosystem integrity, plant and animal species, community diversity and productivity through an integrated network of natural areas, habitats, and linkages.

Recommendations include stream restoration in urban areas and better SWM, including areas where land use is not changing. Best management practices (BMPs) for SWM include low impact development (LID) techniques, such as infiltration at source, where possible. Additional rural measures include conservation tillage, tile outlet controls, nutrient management, septic system repair/replacement, natural area buffers, reforestation, and wetland restoration.

### 2.1.2 Humber River Watershed Plan: Pathways to a Healthy Humber

The *Humber River Watershed Plan: Pathways to a Healthy Humber* was completed in 2008 (TRCA 2008a). The plan provides strategic recommendations regarding high priority remedial actions to assist in delisting impaired beneficial uses in the Toronto and Region Area of Concern (AOC) for Lake Ontario, such as priority areas for improvement of SWM controls and aquatic habitat restoration. Issues identified include uncontrolled stormwater runoff, increasing chloride in stream water, and a reduction in cold water fish habitat. Recommendations included using LID and green infrastructure for future development, reducing the amount of impervious cover in developments where possible, and restore and enhance natural cover.

The *Humber River Watershed Plan Implementation Guide* (TRCA 2008b) contains recommendations organized into the following categories: policy, regeneration, land securement, stewardship and education, operation and maintenance, enforcement and monitoring.

### 2.1.3 Humber River Hydrology Study

The *Humber River Hydrology Update* (Civica 2015) provides insight into the impacts of future development on the Humber River watershed. The modelling update identified the potential impacts of the full development plans for Brampton, Caledon, and Mississauga on peak flows within the watershed.

The hydrology model did not include any possible urban expansion areas outside of current Official Plans (Brampton 2015, Caledon 2016, Mississauga 2017). A new SWM flood control strategy for the Humber River watershed is being established in 2019. This process will show the results of the increase in the regional flows and establishes the control criteria. This information should be incorporated into the

scoped subwatershed planning process. It will also update stormwater quantity control criteria for the two year to 100-year storms for future development.

#### **2.1.4 Etobicoke Creek & Mimico Creek Watersheds**

The *Etobicoke and Mimico Creeks Watersheds Technical Update Report* (TRCA 2010) updates the strategic management recommendations and implementation priorities for the two watersheds. The report outlined five strategic management directions for existing and future land uses:

- 1) expand and enhance natural cover and habitat connectivity
- 2) restore a more natural water balance through enhanced SWM controls
- 3) foster stewardship and sustainable behaviour
- 4) manage rebounding groundwater levels (particularly in the vicinity of former Brampton Esker aggregate pits)
- 5) advance the science and practice of watershed management.

#### **2.1.5 Sixteen Mile Creek Watershed Plan**

The *Sixteen Mile Creek Watershed Plan* (Halton Region 1996) was completed in support of the Halton Urban Structure Plan. The project was led by the Region of Halton, with input from Conservation Halton, provincial ministries, and local municipalities. This plan provides a framework for the effective management of watershed and related environmental resources. Given the urbanization of the area, especially below the escarpment, the plan provided a series of recommendations to achieve a sustainable approach. The plan consisted of 46 recommendations. Emphasis was placed on the need for appropriate SWM approaches to address potential issues related to growth, such as erosion and sedimentation, increased runoff volumes and creek flows, reduction in base flows, altered water budgets and water quality degradation.

#### **2.1.6 Ninth Line Lands Scoped Subwatershed Study, City of Mississauga (Amec 2015, 2017, and in progress)**

The Ninth Line Lands Scoped Subwatershed Study is an ongoing City of Mississauga / Region of Peel initiative with a consultant team led by Amec Foster Wheeler (Wood Environment and Infrastructure Solutions). The Ninth Line Lands, in the City of Mississauga, are at the western limit of the city. The lands are generally bounded by Highway 407 to the west, Ninth Line to the east, Highway 401 to the north and the Highway 407 / Ninth Line overpass to the south. The Ninth Line Lands were transferred from the Region of Halton / Town of Milton to the Region of Peel / City of Mississauga on January 1, 2010, as part of a restructuring process for municipal boundary realignment. As a result, a planning study was necessary to consider the future of the area including a MCR to determine if there is justification for inclusion of some or all the lands within the Region of Peel and City of Mississauga urban settlement boundary.



The Scoped Subwatershed Study is a significant component of the MCR that will define and establish the development constraints and opportunities related to terrestrial and aquatic ecology, the watercourse system, and groundwater resources. Management recommendations and implementation principles will establish a linked and contiguous natural heritage system (NHS) consisting of a regulated tributary of Sixteen Mile Creek and associated floodplain, wetlands, and woodlands in the study area.

The study is guided by a Technical Steering Committee comprised of representatives from the City of Mississauga, the Region of Peel and Conservation Halton. In addition, representatives from the Ministry of Transportation and the Highway 407 ETR are engaged to coordinate the planning and servicing of the Ninth Line Lands specific to the future of the transitway corridor which constitutes a significant future land use within the study area. The study is being completed in the following three phases:

- Phase 1: Study Area Characterization (Amec 2015)
- Phase 2: Impact Assessment/Management Strategy (Amec 2017)
- Phase 3: Implementation and Monitoring (in progress)

#### **2.1.7 NVCA Watershed Plan Strategic Review and Update 1996-2015**

In 2006, NVCA published their *Watershed Plan Strategic Review and Update 1996-2015* (NVCA 2006). The strategic review identified three main issues facing the NVCA watersheds:

- 1) impacts from growth on the natural heritage and aquatic ecosystems
- 2) water quality and quantity concerns (including impacts from septic systems, land use practices, water takings and increased flooding)
- 3) environmental impacts on water resources from natural resource extractions (aggregates, peat and water bottling)

The protection of groundwater was identified as a priority. The review provided 20 recommendations for how to achieve goals and objectives for the watershed.

#### **2.1.8 Lake Simcoe Protection Plan**

*The Lake Simcoe Protection Plan* (Ontario 2009) was approved under the *Lake Simcoe Protection Act, 2008* and took effect on June 2, 2009. It has an overall goal to protect and restore the ecological health of the Lake Simcoe watershed. It follows an ecosystem, subwatershed, precautionary, adaptive management, and sustainable development approach. Implementation relies on shared responsibility and cost-effectiveness. The plan is focused on the issues most critical to the health of Lake Simcoe including:

- Restoring the health of aquatic life within the Lake Simcoe watershed
- Improving water quality, including reducing loadings of phosphorus to the lake
- Maintaining water quantity

- Improving the health of the ecosystem by protecting and rehabilitating important areas, such as shorelines and natural heritage
- Addressing impacts of invasive species, climate change, and recreational activities

The policies in the plan are grouped into four categories; the Act gives legal effect to the first three of these. The first category of policies is the “designated policies” in the plan. The second category of policies is the “have regard to” policies. These first two categories of policies affect how decisions are made under specific statutes. The third category of policies relates to monitoring by public bodies. The fourth category of policies is not given legal effect by the Act. These policies set out strategic actions that public bodies should take in order to meet the plan’s objectives.

See Part B: Appendix A for more details on watershed and subwatershed plans from each CA.

## 2.2 Key Watershed Management Challenges in Peel Region

Water is key to sustainable ecosystem function. Having a role to play within the ecosystem, people, like other water users, need water for many reasons – drinking water, household use, agriculture, industry and for urban development. Maintaining healthy and resilient watersheds, along with effective and efficient management of water resources, is essential to maintain an adequate clean water supply and ecosystem functions. Urbanization is the principal land use stress on natural systems in Peel Region, although aggregate extraction and agriculture are also important (PCCP 2017).

Although there are some challenges unique to specific watersheds / locations, the watershed plans completed for Peel Region point to several challenges that are common across the Region:

- Increasing impervious cover and stormwater runoff
  - Stormwater runoff from impervious surfaces can have many impacts including increased flooding risks, river bank and bed erosion, increased pollutants (e.g. road salt) that are carried into streams, increased stream flow, destruction of aquatic habitat, increased water temperature, and infrastructure damage
  - Inconsistent or inadequate stormwater infrastructure coverage or sizing
- Water quality issues
  - Increasing chloride concentrations are common throughout the Region, particularly in urban areas; chloride poses a threat to both stream and groundwater quality
  - Nutrient loading (from urban stormwater runoff and agricultural lands), which contributes to eutrophication and undesirable algae, is a concern for water bodies such as Lake Ontario
- Loss / degradation of natural cover (NHS)
  - Urbanization has reduced the amount of natural cover, increased fragmentation, and increased pressure on remaining NHS components

- Degradation of fish / wildlife habitat
  - Stormwater runoff has and continues to alter stream flow and ecosystem hydrology, and degrade water quality (e.g. higher water temperatures, sedimentation, and chloride levels)
  - Reduction in baseflow to streams through surface water – groundwater interactions
  - Native species composition of ecosystems is altered due to invasive species
  
- Climate change
  - Climate change will interact with, and likely amplify and exacerbate, the many stressors already acting on the water resources and NHSs

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### 3. Other Existing Information

In addition to existing watershed and subwatershed plans, there are numerous studies, policies or plans on specific topics that contribute to the extension knowledge of watersheds within Peel Region. This section will outline:

- CA Policies, Regulations and Regulatory Mapping
- Drinking Water Source Protection Plans
- Climate Change Risk and Vulnerability Studies
- Great Lakes Legislation, Agreements and Strategies
- Identification of Water Resources and Natural Heritage Systems
- Integrated Water and Wastewater Services Planning in Peel Region
- See Part B for more information on the following topics:
- Appendix G – Flood Hazard and Water Quantity Studies
- Appendix H – Erosion Hazard Studies and Mapping
- Appendix I – Water Quality Studies
- Appendix J – Monitoring Programs

#### 3.1 CA Policies, Regulations and Regulatory Mapping

CAs regulate construction, alteration, interference and development activities in and around valleys, streams, wetlands and along the Lake Ontario shoreline. This is done through individual conservation authority regulations under Section 28 of the *Conservation Authorities Act*. Under these regulations, property owners need to apply for a permit from CAs if they are planning to undertake a variety of activities on a property that falls within a CA Regulated Area. CAs often have policies to help guide the administration of their regulation. Regulation mapping shows the areas within a CA's jurisdiction that are likely to be subject to the regulation. These areas are described in regulation and are based on the presence of natural features, such as rivers, streams and wetlands and natural hazards, such as steep slopes, flood plains and erosion areas. CAs can also play a role in the review of Official Plans, zoning bylaws and planning applications under the *Planning Act*, as well as other legislation that CAs may be requested, or responsible for providing comment on, such as the *Canadian Environmental Assessment Act*, *Ontario Environmental Assessment Act*, and the *Greenbelt Act*, etc.

CVC and TRCA, the two CAs which regulate most of Peel Region, are guided by the following policy documents:

- *Watershed Planning and Regulation Policies* (CVC 2010)
- *The Living City Policies* (TRCA 2014)

The Province has recently made changes to the provincial planning framework, including the *Conservation Authorities Act*, through Bill 108. Changes to regulations are still pending. CA's continue to advocate for operational flexibility in their mandates and for the importance of watershed-based

governance models that enable innovative and practical solutions to current and emerging issues (e.g. flood management, drinking water, climate change, water quality and urbanization / growth).

Additional information about these policy documents, as well as links to each CA's respective websites, which maintain up-to-date policies, regulations, and mapping, are provided in Part B, Appendix B.

### 3.2 Drinking Water Source Protection Plans

Peel Region intersects with the boundaries of five source protection areas: Halton Region, Credit Valley, Nottawasaga Valley, Lake Simcoe and Couchiching/Black River, and Toronto and Region. For every source protection area, an Assessment Report was prepared. The Assessment Report is a technical document that provides the scientific basis for the Source Protection Plan.

The Assessment Report describes:

- The local watershed and assesses available water supply
- The vulnerable areas and risks to drinking water
- The maps of the vulnerable areas
- The vulnerability of those areas
- The water quality and quantity issues related to water sources, and
- An assessment of the risk to water systems

The four vulnerable areas defined under the *Clean Water Act, 2006* are highly vulnerable aquifers (HVAs), wellhead protection areas (WHPAs), intake protection zones and significant groundwater recharges areas (SGRAs). Within each source protection area, these areas must be delineated (note: in the case of HVAs and SGRAs, the Growth Plan also requires these areas to be delineated).

A Source Protection Plan is a strategy and suite of policies, which outlines how water quality and quantity supplying municipal drinking water systems will be protected. Part B, Appendix C contains more information on Source Protection Planning. Three Source Protection Plans have been completed within Peel Region, as described in the following sections.

#### 3.2.1 Credit Valley, Toronto and Region, and Central Lake Ontario (CTC) Source Protection Plan

The CTC Source Protection Plan (CTC Source Protection Region 2015) encompasses three source protection areas and their associated Assessment Reports: Credit Valley, Toronto and Region, and Central Lake Ontario. The majority of Peel Region falls under the CTC Source Protection Plan.

**Municipal Water Systems:** There are two water treatment plants drawing surface water in Peel Region. The Lakeview and Lorne Park Water Treatment Plants are part of the South Peel Drinking Water System and sourced from Lake Ontario. There are four groundwater-based municipal drinking water systems in the Town of Caledon: Alton-Caledon Village, Cheltenham, Inglewood and the Palgrave-Caledon East.

Water Budget Assessment: Through a tiered process of water budget analyses, water flow through the Credit Valley and Toronto and Region source protection areas was characterized. A portion of the Orangeville – Mono – Amaranth Significant Water Quantity Threat Areas falls within the Town of Caledon. Many policies in the CTC Source Protection Plan are required to be implemented by Peel Region and its lower tier municipalities where existing and future water quantity threats extend into Peel Region.

For a full list of source protection policies that apply to municipalities and planning approval authorities, see the CTC Source Protection Plan.

### **3.2.2 South Georgian Bay – Lake Simcoe (SGBLS) Source Protection Plan**

A small portion of the SGBLS Source Protection Plan (SGBLS-SPC 2018) area falls within Peel Region. The WHPA-A, WHPA-B, WHPA-C and WHPA-D for the Palgrave – Caledon East Drinking Water System’s Well 3 extends into this source protection area. Several source protection plan policies apply in the WHPA to manage land use activities that can potentially affect the quality of water that flows into a well. See Sections 16 and 17 of the SGBLS Source Protection Plan for specific policies that may apply in Peel Region.

### **3.2.3 Source Protection Plan for the Hamilton and Halton Source Protection Areas**

A small portion of the *Source Protection Plan for the Hamilton and Halton Source Protection Areas* (HH-SPC 2015) is within Peel Region, specifically the south-west corner of the City of Mississauga. The Hamilton-Halton Source Protection Plan includes strategic policies that aim to protect drinking water sources in an indirect way. These policies are discretionary, but all bodies identified within the policies are asked to consider their implementation. The Region of Peel should consider policies O-1-S b., O-1-S e., O-1-S f., O-2-S a., and O-5-S a., that help address the vulnerability posed by transport pathways, the need to collect and interpret climate data, and to increase awareness of the location of source waters and their protection areas during emergencies.

## **3.3 Climate Change Risk and Vulnerability Studies**

Numerous studies and assessments have been undertaken for Peel Region to determine climate change risks and vulnerabilities. This Section provides a brief overview of the key findings and recommendations from the following studies and assessments:

- Peel Climate Change Strategy (Peel Region 2011)
- Peel Climate Change Partnership Action Plan (PCCP 2017)

See Part B, Appendix D for Peel specific vulnerability assessments of natural heritage and water infrastructure, as well as CA specific climate change strategies.

### 3.3.1 Peel Climate Change Strategy (Peel Region 2011)

In 2011, the *Peel Climate Change Strategy* (Peel Region 2011) was shared with the Councils and Boards of each of the partners with the following vision and mission:

- *Vision:* A Region where everyone does their part to mitigate and adapt to climate change by leading greener lifestyles, embracing a low carbon economy, and by enhancing and protecting our natural systems.
- *Mission:* To work collaboratively with our municipal partners, conservation authorities, residents, employees and businesses to combat climate change at the local level.

The Strategy was adopted by Regional Council in June 2011 and aimed to improve coordination of activities related to climate change among municipal and CA partners. The *Peel Climate Change Strategy* is meant to be a roadmap for addressing climate change impacts and identified six main objectives:

- 1) Proactive and responsive planning and leadership
- 2) Actions to reduce greenhouse gases (mitigation)
- 3) Targeted and proactive adaptation actions
- 4) Making the shift to a green economy
- 5) Increasing awareness and level of engagement throughout Peel
- 6) Ongoing research and adaptive risk management

For each objective, the Strategy identifies specific actions to be initiated, within five years, to support effective mitigation of, and adaptation to climate change. From 2013 through 2016, TRCA, CVC and the Region of Peel discussed priority actions coming from the Strategy and advanced the implementation of Action 1.1, which was to compile a vulnerability and risk assessment of all infrastructure, of the community (such as assessment of human health impacts) and of natural heritage.

### 3.3.2 Peel Climate Change Partnership Action Plan (PCCP 2017)

In 2009, the City of Brampton, City of Mississauga, Town of Caledon, CVC, TRCA, and the Region of Peel formed the Peel Community Climate Change Partnership (PCCP) to develop an intergovernmental climate change strategy. This was in response to the urgent need to respond to climate change at the local level and was guided by senior representatives from each of the partners.

In 2017, the PCCP completed an assessment of the current state of the partnership, as well as the original *Peel Climate Change Strategy* (Peel 2009). To position the partners to have a significant collective impact over the next five years, several sub-strategies were developed to reduce community greenhouse gas (GhG) emissions and address vulnerability to extreme heat and flooding:

- *Flood Resiliency:* the purpose of the Flood Resiliency Strategy is to improve flood resiliency for urban and riverine flooding considering current and future extreme weather events. The strategy builds on the Peel Climate Change Vulnerability Assessments. Improvements will be achieved through the optimization and coordination of consistent approaches, optimizing

policies, programs, and practices by partners to reduce risks. Initiatives being conducted under this strategy that support watershed planning include: defining stormwater level of service, a risk management framework, flood risk mapping, watershed study inventory, and risk and return on investment tool.

- *Low Carbon Communities*: thus far the focus has been on integrating energy demand mapping approaches across all three municipal partners, as well as preliminary efforts to develop a region-wide low carbon vehicle strategy.
- *Green Natural Infrastructure / Heat Resiliency*: this strategy is focused on addressing heat vulnerability in areas identified as lacking in urban forest and green infrastructure through priority tree planting. The team leading this strategy has conducted urban heat mapping analysis to determine priority areas and is working to develop a tree planting strategy to address heat risk in these areas.
- *Public Education*: this is a future priority for the partnership, to develop a public outreach strategy to raise awareness of the partnership and mobilize residents and businesses to engage in actions to address GhG emission reductions and enhance resiliency to climate impacts.

### 3.4 Great Lakes Legislation, Agreements, and Strategies

The Peel Region watersheds identified in Figure 2.1 ultimately flow into Lake Ontario. Decisions made at the local municipality and regional level influence watershed stressors that ultimately affect the downstream portion of the watershed. For the purposes of this sub-section, the *Lake Ontario Lake Wide Management Plan* (LAMP) and the *Toronto and Region Remedial Action Plan* (RAP) are described. Additional information can be found in Appendix E to assist with municipal planning and servicing studies. It should be noted that the majority of other plans and studies in the remaining Appendices, while focused on their specific watersheds / subwatersheds would ultimately influence Lake Ontario as the receiving body of water.

The most recent Lake Ontario LAMP was released in 2008 and a new LAMP is expected to be released in 2019. Annual reports are available at <https://binational.net>, including the most recent annual report for 2017 (LAMP 2017)<sup>2</sup>. The Lake Ontario LAMP focuses on:

- Restoring lake wide Beneficial Use Impairments (BUI)
- Virtually eliminating critical pollutants that, due to their toxicity, persistence in the environment and their ability to accumulate in organisms, are likely to contribute to these impairments despite past application of regulatory controls
- Improving physical and biological integrity of the waters of Lake Ontario and water dependent resources that have been impaired by human activities

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<sup>2</sup> A draft 2018 – 2022 Lake Ontario LAMP is out for public review until June 13, 2019.

The Toronto and Region AOC area extends from Etobicoke Creek in the west to the Rouge River in the east and includes six major watersheds that drain into Lake Ontario. For the Region of Peel, these watersheds include Etobicoke Creek, Mimico Creek and the Humber River. A RAP progress report was released in 2016 (TRCA 2016), which looked at the status of the BUIs. Since 1987, significant progress has been made to address various BUIs that applied to this AOC and the focus for the RAP now is addressing the remaining four BUIs that continue to be designated as “impaired”. While many of these actions, in the municipal context, apply to the City of Toronto as the ultimate end point of the applicable watersheds for the RAP, Peel Region can consider similar actions to manage its downstream impacts on Lake Ontario. These actions include:

- Eutrophication or undesirable algae
  - Support upgrades to wastewater treatment plants to manage nutrient loadings
  - Monitor LID projects and SWM facilities to improve the understanding of the effects of wet weather discharges on receiving waters
- Beach closings
  - Continue to support monitoring, planning and design of projects intended to improve conditions at waterfront beaches
- Degradation of fish and wildlife populations
  - Continue to implement coastal wetland creation and restoration projects
  - Prioritize existing instream barriers for future mitigation
- Loss of fish and wildlife habitat
  - Implement priority restoration projects through terrestrial natural heritage system planning

Since many of the recommendations and actions in the following sub-sections are specifically within the purview of municipalities, there will be no additional discussion of Great Lakes legislation, agreements or strategies. However, Peel Region, in collaboration with local municipalities, should ensure that its policies and planning processes account for and consider downstream impacts to Lake Ontario. Of particular importance to municipalities is the management of water and wastewater servicing discussed in section 3.6.

### 3.5 Identification of Water Resources and Natural Heritage Systems

This section summarizes available mapping for each of the system components noted below and in Table 3.1. Additional information on NHS planning, specifically, is provided in Appendix F.

*Natural Heritage System:* The identification of the NHS is a requirement of several policies including: Provincial Policy Statement (PPS), Growth Plan, Greenbelt Plan, and Oak Ridges Moraine Conservation Plan. CVC, TRCA, and LSRCA have developed target NHS mapping for their jurisdictions. CVC did NHS

mapping for the NVCA portion of Peel Region. Future coordination and cooperation will be a continuation of past practice.

*Water Resources System:* The Water Resources System consists of surface water and groundwater features defined as *Key Hydrologic Areas* and *Key Hydrologic Features*.

*Key Hydrologic Areas* include: SGRAs [including ecologically significant groundwater recharge areas (ESGRAs)], significant surface water contribution areas (SSWCAs), and highly vulnerable aquifers (HVAs).

*Key Hydrologic Features* include: permanent and intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.

Except for SSWCAs, CAs maintain the majority of this data in GIS shapefiles and it is readily available for use. An assessment of the ESGRAs for the LSRCA jurisdiction has been completed (Golder 2015). ESGRAs for the entire TRCA jurisdiction have been developed, but are not yet approved by the Board. TRCA will be reviewing the ESGRA layer with its municipal partners in the near future. For the Credit River watershed, an ESGRAs map is currently available (PDF only, no GIS files) and the ESGRAs will be updated and refined as part of Peel Water Budget Study project and are expected by the end of 2019<sup>3</sup>. A data layer for SSWCAs is a requirement of the *Greenbelt Plan* and *the Growth Plan* but a methodology to define them has yet to be clarified.

*Floodplain mapping updates:* CAs ensure public safety and protect property with respect to natural hazards. CAs have mapped their respective Regulated Areas which include information such as floodplain mapping, provincial wetland data, and watercourse information. See Appendix D: Peel Region Natural Systems Vulnerability Assessment, 2017 for additional information.

*Climate Change Vulnerability:* Natural systems climate change vulnerability mapping for all of Peel Region is available for both the terrestrial and aquatic ecosystems. See Appendix D: Peel Region Natural Systems Vulnerability Assessment, 2017 for more information.

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<sup>3</sup> The Region of Peel and CAs will continue to coordinate work, wherever possible, for continuity and consistency.

**Table 3.1: Data Availability of WRS Components**

Data Layers			TRCA	CVC	Halton	NVCA	LSRCA
			54 % of Peel Region	44 % of Peel Region	1 % of Peel Region	1 % of Peel Region	<1 % of Peel Region
Water Resource System	Key Hydrologic Areas	Significant groundwater recharge areas (SGRA)					
		Ecologically significant groundwater recharge areas (ESGRA) <sup>1</sup>			x	x	
		Significant surface water contribution areas (SSWCA)	?	?	?	?	?
		Highly vulnerable aquifers (HVA)					
	Key Hydrologic Features	Permanent and intermittent streams					
		Inland lakes and their littoral zones					
		Seepage areas and springs			x	x	x
Natural Heritage System							
Flood & Natural Hazards							
Natural Systems Climate Vulnerability	Terrestrial System (complete for all of Peel Region)						
	Aquatic System (complete for all of Peel Region)						
<b>Legend:</b> Green indicates layers are complete and available; yellow indicates in progress.							

1: TRCA’s ESGRA layer and methodology is to be reviewed and approved, and if appropriate, applied for consistency across the Region of Peel.



### 3.6 Integrated Water and Wastewater Services Planning in Peel Region

The following provides a summary of the Region of Peel's rural groundwater and Lake Ontario based water and wastewater services. The Region of Peel is completing assessments of system capacities needed to accommodate anticipated growth to 2041 as part of the Peel 2041 Regional Official Plan Review and Water and Wastewater Master Plan Update. Information is provided on how the Region is integrating watershed planning information into the required studies being prepared to support growth management planning in Peel. Studies being completed as part of the Peel 2041 municipal comprehensive review are summarized along with next steps to complete detailed studies and further assessments in fulfillment of the Municipal Engineers Association (MEA) Class EA requirements. This includes completion of required environmental assessment documentation in accordance with the MEA Municipal Class Environmental Assessment Process.

Most of the Region of Peel is currently serviced by lake-based water and wastewater systems supplied by Lake Ontario. The systems service all of Mississauga and Brampton and some areas of Caledon, including Bolton, Mayfield West and, for wastewater servicing, Caledon East.

The lake-based water system servicing capacity has been planned and currently approved to accommodate growth to 2031 through existing water plants in Mississauga. The lake-based system includes two water treatment facilities, the Lakeview Water Treatment Plant in the central system and Lorne Park Water Treatment Plant in the west, as well as other infrastructure including trunk transmission mains, pumping stations and storage facilities.

The lake-based wastewater system consists of two largely separate gravity trunk sewer systems (the east trunk and west trunk) that terminate at the G.E. Booth and Clarkson Wastewater Treatment Facilities, both of which discharge to Lake Ontario.

As not all the Region's water is lake-based, a portion will continue to be supplied by groundwater sources via Regional groundwater well systems or private wells. In the rural parts of Caledon, water is provided to homeowners through a well-based system where the source of the water is groundwater, rather than Lake Ontario. Groundwater supplies are drawn from one of 14 municipal wells and treated at one of five small-scale water treatment plants in Caledon. With respect to wastewater collection and treatment in the rural system, the Region's only wastewater treatment plant discharging to an inland water body is the Inglewood Communal Wastewater Treatment Station, which discharges treated effluent to the Credit River. Similar to the lake-based system, the Region's groundwater system has been planned with approved capacity to accommodate growth to 2031.

The Region is currently reviewing the Lake-Based system requirements to accommodate new growth to 2041 through the preparation of a Water and Wastewater Master Plan conducted in accordance with the MEA Municipal Class Environmental Assessment Process. The study is being undertaken in accordance with Approach 1 of the Master Planning process as set out in the MEA Class EA (October 2000, as amended in 2007, 2011 and 2015). This approach involves the preparation of a Master Plan document at the conclusion of Phase 1 and 2 of the Class EA process. The Master Plan will be prepared at a broad level assessment recognizing that further detailed assessment will be required through

separate future studies to satisfy project specific fulfilment of the MEA Class EA requirements for the specific Schedule B and C projects identified within the Plan.

Capacity assessments undertaken as part of the Master Plan have determined that the lake-based water treatment plant capacities are sufficient to meet projected growth to 2041. However, capacity upgrades will be required to the wastewater treatment plants to meet the future wastewater flow projections. The current approved capacities of the groundwater and rural wastewater systems are undergoing assessments to confirm if the limited growth anticipated in the rural settlements and rural system will require expansions in the rural water/wastewater systems.

The scope of the Master Plan as it pertains to the Wastewater Treatment Plant expansions is to:

- identify the future capacity requirements
- identify the timing of expansion needs
- identify high level technical details related to capacity expansion to service growth
- identify follow on study requirements and preliminary approvals and implementation steps

The Master Plan will also identify the EA Schedule for all recommended projects, which, for both anticipated wastewater plant expansions, will be identified as Schedule C's. Future separate Schedule C projects will satisfy all five phases of the MEA Class EA process which includes technical studies to support the review of environmental features and mitigating measures to inform a holistic and comprehensive decision-making process. As part of the Schedule C EAs that are to be completed, detailed technical studies will need to be undertaken. These studies will include, but are not limited to:

- Archaeological
- Geotechnical
- Hydrogeological
- Cultural Heritage
- Natural Environment
- Assimilative Capacity

Additionally, an extensive consultation program is required under separate Schedule B and C Class EA processes. Future consultation will include but not be limited to: Ministries, Conservation Authorities, Source Water Protection Committees, Indigenous Groups and internal and external stakeholders. This consultation will be an integral part of the future studies which will feed into the options evaluation as well as inform permitting and approval requirements.

The Master Plan document will provide a preliminary indication of what studies, permits, approvals are required for Schedule C projects, however, it is during the EA process that these elements will be formally defined and undertaken. These technical studies, once completed, will inform the Environmental Assessment and will be a part of the evaluation of Alternative Options and Alternative Design Concepts. The Detailed Design and Implementation of the Treatment Upgrades will take into consideration the results of these studies.

New growth dependent on the groundwater system will be limited to infill and redevelopment in existing rural settlement areas and based on existing servicing capacities. There is currently no proposal to expand groundwater and non-lake-based wastewater servicing capacity to accommodate new growth in the rural system. Subject to the assessment of the rural groundwater and wastewater system capacity noted above, it is proposed that no new water taking or effluent discharges involving groundwater sources or inland receiving waters will be required to accommodate and service new growth allocations in Peel to 2041.

Extending servicing from a lake-based system to service new growth is advantageous over riverine or groundwater sources, as it is a more consistent supply from a quality (e.g. chemical composition) and quantity perspective. The water and wastewater systems, being both lake-based, enables the Region to better protect its watersheds which ultimately supplies Lake Ontario with water through surface and groundwater. The Region can focus on improving watershed conditions without needing to constantly work to accommodate / incorporate growing water demands and wastewater flows that are based on new groundwater supplies or that require assimilative capacity within an inland receiving water. The watercourses or rivers and their tributaries within Peel are not as impacted by water and wastewater servicing needs and demands as servicing systems that depend solely on groundwater and river water.

For Schedule C Class EAs, the Region is required to undertake a five phase Municipal Class Environmental Assessment. The five phases can be summarized as follows:

- Phase 1: Identify the problem (deficiency) or opportunity.
- Phase 2: Identification of alternative solutions to address the problem or opportunity by taking into consideration the existing environment and establish the preferred solution using public and review agency input.
- Phase 3: Examine alternative methods of implementing the preferred solution, based on the existing environment, public and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- Phase 4: Document in an Environmental Study Report, a summary of the rationale, and the planning, design and consultation process of the project of the project as established through the above phase, and to make such documentation available for scrutiny by review agencies and the public.
- Phase 5: Complete contract drawings and documents and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

According to the Province of Ontario (2015), the planning and design process is to be undertaken to ensure the reviewer can understand the steps taken, the criteria to identify and assess the alternatives, the weighing of the criteria and the decision-making process followed. It must be an understandable, logical and replicable process. Although not anticipated or planned, should additional servicing capacity within the systems be required, the appropriate *Environmental Protection Act*, *Ontario Water Resources Act*, assimilative capacity, and water taking studies and approvals will be identified. The Peel Synthesis Report identifies the studies and recommended actions the Region will be undertaking for watershed protection to support future growth requirements.

Additional information is provided in Section 4.2 which outline recommendations for infrastructure planning and which should be read in conjunction with section 4.1 dealing with land use planning.

## 4. Recommendations

Broad-scale watershed planning provides the basis for an integrated assessment of hydrological and ecological impacts of growth and land use decisions. The provincial planning policy framework provides the basis for watershed planning to inform integrated land use planning decisions.

Recommendations have been grouped by policy consideration under the categories of informing land use (section 4.1) and infrastructure (section 4.2) planning. These sections represent a summary of the various recommendations from all the plans, studies and reports cited as part of this Synthesis Report. See applicable appendices for more detailed recommendations on specific topics beyond these policy considerations. Note that the list of recommendations in sections 4.1 and 4.2 is not exhaustive but intended to summarize the themes of recommendations that encompass this Synthesis Report. These recommendations are also intended to address the key challenges identified in section 2.1.

### 4.1 Informing Land Use Planning

This section highlights recommendations for the Region of Peel to consider for managing and mitigating the impacts of growth and land use decisions on watershed conditions. Section 4.2 will outline recommendations for infrastructure planning specifically. The recommendations for land use and infrastructure planning (Section 4.1 and 4.2) should be read in their entirety to support integrated planning. These recommendations are supported by the various watershed plans, studies and reports completed by CAs. Recommendations to inform land use planning are summarized in Table 4.1.

**Table 4.1: Recommendations to Inform Land Use Planning**

Municipal Planning Decision (including provincial policy basis)	Recommendation
<b>Allocation of Growth</b> <i>(Growth Plan – 4.2.1)</i>	1) Undertake growth allocation planning to achieve minimum intensification and density targets and reduce the need for expansion in new areas and ensure that new development and redevelopment is designed with sustainable practices.
	2) Advance, through municipal policies and programs, the use of LID and / or green infrastructure design standards to: <ol style="list-style-type: none"> <li>a) Reduce stormwater flow associated with impervious surfaces that can lead to flooding and erosion</li> <li>b) Reduce contaminant loads associated with stormwater</li> <li>c) Maintain a more natural water balance in waterways and ecosystems</li> </ol>
	3) Identify and ensure appropriate municipal policy designations are in place to protect the water resource system and its functions. This means that development in key hydrologic areas and features should be avoided, unless it can be demonstrated that hydrologic function will be

Municipal Planning Decision (including provincial policy basis)	Recommendation
	<p>maintained and that the quality and quantity of water in these areas and features will be protected, enhanced or restored.</p> <p>4) Maintain, or enhance, existing natural cover to reduce the impacts of potential growth, through regional and local NHS planning and through updates to existing NHS policies.</p> <p><b>Note: Recommendations 1 – 4 apply to all municipal planning decisions outlined in this table.</b></p> <p>5) Ensure regional consistency in terms of policy implementation, as identified in <i>Protecting Water Resources: Policy Options – Peel 2041 Discussion Paper</i> (Peel Region 2018). Consider additional municipal policies, standards and guidelines (if not already in place) for (not an exhaustive list):</p> <ul style="list-style-type: none"> <li>a) Green design standards (e.g. <a href="#">Toronto’s Green Standard</a>, <a href="#">Halton Hills Green Development Standards</a>)</li> <li>b) Incentive programs (e.g. <a href="#">Toronto’s Green Roof Program</a>)</li> </ul>
<p><b>Redevelopment (Intensification)</b> (<i>Growth Plan 2.2.2, 3.2.1, 3.2.6, 4.2.10</i>)</p>	<p>6) In areas of redevelopment or intensification, require BMPs associated with LID and green infrastructure.</p> <p>7) Continue to support or expand programs like TRCA and CVC’s Sustainable Neighbourhood Action Programs (SNAP). Examples of SNAP projects within Peel Region:</p> <ul style="list-style-type: none"> <li>a) <a href="#">Burnhamthorpe SNAP</a> - Mississauga</li> <li>b) <a href="#">County Court SNAP</a> – Brampton</li> <li>c) <a href="#">West Bolton SNAP</a> – Caledon</li> <li>d) <a href="#">Fletchers Creek SNAP</a> - Brampton</li> </ul> <p>8) Conduct comprehensive flood risk assessment plans where intensification is proposed in a flood vulnerable area. Prior to secondary plan approval, analyze, at the subwatershed level, potential future flooding and confirm the level of SWM control required. Special Policy Areas (SPAs) that require site-specific policies be approved by the province in Peel Region include:</p> <ul style="list-style-type: none"> <li>a) Central Core, City of Brampton</li> <li>b) Avondale, City of Brampton</li> <li>c) Brampton East, City of Brampton</li> <li>d) Bolton Core Area, Town of Caledon</li> </ul>

<b>Municipal Planning Decision (including provincial policy basis)</b>	<b>Recommendation</b>
	<p>e) Dixie / Applewood, City of Mississauga</p> <p>f) Etobicoke Creek, City of Mississauga</p> <p>g) Malton, City of Mississauga – Designated Two Zone Area</p> <p>9) Continue to encourage or expand brownfield redevelopment programs based on compact mixed-use forms that integrate natural and water resource features. The Port Credit West Village Master Plan is an example.</p> <p>10) Peel Region and its local municipalities should consider, if not already in place, brownfields programs based on grants, development charge reductions, tax incentives, etc. Some examples of municipal programs within the Growth Plan region include:</p> <p>a) City of Toronto’s <a href="#">Brownfield Remediation Tax Assistance (BRTA)</a></p> <p>b) City of Kitchener and Region of Waterloo – <a href="#">Brownfields Financial Incentive Program – Joint Tax Increment Grant (TIG)</a></p> <p>c) City of Hamilton’s <a href="#">Brownfields / ERASE Programs</a></p>
<b>Large-scale development in designated greenfield areas (Growth Plan – 4.2.1)</b>	11) Subwatershed planning will inform planning for large-scale development in designated greenfield areas. Peel Region and its local municipalities will implement actions and mitigation measures as identified in applicable subwatershed studies.
<b>Settlement Area Boundary Expansions (Growth Plan – 2.2.8)</b>	12) Key hydrologic areas and the NHS should be avoided.

Collectively, these land use planning recommendations will address the greatest challenges in Peel Region’s watersheds by building smarter and more compact communities that:

- Minimize impervious cover, support infiltration and mitigate flood risks. For example, monitoring by CVC has shown that streamflow downstream of development areas can increase by up to two orders of magnitude compared with pre-development flows, due to increases in discharge and impervious surfaces.
- Protect the Water Resource System (WRS) and the NHS to protect water quality and quantity, maintain ecological functions, and improve community resiliency. Include appropriate buffers in WRS and NHS policies.

- Ensure Peel Region and its local municipalities take a consistent policy and BMPs approach to land use decisions across their Official Plans, zoning, by-laws, etc.
- Minimize erosion by updating municipal erosion and sediment control by-laws, or fill by-laws, or adopt existing BMPs to prevent degradation of watercourses and aquatic habitat from sedimentation near construction sites.
- Prioritize, in collaboration with CA partners, restoration projects to improve the quality and extent of the NHS and water resource systems as identified in applicable watershed and / or subwatershed study / plan.

#### 4.2 Informing Infrastructure Planning

Since land use and infrastructure decisions are inherently linked, there will be some overlap with the recommendations provided in the preceding section with information presented below. Provincial policies require infrastructure planning to be informed by watershed planning to protect, enhance or restore water quality and quantity. Recommendations to inform infrastructure planning are summarized in Table 4.2.

**Table 4.2: Recommendations to Inform Infrastructure Planning**

Infrastructure Planning (including provincial policy basis)	Recommendation
<p><b>Planning for water and wastewater infrastructure, including master planning (PPS, Growth Plan – 3.2.6 and 4.2.1)</b></p>	<p>13) Watershed planning will inform water and wastewater infrastructure planning and master planning to:</p> <ul style="list-style-type: none"> <li>a) Ensure sustainable water use relative to anticipated growth and servicing capacity. Peel Region is encouraged to undertake water conservation planning to maximize the efficient use of its water infrastructure</li> <li>b) Evaluate the servicing options (municipal, private communal, individual on-site) most appropriate to accommodate demand</li> <li>c) Ensure source protection policies are embedded in municipal policies and master planning</li> <li>d) Evaluate existing infrastructure to identify opportunities to upgrade, or retrofit, to maximize efficiencies</li> <li>e) Monitor and set limits on effluent discharge to protect water quality</li> <li>f) Ensure wastewater infrastructure can accommodate extreme weather events</li> </ul>
	<p>14) Undertake stream geomorphic studies, where information does not already exist, to assess risks and recommend stream restoration projects to protect water and</p>



<b>Infrastructure Planning (including provincial policy basis)</b>	<b>Recommendation</b>
	<p>wastewater infrastructure from watercourse erosion impacts.</p> <p>15) Direct growth to areas already serviced by municipal water and wastewater systems, when possible.</p> <p>16) When completing water and wastewater master plans to support growth allocations, ensure that master plans consider and provide sufficient direction to incorporate watershed/subwatershed planning information and complete required environmental impact studies and approvals at the appropriate implementation stage, including assimilative capacity studies if discharging to inland and surface water bodies.</p>
<p><b>Stormwater management, including master and management planning</b> <i>(PPS, Growth Plan – 3.2.7 and 4.2.1)</i></p>	<p>17) Develop and update programs and master plans over time to implement improved SWM practices for new development and redevelopment, including retrofitting existing areas undergoing redevelopment. SWM needs to be undertaken on a ‘volume control’ basis (rather than managing peak flows) that maintains pre-development recharge rates, flow paths and water quality.</p> <p>18) Develop a monitoring and maintenance plan for stormwater infrastructure to ensure optimal performance. Identify opportunities to upgrade existing stormwater infrastructure and install stormwater infrastructure in areas that currently lack stormwater control:</p> <ul style="list-style-type: none"> <li>a) The Humber Hydrology Study identified the need for SWM controls in excess of the 100-year storm for West Humber tributaries.</li> </ul> <p>19) Modern SWM designs and practices should be used for any new developments and retrofits of existing developments to:</p> <ul style="list-style-type: none"> <li>a) Minimize runoff volumes and contaminant loads</li> <li>b) Minimize water balance changes / erosion</li> <li>c) Maximize natural vegetation and pervious surfaces</li> <li>d) Keep peak flow rates to pre-development levels</li> <li>e) Maintain appropriate temperatures of stormwater discharge to streams</li> </ul> <p>20) Manage wet weather flows on a watershed basis, recognizing rainwater as a resource, by utilizing a hierarchy</p>

Infrastructure Planning (including provincial policy basis)	Recommendation
	of management solutions starting with source controls followed by conveyance controls and finally end-of-pipe controls. See City of Toronto's <a href="#">Wet Weather Flow Master Plan Implementation Status Update</a> for examples.
	21) See Recommendation 1.

Collectively, these infrastructure planning recommendations will address the greatest challenges in Peel Region's watersheds by:

- Taking a proactive and BMPs approach to managing stormwater and its associated impacts on water quality, natural water balance and flows.
- Reducing the likelihood of sewer overflows during storm events.
- Ensuring water and wastewater infrastructure is designed and sited in appropriate locations to protect, enhance and restore water quality and quantity.

## 5. Conclusion

Part A of this Synthesis Report has provided a broad overview of the key existing information and high-level recommendations. Part B: Appendices provides more details on the plans, reports and studies undertaken by each CA responsible for watersheds within the Region of Peel.

There is a wealth of existing information on the conditions of watersheds within the Peel Region that can be used to inform municipal planning processes. CAs look forward to continuing to advance watershed planning knowledge within the region and supporting municipal land use and infrastructure planning processes that better integrate the outcomes of watershed planning into municipal decision-making. CAs and the Region of Peel have a collaborative partnership, which will help support the next generation of watershed planning in alignment with the provincial policy framework.



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