

Healthy Watersheds, Healthy Communities

Policies for Land Use Planning and Development Regulation in the Watersheds of the Hamilton Conservation Authority

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TABLE OF CONTENTS

1 INTRODUCTION.....	7
2 THE HAMILTON CONSERVATION AUTHORITY AND ITS WATERSHEDS.....	9
3 LEGISLATIVE AND POLICY FRAMEWORK.....	18
4 POLICIES FOR LAND USE PLANNING	29
5 POLICIES FOR THE REGULATION OF DEVELOPMENT	41
6 DEFINITIONS	99
7 SELECTED BIBLIOGRAPHY	110

1 INTRODUCTION.....	7
1.1 How to Read this Document	7
1.2 Approval and Amendments	8
2 THE HAMILTON CONSERVATION AUTHORITY AND ITS WATERSHEDS	9
2.1 A Brief History of the HCA	9
2.2 Overview of the HCA Watersheds	11
2.2.1 Spencer Creek	12
2.2.2 Borer's Creek	13
2.2.3 Chedoke Creek	13
2.2.4 Red Hill Creek	14
2.2.5 Stoney Creek and Battlefield Creek	14
2.2.6 Stoney Creek Numbered Watercourses	15
2.2.7 Urban Hamilton	15
2.3 Watershed Threats, Impacts and Challenges.....	16
3 LEGISLATIVE AND POLICY FRAMEWORK.....	18
3.1 Conservation Authorities Act	18
3.1.1 Conservation Authority Regulation of Development.....	20
3.2 Other Legislation	21
3.3 City of Hamilton Official Plan.....	25
3.4 Township of Puslinch.....	26
3.5 Hamilton Harbour Remedial Action Plan	26
3.6 Description of HCA Roles and Responsibilities	27
4 POLICIES FOR LAND USE PLANNING	29
4.1 Land Use Planning Review (Plan Input and Plan Review)	29
4.1.1 General Policies for Plan Input and Plan Review	30
4.2 Watershed Planning Approach.....	33
4.2.1 Policies for Watershed and Subwatershed Planning.....	33
4.3 Natural Hazard Management.....	35
4.3.1 Policies for Natural Hazard Management and Development.....	36

4.4 Water Resource Systems.....	38
4.4.1 Policies for Water Resource Systems	38
4.5 Stormwater Management	39
4.5.1 Policies for Stormwater Management	39
5 POLICIES FOR THE REGULATION OF DEVELOPMENT	41
5.1 Regulation of Development and Permitting	41
5.1.1 Regulated Areas	42
5.1.2 Regulated Activities.....	43
5.1.3 Permits and Regulation Tests	44
5.1.4 Relationship to Land Use Planning Policies	45
5.2 General Policies.....	47
5.3 Lake Ontario Shoreline	50
5.3.1 Defining Shoreline Regulation Limits	50
5.3.2 Lake Ontario Shoreline Hazards	52
5.3.2.1 Identifying the Shoreline Flooding Hazard	52
5.3.2.2 Identifying the Shoreline Erosion Hazard	54
5.3.2.3 Identifying the Shoreline Dynamic Beach Hazard	55
5.3.3 Policies for Development on the Lake Ontario Shoreline	56
5.3.3.1 General Policies	56
5.3.3.2 Shoreline Protection Works (Protection Works Standard)	57
5.3.3.3 New Development	59
5.3.3.4 Existing Development	60
5.3.3.5 Policies for Development Within the Regulated Allowance	61
5.4 River and Stream Valleys	62
5.4.1 Defining River and Stream Valley Regulation Limits	62
5.4.2 River and Stream Valleys – Erosion Hazards	65
5.4.2.1 Identifying the Erosion Hazard	65
5.4.2.1.1 Erosion Hazard Limit for Confined Systems	67
5.4.2.1.2 Erosion Hazard Limit for Unconfined Systems	68
5.4.3 Policies for Development Within the Erosion Hazard	69
5.4.3.1 General Policies	69
5.4.3.2 New Development	70
5.4.3.3 Existing Development	70
5.4.3.4 Policies for Development Within the Regulated Allowance	72

5.4.4 River and Stream Valleys – Flooding Hazards.....	72
5.4.4.1 Identifying the Flooding Hazard	72
5.4.4.1.1 One Zone Areas.....	73
5.4.4.1.2 Two Zone Areas.....	73
5.4.4.1.3 Special Policy Areas	74
5.4.4.1.4 Floodplain Spill Areas	74
5.4.5 Policies for Development Within the Flooding Hazard	75
5.4.5.1 General Policies	75
5.4.5.2 New Development	75
5.4.5.3 Existing Development.....	76
5.4.5.4 Policies for Development Within the Regulated Allowance	78
5.4.5.5 Policies for Cut and Fill	78
5.4.5.6 Policies for Floodplain Spill Areas.....	79
5.6 Wetlands.....	82
5.6.1 Defining Wetland Regulation Limits	82
5.6.2 Policies for Development and Interference with Wetlands	83
5.6.2.1 General Policies	83
5.6.2.2 Development and Interference within Wetlands	84
5.6.2.3 Development within 30 m of a Wetland.....	85
5.7 Hazardous Lands.....	86
5.7.1 Defining Hazardous Lands Regulation Limits.....	86
5.7.2 Identifying Hazardous Lands.....	87
5.7.3 Policies for Development Within Hazardous Lands.....	87
5.7.3.1 General Policies	87
5.7.3.2 New Development	88
5.7.3.3 Unstable Bedrock (Karst) Specific Policies	88
5.8 Floodproofing Standards	90
5.8.1 General Policies	90
5.8.2 Dry Floodproofing.....	91
5.8.3 Wet Floodproofing.....	91
5.8.4 Additions and Replacement Structures	91
5.9 Access Standards.....	92
5.9.1 Safe Access for New Development.....	92
5.9.2 Access Allowances	93
5.9.3 Access for Existing Development.....	93

5.10 Fill Placement and Site Grading	95
5.10.1 General Policies	95
5.10.2 Large-Scale Fill Placement	96
5.11 Development Exemptions	97
6 DEFINITIONS	99
7 SELECTED BIBLIOGRAPHY	110

LIST OF FIGURES

Figure 1: The Hamilton Conservation Authority watersheds	10
Figure 2: Lake Ontario shoreline flooding hazard regulated area	51
Figure 3: Lake Ontario shoreline erosion hazard regulated area	51
Figure 4: Lake Ontario shoreline dynamic beach hazard regulated	51
Figure 5: Lake Ontario shoreline flooding hazard limit	53
Figure 6: Lake Ontario shoreline erosion hazard limit	55
Figure 7: Lake Ontario shoreline dynamic beach hazard limit	56
Figure 8: Confined river or stream valley where the valley slopes are stable	63
Figure 9: Confined river or stream valley associated with unstable slopes and stable toe	64
Figure 10: Confined river or stream valley with unstable slopes and active toe erosion	64
Figure 11: Unconfined river or stream valley (floodplain)	64
Figure 12: Unconfined river or stream valley (meander belt)	65
Figure 13: Erosion hazard limit for a confined system (toe of slope greater than 15 m)	68
Figure 14: Erosion hazard limit for a confined system (toe of slope less than 15 m)	68
Figure 15: Erosion hazard limit for an unconfined system	69
Figure 16: Flooding hazard limit for one zone areas	73
Figure 17: Flooding hazard limit for two zone areas	74
Figure 18: Regulation limits of wetlands and other areas	83
Figure 19: Shoreline Access Allowance	94
Figure 20: Riverine Access Allowance	94

LIST OF TABLES

Table 1: Summary of land use planning and conservation legislation, policies and plans	22
Table 2: Minimum toe erosion allowance - where river is within 15 m of slope toe	66

1 INTRODUCTION

The Hamilton Conservation Authority (HCA) is a watershed-based organization established under the provisions of the *Conservation Authorities Act*. Since 1958 the HCA has dedicated itself to the conservation and management of watershed lands and water resources for the benefit of people, communities and the environment.

The HCA undertakes programs on a watershed basis to further the conservation and management of natural resources. This includes programs to protect people and property from risks associated with natural hazards, manage water resources, monitor and conserve the natural environment, and provide recreational and educational opportunities. The HCA works collaboratively with a variety of agencies and groups in implementing its programs, and in support of its vision for a healthy watershed.

HCA's *Policies for Land Use Planning and Development Regulation* outline the policies that will be used to guide the HCA in administering and implementing its programs and services related to municipal land use planning and regulation of development.

1.1 How to Read this Document

The HCA may become involved in land use planning matters, regulation of development, and natural hazard management in a number of different roles and capacities. Therefore, not all of the policies contained in the document will be applicable in all cases. However, the policies should not be read in isolation of one another. Rather, they should be reviewed and considered in their entirety, and the appropriate range of policies should be applied to each situation. The policies are intended to be complimentary in nature, and there are clear linkages across policy areas and sections in the document. While specific policies sometimes refer to other policies for ease of use, these cross-references do not take away from the need to read the document as a whole. There is no implied priority in the order in which the policies appear.

This document consists of the following major sections:

Section 1 provides a general introduction and outlines the purpose of the document, and explains how to read and interpret the policies it contains.

Section 2 provides some background and characterization of the HCA watersheds, including summary descriptions of its major subwatersheds.

Section 3 summarizes the legislative and regulatory framework within which HCA operates and administers its various programs and services related to land use planning, regulation of development and management of natural hazards.

Section 4 outlines policies to guide HCA's involvement in municipal plan input and municipal plan review matters under the *Planning Act* and other legislation where HCA may comment on land use planning matters.

Section 5 defines the policies HCA will apply to its administration of the development regulations outlined in the *Conservation Authorities Act* (CA Act) and *Ontario Regulation 41/24*. These policies will be applied to the review of development permit applications received under the CA Act and regulations.

Section 6 provides a glossary of defined terms. Italicized terms in the document have a corresponding definition included in the glossary. Other terms should be interpreted based on normal use and definition or meaning of the word.

The document also includes a number of Figures to support the content included in Sections 1 to 6.

1.2 Approval and Amendments

This policy document will be reviewed periodically and updated as required to ensure consistency with applicable legislation and regulations. Amendments to the policies contained in this document will require HCA Board of Directors approval, and may require public consultation depending on the scope of changes. Minor editorial and other housekeeping amendments to this document that do not impact overall policy direction or objectives will not require Board approval or public consultation. Technical guidelines that may be developed to clarify and support implementation of the policies outlined in this document will require Board approval.

2 THE HAMILTON CONSERVATION AUTHORITY AND ITS WATERSHEDS

2.1 A Brief History of the HCA

The origins of the conservation movement and conservation authorities in Ontario dates to the early 1900s. It was during this period that some individuals and organizations began to take notice of deteriorating environmental conditions, including pollution, deforestation, flooding and soil erosion. These conditions were the result of over a hundred years of settlement in Ontario and an associated legacy of poor land and natural resource management practices in some regions. The conservation movement that began during this period would eventually lead to a number of important conservation milestones, including passing of the *Conservation Authorities Act* in 1946.

Growth and development in the Townships of Puslinch, Flamborough, Beverly, Ancaster and Dundas in the 1950s eventually led to concern among residents over conservation issues, including summer creek flows, flooding, reforestation and recreation. These communities petitioned the province under the *Conservation Authorities Act* to establish a watershed unit charged with the management of water resources. That request was approved, and the Spencer Creek Conservation Authority was founded on May 8, 1958, and held its first meeting on June 20, 1958. The Spencer Creek watershed included an area of approximately 25,000 ha extending from the Township of Puslinch to Hamilton Harbour.

In an effort to temper growth with some greater consideration for the environment, the City of Hamilton and parts of the surrounding communities of Stoney Creek, Saltfleet, Binbrook, and Glanford decided to join the Spencer Creek Conservation Authority in 1966, which resulted in the creation of the Hamilton Region Conservation Authority. In 2000, with the amalgamation of municipalities in the Hamilton region, the name of the conservation authority was changed to the Hamilton Conservation Authority (HCA) for administrative purposes, but remains Hamilton Region Conservation Authority in law.

Today, the HCA watersheds cover an area of approximately 57,000 ha (570 sq km), that includes portions of the Town of Grimsby, the City of Hamilton, and the Township of Puslinch in Wellington County (Figure 1). Within the watersheds under its jurisdiction, HCA administers programs and services to further the conservation and management of natural resources. This includes programs to manage water resources, protect people and property from natural hazards, monitor and conserve the natural environment, and provide recreational and educational opportunities. The HCA works collaboratively with a variety of agencies and groups in implementing its programs and services, and in support of its vision for a healthy watershed for everyone.

In support of its mandate, the HCA owns and manages approximately 4,700 ha of land. This includes large areas of conservation land that support important natural heritage features and ecological and hydrological functions, and which provide for passive recreational use. The HCA also operates a number of Conservation Areas with facilities and infrastructure that provide for a wide range of recreational uses, educational programming and events.

The HCA is governed by a Board of Directors, which consists of 10 members appointed by the City of Hamilton, 7 elected officials and 3 citizen appointments, and 1 member from the Township of Puslinch. Funding for HCA's programs comes primarily from municipal levy and revenues that are self-generated.

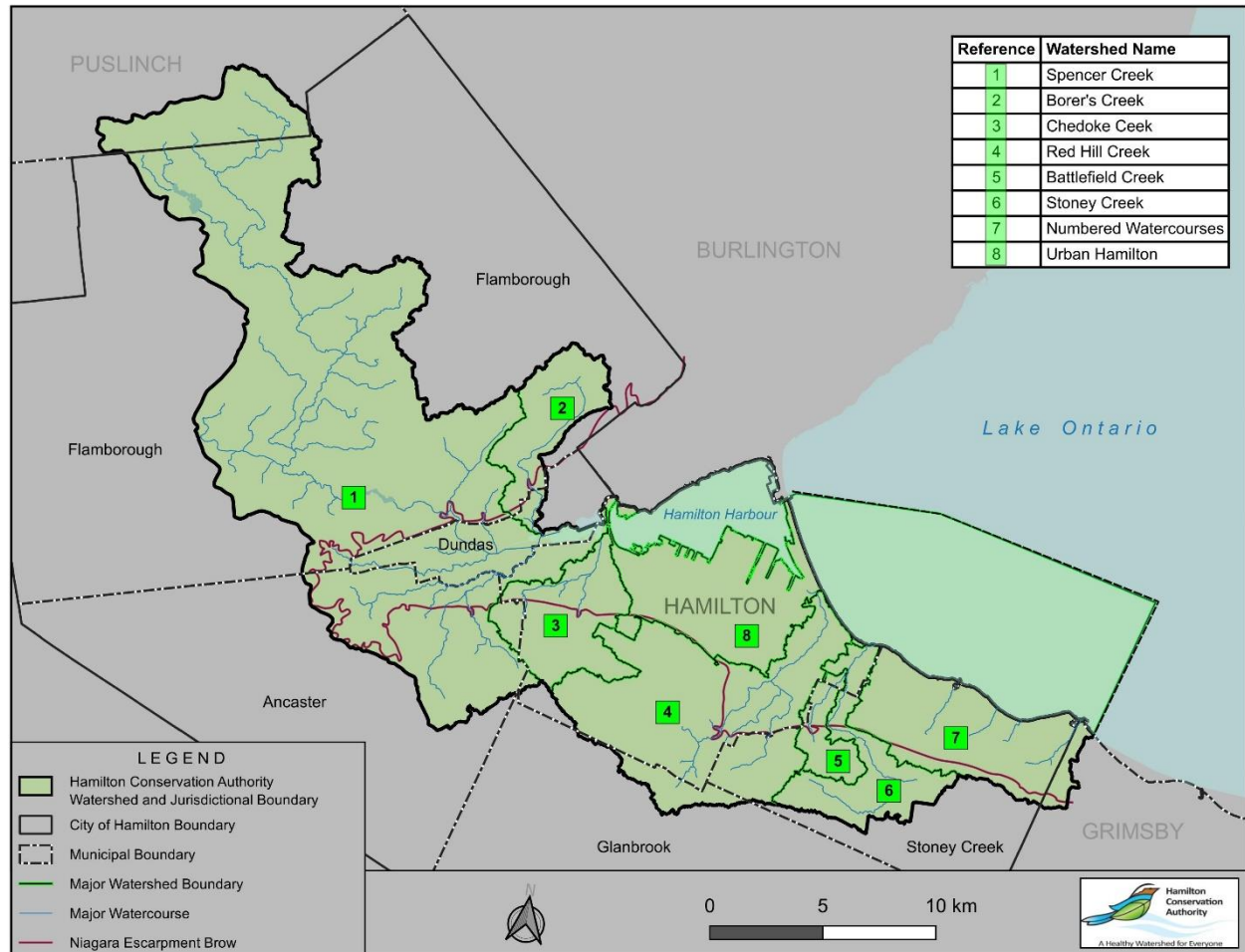


Figure 1: The Hamilton Conservation Authority watersheds

2.2 Overview of the HCA Watersheds

The Hamilton Conservation Authority (HCA) watersheds are located at the western end of Lake Ontario within the Treaty Lands and Territory of the Mississaugas of the Credit First Nation and traditional territory of the Haudenosaunee.

The major watersheds include Spencer Creek, Borers Creek, Chedoke Creek, Redhill Creek, Stoney Creek, Battlefield Creek and the Stoney Creek Number Watercourses, as well as portions of the Hamilton Harbour and Lake Ontario shoreline (Figure 1). These watersheds cover an area of approximately 57,000 ha (570 km²), encompassing the majority of the City of Hamilton and portions of the Town of Grimsby and Township of Puslinch, with a population of over 600,000 residents.

The major watercourse systems within these watersheds drain from above the Niagara Escarpment, through southern Puslinch Township and the former municipalities of Flamborough, Dundas, Ancaster, Glanbrook, Stoney Creek and Hamilton, and ultimately to Hamilton Harbour and Lake Ontario. The watersheds are comprised of a mix of urban, rural, agricultural and natural lands.

The physical landscapes of the HCA watersheds are diverse, shaped by glacial activity of the past. The watersheds have varied geologic conditions and physiographic features, including clay, sand and limestone plains, exposed bedrock, karst, moraines, cliff faces, talus slopes, beaches and shoreline. Prominent landform features include the Niagara Escarpment, Dundas Valley and Red Hill Valley systems, as well as Cootes Paradise Marsh, Hamilton Harbour and Lake Ontario.

These varied landscape conditions support a diverse natural heritage and rich biodiversity. The Great Lakes-St. Lawrence Forest region is represented in the upper watersheds, and the deciduous forest region (often referred to as the Carolinian forest), in the central and lower watersheds. These areas are among the most biologically diverse in Ontario, and support a number of rare species and a wide variety of ecosystem types, including wetland, forest, meadow, prairie and alvar.

Forest cover across the HCA watersheds is approximately 19%, while wetlands cover approximately 8% of the watershed area, although forest and wetland coverage varies considerably on a subwatershed basis. In areas where agricultural and urban land uses dominate, smaller, more fragmented and disturbed areas of woodlot, plantation, and old field habitats are widespread.

The following sections provide a summary overview of the major watersheds within HCA's jurisdiction. A characterization of the watersheds is helpful towards understanding the present-day landscape within which land use planning and development regulation occurs.

2.2.1 Spencer Creek

The Spencer Creek watershed is the largest watershed within the jurisdiction of the HCA at 23,700 ha (237 km²), representing close to half of HCA's entire jurisdictional area. The Spencer Creek watershed outlets directly into Cootes Paradise Marsh, and is comprised of a number of subwatersheds, including Ancaster Creek, Flamborough Creek, Fletcher Creek, Logie's Creek, Lower Spencer Creek, Middle Spencer Creek, Spring Creek, Sulphur Creek, Sydenham Creek, Tiffany Creek, Upper Spencer Creek, West Spencer Creek, and Westover Creek.

In the upper part of the Spencer Creek watershed, the Upper Spencer Creek and Fletcher Creek subwatersheds form their headwaters in the rural lands and wetlands in the Township of Puslinch and the City of Hamilton. This portion of the watershed is characterized by drumlins, moraines, poorly drained organic soils, till and limestone plains (the Flamborough Plain). These features support a varied landcover that includes large organic coniferous swamps, fens, shrub thickets, deciduous forests and a small number of alvar communities. Groundwater discharge in these headwater areas plays an important role in regulating stream temperatures and supporting cold and cool water habitat for more sensitive fish species.

The Beverly Swamp encompasses close to 2,500 ha and is one of the largest remaining tracts of lowland swamp forest in southern Ontario. The Beverly Swamp and Fletcher Creek Swamp wetland complexes comprise a significant portion of the upper watershed, and play important hydrological functions storing water, maintaining downstream flows, recharging groundwater and improving water quality. Groundwater recharge areas are generally concentrated in areas above the Niagara Escarpment, with significant portions of Flamborough and the Spencer Creek watershed identified as significant groundwater recharge areas.

Moving south from the upper watershed, the Flamborough Creek, Westover Creek and West Spencer Creek subwatersheds occupy predominantly rural and agricultural lands above the Niagara Escarpment. The Ancaster, Tiffany, Spring, Sulphur, Logie's, Sydenham and Middle Spencer Creek subwatersheds also have their headwaters in rural areas draining from above the Niagara Escarpment through a glacial valley, into the Lower Spencer Creek subwatershed and urbanized areas below the escarpment.

The lower portion of the Spencer Creek watershed is characterized by sand plains, moraines and escarpment. The Dundas Valley is the largest deciduous forest located in the watershed, and supports Carolinian forests, meadows, significant geological formations and a diversity of rare plants, birds and wildlife. It is connected through narrow corridors to Cootes Paradise marsh, which is the largest coastal wetland in western Lake Ontario.

Significant aggregate resources are found within the Spencer Creek watershed, with quarries operating within both the Middle Spencer and Logie's Creek subwatersheds.

There are two large dams located in the Spencer Creek watershed, Christie Dam located at Christie Lake Conservation Area and Valens Dam at Valens Lake Conservation Area. Both of these dams are managed by the Hamilton Conservation Authority to help regulate water flows and mitigate the potential for flooding within the Spencer Creek system.

2.2.2 Borer's Creek

The Borer's Creek watershed is the smallest watershed at 1,950 ha (19.5 km²), or close to 4% of HCA's jurisdictional area. The Borer's Creek watershed is characterized by areas of sand plain and moraine, which support a number of significant natural areas. The headwaters of Borer's Creek originate in the Parkside Drive Wetland Environmentally Significant Area then flow west from the community of Waterdown in the City of Hamilton through commercial, industrial, rural and agricultural lands, before flowing over the Niagara Escarpment and outletting directly to Cootes Paradise Marsh south of York Road in the Town of Dundas.

The Borer's Creek watershed houses five municipally designated Environmentally Significant Areas, including the Parkside Drive Wetland, Millgrove South Woodlot, Waterdown North Wetlands, Borer's Falls – Rock Chapel, and Cootes Paradise. The wetlands, woodlots and successional areas contained within these ESA's support a diversity of flora and fauna, and provide riparian corridors and connections to the Cootes Paradise wetland below the Escarpment, which is the largest remaining shoreline marsh at the western end of Lake Ontario.

2.2.3 Chedoke Creek

The Chedoke Creek watershed is 2,440 ha (24.4 km²), or 4% of the HCA jurisdictional area. This watershed drains from an urban area of Hamilton located above the Niagara Escarpment at the western end of the Lincoln. M. Alexander Parkway. The headwaters of the Chedoke Creek watershed are mainly enclosed within the City of Hamilton stormwater and sewer system, except for tributaries of Chedoke Creek that occur within the Iroquoia Heights Conservation Area Environmentally Significant Area.

Watercourses are open as they spill over the Niagara Escarpment, and then re-enter the municipal piped system located in the urban areas of Hamilton below the escarpment. Chedoke Creek flows in an open concrete-lined channel along Highway 403, before outletting to the south shore of Cootes Paradise Marsh.

This area has been intensively developed, and the majority of this warm water system is a direct result of stormwater input. Observable channels are present in the three municipally designated Environmentally Significant Areas within the watershed, including Iroquoia Heights Conservation Area, Hamilton Escarpment, and Cootes Paradise.

2.2.4 Red Hill Creek

The Red Hill Creek watershed is the second largest watershed within the jurisdiction of the HCA at 6,800 ha (68 km²), or 12% of the HCA watershed. It is comprised of 8 subwatersheds, including Hannon Creek, Lower Davis Creek, Lower Greenhill, Montgomery Creek, Red Hill Valley, Upper Davis Creek, Upper Greenhill and Upper Ottawa.

The Lincoln M. Alexander Parkway, Red Hill Valley Parkway and Queen Elizabeth Way are major transportation corridors within this watershed. The Niagara Escarpment and its associated valley lands, such as the Felker's Falls Escarpment Valley Environmentally Significant Area, as well as successional meadows found throughout, form the majority of natural areas within the watershed.

The Red Hill Valley extends approximately eight kilometres between the Niagara Escarpment and Lake Ontario. The valley today is comprised of a natural corridor and Red Hill Creek, which was re-aligned to accommodate the Red Hill Valley Parkway.

The Eramosa Karst is located within the Upper Davis Creek subwatershed, and features significant karst geological features, such as caves, sinking streams, springs, and dry valleys. It is considered to be the best example of karst topography found in Ontario, and is designated as a provincially significant Earth Science Area of Natural and Scientific Interest (ANSI).

The Red Hill Creek watershed is predominantly urbanized, with some agricultural, commercial and industrial land use in the Hannon Creek subwatershed. All of the subwatersheds originate above the Niagara Escarpment. Flow from the Escarpment is funneled into the Red Hill Valley and associated Red Hill Creek Escarpment Valley Environmentally Significant Area corridor. Red Hill Creek flows through the valley into Windermere Basin and outlets to the east end of the Hamilton Harbour.

2.2.5 Stoney Creek and Battlefield Creek

The Stoney-Battlefield Creek watershed comprises 2,730 ha (27.3 km²) or 5% of the HCA jurisdictional area. As its name suggests, it is comprised of two subwatersheds, Stoney Creek and Battlefield Creek, with both creek systems having their headwaters originating in rural agricultural lands above the Niagara Escarpment in the east end of the City of Hamilton. The two subwatersheds converge just south of Barton Street East within the Stoney Creek Ravine Environmentally Significant Area, in the former Town of Stoney Creek.

Land use within the watershed below the Niagara Escarpment has long been urban and industrial. With early urbanization resulting in creek channelization, poor stormwater infrastructure, and development within floodplain areas, this watershed has been prone to flooding and erosion and the stability and function of the watercourses has been impacted over time.

Three Environmentally Significant Areas occur in the watershed, including Stoney Creek Ravine, the Felker's Falls Escarpment Valley, and the Devil's Punchbowl Escarpment, all of which are associated with the Escarpment and its associated valleys. The Devil's Punchbowl is a large gorge cut from the last ice age where visitors can view over 40 million years of geological history on the gorge walls.

In 2022, the HCA began work to establish and construct a number of wetlands in the new Saltfleet Conservation Area to help alleviate flooding in the Battlefield Creek subwatershed and to restore and enhance natural areas along the Niagara Escarpment.

2.2.6 Stoney Creek Numbered Watercourses

The Stoney Creek Numbered Watercourses watershed is 3,900 ha (39 km²) in area, representing 7% of the HCA jurisdictional area, and is comprised of numerous subwatersheds that outlet to the southwestern shore of Lake Ontario in the community of Stoney Creek, in the City of Hamilton. The subwatersheds are identified by watercourse (WC) number (i.e. WC 1, 2, 2.1, etc.)

The headwaters of the watershed begin in the predominantly rural concessions that traverse the top of the Niagara Escarpment south of the community of Stoney Creek. At the toe of the Escarpment, agricultural lands still persist and many of the watercourses were historically channelized and moved to roadsides to promote agricultural drainage. Residential development has steadily encroached along Highway 8 and Barton Street as they cross through Stoney Creek, where a number of watercourses have been enclosed in the City of Hamilton piped system. The numbered watercourses flow through commercial and industrial lands to the north of Barton Street, before crossing the Queen Elizabeth Way highway and through urban areas associated with the Lake Ontario shoreline. All of the subwatersheds outlet directly to Lake Ontario.

This watershed has two remnant natural areas that have been recognized as Environmentally Significant Areas. Fifty Creek Valley ESA which occurs along the riparian corridor of WC 12 north of the QEW and within Fifty Point Conservation Area. The Devil's Punchbowl Escarpment ESA is a ribbon of natural area along the Niagara Escarpment that runs through the majority of this watershed and is home to remnant natural communities.

2.2.7 Urban Hamilton

The Urban Hamilton watershed is the third largest watershed at 5,880 ha (58.8 km²), representing 10% (including Hamilton Harbour in its entirety) of the HCA jurisdictional area. As its name implies, the watershed consists of the urban core of the City of Hamilton, as well as Hamilton Harbour.

This watershed is comprised of three subwatersheds. The Urban Core subwatershed drains the urban core of Hamilton and a small portion of the Niagara Escarpment along the Claremont and Sherman Access Roads. The Beach Strip subwatershed, which drains the peninsula of land that occurs south of the Burlington Canal, and the Hamilton

Harbour subwatershed, which traces the Hamilton Harbour shoreline, extending to encircle the Woodland Cemetery and the Royal Botanical Garden's Rock Garden.

The watershed contains a portion of the Hamilton Escarpment Environmentally Significant Area, and lands surrounding the Hamilton Harbour are part of the Cootes Paradise and Hamilton Harbour Environmentally Significant Areas. Cootes Paradise wetland is the largest remaining shoreline marsh in the western end of Lake Ontario, and while the Urban Hamilton watershed is highly urbanized, these Environmentally Significant Areas provide important ecological linkages connecting Cootes Paradise to upland terrestrial habitats.

The Iroquois Plain, which extends from the base of the Niagara Escarpment to Hamilton Harbour and Lake Ontario, marks the area of former glacial Lake Iroquois. Former beaches of Lake Iroquois now form barrier bars, including the Burlington Barrier Bar (commonly referred to today as the Beach Strip) which separates Hamilton Harbour from Lake Ontario, and the Hamilton Barrier Bar which separates Cootes Paradise from Hamilton Harbour.

The northern section of the Lake Ontario shoreline is composed of a dynamic beach which supports a natural beach and dune system. A large portion of Hamilton Harbour is developed as a major deep-water industrial port, with inner areas of the Harbour comprised of municipal parkland and recreational facilities. Historic landfilling and dredging operations have significantly changed the internal configuration of the harbour, with the southern and eastern shorelines consisting almost entirely of fill to support industrial development. Hamilton Harbour contains the only large deep water and littoral aquatic system in the watershed. Although these communities are degraded, they remain locally significant. Hamilton Harbour is identified as an Area of Concern and has a Remedial Action Plan in place.

2.3 Watershed Threats, Impacts and Challenges

The terrestrial environment throughout many of the major watersheds is dominated by agricultural and urban land uses. Vegetation is diverse, despite the conversion of most forested land and wetlands to urban and suburban areas, road networks, and agriculture. However, remaining natural areas continue to be threatened by habitat loss, invasive species, pollution and climate change.

Habitat loss is the biggest threat to the natural heritage of HCA's watersheds. This loss is related primarily to continuing growth and development pressures. With respect to wetlands, which are among the most important habitat types, the Hamilton region has seen 78% of its wetlands lost since pre-settlement (Ducks Unlimited, 2010). Loss of wetland and forest habitat types continues to be an issue across the HCA watersheds.

Invasive species are plants, animals, aquatic life, and micro-organisms that outcompete native species when introduced outside of their natural environment, and which threaten ecosystems, economy, and society. Invasive species can be difficult to control, and require considerable resources to manage. The impact of invasive species in the HCA

watersheds includes the creation of monocultures as habitats dominated by one invasive species, loss of forest canopy and declining forest health, as well as lack of wetland establishment due to invasive fish species.

Pollution can have a variety of impacts on natural systems including creating toxic environments that can decrease biodiversity. Nutrients such as phosphorus are impacting HCA's watersheds and the Hamilton Harbour. Road salt that washes into local waterways is also having an impact, and can result in high levels of chlorides which are toxic to fish, amphibians and macroinvertebrates.

Climate change is increasingly disrupting natural habitats, impacting the ability of various plants and animals to adapt to changing conditions (Government of Canada, 2022).

HCA is working cooperatively with other conservation organizations, groups and municipalities to address these threats and challenges. HCA administers programs and services which are contributing to the monitoring and management of watershed impacts. This includes programs for the acquisition of environmentally significant lands, ecological and water quality monitoring, invasive species management, stewardship of private lands, and land use planning and regulation of development.

3 LEGISLATIVE AND POLICY FRAMEWORK

The legislative and policy framework for conservation, natural resource management and land use planning in Ontario is complex. There are numerous statutes, regulations, policies and plans that guide conservation and planning work. There are also many agencies and organizations that play a role in land use planning, the management of natural resources and the conservation of the environment. This includes federal, provincial and municipal governments, as well as a diverse range of conservation, business and industry organizations, and private landowners.

This section provides an overview of the *Conservation Authorities Act* and its associated enabling provisions and regulations that provide the authority for the programs and services administered by the HCA. This section also looks at other selected important laws, policies and plans from provincial and municipal jurisdictions that are applicable to conservation, resource management and land use planning. The section concludes with a summary overview of the various roles and responsibilities that HCA (and other conservation authorities) play related to the implementation of this provincial legislative and policy framework.

Having a general understanding of some of the statutes, regulations, plans and policies that govern land use planning and natural resource management provides useful context for HCA's role in land use planning and regulation of development.

3.1 Conservation Authorities Act

The *Conservation Authorities Act* (CA Act) was first passed in 1946. The CA Act was developed in response to growing concerns over deteriorating environmental conditions across Ontario, including severe flooding and erosion problems. The CA Act sought to provide a basis for a provincial program of conservation, restoration and the wise use and management of Ontario's natural resources, including water, soils, forests and wildlife.

Today, the CA Act continues to provide the legislative basis for the formation of a conservation authority and determination of its jurisdiction and objects. It includes provisions to identify a conservation authority's membership and governance, to define its powers and authorities, to allow for the passing of regulations related to its authorities, and to provide certain enforcement powers.

Conservation authorities are corporate bodies established by the province at the request of two or more municipalities within a shared watershed in accordance with the requirements of the CA Act. A conservation authority is governed by the CA Act and by a Board of Directors whose members are appointed by participating municipalities based on representation criteria that are defined in the CA Act.

The purpose of the CA Act is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario. The CA Act further describes the objects

of a conservation authority, which are to provide, in the area over which it has jurisdiction, a variety of mandatory programs and services as defined in the act and associated regulations. This includes, programs and services to manage risks related to natural hazards, monitor water resources, and conserve and manage lands owned or controlled by the authority; an Authority shall also fulfill any duties and responsibilities as a source protection authority under the *Clean Water Act*.

The CA Act also provides that a conservation authority may enter into agreements to provide additional programs and services on behalf of a municipality situated within its area of jurisdiction, or to provide any other program or service it may deem advisable to further the purposes of the Act.

The CA Act enables conservation authorities with broad powers for the purpose of accomplishing their objects. This includes the ability to study and investigate the watershed to assist in developing programs and services, to acquire and dispose of land, to develop and use lands acquired for purposes not inconsistent with its objects, to collaborate and enter into agreements, and to create reservoirs, construct dams and control the flow of surface waters in order to prevent or reduce the adverse effects of flooding.

Section 21.1 of the CA Act requires conservation authorities to provide programs and services related to the risk of natural hazards, the conservation and management of lands owned or controlled by the authority, the authority's responsibilities as a source protection authority under the *Clean Water Act*, and other programs and services as prescribed by regulations created under the CA Act.

Ontario Regulation 686/21, Mandatory Programs and Services, (O. Reg. 686/21) under the CA Act further details the responsibilities of conservation authorities to manage risks related to natural hazards. This includes responsibilities related to reviewing and providing comments for plans of development under the *Planning Act*, *Aggregate Resources Act*, *Drainage Act*, *Environmental Assessment Act* and *Niagara Escarpment Planning and Development Act*, as well as responsibilities for administering and enforcing the regulations of the CA Act.

Section 21.1.1 further enables conservation authorities to enter into agreements with municipalities within their jurisdiction to provide municipal programs and services under a memorandum of agreement. Section 21.1.2 provides that a conservation authority may provide any program or service that it determines are advisable to further the purposes of the CA Act.

In accordance with these powers and the provisions of the CA Act more generally, conservation authorities have been given a broad mandate to work at the watershed level to conserve, restore and responsibly manage Ontario's water, land, and natural resources.

3.1.1 Conservation Authority Regulation of Development

The CA Act first empowered conservation authorities to establish development control regulations in 1956, for the purpose of prohibiting filling in floodplains. The regulations were broadened in 1960 to regulate the placing or dumping of fill in defined areas where, in the opinion of a conservation authority, the control of flooding, pollution or the conservation of land may be affected. Further amendments to the CA Act in 1968 expanded the regulations to prohibit or control construction and alteration to waterways, in addition to filling.

In 1998, the *Conservation Authorities Act* was amended to ensure that regulations under the CA Act were consistent across the province, and complementary to the current provincial environmental and natural hazard policies of the time. These changes led to the replacement of the earlier “Fill, Construction and Alteration to Waterways” Regulation, with the “Development, Interference with Wetlands and Alterations to Shorelines and Watercourses” Regulation (*Ontario Regulation 97/04*), which was passed in 2004.

Ontario Regulation 97/04 outlined the content that each conservation authority’s “Development, Interference with Wetlands and Alterations to Shorelines and Watercourses” Regulation must contain. The regulation required all conservation authorities to regulate Great Lakes shorelines, interconnecting channels, inland lakes and wetlands, in addition to the areas and features each conservation authority historically regulated. In 2006, individual regulations were passed for each Conservation Authority to be consistent with *Ontario Regulation 97/04*, including *Ontario Regulation 161/06*, HCA’s *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

Between 2017 and 2024, amendments were made to the CA Act, including amendments impacting the regulation of development. The changes made by the government during this time were intended to streamline regulatory requirements to focus on natural hazards and public safety. Changes that came into effect on April 1, 2024 revoked *Ontario Regulation 161/06* and individual conservation authority development regulations. These regulations were replaced by *Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits (O. Reg. 41/24)*, a single regulation to address matters related to CA regulation of development.

Earlier amendments to sections 28 and 30.1 of the CA Act addressing regulation of development activities, permitting and enforcement also came into effect on April 1, 2024. The CA Act and *O. Reg. 41/24* must be reviewed in conjunction to understand how conservation authorities administer the regulation of development activities.

The changes implemented April 1, 2024 removed the consideration of natural heritage matters (previous ‘conservation of land’ and ‘pollution’ tests under *Ontario Regulation 97/04*) from permitting decisions. However, the CA Act continues to provide for the regulation of development activities in and adjacent to watercourses, wetlands and

hazard prone areas such as river valleys and shorelines, and permits continue to be required for development activities in such areas in most cases.

Under section 28.1 of the CA Act, a conservation authority may grant permission for development and other activities in a regulated area where it is of the opinion the activity is not likely to affect the control of flooding, erosion, dynamic beaches or unstable soil or bedrock, or create conditions that in the event of a natural hazard might jeopardize the health or safety of persons, or result in the damage or destruction of property.

The Minister of Natural Resources has certain powers under the *Conservation Authorities Act* that may at times supersede the power granted to conservation authorities. Where a conservation authority refuses a permit or attaches conditions to a permit that an applicant objects to, the applicant may request a review of the decision by the Minister. The Minister may also issue orders to make a permitting decision in place of a conservation authority. The circumstances under which the Minister may issue an order to make a permitting decision in place of a conservation authority or undertake a review of a conservation authority permitting decision are more specifically described in *Ontario Regulation 474/24, Minister's Reviews under Sections 28.1, 28.1.2 of the Act and Minister's Orders under Section 28.1.1 of the Act*.

Section 47 of the *Planning Act* enables the Minister of Municipal Affairs and Housing to issue zoning orders. When a conservation authority receives a permit application for a project authorized through a zoning order, Section 28.1.2 of the CA Act generally requires that the permit be granted if the project is not to be carried out in the Greenbelt Area. A conservation authority may impose conditions on such permits to mitigate hazard impacts, and may also enter into an agreement with the permit holder that sets out requirements to be satisfied in order to compensate for ecological impacts and any other impacts that may result from the development project.

The provisions of the CA Act and regulations that provide for the regulation of certain development activities are intended to help in the achievement of the broad goals and objectives of the conservation authorities, including in particular those related to the protection of people and property from natural hazards.

3.2 Other Legislation

There are a number of other important statutes that impact land use planning and the regulation of development, and the role of conservation authorities in these processes. In particular, O. Reg. 686/21 under the CA Act, prescribes a number of Acts under which conservation authorities have responsibilities related to reviewing and providing comments on development proposals. This includes the *Planning Act*, *Aggregate Resources Act*, *Drainage Act*, *Environmental Assessment Act* and *Niagara Escarpment Planning and Development Act*. A summary of each of these Acts and their relevance to the work of conservation authorities is provided in Table 1.

Table 1: Summary of land use planning and conservation legislation, policies and plans

Legislation/Policy/Plan	Primary Purpose	Role of HCA
<i>Federal</i>		
Impact Assessment Act	The <i>Impact Assessment Act</i> governs federal environmental assessments in Canada. The <i>Act</i> applies to projects undertaken on federal lands, as well as designated projects such as the construction, operation, decommissioning and abandonment of mines, renewable energy facilities, hazardous waste facilities, etc.	Conservation authorities may provide comments regarding potential natural hazard risks on proposals subject to the <i>Act</i> .
Hamilton Harbour Remedial Action Plan (HHRAP)	The HHRAP identifies the environmental concerns and impacts (impairments) to Hamilton Harbour, as well as their causes and goals and criteria for restoring beneficial use impairments, remedial actions to be taken and the agencies/authorities responsible for implementing them.	HCA participates in the collaborative governance structure of the HHRAP, and supports its implementation through various programs and activities, such as its watershed ecological and water quality monitoring programs.
<i>Provincial</i>		
Conservation Authorities Act (CA Act)	The purpose of the CA Act is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario. The <i>Act</i> provides the legislative basis for the formation of a conservation authority and the determination of its jurisdiction and programs and services.	Conservation authorities may provide a variety of programs and services under the <i>Act</i>, including related to natural hazards, the monitoring of water resources, and management of land owned or controlled by the Authority. Conservation authorities have responsibilities related to reviewing and providing comments on natural hazards for plans of development under the <i>Planning Act</i>, <i>Aggregate Resources Act</i>, <i>Drainage Act</i>, <i>Environmental Assessment Act</i> and <i>Niagara Escarpment Planning and Development Act</i>. The <i>Act</i> also provides Authority's with responsibilities for regulating development and enforcing these regulations.
Planning Act	The <i>Planning Act</i> is the principal statute that guides Ontario's land use planning system, setting out the rules for land use planning and decision making.	The <i>Act</i> requires that municipalities notify relevant public agencies, including conservation authorities, of planning proposals so these agencies can offer comments.

	The key purposes of the <i>Act</i> include promoting sustainable economic development in a healthy natural environment, and integrating matters of provincial interest into municipal planning decisions. The <i>Act</i> provides municipalities with a variety of tools for facilitating land use planning and development.	Conservation authorities provide comments related to natural hazards on land use planning applications made under the <i>Planning Act</i> .
Provincial Planning Statement (PPS)	The Provincial Planning Statement was created under the <i>Planning Act</i> to provide direction to municipalities regarding land use planning policies in areas of provincial interest.	Conservation authorities review and comment on development applications under the <i>Planning Act</i> to help ensure that decisions made under the <i>Act</i> are consistent with the natural hazard policies of the PPS. The PPS directs municipalities to collaborate with conservation authorities to identify hazardous lands and hazardous sites, and to manage development in these areas. The PPS also encourages municipalities to collaborate with local Conservation Authorities in undertaking watershed planning.
Greenbelt Act	The <i>Greenbelt Act</i> was enacted to protect natural heritage and water resource systems, preserve agricultural land as a source of food and employment, and to control urbanization in Southern Ontario. Planning decisions made under the <i>Planning Act</i> must conform to the policies of the Greenbelt Plan.	The Greenbelt Plan mandates that key natural heritage features and key hydrologic features must be shown in Official Plans, and that the delineation of these features can be undertaken by municipalities and conservation authorities.
Niagara Escarpment Planning and Development Act (NEPDA)	The <i>NEPDA</i> was enacted to maintain the Niagara Escarpment and land in its vicinity as a continuous natural environment, and to ensure only development compatible with that natural environment occurs. The NEPDA allows the Minister to make regulations designating any area or areas of land within the Niagara Escarpment Planning Area as a Development Control Area.	Development proposed within an area designated as a Development Control Area will require a development permit from the Niagara Escarpment Commission (NEC). Conservation authorities support the NEC development permit application review and approval process. A conservation authority may review development permit applications for the purpose of commenting on risks related to natural hazards.

Ontario Environmental Assessment Act (EA Act)	The <i>EA Act</i> sets up a process for reviewing the environmental impact of certain activities and projects. Proponents of projects (undertakings) subject to the <i>Act</i> must demonstrate that alternatives to the undertaking and alternative methods of implementing the undertaking have been considered, and that the chosen approach is environmentally preferable and needed.	<i>Ontario Regulation 686/21</i> under the <i>CA Act</i> enables conservation authorities to review proposals subject to the <i>EA Act</i> for the purpose of commenting on any risks related to natural hazards that may arise from a proposal.
Drainage Act	The <i>Drainage Act</i> provides a process for one or more landowners to obtain a legal drainage outlet for an 'area requiring drainage'. The establishment of a municipal drain is a communal project, benefiting and paid for by those property owners whose lands are served by the drain.	Municipal drains are often regulated by conservation authorities as watercourses. For certain municipal drain and repair activities, a protocol has been developed to fulfill permission requirements under Section 28 of the <i>Conservation Authorities Act</i> without the full permitting process.
Aggregate Resources Act (ARA)	The <i>Aggregate Resources Act</i> governs the management of aggregate resources in Ontario. This includes provisions for the government to control and regulate aggregate operations on designated private and Crown lands, to minimize adverse impacts on the environment, and to require the rehabilitation of land after the excavation of aggregate resources.	<i>Ontario Regulation 686/21</i> under the <i>CA Act</i> enables conservation authorities to review to review proposals subject to the <i>ARA</i> for the purpose of commenting on any risks related to natural hazards that may arise from an aggregate resource extraction operation.
<i>Municipal</i>		
Municipal Official Plans, Zoning By-laws, Secondary Plans, and other land use plans	Municipal Official Plans, Zoning By-laws, Secondary Plans, and other land use plans inform land use planning and development within municipalities.	Conservation authorities may provide input to the development and implementation of these plans and policies, including the identification of lands affected by natural hazards and developing policies for managing land use change and development in areas affected by natural hazards.

3.3 City of Hamilton Official Plan

Official Plans (OPs) are policy documents created by municipalities that inform land use planning and development within their communities. When a municipality develops an OP, they must consult the public and with Indigenous communities. OPs must conform to any policy statements issued under the *Planning Act*, as well as provincial plans, and may require approval from the Province to take effect. Municipalities are expected to update and amend their OPs over time to ensure that policies are aligned with direction from the Province and reflect the current needs of the community.

The City of Hamilton has two Official Plans that apply to different areas within Hamilton, but the plans are complementary and both are designed to serve the City's vision of being a strong, vibrant, healthy, and diverse community. The Urban Hamilton Official Plan (UHOP) defines the City's urban boundary, and guides land use planning and development within it. The Rural Hamilton Official Plan (RHOP) applies to the rural areas in the City, and generally directs non-farm and non-resource-based growth to rural settlement areas with boundaries that are not to be expanded. The plans encourage residential intensification and generally direct growth towards existing built-up areas. The UHOP and RHOP identify a City-wide Natural Heritage System that is comprised of provincially and locally significant natural areas and features, and the linkages between them. The City NHS seeks to protect and enhance biodiversity and ecological functions, while also contributing to the character of the City and quality of life for its residents.

Both plans direct hazard lands to be placed in a separate zoning classification under the Zoning By-law. With some exceptions, the UHOP prohibits development and site alteration within hazards lands, which include both hazardous lands and hazardous sites as identified and mapped by conservation authorities within the City. The plans require that development proposals within conservation authority regulated areas are only approved by the City if they are permitted by the applicable conservation authority.

The Official Plans also include Special Policy Areas (SPAs), Area Specific Policies (ASPs), and Site Specific Policies (SSPs). SPAs are areas spanning multiple parcels of land where additional studies are required to determine land uses. ASPs are policies that apply to specific areas where unique consideration is needed. ASPs include policies specific to the Dundas Two Zone Floodplain Area. Whereas a one-zone system is used to identify and manage floodplain areas for the rest of the City, the two-zone system for the Dundas Two Zone Floodplain Area categorizes portions of the floodplain into a floodway and a flood fringe. Through these policies, some development activities that would be prohibited in the floodway can be permitted in the flood fringe. SSPs are policies that apply to specific parcels of land. Some SSPs require additional clearance of activities from conservation authorities (e.g. drainage diversions across watersheds).

3.4 Township of Puslinch

The Township of Puslinch is a lower-tier municipality in the County of Wellington. For lower-tier municipalities, the adoption of their own Official Plans is discretionary and not mandated by the *Planning Act*. In the case of Puslinch, the Township has not adopted its own OP, and relies on the policies set out in the County of Wellington OP. In addition to the general policies of the County of Wellington OP, the OP also provides local area specific policies for the Township of Puslinch in order to provide direction regarding what types of developments should be permitted in different areas of Puslinch.

3.5 Hamilton Harbour Remedial Action Plan

Hamilton Harbour is located at the western end of Lake Ontario, bounded by the City of Burlington to the north and City of Hamilton to the south. It supports Ontario's largest port, the Port of Hamilton, and significant commercial and industrial land use, as well as municipal parkland and recreational uses. Cootes Paradise Marsh, the largest coastal wetland on the Great Lakes system, is located at the western end of the harbour. A number of major watersheds drain to Hamilton Harbour, including Red Hill Creek, Spencer Creek and Grindstone Creek.

Hamilton Harbour is identified as an Area of Concern (AOC) under the Great Lakes Water Quality Agreement (GLWQA). AOC are locations on the Great Lakes system where water quality and ecosystem health have been degraded as a result of human activities. Conditions in Hamilton Harbour have been impacted by a 150-year history of industrial and urban development, and related discharges of industrial and municipal waste water and stormwater.

The GLWQA provides for the establishment of Remedial Action Plans (RAP) for AOCs. RAPs are developed locally under a partnership framework in order to guide restoration efforts. The Hamilton Harbour Remedial Action Plan (HHRAP) was developed between 1987 and 1992, and identifies the environmental concerns and impacts (impairments) to the harbour and their causes, goals and criteria for restoring beneficial use impairments (BUI), remedial actions to be taken and the agencies/authorities responsible for implementing them, and a monitoring and evaluation plan for tracking progress.

The federal and provincial governments, through the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA), share responsibility for implementing the HHRAP. Implementation is also supported by municipal government, non-governmental organizations, business and industry, academia, Indigenous communities and the public. These groups work through the Bay Area Implementation Team (BAIT) and various technical committees to oversee implementation of the HHRAP and track progress. HCA participates in the collaborative governance structure of the HHRAP, and supports its implementation through various programs and activities, such as its watershed ecological and water quality monitoring programs.

3.6 Description of HCA Roles and Responsibilities

The purpose of the *Conservation Authorities Act* (CA Act) is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources Ontario. The CA Act provides for the establishment of individual conservation authorities to undertake programs and services to meet these purposes on a watershed basis. The fundamental role for conservation authorities focuses on natural hazard management. In this capacity, a conservation authority may undertake a variety of roles and activities related to land use planning and regulation of development activities, including the following:

- i. **Resource Management Agencies** – The CA Act provides conservation authorities with a broad mandate to undertake a variety of programs and services on a watershed basis to further the conservation and management of natural resources within their areas of jurisdiction. A conservation authority develops its programs and services to reflect local resource management needs within their jurisdiction, which are approved by the CA Board of Directors and may be funded from a variety of sources including municipal levies, fees for services, provincial and federal grants, and self-generated revenue.
- ii. **Regulatory Authorities** – Part VI of the CA Act and *O. Reg. 41/24* made under the CA Act provide for the regulation of certain types of activities in and adjacent to river and stream valleys, wetlands, shorelines of inland lakes and the Great Lakes-St. Lawrence River System and other hazardous lands. A conservation authority may issue permits for prohibited activities where it is of the opinion certain criteria, as laid out in the CA Act, are satisfied. *O. Reg. 686/21* made under the CA Act requires that a conservation authority provide programs and services to ensure its regulatory duties and responsibilities to administer Part VI of the CA Act are met.
- iii. **Delegated Provincial Interest in Plan Review** – As outlined in the Conservation Ontario/Ministry of Natural Resources (MNR)/Ministry of Municipal Affairs and Housing (MMAH) Memorandum of Understanding (MOU) on CA Delegated Responsibilities, conservation authorities have been delegated responsibilities to represent the provincial interest in natural hazards in land use planning matters. Under *O. Reg. 686/21*, section 7, a conservation authority, whether acting on behalf of the MNR or in its capacity as a public body under the *Planning Act*, shall provide programs and services for the purposes of helping to ensure that the decisions made under the Planning Act are consistent with the natural hazard policies of any policy statements issued under that Act.
- iv. **Public Bodies** – Pursuant to the *Planning Act*, conservation authorities are considered ‘public bodies’, and as such are to be notified of certain municipal policy documents and planning applications. Conservation authorities may comment as per their Board approved policies as local resource management agencies to the municipality or planning approval authority on these documents and applications, and retain certain appeal rights for decisions made under the *Planning Act*.

- v. Service Providers – Individual conservation authorities may enter into agreements with ministries and agencies of government, as well as municipal councils, local boards and other organizations and individuals to further the objects of conservation authority and the purposes of the CA Act.
- vi. Landowners – Many conservation authorities are landowners, and as such, may become involved in land use planning and development processes under the *Planning Act*, either as an adjacent landowner or as a proponent. Under *O. Reg. 686*, section 9(1) a conservation authority shall provide programs and services to enable the authority, in its capacity as an owner of land, to make applications or comment on matters under the *Planning Act*.

4 POLICIES FOR LAND USE PLANNING

Land use planning is the process by which decisions are made on how land is to be used and resources allocated within a region or community. Land use planning typically seeks to balance community growth and development with social objectives, management of natural resources, and conservation of the environment.

Ontario has a policy-led land use planning system, governed by the *Planning Act* and policy statements issued under the Act. The *Provincial Planning Statement* (PPS) defines policies which provide for growth and development while also protecting resources of provincial interest, public health and safety, and the quality of the natural and built environment. The PPS supports an integrated, balanced and long-term approach to planning to achieve its economic, social and environmental objectives.

Municipal planning authorities are responsible for undertaking land use planning that implements the provincial policy framework. Conservation authorities play an important role supporting municipalities in the implementation of the policy-led land use planning system. This includes collaborating on watershed planning, providing input to municipal official plans and reviewing development proposals to help in managing risks to public health and safety that may result from natural hazards.

4.1 Land Use Planning Review (Plan Input and Plan Review)

Historically, most land use planning decisions were made by the province. However, in the 1990s, in an effort to promote greater local decision making the province began transferring approval authority for certain planning matters to municipalities. At this time, the province also delegated responsibility to conservation authorities to represent the provincial interest in natural hazard policy matters. While the province retains a significant role in land use planning through the development of the policy-led framework, most land use planning decisions are now made by local municipal planning authorities.

Through the enactment of *Ontario Regulation 686/21* under the *Conservation Authorities Act*, the province identified the programs and services that are mandatory for a conservation authority to provide. This includes a range of programs and services related to managing risks associated with natural hazards, confirming that conservation authorities continue to have delegated responsibility for addressing the provincial interest in natural hazard matters and for ensuring that decisions under the *Planning Act* are consistent with the natural hazard policies of the PPS and conform with any natural hazards policies included in any applicable provincial plan.

In this regard, the HCA continues to support its local planning authorities and municipal land use planning processes through programs and services that provide mapping and information related to the identification of natural hazards, input to municipal official plans on natural hazard policy development, and technical review and advisory comments on natural hazard matters for development applications submitted under the *Planning Act*.

HCA also provides a similar review and commenting function regarding risks from natural hazards that may arise from proposals made under other legislation, including the *Aggregate Resources Act*, *Environmental Assessment Act*, and *Niagara Escarpment Planning and Development Act*.

In carrying out its land use planning review functions and responsibilities HCA has the following objectives:

- Provide information and mapping to identify areas of natural hazards
- Promote appropriate land use designation and zoning of hazardous lands and wetlands
- Collaborate on the development and implementation of watershed planning
- Support the development of policies and guidelines that provide for the management of risks and impacts associated with natural hazards, and which protect hydrological and ecological features and functions (watercourses, wetlands, etc.) that play a role in regulating and mitigating natural hazards
- Promote the consideration of watershed-scale impacts and watershed health in land use planning decisions
- Ensure that land use planning decisions provide for the protection of public health and safety and property from natural hazards

The policies set out in Section 4 will be applied to inform any requirements, comments and recommendations made by HCA through its land use planning input and review programs and services.

4.1.1 General Policies for Plan Input and Plan Review

HCA may review and comment on land use planning matters in a number of different capacities, including as the delegated authority for representing the provincial interest in natural hazards for applications and other matters under the *Planning Act*. HCA may also review and comment on natural hazard matters for proposals made under the *Aggregate Resources Act*, *Environmental Assessment Act*, and *Niagara Escarpment Planning and Development Act*.

HCA will work collaboratively with municipalities and other agencies and ministries, as required, to implement its legislated responsibilities to provide land use planning input and review comments on natural hazard matters for proposals submitted under these Acts. Comments and recommendations provided by HCA will consider and be consistent with the *Provincial Planning Statement* or any other provincial policy statements issued under the *Planning Act*, and conform with provincial plans where applicable.

The following general policies will be applied to HCA's consideration and comments on planning applications and other proposals, and must be considered in conjunction with the policies of Sections 4.2 to 4.5, as well as the policies of Section 5 as may be applicable.

- a) HCA will work cooperatively with municipalities, ministries, agencies and applicants, as applicable, on land use planning matters to ensure efficient review processes and to promote coordination of review processes and requirements where multiple statutory or regulatory approvals may be required.
- b) HCA will provide input to the development and maintenance of land use planning policy documents, plans and guidelines that are based on the most current information available regarding natural hazards and best practices for their management and mitigation of associated risks.
- c) HCA supports and will promote land use planning processes whereby proposals for *development* and other activities are first evaluated under the applicable policy documents and plans in order to establish the principle of the proposed land use and appropriateness of the activity, prior to making an application for any required regulatory approval or permit that would implement the proposal.
- d) HCA will encourage and participate in pre-consultation on proposals for *development* and other activities in order to identify HCA's interests and requirements.
- e) When commenting on planning applications HCA will include comments regarding the applicability and requirements of any applicable development regulations under the *Conservation Authorities Act*.
- f) HCA may recommend the completion of technical studies and plans (subwatershed study, hydrogeological study, floodplain impact assessment, karst assessment, etc.) to support a proposal for *development* or other activity in order to be able to assess its consistency with applicable policies. Study requirements are to be confirmed and scoped in consultation with the HCA and other applicable authorities, and must be completed by qualified professionals in accordance with accepted standards, practices and guidelines.
- g) HCA may reference existing available studies, including watershed plans, subwatershed plans, environmental assessments and other *comprehensive studies*, to help guide and inform its plan input and plan review comments.
- h) *Development* or any other activity which would be susceptible to natural hazards, or would cause or aggravate natural hazards, will generally not be supported unless natural hazards have been addressed in accordance with the policies of Section 4 and Section 5, as may be applicable.
- i) HCA comments on land use planning matters will recognize and consider, where appropriate, the interconnections between natural hazards, *water resource systems*, and *natural heritage systems*, and where such systems and their constituent features and functions may play a role in the control or mitigation of natural hazards.

- j) HCA comments on land use planning matters will recognize and consider, where appropriate, the potential *impacts of a changing climate* on the risks associated with natural hazards.
- k) HCA comments on land use planning matters will recognize and consider, where appropriate, the cumulative impacts of development on natural hazards at a watershed scale.
- l) HCA may support the transfer or dedication of *hazardous lands* or *hazardous sites* to public ownership through land use planning processes where deemed practical and to be of public benefit. Hazardous lands and sites will only be accepted by HCA through dedication in accordance with HCA's Land Securement Strategy.
- m) Where HCA is requested by a municipal planning authority or the province to support an appeal of a planning application under the *Planning Act* at the Ontario Land Tribunal, HCA will work to support the appeal as may be required and within its mandate, and subject to receiving authorization from the HCA Board of Directors.
- n) HCA may undertake an appeal to the Ontario Land Tribunal of a decision under the *Planning Act* as a public body in accordance with that Act, if it relates to a natural hazard matter and subject to receiving authorization from the HCA Board of Directors.

4.2 Watershed Planning Approach

Watershed planning provides a comprehensive and integrated framework for the characterization and assessment of watershed conditions and health. It takes an ecosystem-based approach to identifying hydrological and ecological systems, features and functions, and their interconnections, and establishes direction for the protection, enhancement, and restoration of water and other natural resources within a watershed.

The Provincial Planning Statement (PPS) recognizes the watershed as the ecologically meaningful scale for integrated and long-term planning, and as a foundation for considering cumulative impacts of development. The PPS supports municipalities undertaking watershed planning in collaboration with conservation authorities.

Planning authorities involved in watershed planning may develop watershed and subwatershed plans, which may address similar issues but differ in scope and objectives. Where a watershed plan provides direction for the management of water and other natural resources at the watershed scale, a subwatershed plan pertains to a smaller area within the larger watershed, and provides a greater level of detail related to the local context. Watershed planning may inform subwatershed planning, with resulting subwatershed plans refining the objectives and assessments of a watershed plan and tailoring direction to address local conditions and issues. Both watershed and subwatershed plans may address a variety of matters, including but not limited to:

- Water quality and quantity assessments and management;
- Identification of water resource and natural heritage features and systems;
- Development, servicing and infrastructure needs and objectives;
- Evaluation of growth and development scenarios and their related impacts;
- Establishment of targets and objectives for restoration and enhancement; and
- Define implementation strategies and monitoring requirements.

Watershed planning, used in conjunction with subwatershed planning and other land use planning processes and studies, can provide an effective means for supporting the achievement of local development, resource management and conservation goals and objectives, including the mitigation of risks to public health and safety associated with natural hazards.

4.2.1 Policies for Watershed and Subwatershed Planning

- a) HCA will promote using the *watershed* as the ecologically meaningful scale for integrated and long-term planning, and for providing a foundation for the consideration of cumulative impacts of *development*.
- b) HCA supports the development of watershed and subwatershed plans and related studies to help guide land use and infrastructure planning, the protection of *water resource systems*, and the identification of natural hazards and approaches to managing and mitigating associated risks to public health and safety.

- c) HCA will work collaboratively with municipalities in the development of a watershed and subwatershed planning work program, and in the completion of related studies and plans.
- d) HCA will support watershed and subwatershed planning through the provision of water resource and natural hazard information and data that has been collected or is available from existing HCA programs and resources.
- e) HCA will recommend the completion or update of watershed or subwatershed plans, as appropriate, prior to or in conjunction with any proposed urban boundary expansion application.
- f) Where undertaking watershed and subwatershed planning, HCA will support the evaluation of cumulative impacts resulting from development and consideration of the *impacts of a changing climate, on water resource systems, hazardous lands and hazardous sites*.
- g) In providing comments and recommendations on land use planning matters HCA may reference and rely on any applicable watershed plan, subwatershed plan, or related study or plan.

4.3 Natural Hazard Management

Ontario has a long history of settlement in areas prone to natural hazards, including areas adjacent to rivers, streams, valleys and shorelines of the Great Lakes. As a result of development in such areas, Ontario has experienced significant property damage, economic impacts, social disruption, and even loss of life, due to natural hazard occurrences. Development within areas affected by flooding and erosion, and other natural hazards, increases risks to people, property and public health and safety.

The Ministry of Natural Resources (MNR) is the provincial lead for natural hazard management in Ontario. They are responsible for the development of the overall provincial natural hazard management program, establishing policies, standards and guidelines, and coordinating responses to emergencies resulting from natural hazards. However, other levels of government and agencies, including municipalities and conservation authorities, play a central role in managing hazards and mitigating their associated risks and impacts. Municipalities and conservation authorities are responsible for implementing many aspects of hazard management, including the identification of areas affected by natural hazards within their jurisdiction, and the development of local land use planning and regulatory policies to limit hazard-related risks and impacts.

The province's current approach to managing flooding and other natural hazards adopts elements of both hazards-based and risk-based approaches. A hazards-based approach focuses on determining where hazards exist and then taking steps to prevent activities from occurring in those areas, such as limiting new development. A risk-based approach focuses on determining the risks posed by natural hazards, and then taking steps to reduce those risks to acceptable levels, such as the use of floodproofing or Special Policy Areas to address risks associated with development located in flood-prone areas (McNeil, 2019).

The core components, strategies and measures applied to the management of natural hazards generally fall into the following categories – prevention, protection and other mitigation measures, and emergency preparedness, response and recovery. While a broad range of strategies have been important to Ontario's overall approach to managing natural hazards, prevention measures have generally been viewed as the preferred approach and most cost-effective means of reducing risks and impacts, and protecting public health and safety.

Land use planning and the regulation of development in areas prone to natural hazards is a key component of a preventative approach. A central tenant of provincial natural hazard policy is that development shall generally be directed to areas outside of *hazardous lands* and *hazardous sites*. Planning authorities, through the land use planning tools and processes available under the *Planning Act*, can help to reduce the exposure of people and property to hazards by prohibiting or restricting development in areas affected by natural hazards.

4.3.1 Policies for Natural Hazard Management and Development

- a) HCA will work collaboratively with municipalities to identify *hazardous lands* and *hazardous sites*, and to ensure that these lands are designated and zoned appropriately in municipal planning documents.
- b) The limit and extent of *hazardous lands* and *hazardous sites* will be determined in accordance with applicable *provincial standards* and guidelines, as may be amended from time to time, and as generally outlined in Section 5.
- c) HCA will provide input to the development of municipal planning documents and policies, and other land use plans and policy documents as may be appropriate, to address the management of natural hazards and mitigation of their associated risks.
- d) HCA will work with municipalities to prepare for the *impacts of a changing climate* and consider how this may increase risks associated with natural hazards, affect the management of natural hazards, and impact land use planning and development.
- e) HCA will endeavour to ensure its comments on land use planning matters and *development* proposals are consistent with the natural hazard policies of the PPS, or any other policy statements issued under the *Planning Act*, and any other applicable provincial plans.
- f) HCA will generally seek to direct *development* away from areas potentially impacted by *hazardous lands* and *hazardous sites* wherever possible.
- g) HCA will not support *development* in *hazardous lands* and *hazardous sites* where the proposed use is:
 - i. an *institutional use* including hospitals, long-term care homes, retirement homes, preschools, school nurseries, day cares and schools;
 - ii. an *essential emergency service* such as that provided by fire, police, and ambulance stations and electrical substations; or
 - iii. uses associated with the disposal, manufacture, treatment or storage of *hazardous substances*.
- h) HCA will not support *development* within:
 - i. the *dynamic beach hazard*; or
 - ii. areas that would be rendered inaccessible to people and vehicles during times of *flooding hazards*, *erosion hazards* and/or *dynamic beach hazards*, unless it has been demonstrated that the site has *safe access* appropriate for the nature of the *development* and the natural hazard.
- i) Except as prohibited in policy 4.3.1(g) and 4.3.1(h), HCA may support limited development in areas affected by natural hazards in accordance with the policies of the PPS and Section 4 and Section 5, as may be applicable.

- j) HCA will support development proposals within a *Special Policy Area (SPA)* in accordance with the policies of the SPA.
- k) HCA will work collaboratively with municipal planning authorities and the province in the development of SPA, as may be required, and to periodically review and update existing SPA in accordance with applicable *provincial standards* and guidelines.
- l) Certain uses, such as public *infrastructure* and *conservation projects*, may be required at times to be located within *hazardous lands* and *hazardous sites*. HCA may support such uses where they have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and where the study has been supported by HCA.
- m) HCA may support *site alteration* or other modifications to *hazardous lands* and *hazardous sites* for the purpose of facilitating development where:
 - i. the activity will result in the mitigation or *remediation* of hazardous conditions, reduce risks to existing development, and improve public safety;
 - ii. the activity has been considered and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and where the study has been supported by HCA; and
 - iii. all other applicable policies in Section 4 and Section 5 have been satisfied.
- n) Where *development* or *site alteration* may be considered in *hazardous lands* and *hazardous sites* HCA will recommend the following be demonstrated:
 - i. risks to public health and safety are minor and can be mitigated in accordance with *provincial standards*, including *floodproofing standards*, *protection works standards* and *access standards*;
 - ii. *safe access* for people and vehicles would be available during a natural hazard emergency; and
 - iii. new hazards are not created and existing hazards are not aggravated.
- o) Further to policy 4.3.1(n), HCA will consider the regulatory policies of Section 5, and requirements of policy 5.2(c) in particular, when reviewing proposals for development in areas affected by natural hazards and in assessing risks to public health and safety and the potential for impacts.
- p) HCA comments on land use planning matters and *development* proposals will consider and recognize that the hydrological and ecological features and functions that comprise *water resource systems* and *natural heritage systems* may contribute to the control, management or mitigation of *hazardous lands* and *hazardous sites*. HCA will recommend that *water resource systems* and *natural heritage systems* and their constituent features and functions be protected where it would support the management of risks and impacts associated with natural hazards.

4.4 Water Resource Systems

Water resource systems consist of the *ground water features* and areas, *surface water features* (including shoreline areas), *natural heritage features and areas*, and *hydrologic functions*, which are necessary for the ecological and hydrological integrity of the *watershed* (PPS, 2024). *Water resource systems* are an integral part of broader *natural heritage systems*.

Watercourses and their associated valleys and riparian lands, headwater drainage features, wetlands, and Lake Ontario and its shoreline are key components of the *water resource system* within the watersheds of the HCA. These features play an important water management function, allowing for the movement, storage and release of water through the watersheds, and in supporting the functioning of natural processes such as flooding and erosion.

Hazardous lands and *hazardous sites* that may be associated with watercourses, valley systems, wetlands and shorelines should be recognized as part of water resource and natural heritage systems. The protection of these systems contributes to the management of natural hazards and mitigation of associated risks and impacts.

4.4.1 Policies for Water Resource Systems

- a) HCA recognizes the critical function that *water resource systems* play in the control, management and mitigation of *hazardous lands* and *hazardous sites*, and in the maintenance of watershed health.
- b) HCA will work with municipalities to identify, protect and restore *water resource systems* through the completion of watershed plans, subwatershed plans or other land use planning exercises as may be appropriate.
- c) HCA comments on land use planning matters and *development* proposals will recommend the protection of *water resource systems*, including *watercourses*, *valleylands*, and *wetlands*, where they contribute to the management of natural hazards or mitigation of associated risks and impacts.
- d) The stormwater management policies of Section 4.5 will also be considered when providing comments on *development* proposals and the potential for impacts on *water resource systems* and natural hazards.

4.5 Stormwater Management

Development can have a significant impact on the movement of water through the watershed, and on water resource and natural heritage systems and their associated features and hydrological and ecological functions. Land use change may result in increases in impervious surfaces (roads, sidewalks, buildings, rooftops, driveways, etc.) and volumes of surface runoff, and a corresponding decrease in the ability of the ground to absorb water (infiltration) and release water (evapotranspiration). These changes to the cycling and storage of water through the watershed can impact water quality and lead to increased potential for flooding and erosion.

Stormwater management is the process of controlling the quantity and quality of water runoff from impervious surfaces, from its source to its ultimate outlet. Stormwater management aims to minimize and mitigate the impacts of stormwater runoff to the greatest extent possible. When done effectively, it can contribute to the conservation of *water resource systems*, control of flooding and erosion, protection of property and public health and safety, and the development of resilient communities.

4.5.1 Policies for Stormwater Management

- a) HCA supports the use of stormwater management as part of land use planning and development processes to minimize impacts on *water resource systems*, mitigate the potential for increases in flooding and erosion, and protect public health and safety and property.
- b) HCA supports planning for stormwater management facilities and infrastructure in a coordinated and integrated manner with other land use planning and growth management exercises, and through the completion of a *comprehensive study*.
- c) HCA will provide information and input to municipal stormwater management planning exercises regarding watershed conditions and natural hazards, as may be required, and will recommend approaches that will:
 - i. prevent or minimize increases in stormwater volumes and erosion rates;
 - ii. protect *water resource systems* and water balance;
 - iii. mitigate risks from natural hazards, and protect public health and safety and property;
 - iv. address climate change considerations; and
 - v. consider cumulative impacts of stormwater from development at the *watershed* scale.
- d) HCA may support the development of stormwater management facilities that control Regional storm event flows, where such facilities have been:
 - i. considered and assessed through a *comprehensive study* that has been supported by HCA and the municipality; and
 - ii. designed in accordance with accepted engineering standards and practices to ensure public safety and mitigate risk associated with the potential for failure.

- e) HCA will work with municipalities, and other agencies as may be required, in the review of *development* proposals to ensure that stormwater management measures that are appropriate for the nature and scale of the development and watershed conditions are implemented.
- f) HCA comments on *development* proposals will consider the potential impacts to *water resource systems*, natural hazards, and public health and safety, and how stormwater management may be implemented to avoid, minimize or mitigate impacts.
- g) HCA comments on *development* proposals will seek to prevent increases in flooding and erosion resulting from stormwater.
- h) HCA comments regarding stormwater management will consider and reflect criteria, standards, guidelines and best management practices established by the province, municipality or conservation authorities, as may be applicable.
- i) HCA comments regarding stormwater management will seek to ensure conformity with criteria and targets established in any applicable watershed plan, subwatershed plan or other *comprehensive study*.
- j) HCA supports and will recommend the use of *low impact development* (LID) measures, *green infrastructure*, conveyance controls, and other sustainable technologies in a treatment train approach, as may be appropriate, to meet stormwater management criteria, promote protection of *water resource systems*, and mitigate potential impacts on natural hazards.
- k) HCA will generally not support stormwater management ponds, facilities or other infrastructure that are proposed to be located in *hazardous* lands or *hazardous* sites, on-line with a *watercourse*, or in or near *sensitive surface water features* or *sensitive groundwater features*.
- l) HCA may recommend the completion of studies, such as a hydrogeological study, water balance assessment, or floodplain and erosion impact assessments, to evaluate the potential impacts of a development and proposed stormwater management measures.
- m) When reviewing stormwater management plans, HCA will generally recommend that pre-development conditions be maintained to the greatest extent possible as part of site development (i.e. post- to pre-), including peak flows from frequent storm events (i.e. 2-year to 100-year), runoff volumes and water balance.

5 POLICIES FOR THE REGULATION OF DEVELOPMENT

In support of their mandate to protect people and property from risks associated with natural hazards, conservation authorities are empowered to regulate certain activities in hazard-prone areas. Part VI of the *Conservation Authorities Act* (CA Act) and *Ontario Regulation 41/24* set out the areas where certain activities are prohibited, and the conditions under which a conservation authority may issue a permit for a prohibited activity.

Section 21.1 of the CA Act and related *Ontario Regulation 686/21* requires that an Authority shall provide programs and services to manage risks related to natural hazards and to ensure that a conservation authority satisfies its duties, functions and responsibilities to administer and enforce the provisions of Parts VI and VII of the Act, and any regulations made under those parts as they relate to the regulation of development and other activities, and for ensuring compliance with the Act and regulations.

The development regulations under the CA Act are intended to help in the achievement of the broad goals and objectives of the conservation authorities and the provincial government as they relate to the protection of people and property from natural hazards. Conservation authority regulation of development is a key component of the province's prevention-first approach to natural hazard management. The regulation of development activity also provides for the protection and functioning of *water resource systems* and *natural heritage systems* and their constituent features and functions where they may support natural processes related to flooding and erosion and the management of natural hazards more generally.

5.1 Regulation of Development and Permitting

The policies outlined in Section 5 will guide HCA's administration of the development regulations of Part VI of the CA Act and associated *O. Reg. 41/24*, and establish the criteria and conditions to be satisfied in order for HCA to issue a permit for *development activity* or other activities that would change or interfere with a watercourse or wetland. The policies must be read and considered in their entirety to determine the full range of policies that may be applicable to a proposed development activity or interference.

In carrying out its regulatory functions and responsibilities under the *Conservation Authorities Act* HCA has the following objectives:

- Protect people and property from risks associated with natural hazards;
- Raise awareness regarding natural hazards and their associated risks;
- Manage natural hazards on a watershed basis, and in accordance with *provincial standards* and accepted best practices;
- Direct *development activity* to areas outside of *hazardous lands* wherever possible;
- Prevent *interference* with *watercourses* and *wetlands* to protect their *hydrologic functions* and contributions to the control of flooding and erosion; and

- Protect *water resource systems* and *natural heritage systems* where they contribute to the control, management or mitigation of risks and impacts associated with natural hazards

5.1.1 Regulated Areas

The areas over which conservation authorities have jurisdiction to prohibit certain activities and the conditions under which a permit may be issued for a prohibited activity are set out in Part VI of the CA Act. *O. Reg. 41/24* further defines the areas regulated by a conservation authority, permit application requirements, and identifies certain activities which are to be exempt from requiring a permit.

Under the CA Act and its regulations, HCA regulates *wetlands*, *watercourses*, river and stream valleys, the Lake Ontario shoreline, as well as other *hazardous lands* such as karst. More specifically, Section 28(1) of the CA Act establishes:

28 (1) No person shall carry on the following activities, or permit another person to carry on the following activities, in the area of jurisdiction of an authority:

1. Activities to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland.
2. Development activities in areas that are within the authority's area of jurisdiction and are,
 - i. hazardous lands,
 - ii. wetlands,
 - iii. river or stream valleys the limits of which shall be determined in accordance with the regulations,
 - iv. areas that are adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to an inland lake and that may be affected by flooding, erosion or dynamic beach hazards, such areas to be further determined or specified in accordance with the regulations, or
 - v. other areas in which development should be prohibited or regulated, as may be determined by the regulations.

The extent of regulated areas identified above is in some cases further defined in *O. Reg. 41/24*. While the CA Act and *O. Reg. 41/24* provide direction on regulated areas, they do not define how natural hazard limits that may be associated with regulated features and areas are to be determined. Direction for the identification of hazards, such as flooding and erosion, is provided in a series of technical guides developed by the MNR in the late 1990s and early 2000s. Sections 5.3 to 5.7 describe how the regulated

area is determined for each feature type identified in the CA Act and *O. Reg. 41/24*, as well as how associated natural hazard limits are to be identified.

Associated with some regulated features are additional regulated areas, or ‘allowances’, that extend beyond the regulated feature or hazard limit. *Allowances* are identified in *O. Reg. 41/24*, and are measured from the outer boundary or limit of a regulated feature or hazard. In the case of river and stream valleys and the Lake Ontario shoreline, an allowance of 15 m is included in the regulated area beyond the identified flood or erosion hazard limits. Figures included throughout Section 5 identify how natural hazard limits and associated regulated areas and allowances are defined.

Allowances provide for the regulation of development adjacent to erosion and flooding hazards, which can protect against unforeseen circumstances or conditions that could have an adverse effect on natural processes and hazards. *Allowances* are also intended to account for variability in how hazard limits may be defined at a site-specific scale. They further provide opportunity to ensure that appropriate access to hazard-prone areas is maintained for emergency purposes and to allow for long-term maintenance of property and protection structures.

HCA maintains maps to identify regulated areas. Mapping is reviewed annually, or more frequently where significant changes are required as a result of new information. Mapping is available publicly. While the mapping is intended to provide a useful reference for identifying regulated areas, the description of the areas to be regulated included in the CA Act and *O. Reg. 41/24* prevails in the event of any mapping discrepancy or absence of mapping.

5.1.2 Regulated Activities

Section 28(1) of the CA Act establishes that certain activities are prohibited in areas regulated by a conservation authority. This includes development activities, which are defined in *O. Reg. 41/24* to include:

- (a) the construction, reconstruction, erection or placing of a building or structure of any kind,
- (b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
- (c) site grading, or
- (d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

Section 28(1) also prohibits activities that would straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or to change or interfere in any way with a wetland. While neither the CA Act or *O. Reg. 41/24* define ‘interfere in any way’, the Ministry of Natural Resources and Conservation Ontario

provided an interpretation in the 2008 *Draft Guidelines to Support Conservation Authority Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation*, where *interference*, or ‘interfere in any way’, may be considered as:

“any anthropogenic act or instance which hinders, disrupts, degrades or impedes in any way the natural features or hydrologic functions of a wetland or watercourse”

For the purposes of this policy document, the terms *development activity* and *interference* will be defined as outlined above and will be used to refer to prohibited activities.

5.1.3 Permits and Regulation Tests

Under Section 28.1 of the CA Act, a conservation authority may issue a permit to engage in activity that would otherwise be prohibited where it is of the opinion:

- (a) the activity is not likely to affect the control of flooding, erosion, dynamic beaches or unstable soil or bedrock; or
- (b) the activity is not likely to create conditions or circumstances that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property.

These criteria, which are sometimes referred to as ‘tests’, must be satisfied in order for a permit to be issued.

What constitutes the control of flooding, erosion, dynamic beaches or unstable soil or bedrock is not defined in the legislation or regulations. The policies defined in this Section 5 consider these ‘tests’ to broadly include any direct, indirect or cumulative impact or change resulting from a *development activity* or *interference* that would have the effect of creating or altering hazardous conditions, increasing risks related to or resulting from any natural hazard, or hindering the ability to manage or mitigate risks associated with any natural hazard.

The CA Act also provides for health, safety and property considerations in determining if a permit may be issued. These tests allow for the broad consideration of the potential for direct, indirect and cumulative impacts on individual and public health, social disruption, personal injury, loss of life and damage to property as a result of a *development activity* or *interference*. Factors such as age and mobility of persons, the proposed land use or activity, as well as the type, use and occupancy of a structure, will influence the determination of potential impacts and risks.

Access (ingress and egress) considerations are also important towards determining if a *development activity or interference* may impact the control of hazards, health and safety of persons, or the potential for property damage. The ability for property owners, building occupants and public and emergency services to safely access (enter and exit) a site during an emergency is a central consideration in determining if a permit for a *development activity or interference* may be issued. Access is also an important consideration to allow for the long-term maintenance and repair of features and structures that may be impacted by hazards. HCA's policies for providing access are outlined in Section 5.9

Both the control of hazards and health and safety tests must also consider the ability to meet protection works standards, floodproofing standards and access standards, as discussed further in Sections 5.3, 5.8 and 5.9.

Finally, *water resource systems* and *natural heritage systems* and their constituent features provide important hydrological and ecological functions that may contribute to the control of flooding, erosion, dynamic beaches and unstable soil or bedrock, and/or help to mitigate related hazards. For example, wetlands may provide a critical water attenuation function at both site specific and subwatershed scales. As a result, the policies outlined in this chapter provide for the consideration of water resource and natural heritage features, areas and systems and their related functions, where appropriate, in the determination of whether or not an activity may affect the control of flooding, erosion, dynamic beaches or unstable soil or bedrock.

5.1.4 Relationship to Land Use Planning Policies

As reviewed in Section 3 and Section 4, the province has a policy-led land use planning system under the *Planning Act* and PPS. Land use planning processes establish appropriate land use designations and zoning, and play a critical function in implementing the province's prevention-first approach to natural hazard management whereby development is generally to be directed to areas away from *hazardous lands* and *hazardous sites*.

Conservation authorities play an important role in supporting the land use planning system, and in implementing the policies of the PPS as they relate to natural hazards. The CA Act and regulations mandate conservation authorities to provide a land use planning review function in order to provide municipal planning authorities with information, comments and technical support to help ensure planning decisions are consistent with the natural hazard policies of the PPS and provincial plans. Conservation authorities play a similar role in providing natural hazard comments on proposals under other legislation, such as the *Environmental Assessment Act* and *Niagara Escarpment Planning and Development Act*. The policies set out in Section 4 direct HCA's input to land use planning matters.

Regulation of development under the CA Act is intended to complement the *Planning Act* and PPS, as well as other legislation, and support the implementation of the province's natural hazard program. While land use planning establishes the principle of

development, permits issued under the CA Act are an implementation instrument used to confirm the appropriateness of a proposed development or other activity from a natural hazard perspective and to identify any site-specific requirements prior to an activity taking place. The policies set out in Section 5 direct HCA's input to the review of permit applications under the CA Act.

When commenting on a municipal land use planning application or application under other legislative review processes, HCA will include comments regarding the applicability and requirements of the development regulations under the CA Act. In some cases, a regulatory permit application may proceed in conjunction with the municipal plan review process; in other cases, a permit application may not be received for months or years after a planning approval. In any case, it is important that development applicants understand regulatory requirements during the land use planning process in order to ensure these requirements can be reasonably met at the time of a CA Act permit application, and to allow for efficient coordination of applications where appropriate.

Past planning decisions that may have been made without plan review input from HCA, or that were based on dated or incomplete technical information regarding natural hazards, will not bind HCA to issue a permit. In such situations, HCA will work with the municipality, or other approval agency, and the development applicant to review the proposed activity in relation to current information, policies and standards, to determine if alternative approaches may be available to address site constraints and meet current regulatory requirements.

It is important to note that a municipal planning authority may not issue a building permit for development in an area regulated by a conservation authority until a permit has been issued, where required, under the CA Act. Conversely, in the case of development permit application reviews under the *Niagara Escarpment Planning and Development Act*, a conservation authority may not issue a permit within an area of NEC development control unless a development permit has been issued by the NEC or the activity is exempt under the *Niagara Escarpment Planning and Development Act*.

5.2 General Policies

The following policies will be applied to any proposed *development activity*, *interference* or other prohibited activity within the areas of jurisdiction of the HCA. These policies must be considered in conjunction with the policies contained in Sections 5.3 to 5.9, and the policies of Section 4 as may be applicable, which may contain more specific policy direction applicable to the proposed *development activity* or *interference*.

- a) *Development activities* and *interference* within regulated areas are prohibited except in accordance with the policies of Sections 5.2 to 5.9.
- b) *Development activities* and *interference* may be permitted in regulated areas where the activity is not likely to affect control of flooding, erosion, dynamic beaches or unstable soil or bedrock, or create conditions or circumstances that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property.
- c) Further to 5.2(b), in considering if an activity is not likely to affect the control of hazards, or create conditions that would jeopardize health, safety or property, the following must be demonstrated:
 - i. no changes to the limits or extent of existing *hazardous lands*, and no new hazards are created;
 - ii. susceptibility to natural hazards is not increased for any existing or proposed development;
 - iii. no adverse impacts on slope stability;
 - iv. no *adverse hydraulic and fluvial impacts*;
 - v. no changes to the frequency, duration or extent of flooding or erosion;
 - vi. flood conveyance and flood storage conditions are maintained;
 - vii. risks to the health and safety of persons or the public are not increased;
 - viii. potential for damage or destruction of property is not increased;
 - ix. *safe access* and *access allowances* are provided;
 - x. no adverse impacts to natural coastal processes associated with the Lake Ontario shoreline;
 - xi. no adverse impacts to the *hydrologic functions*, fluvial processes or hydraulics of *watercourses*;
 - xii. no adverse impacts to the *hydrologic functions* or conditions of *wetlands*;
 - xiii. no *negative impacts* to *water resource systems*;
 - xiv. no *negative impacts* to *natural heritage features and areas* that contribute to the control, regulation or mitigation of natural hazards;
 - xv. *development activities* and *interference* are carried out in accordance with provincial *floodproofing standards*, *protection works standards* and *access standards*;
 - xvi. *development activities* and *interference* are carried out in accordance with accepted design, engineering and construction best practices and standards; and
 - xvii. mitigation measures and restoration work appropriate for the scale of the *development activity* or *interference* and site conditions will be implemented;

- d) Notwithstanding policy 5.2(b) and (c), HCA will not support *development activity* in *hazardous lands* where the proposed use is:
 - i. an *institutional use* including hospitals, long-term care homes, retirement homes, preschools, school nurseries, day cares and schools;
 - ii. an *essential emergency service* such as that provided by fire, police, and ambulance stations and electrical substations; or
 - iii. uses associated with the disposal, manufacture, treatment or storage of *hazardous substances*.
- e) *Safe access* (ingress and egress) and *access allowances* must be provided for any development within a regulated area. Access must be in accordance with provincial *access standards* and meet the requirements of Section 5.9.
- f) Where the policies of Sections 5.3 – 5.9 require that the feasibility of locating *development activity* to an area outside of any *hazardous lands* or *wetlands* be examined, that the development be setback from regulated features and hazards to the greatest extent possible, and otherwise be located in the area of least hazard susceptibility and risk, HCA will consider the following in applying these requirements:
 - i. availability of land or areas for the proposed *development activity* that are located outside of *hazardous lands* and *wetlands*;
 - ii. ability to locate the *development activity* outside all hazard limits and *wetlands*;
 - iii. if the proposal maximizes use of property depth and width to avoid locating within *hazardous lands* or *wetlands*;
 - iv. if reasonable changes to the size, scale and/or design of a building or structure could be made to avoid or minimize encroachment on *hazardous lands* or *wetlands*;
 - v. if minor variances would allow for the development to be located outside of *hazardous lands* or *wetlands*;
 - vi. severity of hazardous conditions, including flood depths and velocities, and susceptibility to erosion hazards;
 - vii. ability to incorporate protection works or *floodproofing* measures; and
 - viii. availability of *safe access* and *access allowances*.
- g) *Development activity* and *interference* shall generally not be permitted within regulated areas for the purpose of creating a new building lot, establishing additional developable area or facilitating new development.
- h) Notwithstanding policy 5.2(g), such activities may be considered where the following are demonstrated:
 - i. the activity will result in the mitigation or *remediation* of hazardous conditions, reduce risks to existing development, and improve public safety;
 - ii. the activity has been considered and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and where the study has been supported by HCA; and
 - iii. all other applicable policies in Section 4 and Section 5 have been satisfied.

- i) The completion of technical studies and plans (geotechnical assessment, hydraulic modelling, floodplain impact assessment, erosion and sediment control plan, etc.), monitoring programs and/or site visits may be required to support a proposal for *development activity* or *interference* in order to identify features, determine natural hazard limits, evaluate potential impacts, or to identify appropriate design, mitigation or remedial measures. Study and monitoring requirements are to be determined and scoped in consultation with the HCA and must be completed in accordance with accepted standards, practices and guidelines to the satisfaction of the HCA.
- j) HCA may require peer review of any technical study or plan completed in support of a proposal for *development activity* or *interference* in order to confirm that appropriate study methods, assessments, findings and recommendations have been provided. Peer reviews are to be completed at the applicant's expense.
- k) As-built drawings, surveys or other reports may be required as a condition of a permit to ensure that any building, structure, or other *development activity* is constructed and completed in accordance with plans approved through the permit. As-built drawings, surveys and reports will be prepared by a qualified professional.
- l) HCA will not permit *development activity* or *interference*, as may be permitted by the policies of Sections 5.2 – 5.9, where an associated existing building or structure was established illegally or without all required approvals and permits.
- m) HCA may attach conditions to a permit to be issued where it is of the opinion the conditions are required to:
 - i. assist in preventing or mitigating any effects on the control of flooding, erosion, dynamic beaches or unstable soil or bedrock;
 - ii. assist in preventing or mitigating any effects on human health or safety or any damage or destruction of property in the event of a natural hazard; or
 - iii. support the administration or implementation of the permit, including conditions related to reporting, notification, monitoring and compliance with the permit.
- n) Where a zoning order has been made by the Minister of Municipal Affairs and Housing, and HCA is required to issue a permit for a development project within the area affected by the order to comply with Section 28.1.2 of the *Conservation Authorities Act*, HCA will issue a permit subject to the following:
 - i. confirmation the development is not located within the Greenbelt Area;
 - ii. attaching conditions to the permit as may be required in accordance with policy 5.2(m);
 - iii. entering into an agreement with the permit holder that sets out requirements to be satisfied in order to compensate for any ecological or other impacts that may result from the development project; and
 - iv. where compensation requirements are developed in accordance with HCA's *Natural Heritage Offsetting Guidelines*.

5.3 Lake Ontario Shoreline

The Lake Ontario shoreline is a dynamic area, subject to constant change as a result of naturally occurring processes and forces of erosion, sediment transport and deposition, wind, waves, and water level fluctuations. As a result of these conditions, areas that lie along the Lake Ontario shoreline, including Hamilton Harbour, may be subject to hazardous conditions resulting from flooding, erosion and dynamic beaches.

The northern half of the Lake Ontario shoreline within the HCA watershed consists of a continuous stretch of dynamic beach. This area is largely in public ownership, and is composed of parkland connected by a trail system. The southern half of the Lake Ontario shoreline, along with the Hamilton Harbour shoreline, is predominantly privately owned and developed. The shoreline in these areas has also largely been hardened, with a wide variety of erosion protection structures in place. Interest in property re-development and infilling along sections of the shoreline has created challenges in managing the risks to public safety and property damage, and resulted in impacts to coastal processes and shoreline ecosystems.

The provincial legislative and regulatory framework recognizes there are significant risks associated with development in shoreline areas. As a result, the overall objective of both provincial and HCA policy is focused on prevention, and to generally direct development to areas outside of shoreline hazard areas. In considering proposals for *development activity* on the shoreline, it is necessary to consider and account for the combined landward limits of the flooding, erosion and dynamic beach hazards in order to mitigate, to the greatest extent possible, the potential effects of these hazards on property and public safety, to ensure existing hazardous conditions are not aggravated, and to provide for the maintenance of coastal processes and conservation of sensitive ecosystems.

The hazards associated with Lake Ontario shoreline are discussed further in the following sections, including how regulation limits for the shoreline are defined, how the related hazards are identified, and the policies to be applied for managing development and other activities in these areas.

5.3.1 Defining Shoreline Regulation Limits

Under *O. Reg. 41/24*, the regulated limits of Great Lakes shorelines are defined as follows:

2. (2) For the purposes of subparagraph 2 iv of subsection 28 (1) of the Act, areas adjacent or close to the shoreline of the Great Lakes-St. Lawrence River System or to inland lakes that may be affected by flooding, erosion or dynamic beaches include,

(a) the area starting from the furthest offshore extent of the Authority's boundary to the furthest of the following distances:

(i) the 100-year flood level, plus the appropriate allowance for wave uprush, and, if necessary, for other water-related hazards, including ship generated waves, ice piling and ice jamming;

(ii) the predicted long-term stable slope projected from the existing stable toe of the slope or from the predicted location of the toe of the slope as that location may have shifted as a result of shoreline erosion over a 100-year period; and

(iii) where a dynamic beach is associated with the waterfront lands, an allowance of 30 metres inland to accommodate dynamic beach movement; and

(b) the area that is an additional 15 metres allowance inland from the area described in clause (a).

Figures 2 to 4 illustrate how the regulated area associated with the shoreline is defined.

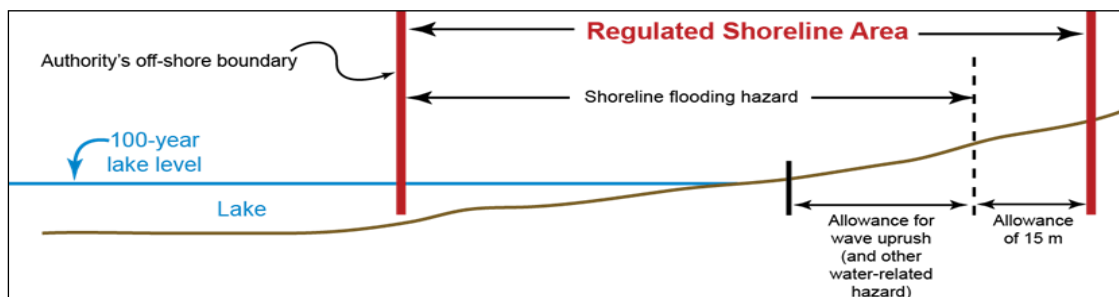


Figure 2: Lake Ontario shoreline flooding hazard regulated area

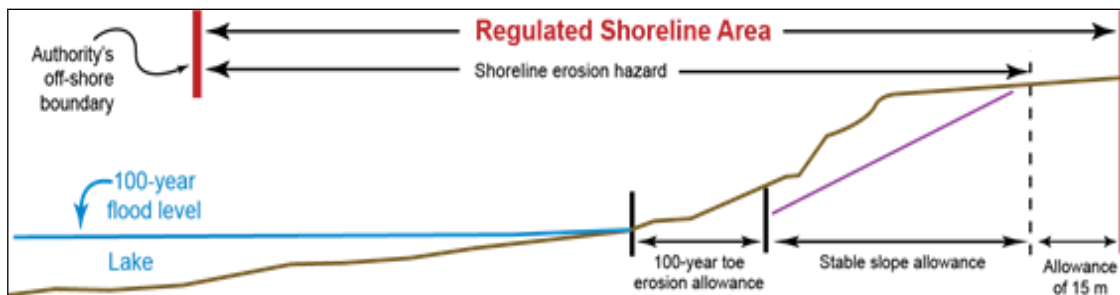


Figure 3: Lake Ontario shoreline erosion hazard regulated area

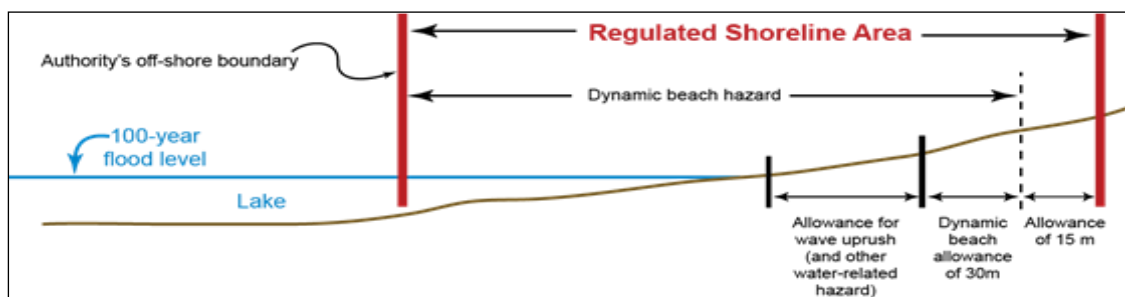


Figure 4: Lake Ontario shoreline dynamic beach hazard regulated

Based on the above, the regulation limit associated with the Lake Ontario Shoreline is the furthest landward extent of the aggregate of the *flooding hazard*, *erosion hazard*, and *dynamic beach hazard*, plus an additional allowance of 15 m (Figure 2). Flooding, erosion and dynamic beach hazard limits associated with regulated shoreline areas are delineated based on standards and criteria established by the Ministry of Natural Resources in *Understanding Natural Hazards* (2001) and in the *Great Lakes-St. Lawrence River System Technical Guide* (2001). How each of these components is determined is described more specifically in the following sections.

5.3.2 Lake Ontario Shoreline Hazards

HCA completed a *Shoreline Management Plan* (SMP) in 2025, which identifies shoreline hazard limits for the Lake Ontario shoreline within the HCA watershed. Hazard determination and mapping was based on standards and criteria established in the provincial technical guidelines, and in consideration of current data, information and assessment undertaken through the shoreline study. This included technical assessment to establish long-term recession (erosion) rates and to update statistical analysis of lake levels. Numerical modelling tools were used to evaluate spatial variability in storm surge and nearshore wave conditions in the lake and harbour. Based on the outputs from the data collection and technical analysis, updated mapping was produced for the flooding, erosion, and dynamic beach hazards.

5.3.2.1 Identifying the Shoreline Flooding Hazard

The Lake Ontario shoreline is subject to water level fluctuations as a result of both human intervention and natural processes. As part of the *Great Lakes-St. Lawrence River system*, lake levels in Lake Ontario are subject to regulation under the *Lake Ontario – St. Lawrence River Plan 2014* (Plan 2014, IJC, 2014), with outflow from Lake Ontario being influenced by the operation of the Moses-Saunders Power Dam in Cornwall. However, water levels in Lake Ontario are primarily influenced by natural factors like rainfall, snowmelt, evaporation, wind, waves and storms. These factors influence both seasonal and shorter-term changes in water levels.

Storms, wind and waves can have a short-term, temporary, but significant impact on shoreline flooding, pushing water farther inland than under normal water level conditions. Along irregular shorelines, or where there are shoreline protection structures, groynes, or other structures, the effect of waves hitting vertical surfaces and sending spray inland and the potential for strong waves to overtop breakwalls, bluffs and other shoreline structures may also occur.

As a result, the Lake Ontario *flooding hazard* considers the *100-year flood level*, as well as *wave effects* and *other water-related hazards*, such as wave uprush, ship generated waves and ice, that may magnify flooding conditions.

The *flooding hazard* limit for Lake Ontario is therefore based on the combined influence of the following, as conceptually shown in Figure 5 and described in more detail below:

- i. The *100-year flood level*;
- ii. The extent of *wave uprush*; and
- iii. The extent of *other water-related hazards*.

The *100-year flood level* is defined as the water level reached through a combination of static lake level and local storm surge, that has a combined probability of occurrence of 1% in any given year. Historically, the identification of 100-year flood levels for most Great Lakes shorelines was based on work completed by the Ministry of Natural Resources in the 1980's, and published in a report titled *Great Lakes System Flood Levels and Water Related Hazards* (MNR, 1989).

HCA's *Shoreline Management Plan* (2025) reviewed and updated this earlier work, including an analysis of mean monthly lake levels between 1900 and 2021 and measured storm surge events from 1971 to 2021. Based on this assessment, the SMP identifies the *100-year flood level* for Lake Ontario and Hamilton Harbour as 76.2 m (International Great Lakes Datum (IGLD85)). Where topographic surveys are completed in other datums, a conversion may be required to identify the 100-year flood level in that datum. For example, where the Canadian Geodetic Vertical Datum (CGVD28) is used, the 100-year flood level becomes 76.11 m, and under CGVD2013 it is 75.68 m.

To identify the extent of *wave uprush*, or the horizontal distance landward from the waterline that may be impacted by waves and other water related hazards, HCA's SMP undertook an analysis and modelling of nearshore wave conditions. Based on this assessment, the SMP identifies wave uprush as a horizontal distance, which varies based on conditions across different sections (reaches) of the shoreline, and ranges from 10 m to 30 m.

The SMP identifies and maps the *floodings hazard limit* for the shoreline based on the *100-year flood level* contour of 76.2 m plus an additional horizontal distance of 10 m to 30 m measured landward from this contour line to account for *wave uprush* and *other water-related hazards*.

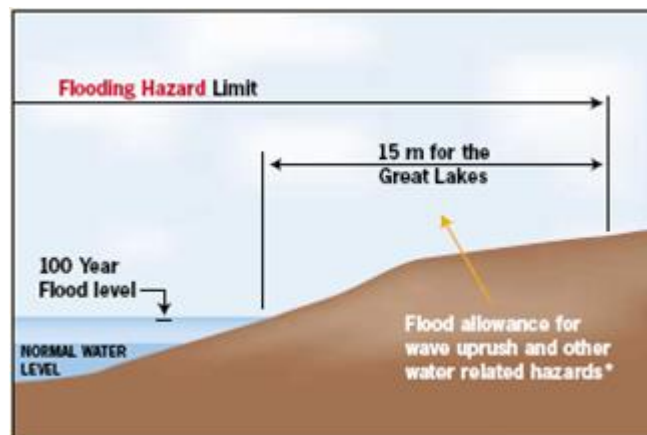


Figure 5: Lake Ontario shoreline flooding hazard limit

5.3.2.2 Identifying the Shoreline Erosion Hazard

Water level fluctuations, waves, wind and ice exert erosive forces on the shoreline, and result in shoreline recession over time. The erodibility of the shoreline is influenced by a number of factors, including geology, soils, vegetation cover, shoreline orientation and the presence or absence of shoreline protection structures. Erosion of the shoreline generally occurs slowly over the long-term, but may also result from significant storm events that can result in large losses of land over a very short period.

The Lake Ontario shoreline within the HCA watershed includes areas of natural shoreline, beach and bluffs, but is otherwise largely developed with hardened shoreline protection measures in place. The shoreline within HCA's watershed is generally considered to be highly erosive, especially on the lake bottom at the toe of existing shoreline protection structures (SMP, 2025).

The *erosion hazard* limit for the shoreline is based on the combined influence of the following, as shown in Figure 6:

- i. *Stable slope allowance*; and
- ii. 100-year erosion allowance (100 times the average annual recession rate) or 30m erosion allowance, whichever is greater.

HCA's SMP examined long-term shoreline change to identify average annual recession rates. This included assessment of orthophotographs, historical recession measurements, and consideration of recession rates from adjacent Lake Ontario shoreline areas beyond the HCA watershed. Based on this work, the SMP identifies a long-term average annual recession rate of 0.5 m/yr. Within the Hamilton Harbour, a rate of 0.1 m/yr is identified. Recession rates at the dynamic beach areas identified between Confederation Beach Park and the navigation channel, Newport Yacht Club and Fifty Point were generally considered to be dynamically stable.

The SMP applied a stable slope allowance of 3(H):1(V). A site specific assessment of the shoreline slope by a qualified geotechnical engineer may allow for a reduction in the stable slope allowance that has been identified in the SMP.

The SMP identifies and maps the *erosion hazard limit* for the shoreline based on a 3:1 *stable slope allowance* and 100-year erosion allowance of 50 m for most of the Lake Ontario shoreline (0.5 m/yr x 100 years) and 10 m for the Hamilton Harbour shoreline (0.1m/yr x 100 years).

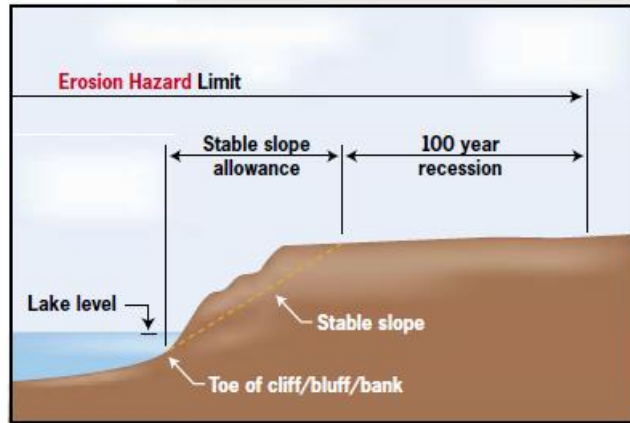


Figure 6: Lake Ontario shoreline erosion hazard limit

5.3.2.3 Identifying the Shoreline Dynamic Beach Hazard

A beach is an area of accumulation of eroded material (sediment, sand, gravel, cobble, rock, etc.) that has been transported from elsewhere and deposited by currents and waves on the shoreline. Beaches that are unstable and subject to continuous change as a result of erosion and accretion from wind, waves and water level changes are sometimes referred to as dynamic beaches. In dynamic beach areas, elevations can change dramatically due to build up or loss of beach materials. Changes may occur over a range of time scales, from hours or days, to years and decades.

When beach elevations change, so does the location of the *floodings hazard* limit. This is an important consideration in determining the dynamic beach hazard limit. In times of low lake levels, near shore areas that are submerged under normal or high lake levels may become exposed, making it seem that the landward extent of the dynamic beach has changed, and thereby introducing potential for *development activity*. Historic information about the farthest landward extent of flooding will be an important consideration for the long-term management of *dynamic beach hazards* (MNR, 2001).

The *dynamic beach hazard* limit is determined in accordance with the following, as shown in Figure 7:

- i. The *floodings hazard* limit (100-year flood level plus an allowance for wave uprush and other water-related hazards); and
- ii. A 30 m *dynamic beach* allowance.

HCA's SMP examined changes in shoreline and beach positions at Hamilton Beach, Fifty Point Beach and Newport Yacht Club Beach using historical orthophotographs. Based on this assessment, each of these areas is identified as a dynamic beach, but with recession rates considered dynamically stable in recent years.

The SMP identifies and maps the *dynamic beach hazard limit* for these areas based on a 30 m setback from the *floodings hazard limit*, unless the beach material extent was less

than 30 m due to an engineered walkway, road or a transition to non-beach material (e.g. residential backyard, parking lot). In these cases, the dynamic beach allowance was mapped as the lakeward edge of the engineered structure or transition area.

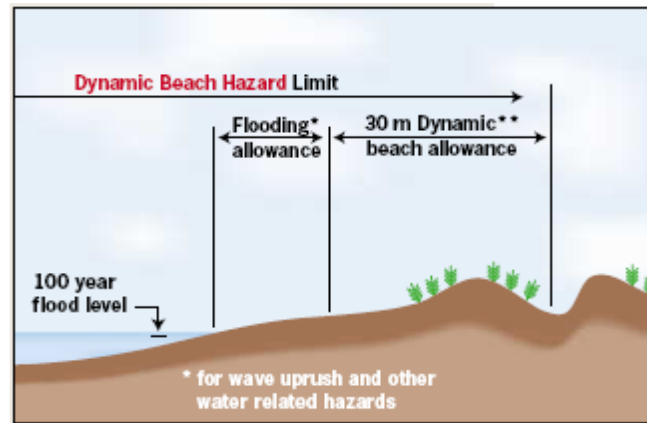


Figure 7: Lake Ontario shoreline dynamic beach hazard limit

5.3.3 Policies for Development on the Lake Ontario Shoreline

5.3.3.1 General Policies

- a) *Development activities* within the shoreline *erosion hazard*, *flooding hazard* or *dynamic beach hazard*, or the associated regulated *allowance*, are prohibited, except in accordance with the policies of Sections 5.3.3.1 to 5.3.3.5, and the general policies of Section 5.2.
- b) Erosion, flooding and dynamic beach hazard limits must be identified as part of any proposal for development along the shoreline.
- c) The HCA will reference and rely on the *HCA Shoreline Management Plan (2025)* to identify hazard limits. The completion of additional studies such as a coastal hazard assessment or geotechnical assessment may be required to confirm or refine shoreline hazard limits, or to evaluate the potential impacts of any proposed development. Study requirements are to be determined and scoped in consultation with the HCA.
- d) *Safe access* and an *access allowance* must be provided as part of any proposed *development activity* in accordance with the requirements of Section 5.9.
- e) HCA will work cooperatively with watershed municipalities and other agencies as appropriate, and where opportunities or needs arise, to develop comprehensive shoreline management plans, strategies and policies to manage shoreline related hazards, to mitigate associated risks, and to promote the protection and restoration of *water resource systems* and associated natural coastal process.

5.3.3.2 Shoreline Protection Works (Protection Works Standard)

Protection works include both structural and non-structural works, as well as landform modifications, that are designed and constructed to address the impacts of flooding and other water related hazards, to slow the landward retreat of shorelines subject to erosion, and/or to address dynamic beach hazards. While protection works cannot provide total protection from shoreline hazards, where designed and constructed in accordance with accepted engineering standards and in an environmentally sound manner, they can be effective in reducing risks and lessening the potential for damages from shoreline hazards.

The *Great Lakes-St. Lawrence River System Technical Guide* (2001) provides guidance on *protection works standards*, and how such structures may be applied in the consideration of development limits in areas affected by shoreline hazards. More specifically, the 100-year erosion allowance component of the *erosion hazard* may be reduced by the presence of shoreline protection works. A reduction in the erosion allowance does not change the extent of the *erosion hazard* limit, but rather identifies the area within the *erosion hazard* where it may be deemed safe for some types of development to be permitted. For the purposes of the shoreline policies, the area of reduced erosion allowance as a result of shoreline protection works is referred to as the *mitigated erosion hazard*.

HCA's SMP documented significant use of structural protection measures along most reaches of the shoreline. The SMP notes that rates of damage and failure of shoreline structures on the Great Lakes are high given harsh conditions and lack of regular maintenance. In the case of the Lake Ontario shoreline within the HCA watershed, ongoing lakebed downcutting (vertical erosion) at the shoreline is also a significant factor in considering the life expectancy of protection structures. The SMP recommends structural protection measures only be considered where required to protect existing developments that are at high risk, where non-structural or nature-based solutions are not feasible, and where environmental and downdrift impacts have been appropriately addressed and incorporated into the design of the protection works.

In consideration of the above, the following policies will apply to the use of shoreline protection structures.

- a) Shoreline protection works may be proposed to conserve areas of natural shoreline, to protect existing development, and to facilitate new development. Protection works may include both structural and non-structural measures, and may involve the construction of a new protection structure or the maintenance or repair of an existing structure.
- b) Where protection of the shoreline is required, first priority should be given to the consideration of non-structural and nature-based structures and measures. Such measures may be appropriate where there is limited development, where natural areas are present, and/or where there is relatively low exposure to wind and waves.

- c) Structural approaches to shoreline protection will generally only be considered where such actions are required to protect existing development that is at risk from flooding or erosion, or where non-structural or nature-based solutions are not feasible, and where adverse impacts on shoreline coastal processes can be appropriately addressed through the design of the protection works.
- d) Where shoreline protection works are proposed they must meet the following requirements:
- i. the purpose of the proposed works must be clearly defined;
 - ii. ownership of the land where the protection works are proposed, must be clearly established by the applicant;
 - iii. be designed by a qualified coastal engineer, according to accepted coastal engineering principles and standards;
 - iv. be designed to address applicable shoreline hazards, and withstand scour, wave impact, overtopping, flank erosion, and other forces as appropriate;
 - v. have a professional geotechnical engineer assess slope stability where a stable slope allowance greater than 3:1 is proposed;
 - vi. be designed in consideration of and to be integrated with adjacent shoreline properties and conditions;
 - vii. not aggravate existing hazards or create new hazards for the subject property or adjacent properties, or have an adverse impact natural shoreline coastal processes;
 - viii. be designed to incorporate an *access allowance* in accordance with the requirements of Section 5.9; and
 - ix. the general policies of Section 5.2 are met.
- e) The construction of shoreline protection works must be supervised by a qualified coastal engineer. Upon completion of the protection works, the applicant must provide an as-built survey of the constructed structure and a corresponding report from the supervising coastal engineer confirming if the shoreline protection works have been constructed in accordance with the approved design. Where deviations are identified, the report shall discuss their impact on the structural stability of the protection works and make recommendations as may be required to address these.
- f) Where *development activity* is proposed within shoreline hazard limits, a reduction in the 100-year erosion allowance may be considered where shoreline protection works are in place. The amount that the erosion allowance may be reduced will be based on the determined design life of the shoreline protection works. Design life must be evaluated by a coastal engineer, based on the design, condition and age of the structure, and in consideration of site conditions and hazards.
- g) The maximum design life that will be accepted for shoreline protection works is 50 years, and in no case will a reduction in the erosion allowance greater than 25 m be accepted.

- h) HCA will encourage shoreline property owners to consult the Ministry of Natural Resources (MNR) and Department of Fisheries and Oceans (DFO) for all shoreline protection works to determine if other approvals or permits may be required.

5.3.3.3 New Development

- a) *Development activity* will not be permitted within the *dynamic beach hazard*.
- b) *Development activity* will not be permitted within the *stable slope allowance*, with the following exceptions:
 - i. shoreline protection works;
 - ii. patios, staircases and boat ramps that are integrated with shoreline protection works designed by a coastal engineer and approved by HCA; and
 - iii. landscaping that does not include the construction of structures.
- c) Public *infrastructure* and *conservation projects* that have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA, may be permitted within the shoreline *erosion hazard*, *flooding hazard* or *dynamic beach hazard* where it has been demonstrated:
 - i. the feasibility of locating the development outside the shoreline hazards has been examined and no alternative exists;
 - ii. the development is setback from the shoreline hazards to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk; and
 - iii. the general policies of Section 5.2 are met.
- d) Except as prohibited in 5.3.3.3(a) and (b), *development activity* within the shoreline *flooding hazard* or *erosion hazard* may be permitted where it has been demonstrated:
 - i. the feasibility of locating the development outside the shoreline hazards has been examined and no alternative exists;
 - ii. the development is setback from the shoreline hazards to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. the hazards can be addressed in accordance with the shoreline *protection work standards* policies of Section 5.3.3.2;
 - iv. the development is located beyond the *mitigated erosion hazard*;
 - v. the development is floodproofed in accordance with the *floodproofing standards* of Section 5.8;
 - vi. *safe access* and a *maintenance access allowance* are provided in accordance with the requirements of Section 5.9; and
 - vii. the general policies of Section 5.2 are met.

5.3.3.4 Existing Development

- a) Where an existing building or structure is wholly or partially within the shoreline *flooding hazard* or *mitigated erosion hazard*, *minor additions* may be permitted where it has been demonstrated:
- i. no additional *dwelling units* are created;
 - ii. the feasibility of locating the *minor addition* outside the shoreline hazards has been examined and no alternative exists;
 - iii. the *minor addition* is setback from hazard limits to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iv. the *minor addition* does not encroach any further into the hazards than the existing structure;
 - v. the *minor addition* is setback a minimum of 12.5 m from the stable slope crest;
 - vi. the *erosion hazard* is mitigated in accordance with the shoreline *protection work standards* policies of Section 5.3.3.2;
 - vii. *floodproofing* measures are incorporated to the extent and level possible, based on site-specific conditions, in accordance with the floodproofing policies of Section 5.8;
 - viii. the *minor addition* shall not be more flood vulnerable than the existing structure, in that no openings on the *minor addition* are to be below the elevation of existing openings, nor shall the flood vulnerability of the existing building or structure be increased as the result of the addition;
 - ix. no basement is proposed, and any crawl space is designed to be non-habitable;
 - x. *safe access* and a *maintenance access allowance* are provided in accordance with the requirements of Section 5.9;
 - xi. subsequent requests for additions which will result in the cumulative exceedance of the maximum permitted allowance, as based on the original ground floor area, shall not be permitted.
- b) The *replacement* of an existing building or structure located wholly or partially within the shoreline *flooding hazard* or *mitigated erosion hazard*, other than those destroyed by flooding or erosion, may be permitted where it has been demonstrated:
- i. the feasibility of locating the *replacement structure* outside the shoreline hazards has been examined and no alternative exists;
 - ii. the *replacement structure* is setback from hazard limits to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. the *replacement structure* does not encroach any further into the hazards than the existing structure;
 - iv. the *replacement structure* is not located within the *stable slope allowance*;
 - v. the *erosion hazard* is mitigated in accordance with the shoreline *protection work standards* policies of Section 5.3.3.2;

- vi. *floodproofing* measures are incorporated to the extent and level possible, based on site-specific conditions, in accordance with the floodproofing policies of Section 5.8;
 - vii. the *replacement structure* shall not be more flood vulnerable than the existing structure; and
 - viii. *safe access* and a *maintenance access allowance* are provided in accordance with the requirements of Section 5.9.
- c) Both the *replacement* of an existing building or structure and a *minor addition* to the same building may be permitted where the policies of both 5.3.3.4(a) and (b) are met.
- d) *Accessory structures* less than or equal to 15 m² (160 sq. ft.) will not require approval from the HCA.
- e) *Accessory structures* greater than 15 m² (160 sq. ft.) but less than or equal to 46 m² (500 sq. ft.) may be permitted within the shoreline *flooding hazard* or *erosion hazard* where it has been demonstrated:
- i. the *accessory structure* cannot reasonably be located outside of the hazards;
 - ii. the *accessory structure* is not located within the *stable slope allowance*;
 - iii. the *accessory structure* is adequately protected from the shoreline hazards;
 - iv. *floodproofing* measures are incorporated to the extent and level possible, based on site-specific conditions, in accordance with the floodproofing policies of Section 5.8;
 - v. any mitigation of the *erosion hazard* that may be required is in accordance with the shoreline *protection work standards* policies of Section 5.3.3.2; and
 - vi. a *maintenance access allowance* is maintained in accordance with the requirements of Section 5.9.
- f) *Accessory structures* greater than 46 m² (500 sq. ft.) must meet the requirements of Section 5.3.3.3.
- g) Repairs, maintenance and renovations to an existing building or structure that do not alter the use or potential use, do not increase the size, do not increase the number of *dwelling units*, or increase risks associated with shoreline hazards may be permitted.

5.3.3.5 Policies for Development Within the Regulated Allowance

Development activity that is within the regulated *allowance* associated with the shoreline may be permitted where it is confirmed the development activity is located outside of the *flooding hazard*, *erosion hazard* and *dynamic beach hazard*, and the general policies of Section 5.2 are met.

5.4 River and Stream Valleys

River and stream valleys are dynamic systems, shaped by natural processes that include flooding and erosion. The degree and frequency with which physical change occurs in these systems depends on the interaction of a number of factors and system characteristics including watercourse channel configuration, flows and sediment transport and deposition, water recharge and discharge, as well as bedrock and soil types, vegetation communities, and the stability of watercourse banks and adjacent valley slopes.

River and stream valley systems provide important hydrological and ecological functions at local and broader landscape level scales, and are critical to supporting the health of our watersheds. However, the constant shaping and re-shaping of river and stream systems can also create hazardous conditions which may pose risks to human health and safety, or cause property damage.

The flooding and erosion hazards associated with river and stream valley systems are discussed further in the following sections, including how regulation limits for valley systems are defined, how their related hazards are identified, and the policies to be applied for managing development and other activities in these areas.

5.4.1 Defining River and Stream Valley Regulation Limits

Under *O. Reg. 41/24*, the regulated limits of river and stream valleys are defined as follows:

2. (1) For the purposes of subparagraph 2 iii of subsection 28 (1) of the Act, river or stream valleys include river or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse, the limits of which are determined as follows:

1. Where the river or stream valley is apparent and has stable slopes, the valley extends from the stable top of the bank, plus 15 metres, to a similar point on the opposite side.
2. Where the river or stream valley is apparent and has unstable slopes, the valley extends from the predicted long-term stable slope projected from the existing stable slope or, if the toe of the slope is unstable, from the predicted location of the toe of the slope as a result of stream erosion over a projected 100-year period, plus 15 metres, to a similar point on the opposite side.
3. Where the river or stream valley is not apparent, the valley extends,
 - (i) to the furthest of the following distances:

A. the distance from a point outside the edge of the maximum extent of the floodplain under the applicable flood event standard to a similar point on the opposite side, and

B. the distance from the predicted meander belt of a watercourse, expanded as required to convey the flood flows under the applicable flood event standard to a similar point on the opposite side, and

(ii) an additional 15-metre allowance on each side

The application of the regulation limit for rivers and stream systems is based on two simplified landforms, as explained in the *Technical Guides for River and Stream Systems* (MNR, 2002):

Apparent river and stream valleys (confined systems) are valleys in which the physical presence of a valley corridor containing a river or stream channel, which may or may not contain flowing water, is visibly discernible (i.e. valley walls are clearly definable) from the surrounding landscape by either field investigations, aerial photography and/or map interpretation. The location of the river or stream channel may be located at the base of the valley slope, in close proximity to the toe of the valley slope (i.e. within 15 m), or removed from the toe of the slope (i.e. greater than 15m).

Not Apparent river and stream valleys (unconfined systems) are valleys in which a river or stream is present but there is no discernible valley slope or bank that can be detected from the surrounding landscape. For the most part, unconfined systems are found in fairly flat or gently rolling landscapes and may be located within the headwater areas of drainage basins. The river or stream channels contain either perennial (i.e. year-round) or ephemeral (i.e. seasonal or intermittent) flow and range in channel configuration from seepage and natural channels to detectable channels.

Figures 8 to 12 illustrate how regulation limits are defined for both confined and unconfined systems.

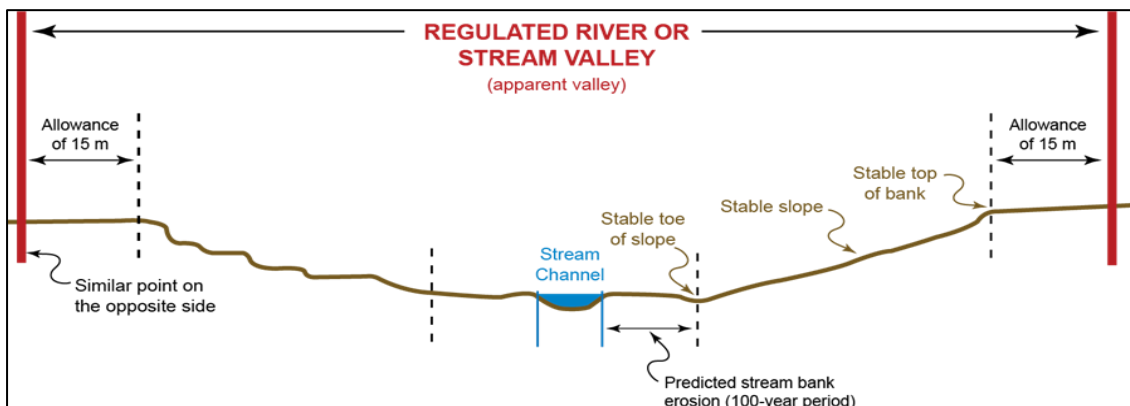


Figure 8: Confined river or stream valley where the valley slopes are stable

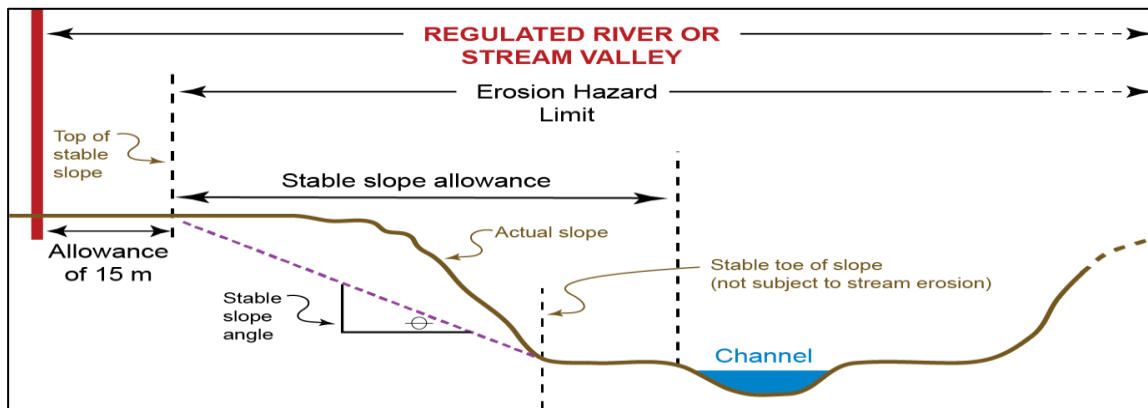


Figure 9: Confined river or stream valley associated with unstable slopes and stable toe

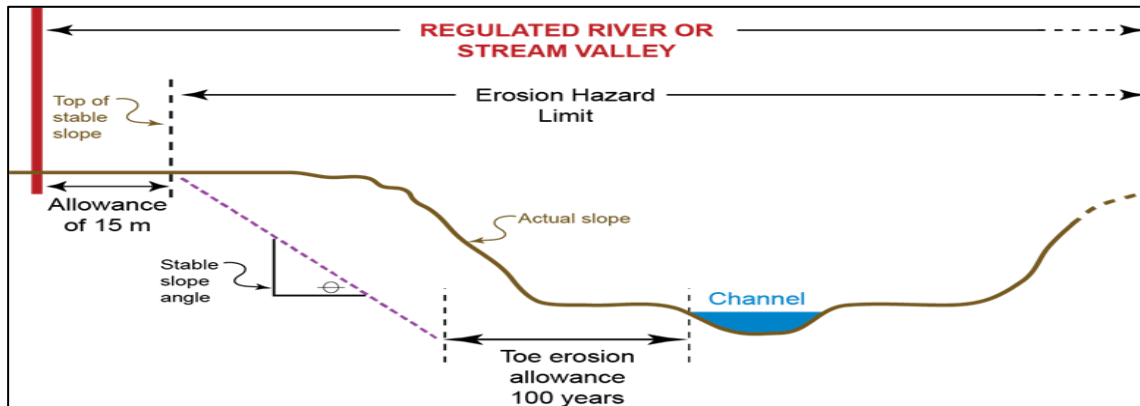


Figure 10: Confined river or stream valley with unstable slopes and active toe erosion

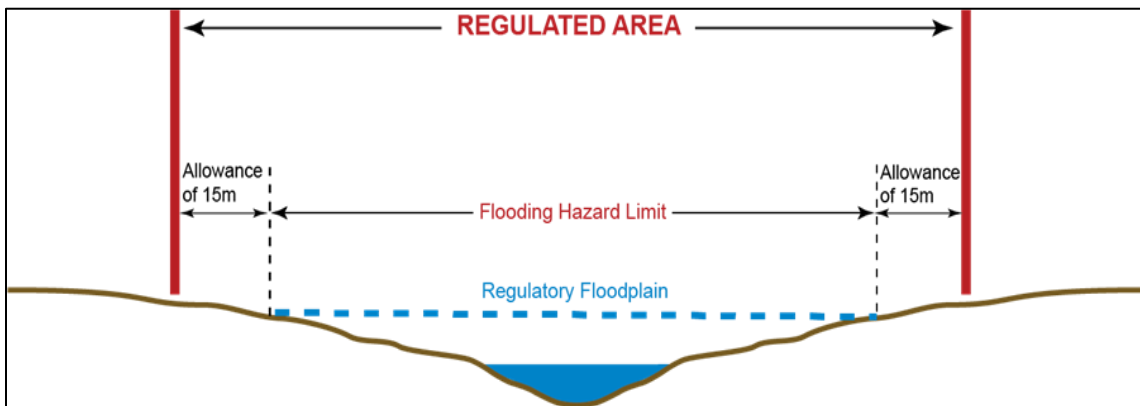


Figure 11: Unconfined river or stream valley (floodplain)

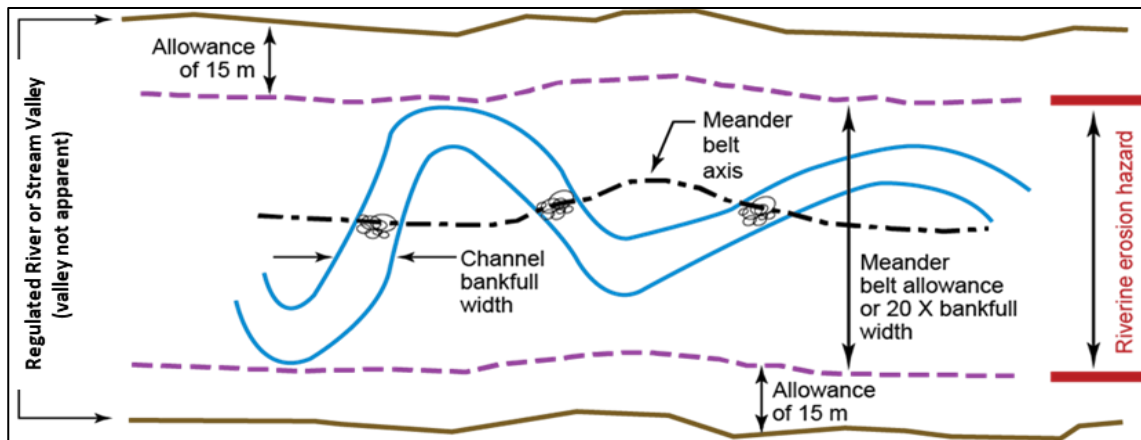


Figure 12: Unconfined river or stream valley (meander belt)

5.4.2 River and Stream Valleys – Erosion Hazards

Erosion involves the removal and transport of the earth's surface materials (rock and soil) by natural forces such as water, wind and ice. The flow of water over land and through river and stream valley systems can cause erosion of the ground surface, valley slopes, and of stream channels and banks. The rate and magnitude of erosion can vary considerably over time, and is dependent on a variety of factors, including flow volumes and velocities. Large storm events, heavy rainfall, ice movement and rapid snowmelt can increase the potential for erosion (MNR, 2001).

Erosion is a natural process, but can result in hazardous conditions where human activity or development comes into contact with erosional forces. Erosion can also be caused or aggravated by human activities, for example, by altering drainage patterns, developing on valley slopes or tablelands, and removing slope or riparian vegetation. *Erosion hazards* are defined as the loss of land, due to human or natural processes, that pose a threat to life and property. This can include the movement or failure of valley slopes, and the movement, scouring or undercutting of the banks of a watercourse.

5.4.2.1 Identifying the Erosion Hazard

The *erosion hazard* component of river and stream systems is intended to address both erosion potential of the bed and banks of a watercourse, as well as erosion or potential slope stability issues or failure of valley walls associated with watercourses. The *erosion hazard* limit for river and stream systems is determined by using the 100-year erosion rate (the average annual rate of recession extended over a hundred-year time span), and allowances for slope stability and access during emergencies.

Determination of the *erosion hazard* depends on the type of system present. In order to identify the *erosion hazard* limit, the following components must be taken into consideration. The specific components that would be utilized vary depending on whether the stream system is *confined* (located within an apparent valley) or *unconfined* (not located in an apparent valley), as described more specifically below. Different

reaches of a stream system may be classified differently where conditions change from upstream to downstream reaches, or from bank to bank within the same reach.

- a) A **toe erosion allowance** is the setback that helps to ensure safety if the toe (i.e. base) of the slope adjacent to a watercourse erodes, increasing the risk of slumping. River banks and valley slopes located in proximity to the outside of meanders or bends of a river or stream are particularly susceptible to erosion. A *toe erosion allowance* is generally only applied where *watercourses* are located within 15 m of the *toe of slope*. The *toe erosion allowance* is determined using one of the following methods:
- Using the values in Table 2, which details the minimum *toe erosion allowances* for specific soil types. If valid studies indicate that allowances should be greater than those indicated within the table, the greater of the two will be utilized; or
 - The average annual recession rate, based on 25 years worth of accumulated erosion data, over a 100-year planning horizon; or
 - A 15 m *toe erosion allowance* measured inland horizontally and perpendicular to the toe of the *watercourse* slope, where the soil type is not known; or
 - As determined by a valid study, which is based on 25 years worth of accumulated erosion data.

Table 2: Minimum toe erosion allowance - where river is within 15 m of slope toe

Type of material Native Soil Structure	Evidence of active erosion or where the bankfull flow velocity is greater than competent flow velocity	No evidence of active erosion		
		bankfull width		
		<5m	5-30m	>30m
Hard rock (e.g. granite)	0-2m	0m	0m	1m
Soft rock (shale, limestone), cobbles, boulders	2-5m	0m	1m	2m
Clays, clay-silt, gravels	5-8m	1m	2m	4m
Sand, silt	8-15m	1-2m	5m	7m

- b) A **stable slope allowance** is the setback that helps to ensure safety if slope failure or slumping occurs. The stability of slopes can be affected by a variety of factors, including soil composition, slope steepness, increases in loading (weight) from the placement of buildings, changes in drainage patterns, presence of groundwater, loss of vegetation, and erosion of the *toe of slope*. Signs that a slope may be unstable can include the presence of bare slopes, outward tilting of trees, toe erosion at the base of the slope, the presence of fill material, an easily erodible soil type, slumping, gullyng or other visible erosion processes, or an angle greater than 3(H):1(V). The *stable slope allowance* identifies the *stable top of slope*, and is determined according to the following:

- i. A horizontal allowance measured landward from the *toe of slope* (or *toe erosion allowance* where applicable) equivalent to three times the height of the slope (i.e. 3:1); or
 - ii. As determined by a valid study, using accepted geotechnical principles.
- c) A ***meander belt allowance*** is the setback that helps to ensure safety where river and stream meandering (movement) may occur. Rivers and streams are dynamic systems, and may change form over time as a result of the changes in flow, the movement of sediment, etc. The *meander belt allowance* identifies the maximum extent that the channel of a watercourse is expected to migrate (move) over time, and the area required to allow the natural processes of a river or stream (flow, flooding, erosion) to continue unimpeded over time. The *meander belt allowance* is determined based on one of the following:
 - i. Analyzing the bankfull channel width of the largest amplitude meander. The *meander belt allowance* is then defined as 20 times the bankfull channel width of the reach, centred on the meander belt axis. When determining the meander belt for relatively straight reaches, the meander belt should be centred on the mid-line of the channel (Figure 12); or
 - ii. As determined by a valid study, using accepted fluvial geomorphological principles.
- d) An ***erosion access allowance*** (or *access allowance*) is the setback that helps to ensure that people and vehicles have safe ingress and egress (entry and exit) during an emergency as a result of an erosion hazard (e.g. slope failure), and to provide access for machinery and equipment for the maintenance and repair of areas affected by erosion hazards. The *erosion access allowance* is based on the following:
 - i. A minimum 5 m *erosion access allowance*, as described further in Section 5.9.

5.4.2.1.1 Erosion Hazard Limit for Confined Systems

Confined systems are those where the *watercourse* is located within a valley corridor, either with or without a *flood plain*, and is confined by valley walls. The *watercourse* may be located at the toe of the *valley slope*, in close proximity to the toe of the *valley slope* (less than 15 m) or removed from the toe of the *valley slope* (more than 15 m). The *watercourse* can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels (MNR, 2001). Within the HCA's watershed, all valleys greater than or equal to 3 m in height are considered confined systems. As shown in Figures 13 and 14, the *erosion hazard* limit for *confined systems* shall be the combined influence of:

- i. a *toe erosion allowance*;
- ii. a *stable slope allowance*; and
- iii. an *erosion access allowance*.

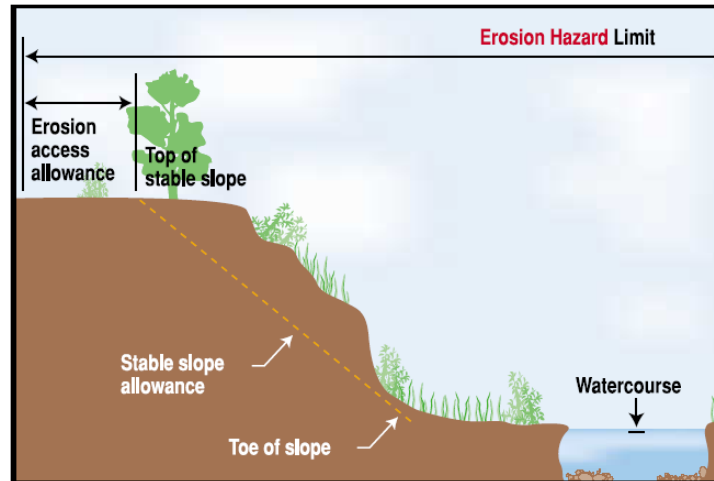


Figure 13: Erosion hazard limit for a confined system (toe of slope greater than 15 m from watercourse)

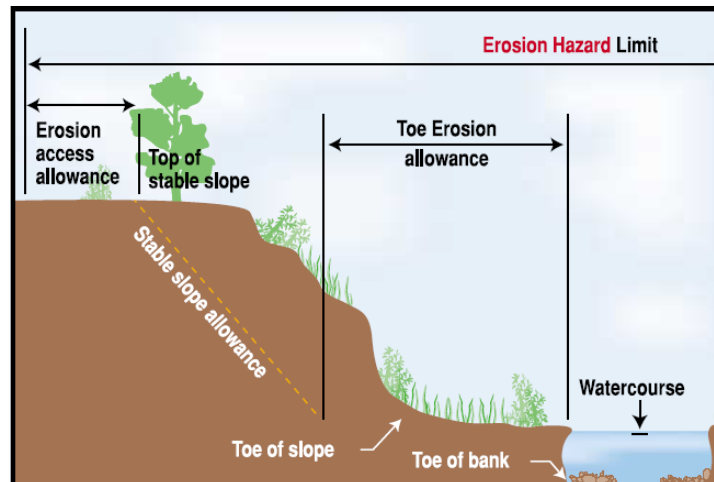


Figure 14: Erosion hazard limit for a confined system (toe of slope less than 15 m from watercourse)

5.4.2.1.2 Erosion Hazard Limit for Unconfined Systems

Unconfined systems are those systems where the *watercourse* is not located within a valley corridor with discernable slopes, but relatively flat to gently rolling plains and is not confined by valley walls. The *watercourse* can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels. As shown in Figure 15, the *erosion hazard* limit for *unconfined river and stream systems* shall be the combined influence of:

- i. the *floodings hazard* limit;
- ii. the *meander belt allowance*; and
- iii. an *erosion access allowance*.

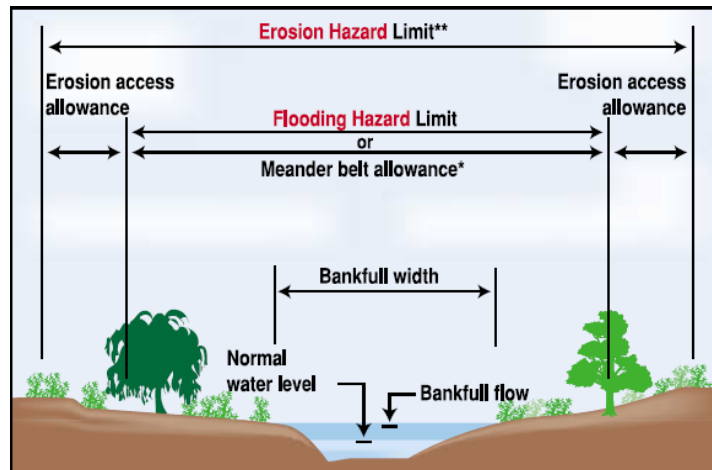


Figure 15: Erosion hazard limit for an unconfined system

5.4.3 Policies for Development Within the Erosion Hazard

The HCA watershed contains numerous river and stream (*watercourse*) valley systems. Historic and on-going development pressures in some of these areas require that erosion hazard limits be appropriately identified and considered. The provincial policy framework directs development away from areas of natural hazards where there is an unacceptable risk to public health or safety or of property damage, and so as to not create new or aggravate existing hazards, or to cause negative impacts to natural river valley systems. Generally, development is to be directed away from lands affected by erosion hazards, as described more specifically in the policies included in this section.

5.4.3.1 General Policies

- a) *Development activities* within the *erosion hazard* or associated regulated *allowance* of a river or stream valley are prohibited, except in accordance with the policies of sections 5.4.3.1 to 5.4.3.4, and the general policies of Section 5.2.
- b) The *erosion hazard* limit must be identified as part of any proposal for *development activity* within or adjacent to a river or stream valley. Where a site-specific study is not completed or required by HCA to identify the *erosion hazard*, HCA will apply the following, as may be applicable:
 - i. 3:1 *stable slope allowance*;
 - ii. 15 m *toe erosion allowance*;
 - iii. 20x bankfull width *meander belt allowance*; and
 - iv. 5 m *erosion access allowance*.
- c) HCA may require that the physical *top of slope* and *stable top of slope* be confirmed in the field and surveyed in support of any proposal for *development activity* within or adjacent to a *confined system*. HCA staff may require a site visit for this purpose. When identifying river or stream valley limits, HCA will evaluate *disconnected features* on a case by case.

- d) *Safe access* and an *erosion access allowance* must be provided as part of any proposed *development activity* in accordance with the requirements of Section 5.9.

5.4.3.2 New Development

- a) Public *infrastructure* and *conservation projects* that have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA, may be permitted within the *erosion hazard* where it has been demonstrated:
 - i. the feasibility of locating the development outside the *erosion hazard* has been examined and no alternative exists;
 - ii. the development is setback from the *erosion hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk; and
 - iii. the general policies of Section 5.2 are met.
- b) Stream bank and slope stabilization, and erosion control works to protect existing development may be permitted subject to the *watercourse* policies of Section 5.5, and the general policies of Section 5.2.
- c) Limited *development activity* may be permitted within an *erosion access allowance* where it is demonstrated:
 - i. there will be no adverse impacts on the valley slope and associated *erosion hazard*;
 - ii. the overall function of the *access allowance* is maintained over the long-term in accordance with Section 5.9; and
 - iii. the general policies of Section 5.2 are met.
- d) Where regulated river or stream valleys contain lands that are not subject to erosion or flooding hazards, such as isolated plateaus or tablelands within a valley, *development activity* may be permitted where it is demonstrated:
 - i. the *development activity* is located outside of *hazardous lands* and there will be no adverse impacts on natural hazards;
 - ii. *safe access* and an *access allowance* are provided in accordance with the requirements of Section 5.9; and
 - iii. the general policies of Section 5.2 are met.

5.4.3.3 Existing Development

- a) A *minor addition* to an existing building or structure within the *erosion hazard* may be permitted where it has been demonstrated:
 - i. the *minor addition* does not establish additional *dwelling units*;
 - ii. the feasibility of locating the *minor addition* outside the erosion hazard has been examined and no alternative exists;
 - iii. the *minor addition* is setback from the erosion hazard to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;

- iv. the *minor addition* does not encroach any further into the *erosion hazard* than the existing structure;
 - v. the existing building or structure or *minor addition* is not located on an unstable slope or bank;
 - vi. there will be no adverse impact on slope or bank stability;
 - vii. appropriate engineering design and structural measures for site conditions are incorporated into the design and construction of the *minor addition*;
 - viii. *safe access* and an *erosion access allowance* are provided in accordance with the requirements of Section 5.9; and
 - ix. subsequent requests for additions which will result in the cumulative exceedance of the maximum permitted allowance, as based on the *original ground floor area*, shall not be permitted.
- b) The *replacement* of an existing building or structure within the *erosion hazard*, other than those destroyed by flooding or erosion, may be permitted where it has been demonstrated:
- i. the feasibility of locating the *replacement structure* outside the erosion hazard has been examined and no alternative exists;
 - ii. the *replacement structure* is setback from the *erosion hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. the *replacement structure* does not encroach any further into the *erosion hazard* than the existing building or structure;
 - iv. the *replacement structure* is not located on an unstable slope or bank;
 - v. there will be no adverse impact on slope or bank stability;
 - vi. appropriate engineering design and structural measures for site conditions are incorporated into the design and construction of the building; and
 - vii. *safe access* and an *erosion access allowance* are provided in accordance with the requirements of Section 5.9.
- c) Both the *replacement* of an existing building or structure and a *minor addition* to the same building or structure may be permitted where the policies of both 5.4.3.3(a) and (b) are met.
- d) *Accessory structures* less than or equal to 15 m² (160 sq. ft.) will not require approval from the HCA.
- e) *Accessory structures* greater than 15 m² (160 sq. ft.) must meet the requirements of Section 5.4.3.2.
- f) Repairs, maintenance and renovations to any building or structure that do not alter the use or potential use, do not increase the size, do not increase the number of *dwelling units*, or increase risks associated with *erosion hazards* may be permitted.

5.4.3.4 Policies for Development Within the Regulated Allowance

- a) *Development activity* that is within the regulated allowance of a river or stream valley may be permitted where it is confirmed the *development activity* is located outside of the *erosion hazard* and the general policies of Section 5.2 are met.

5.4.4 River and Stream Valleys – Flooding Hazards

Flooding is the inundation or submergence of normally dry land under water as a result of a waterbody overflowing its limits. Flooding of river and stream systems is a natural occurrence, and may occur during the spring freshet or as a result of storm events. Flooding is often naturally contained within river and stream valley corridors, and provides important hydrological and ecological functions such as nutrient transport and soil enhancement, habitat creation and groundwater recharge.

Historically, development has occurred in flood prone areas because of the availability of water for power, transportation, waste assimilation, and domestic and industrial consumption. Flooding in developed areas has the potential to create hazardous conditions, and can cause significant property damage and risk to public health and safety. The potential for flooding to occur may be aggravated by human activities and development, for example, as a result of increases in impervious area and greater overland runoff which results in more water reaching river and stream systems more quickly.

The *flooding hazard* limit, or *floodplain*, for a river or stream is defined as the area adjacent to the watercourse which would be inundated by the flood resulting from a specified flood event standard. In Ontario, either storm centred events, observed events, or a flood frequency-based event may be used to determine the extent of the *flooding hazard* limit. Most conservation authorities regulate one of the following storm events, Hurricane Hazel, the Timmins storm, 100-year storm or 200-year storm.

Development is generally to be directed to areas outside of the flooding hazards. The principal objective of the flooding hazard policies outlined in this section is to prevent and minimize the potential for property damage and risk to public health and safety as a result of flooding.

5.4.4.1 Identifying the Flooding Hazard

The *flooding hazard* limit (or '*regulatory floodplain*') for watercourses within most of the HCA watersheds is defined based on the *Hurricane Hazel* flood event standard (the *Regional Storm*), with the exception of the numbered watercourses in Stoney Creek where the 100-year flood frequency event is used to determine the floodplain. The applicable flood event standard may be referred to as the *regulatory storm*. HCA does not regulate flooding that may result from smaller or more frequent storms, or from localized drainage and flooding issues that may be associated with municipal infrastructure.

Within Ontario there are three main policy approaches to floodplain management, the One Zone Areas, Two Zone Areas and Special Policy Areas. Each of these are described in more detail below. The HCA manages *regulatory floodplain* lands in all watersheds based on the *one zone area*, with the exception of the Dundas *Special Policy Areas* (SPAs), which utilize the *floodway* and *flood fringe* management approach, and are treated as *two zone areas*. The HCA watersheds also contain a number of *floodplain spill areas*, which are managed differently than one zone areas.

5.4.4.1.1 One Zone Areas

Under the *one zone area* approach, the *floodplain* is defined as a single zone based on the adopted flood event standard (or *regulatory flood*). Where the *one zone area* approach is applied, the entire *floodplain* or the entire *floodway* limit defines the *floodway* (Figure 16). New development within one zone areas is generally prohibited or significantly restricted. The one zone approach is the most effective way of minimizing threats to public health and safety and property damage. The *one zone area* is the preferred approach for the management of *floodway hazards* within river and stream systems as it provides the most cost-effective means of minimizing potential threats to life and risks of property damage and social disruption.

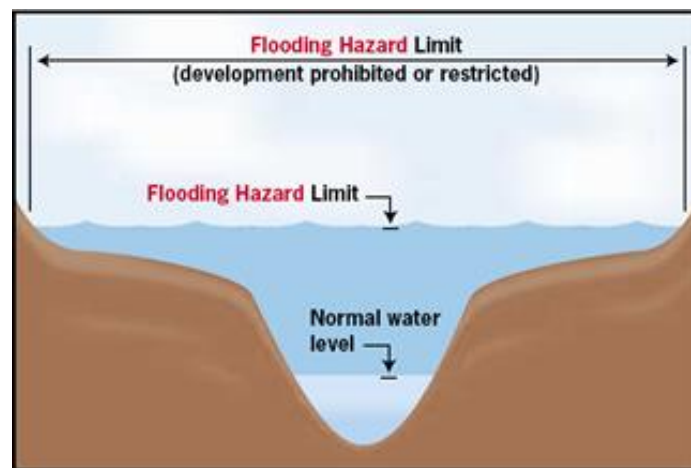


Figure 16: Flooding hazard limit for one zone areas

5.4.4.1.2 Two Zone Areas

Where a municipality and conservation authority, in consultation with the Province, determine and demonstrate that a one zone approach is too restrictive for an existing urban or built-up area, selective application of the *two zone area* approach may be considered. The *two zone area* approach divides the *floodplain* into two areas, the *floodway* and *flood fringe* (Figure 17). The *floodway* refers to the inner portion of the *floodplain* where the majority of the flow is conveyed. The *floodway* represents the area required for the safe passage of flood flows and/or the area where flood depths and/or velocities are considered to pose a threat to public health and safety and property

damage. The *flood fringe* is the portion of the *floodplain* where development may be permitted subject to certain policies and procedures, including meeting floodproofing and access standards. Some factors taken into account when determining the more hazardous areas of *floodplains* include depth of water, velocity of flow, combined depth and velocity, vehicle access and structural integrity (MNR and Watershed Science Centre, 2001).

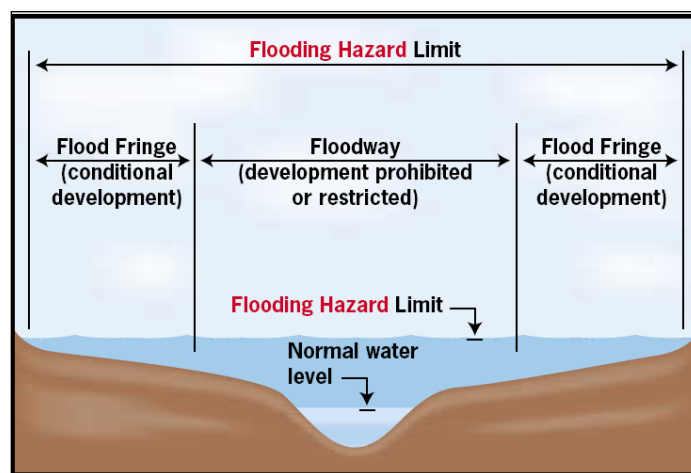


Figure 17: Flooding hazard limit for two zone areas

5.4.4.1.3 Special Policy Areas

The *Special Policy Area* (SPA) concept may be applied in exceptional circumstances where one zone or two zone approaches have been demonstrated to be too stringent, and would likely cause significant social and economic hardships to a community. The SPA approach has generally been limited to those communities or neighbourhoods that were historically built within flood prone areas prior to provincial floodplain policies being in effect. The SPA approach is intended to provide for the continued viability of existing land uses in such communities, while also ensuring sufficient protection against hazards. A SPA is generally not intended to allow for new or intensified development if a community has feasible opportunities for growth outside the floodplain.

Where a SPA is applied, the municipality, conservation authority, and the Province of Ontario (MNR and MMAH) must agree to relax provincial floodproofing and technical standards and accept a higher level of risk for development in flood prone areas. The suitability of applying the SPA approach would be reviewed on the basis of technical criteria and procedures established by the Province.

5.4.4.1.4 Floodplain Spill Areas

Floodplain spill areas are locations where flood waters may leave the normal floodplain of a watercourse and “spill” into surrounding lands, rejoining the watercourse and its

floodplain at a distance downstream. In some cases, a spill area may flow to another watershed. *Floodplain spill areas* may occur naturally, or as a result of barriers to the passage of flood flows through a watercourse system, such as bridges and culverts.

Given these characteristics, the limit and depth of *floodplain spill areas* is often difficult to determine. Regulatory floodplain maps may highlight spill areas using general notation or directional arrows to indicate the approximate location and direction of a spill. With new and emerging modelling and mapping tools and technologies, it is possible to more accurately define spill areas in some cases.

Floodplain spill areas are considered hazardous lands and part of the flooding hazard. These areas may be regulated by conservation authorities, and require regulatory approval where development is proposed.

5.4.5 Policies for Development Within the Flooding Hazard

5.4.5.1 General Policies

- a) *Floodplains* within the HCA watershed are managed as *one zone areas*, with the exception of floodplain lands in portions of the Town of Dundas which are identified as a *Special Policy Area*.
- b) *Development activities* within the *flooding hazard* or associated regulated *allowance* of a river or stream valley are prohibited, except in accordance with the policies of Sections 5.4.5.1 to 5.4.5.7, and the general policies of Section 5.2.
- c) The *flooding hazard* limit must be identified as part of any development proposal within or adjacent to a river or stream valley or *watercourse*.
- d) Where the *flooding hazard* limit has not been identified, or existing available information regarding the extent of the *flooding hazard* limit is insufficient, HCA may require an applicant for *development activity* to undertake an assessment to identify or confirm the *flooding hazard*.

5.4.5.2 New Development

- a) Public *infrastructure* and *conservation projects* that have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA, may be permitted within the *flooding hazard* where it has been demonstrated:
 - i. the feasibility of locating the development outside the *flooding hazard* has been examined and no alternative exists;
 - ii. the development is setback from the *flooding hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk; and
 - iii. the general policies of Section 5.2 are met.

- b) *Agricultural uses* may be permitted where it has been demonstrated:
 - i. the feasibility of locating the development beyond the *flooding hazard* has been examined and no alternative exists;
 - ii. the development is setback from the *flooding hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. the development does not include buildings or structures for housing or habitable space;
 - iv. the development does not include buildings or structures for livestock or other animals;
 - v. the development is not an *agricultural-related use*; and
 - vi. the general policies of Section 5.2 are met.
- c) Stream bank and slope stabilization, erosion control works, and *floodproofing* measures to protect existing development may be permitted subject to the *watercourse* policies of Section 5.5, *floodproofing* policies of Section 5.8, and the general policies of Section 5.2.
- d) Construction or alteration of a driveway or access through the *regulatory floodplain* in order to provide access to lands outside of the *regulatory floodplain* may be permitted where it has been demonstrated:
 - i. *safe access* can be achieved in accordance with the requirements of Section 5.9;
 - ii. the applicable policies addressing *interference* with a *watercourse* or *wetland* have been satisfied; and
 - iii. the general policies of Section 5.2 are met.

5.4.5.3 Existing Development

- a) A *minor addition* to an existing building or structure in the *floodplain* may be permitted where it has been demonstrated:
 - i. the *minor addition* does not establish additional *dwelling units*;
 - ii. the feasibility of locating the *minor addition* outside the *flooding hazard* has been examined and no alternative exists;
 - iii. the *minor addition* is setback from the *flooding hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iv. *minor additions* must incorporate *floodproofing* measures to the extent and level possible, based on site-specific conditions, in accordance with the floodproofing policies of Section 5.8;
 - v. that where flood depths exceed 0.8 m, the structural integrity of the *minor addition* can be maintained through *floodproofing* measures;
 - vi. *minor additions* shall not be more flood vulnerable than the existing structure, in that no openings on the addition are to be below the elevation of existing openings, nor shall the flood vulnerability of the existing building or structure be increased as the result of the addition;

- vii. no basement is proposed, and any crawl space is designed to be non-habitable;
 - viii. *safe access* and an *erosion access allowance* are provided in accordance with the requirements of Section 5.9; and
 - ix. subsequent requests for additions which will result in the cumulative exceedance of the maximum permitted allowance, as based on the *original ground floor area*, shall not be permitted.
- b) The *replacement* of an existing building or structure within the *flooding hazard*, other than those destroyed by flooding or erosion, may be permitted where it has been demonstrated:
- i. the feasibility of locating the *replacement structure* outside the *flooding hazard* has been examined and no alternative exists;
 - ii. the *replacement structure* is setback from the *flooding hazard* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. *replacement structures* must incorporate *floodproofing* measures to the extent and level possible, based on site-specific conditions, in accordance with the *floodproofing* policies of Section 5.8;
 - iv. *replacement structures* shall not be more flood vulnerable than the existing structure; and
 - v. *safe access* and an *erosion access allowance* are provided in accordance with the requirements of Section 5.9.
- c) Both the *replacement* of an existing building or structure and a *minor addition* to the same building or structure may be permitted where the policies of both 5.4.5.3(a) and (b) are met.
- d) *Accessory structures* less than or equal to 15 m² (160 sq. ft.) will not require approval from the HCA.
- e) *Accessory structures* greater than 15 m² (160 sq. ft.) but less than or equal to 46 m² (500 sq. ft.) in size, may be permitted within the *flooding hazard* where it has been demonstrated:
- i. the *accessory structure* cannot reasonably be located outside of the *flooding hazard*;
 - ii. the *regulatory floodplain* elevation is not increased and the existing stage/storage characteristics are maintained;
 - iii. there are no *adverse hydraulic and fluvial impacts*;
 - iv. the *accessory structure* is floodproofed to the level of the *regulatory floodplain* in accordance with the *floodproofing* policies of Section 5.8; and
 - v. an *erosion access allowance* is maintained in accordance with the requirements of Section 5.9.
- f) *Accessory structures* greater than 46 m² (500 sq. ft.) must meet the requirements of Section 5.4.5.2.

- g) Repairs, maintenance and renovations to any building or structure that do not alter the use or potential use, do not increase the size, do not increase the number of *dwelling units*, or increase risks associated with *flooding hazards* may be permitted.

5.4.5.4 Policies for Development Within the Regulated Allowance

- a) *Development activity* that is within the regulated *allowance* of a river or stream valley may be permitted where it is confirmed the development activity is located outside of the *flooding hazard* and the general policies of Section 5.2 are met.

5.4.5.5 Policies for Cut and Fill

Cut and fill is a technique that is used to balance flood storage losses resulting from the placement of *fill* within a *floodplain*. This is achieved by removing (cutting) a volume of earth at the appropriate elevation and location to offset areas within the *floodplain* to be filled. The suitability of cut and fill operations is extremely site-specific.

It should be recognized that in conducting a cut and fill, additional flood free lands are not obtained. A cut and fill will only serve to transfer floodwaters from one area to another as a result of the manipulation of the land's contours. HCA generally does not encourage cut and fill operations as it may alter the existing contours of the *floodplain* which can lead to potential safety risks for people and property. Any proposals for cut and fill operations within the *flooding hazard* must be in accordance with the following policies and general policies of Section 5.2.

- a) The amount of *fill* removed (cut) must be equal to or greater than the volume of *fill* proposed for placement within the *floodplain*.
- b) All excess *fill* material removed (cut) shall be required to be moved to an area that is outside of the *floodplain*.
- c) It is demonstrated there will be no *adverse hydraulic and fluvial impacts*, or adverse impacts to the *hydrologic functions* or conditions of *wetlands*.
- d) Proposals for cut and fill will require a plan prepared by professional engineer.
- e) Depending on the location and extent of the proposed works, a hydraulic analysis and/or geotechnical evaluation may be required to support the cut and fill plan and demonstrate no adverse impacts.

5.4.5.6 Policies for Floodplain Spill Areas

Development activity may be permitted in *floodplain spill areas* subject to the following policies.

- a) Where there is a land use planning process or *comprehensive study* associated with a proposed *development activity*, opportunities for *remediation* of the *floodplain spill area* must be examined and implemented to the extent feasible in accordance with policy 4.3.1(m).
- b) Where a *floodplain spill area* is not completely remediated, or there is no land use planning process, the following must be demonstrated before a *development activity* may be permitted:
 - i. the *development activity* is not prohibited by the policies of Section 4 or Section 5;
 - ii. the depth and velocity of the *floodplain spill area* has been determined or can be reasonably estimated based on existing available information;
 - iii. the *development activity* does not impede flood conveyance or storage, or increase flood depths or velocities;
 - iv. the *development activity* incorporates *floodproofing* measures to the extent and level possible, based on site-specific conditions, in accordance with the *floodproofing* policies of Section 5.8; and
 - v. *safe access* and an *erosion access allowance* are provided in accordance with the requirements of Section 5.9.

5.4.5.7 Policies for the Dundas Special Policy Areas

Due to historical development in flood prone areas associated with Spencer, Sydenham and Ann Creeks in the (former) Town of Dundas, the HCA and the Town underwent a technical assessment and Official Plan consolidation in October of 2000. This had the effect of creating four designated *Special Policy Areas* (SPA) within the former Town of Dundas which are managed as *two zone areas*.

A new Urban Hamilton Official Plan (UHOP) came into effect in 2013. The policies for the Dundas SPAs are included in Volume 3 of the UHOP, in Chapter B, Dundas Area Specific Policies, sections UD-1 to UD-3 for the Dundas Two Zone Floodplain Area. Where HCA receives an application for *development activity* within the Dundas SPAs, the following policies will be applied.

- a) When considering *development activity* within the Dundas SPAs, HCA will refer to, and require conformity with, the Dundas Two Zone Floodplain Area policies of the Urban Hamilton Official Plan, or any amendments, updates, or revisions thereto.
- b) Where the Dundas SPAs refer to the policies of the Hamilton Conservation Authority, HCA will rely on the policies of this plan as may be applicable, including the policies of Section 5.8 and 5.9 where *floodproofing* and *safe access* are required by the SPA.

5.5 Watercourses

Watercourses are vital to the health of watersheds. Rivers, streams, creeks and headwater drainage features provide important functions and benefits that support healthy ecosystems and communities, including habitat for a diversity of aquatic and terrestrial species, groundwater recharge, clean drinking water, irrigation for agriculture, electricity generation and recreation. Watercourses also play a critical role in the conveyance of water through watersheds and in protecting communities from flooding.

The structure and function of watercourses are influenced by channel morphology, sediment characteristics, soil types, bedrock conditions, as well as the nature and extent of vegetation in a watercourse and along its banks. Changes in these conditions can have a significant influence on other parts of the system. Similarly, changes in the volume, peaks and timing of flows can significantly impact watercourse morphology, sediment transport and riparian vegetation. The dynamic nature of watercourses may create hazardous conditions resulting from flooding and erosion.

5.5.1 Defining Watercourse Regulation Limits

For the purposes of Section 28 of the *Conservation Authorities Act* and the prohibition of certain activities in watercourses, *O. Reg. 41/24* defines a *watercourse* as a channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs.

The regulated area associated with a *watercourse* is defined based on the extent of its apparent valley limits, or in the case of a valley that is not apparent, the extent of its *flood hazard* (floodplain) or *erosion hazard* (meander belt), plus an additional 15 m allowance, as described in more detail in Section 5.4.

5.5.2 Policies for Interference with Watercourses

- a) *Interference* in any way with the existing channel of a *watercourse* is prohibited, except in accordance with the policies of Section 5.5.2, and the general policies of Section 5.2.
- b) HCA may require a site visit and/or the completion of technical studies to confirm the presence, status or extent of a *watercourse* as part of any proposed *development activity* or *interference*.
- c) *Interference* with a *watercourse* for public *infrastructure* or *conservation projects* that have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA, may be permitted where the general policies of Section 5.2 are met.
- d) Minor works and activities that may result in *interference* with a *watercourse*, such as roadside ditch maintenance, culvert cleanouts, etc., may be permitted where the general policies of Section 5.2 are met.

- e) *Interference with a watercourse*, including realignment, channelization, or enclosure, for the purpose of creating a new building lot, establishing additional developable area, or facilitating new development may be permitted where the following are demonstrated:
- i. the activity has been considered and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA;
 - ii. alternatives have been considered that could reasonably maintain the *watercourse* in its current location and condition;
 - iii. the activity will result in mitigation or *remediation* of hazardous conditions, reduce risks to existing development, and improve public safety;
 - iv. there will be no *adverse hydraulic and fluvial impacts*;
 - v. there will be no adverse impacts on *water resource systems* or the *hydrologic functions* or conditions of *wetlands*;
 - vi. slope and bank stability issues are addressed; and
 - vii. natural channel design principles are considered and utilized to the maximum extent possible.
- f) *Watercourse* crossings may be permitted where it has been demonstrated:
- i. crossings are designed (i.e. type, location, size, alignment, etc.) to be compatible with site conditions and *watercourse* characteristics, and to minimize adverse impacts;
 - ii. crossings should generally be perpendicular to the *watercourse*;
 - iii. low flow conditions are maintained within the crossing;
 - iv. culverts have an open bottom where feasible, and where not feasible culverts are appropriately embedded into the *watercourse*;
 - v. there will be no *adverse hydraulic and fluvial impacts*;
 - vi. there will be no adverse impacts on *water resource systems* or the *hydrologic functions* or conditions of *wetlands*;
 - vii. slope and bank stability issues are addressed;
 - viii. mitigation measures and restoration work appropriate for the scale of the *interference* and site conditions are implemented; and
 - ix. low-level crossings for agricultural uses are designed and implemented in accordance with accepted best practices and standards.

5.6 Wetlands

Wetlands are among the most productive and biologically diverse habitats on earth. They provide critical ecological and *hydrologic functions*, ecosystem services, and socio-economic benefits. *Wetlands* retain water during periods of high-water levels or peak flows (i.e. spring freshet and storm events), allowing the water to be slowly released into watercourses, infiltrate into the ground, and for evapotranspiration. These processes provide natural flood attenuation and reduce the energy associated with flood waters, helping to mitigate the impacts of flooding and erosion.

Wetlands also release water during times of drought to maintain base flows in streams and creeks. Improvement of water quality, provision of habitat for a wide variety of plant and animal species, climate change mitigation and the provision of recreational opportunities are further benefits that *wetlands* support. The areas adjacent to *wetlands* also play an important role in supporting and maintaining the function of *wetlands*.

Development and other activities that may occur within or adjacent to *wetlands* have the potential to impact the condition and *hydrologic functions* of *wetlands*, and result in adverse impacts to flooding and erosion hazards. Wetlands may also contain unstable (organic) soils, which are considered *hazardous lands* and can present risks to public safety and property. The policies set out in this section are intended to protect, maintain and restore wetlands within the watershed.

5.6.1 Defining Wetland Regulation Limits

For the purposes of Section 28 of the *Conservation Authorities Act* and the prohibition of certain activities in wetlands or areas adjacent to wetlands, O. Reg. 41/24 defines a *wetland* as land that:

- a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface,
- b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse,
- c) has hydric soils, the formation of which has been caused by the presence of abundant water, and
- d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water.

The definition of *wetland* does not include periodically soaked or wet land used for agricultural purposes which no longer exhibits a wetland characteristic referred to in clause (c) or (d) of that definition.

The areas adjacent to *wetlands* are considered to be all lands within 30 m of *wetlands* and are referred to as 'other areas' under the *Conservation Authorities Act* and O. Reg. 41/24:

2. (3) For the purposes of subparagraph 28(1) 2.v. of the Act, no person shall carry out development activities in areas that are within an authority's area of jurisdiction and are within 30 metres of a wetland.

Figure 18 illustrates how regulation limits are defined for wetlands. The figure also summarizes how the criteria (tests) to allow for consideration of *development activity* and *interference* within and adjacent to wetlands are to be applied.

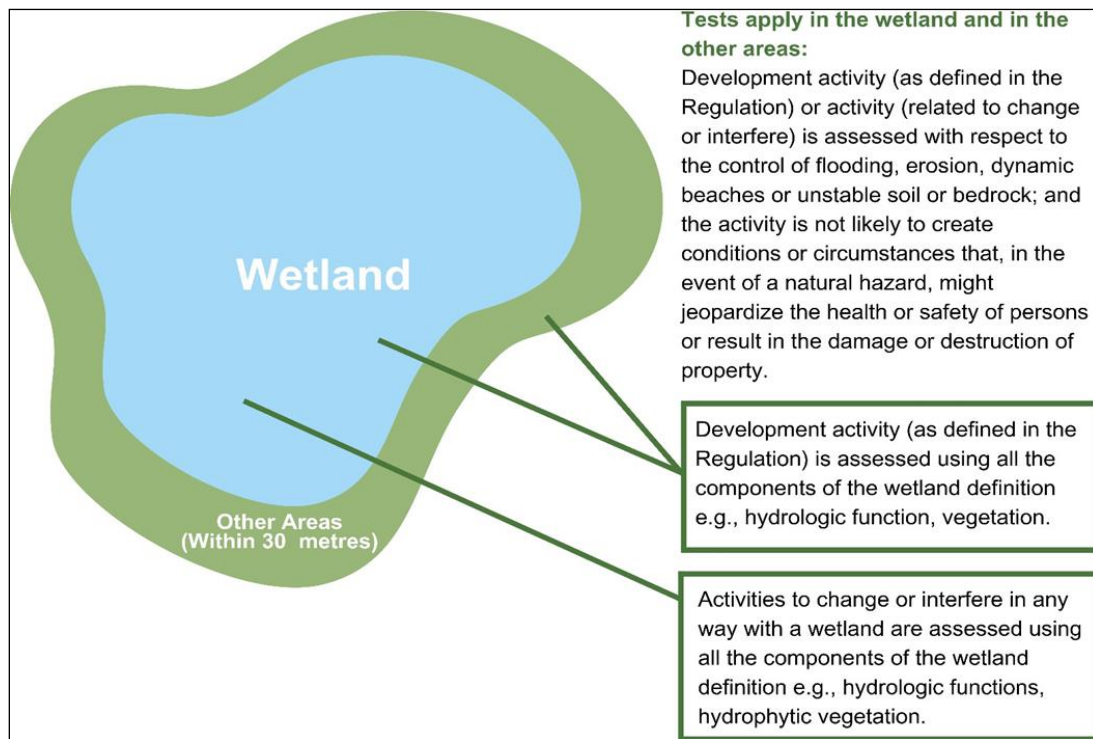


Figure 18: Regulation limits of wetlands and other areas

5.6.2 Policies for Development and Interference with Wetlands

5.6.2.1 General Policies

- a) *Development activity* within wetlands and within 30 m of wetlands, and *interference* within wetlands is prohibited, except in accordance with the policies of 5.6.2.1 to 5.6.2.3, and the general policies of Section 5.2.
- b) *Wetland* boundaries must be confirmed as part of any proposal for *development activity* or *interference* within a wetland or *development activity* within 30 m of a wetland, in consultation with the HCA. A site visit with HCA staff at a seasonally appropriate time, technical studies or assessments, and/or a survey may be required to confirm *wetland* boundaries.

- c) HCA may require the completion of studies, such as a hydrogeological study or feature-based water balance assessment, to evaluate potential impacts and identify mitigation measures for any proposed *development activity* or *interference* within a *wetland* or *development activity* within 30 m of a *wetland*. Study requirements are to be determined in consultation with HCA, and must be completed by a qualified professional.

5.6.2.2 Development and Interference within Wetlands

- a) *Development activity* and *interference* within *wetlands* may be permitted where it has been demonstrated that:
- i. the *wetland* is not located within the Greenbelt Area;
 - ii. the *development activity* or *interference* is not located within a *floodplain*;
 - iii. the feasibility of locating the *development activity* or *interference* outside the *wetland* has been examined and no alternative exists;
 - iv. the *hydrologic functions* and features of the *wetland* and its adjacent lands have been assessed, and there would be no adverse impacts on functions or features that support the control or mitigation of flooding or erosion hazards;
 - v. hazards related to unstable soils (organic soils) are addressed;
 - vi. mitigation measures will be implemented to minimize impacts on the *wetland*, and to restore or replace impacted *hydrologic functions* and features in accordance with HCA's *Natural Heritage Offsetting Guidelines*; and
 - vii. the general policies of Section 5.2 are addressed.
- b) Notwithstanding 5.6.2.2(a), peat extraction within a *wetland* will not be permitted.
- c) Public *infrastructure* and *conservation projects* that have been reviewed and approved through a *comprehensive study* or site-specific study, as applicable based on the scale of the project and that has been supported by HCA, may be permitted within *wetlands* where it has been demonstrated that:
- i. the feasibility of locating the development outside the *wetland* has been examined and no alternative exists;
 - ii. the development is setback from the *wetland* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility, risk and impact;
 - iii. hazards related to unstable soils (organic soils) are addressed;
 - iv. mitigation measures will be implemented to minimize impacts on the *wetland*, and to restore or replace impacted *hydrologic functions* and features in accordance with HCA's *Natural Heritage Offsetting Guidelines*; and
 - v. the general policies of Section 5.2 are met.
- d) The *replacement* of existing buildings and structures within *wetlands*, other than those destroyed by flooding or erosion, may be permitted where it has been demonstrated that:
- i. the feasibility of locating the *replacement structure* outside of the *wetland* has been examined and no reasonable alternative exists;

- ii. the building or structure is replaced within the existing disturbed area, or is otherwise located in the area of least hazard susceptibility, risk and impact;
 - iii. hazards related to unstable soils (organic soils) are addressed; and
 - iv. mitigation measures will be implemented to minimize impacts on the *wetland*.
- e) *Interference* with a *wetland* by selective tree harvesting employing good forestry practices may be permitted where it is demonstrated there will be no adverse impacts on the *hydrologic functions* of the *wetland*.

5.6.2.3 Development within 30 m of a Wetland

- a) *Development activity* within 30 m of a *wetland* may be permitted where it has been demonstrated that:
- i. the *wetland* is not located within the Greenbelt Area;
 - ii. the feasibility of locating the *development activity* greater than 30 m from the *wetland* has been examined and no alternative exists;
 - iii. the *hydrologic functions* and features of the *wetland* and its adjacent lands have been assessed, and there would be no adverse impacts on functions or features that support the control or mitigation of flooding or erosion hazards;
 - iv. the *development activity* is setback from the *wetland* to the greatest extent possible, as determined by appropriate studies; and
 - v. mitigation measures will be implemented to minimize impacts on the *wetland*, and to restore or replace impacted *hydrologic functions* and features in accordance with HCA's *Natural Heritage Offsetting Guidelines*; and
 - vi. the general policies of Section 5.2 are met.
- b) Where buildings or structures already exist within 30 m of a *wetland*, *development activity* may be permitted where it has been demonstrated:
- i. the feasibility of locating the *development activity* greater than 30 m from the *wetland* has been examined and no alternative exists;
 - ii. further encroachment is minimized, and the development activity is setback from the *wetland* to the greatest extent possible, as determined by appropriate studies;
 - iii. mitigation measures will be implemented to minimize impacts on the *wetland's hydrologic functions*; and
 - iv. the general policies of Section 5.2 are met.

5.7 Hazardous Lands

Areas of land and water that are affected by naturally occurring processes or features associated with flooding and erosion, or unstable soils or bedrock may be considered *hazardous lands*. Development in such areas is generally considered unsafe, as it has the potential to put property and people at risk. While Sections 5.3 to 5.6 have covered flooding, erosion and dynamic beach hazards in detail, the focus of this section is on lands affected by unstable soils and bedrock, including karst.

Karst formations include features such as sinking streams, *sinkholes*, fissures, grikes, caves and springs. These features are created by water flowing over and through limestone, dolomite or other soluble rock. Karst formations have unique drainage patterns, where significant portions of the drainage network may be located beneath the surface. Within the HCA watersheds, karst formations are found in areas along and above the Niagara Escarpment, including the Eramosa Karst Area of Natural and Scientific Interest (ANSI) located in Stoney Creek.

Unstable soils include organic soils, which are comprised primarily of organic matter and have a high moisture content. Organic soils form by humification, which is the decomposition of vegetative and organic materials into humus. A wide variety of soils may be characterized as organic, with peat being one of the most common types. Peat is found within the watershed, typically occurring in association with wetlands.

Both karst formations and organic soils are considered *hazardous lands*. Karst formations may be subject to subsidence, collapse, erosion and flooding. Organic soils generally lack structure, and are therefore susceptible to erosion and compression, and unable to support structures. The decomposition of such soils can also create combustible methane gas. Due to the specific nature of unstable soil and bedrock it is often difficult to identify these hazards. The presence of unstable soils or bedrock may not be immediately obvious through surface inspection of a site.

When considering *development activity* in *hazardous lands* it is important to account for the full limits of such hazards in order to understand the potential impacts, and to be able to mitigate, to the greatest extent possible, associated risks to property and public health and safety. Further, the influence of *development activity* on the natural processes involved in the formation and maintenance of karst features and organic soils must also be considered.

5.7.1 Defining Hazardous Lands Regulation Limits

For the purposes of Section 28 of the *Conservation Authorities Act* and the prohibition of *development activity* in *hazardous lands*, O. Reg. 41/24 defines *hazardous lands* as land that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock.

The regulated area associated with karst features or organic soils will be based on site specific studies undertaken to determine the full extent of features and their associated *hazardous lands*. In cases where existing available information regarding the extent of potentially hazardous features such as karst or organic soils is limited, the regulated area will be based on reasonable inferences of the potential for *hazardous lands* that may be associated with these features. In the case of the Eramosa Karst Area of Natural and Scientific Interest (ANSI) located in Stoney Creek, the regulated area has been identified as the ANSI boundary.

5.7.2 Identifying Hazardous Lands

Unlike river and stream systems or the Lake Ontario shoreline, *hazardous lands* do not have a single methodology or standard for identifying the hazard. As a result, the hazards associated with features such as karst and organic soils must be identified on a site-specific basis, in accordance with accepted best practices and approaches for investigation and assessment, including those recommended in the *Hazardous Sites Technical Guide* (MNR, 1996).

Within the HCA watersheds, there are known areas of karst that have been identified, including most significantly the Eramosa Karst ANSI. The Eramosa Karst ANSI is located above the escarpment in Stoney Creek, in the area of Upper Mount Albion Road and Rymal Road. This site contains provincially significant karst features, which were extensively studied and documented between 1999-2003 (Buck et al., 2003). Karst features have also been documented in the broader area surrounding the ANSI, including within the Upper Davis Creek and Upper Hannon Creek subwatersheds.

Organic peat soils are also present in the watershed. These typically occur in association with wetlands, with the extensive area of the Beverly Swamp specifically known to contain organic peat soils.

Given that organic soils and karst features are not always evident at the surface, site-specific studies may be required to confirm conditions and extent of the *hazardous lands* where development is proposed in an area that is known or suspected to contain unstable soil or bedrock.

5.7.3 Policies for Development Within Hazardous Lands

5.7.3.1 General Policies

- a) *Development activity* within *hazardous lands* will generally be prohibited, except in accordance with the policies of Section 5.7.3.1 to 5.7.3.3, and the general policies of Section 5.2.
- b) The limit of *hazardous lands* must be confirmed prior to any *development activity* within or adjacent to areas that are known or suspected to contain *hazardous lands*, such as karst or organic soils.

- c) The limit of the any *hazardous lands* will be established through the completion of site-specific studies, as may be required by HCA, and/or site inspections completed by a qualified professional in consultation with HCA staff.
- d) The HCA may require the completion of studies such as a karst assessment, geotechnical investigation or soil survey to determine the extent of *hazardous lands*, potential impacts of any proposed *development activity* on the hazards, and to identify appropriate mitigation measures. Study requirements are to be determined in consultation with the HCA and must be completed by qualified professionals based on accepted best practices, approaches and standards.
- e) When considering karst features, *hazardous lands* will include any identified or inferred karst features, the connections between them and, in the absence of a site-specific study to identify the full extent of *hazardous lands*, the additional lands within 50 m of any identified or inferred karst features.
- f) When considering organic soils, *hazardous lands* will include any identified areas which contain organic soils, have the potential to contain organic soils, and *wetlands*.

5.7.3.2 New Development

- a) *Development activity* may be permitted within *hazardous lands* where the following have been demonstrated:
 - i. the feasibility of locating the *development activity* outside the *hazardous lands* has been examined and no alternative exists;
 - ii. the *development activity* is setback from the *hazardous lands* to the greatest extent possible, and otherwise located in the area of least hazard susceptibility and risk;
 - iii. the hazards can be appropriately mitigated in accordance with *provincial standards* or other accepted best practices and approaches; and
 - iv. the general policies of Section 5.2 are met.

5.7.3.3 Unstable Bedrock (Karst) Specific Policies

In addition to the policies of Sections 5.7.3.1 and 5.7.3.2, the following policies apply to *hazardous lands* containing unstable bedrock (karst).

- a) *Development activity* will only be considered within *hazardous lands* containing unstable bedrock if the following are appropriately addressed in accordance with accepted best practices and standards:
 - i. site grading and drainage;
 - ii. stormwater management;
 - iii. utilities installation; and
 - iv. building design.

- b) Surface water run-off shall not directly enter a *sinkhole* or closed depression unless that is the natural drainage pattern. Drainage plans shall be designed to route surface water run-off through vegetative filters or other filtration measures before it enters such features.
- c) Stormwater management facilities and other water retaining structures shall not be located within depressions or areas containing karst.
- d) Utility installations and building foundations shall be designed in accordance with accepted best practices and standards to prevent potential subsidence and/or karst-forming processes.
- e) HCA may require that construction or other work associated with *development activity* be supervised by a qualified professional to ensure that measures and recommendations for the mitigation of karst-related hazards are implemented in accordance with approved studies and plans.
- f) In reviewing proposals for *development activity* within or adjacent to the Eramosa Karst ANSI, HCA shall consider the recommendations contained within the *Earth Science Inventory and Evaluation of the Eramosa Karst Areas of Natural and Scientific Interest* (2003).

5.8 Floodproofing Standards

The term *floodproofing* is used to describe the combination of measures that are incorporated into the design, construction and/or alteration of buildings, structures or properties to reduce the risks associated with *flooding hazards*. *Floodproofing* helps to alleviate the potential for damages to buildings and structures as a result of flooding, and to reduce risks to public safety and property.

Where *development activity* may be permitted in areas affected by *flooding hazards*, in accordance with the policies of Section 5, the following policies will be applied to ensure that *floodproofing* that is appropriate for the nature of the development, site conditions and potential hazards is provided.

5.8.1 General Policies

- a) The following criteria may be taken into consideration when determining *floodproofing* requirements on a site-specific basis:
 - i. the type of *development activity* proposed;
 - ii. the depth, velocity and combination of depth and velocity of flood waters;
 - iii. the duration of the flood;
 - iv. the rate of rise and fall of the flood waters; and
 - v. the type of flood warning system in place.
- b) In general, *dry passive floodproofing* is the preferred approach to *floodproofing* and should be applied wherever possible. *Dry passive floodproofing* will be required for any development that includes residential or habitable space.
- c) *Development activity* shall be floodproofed to the level of the *regulatory flood*, plus 0.3 m of freeboard where possible.
- d) *Floodproofing* must make use of materials, methods and design measures to ensure that structural integrity is maintained in the event of a flood, and that water damage will be minimized to the greatest extent possible.
- e) All mechanical and electrical systems must be designed and installed so that the heating, lighting, ventilation, air conditioning and other systems are not vulnerable to flood damage during the flood standard. Where flooding could interrupt key power supplies, it may be necessary to provide stand-by or backup systems, with power and controls located above the level of the flood standard.
- f) *Floodproofing* measures must be designed and approved by a qualified engineer based on site conditions and in consideration of the potential effects of applicable flood forces on the building or structure.

5.8.2 Dry Floodproofing

- a) Wherever possible, *dry floodproofing* measures should be passive rather than active.
- b) *Dry passive floodproofing* designs shall ensure that *fill*, columns or design modifications are used to the greatest extent possible in order to ensure that openings in buildings or structures will be elevated above the level of the *regulatory flood*, plus freeboard of 0.3 m where possible.
- c) Other *dry passive floodproofing* measures may be considered where the use of fill is not possible, and where such measures can be installed to be permanent and not require any further action to put the flood protection into effect.
- d) The use of *dry active floodproofing* measures will only be accepted in instances where it is not possible or practical to utilize dry passive approaches.

5.8.3 Wet Floodproofing

- a) *Wet floodproofing* shall only be considered for structures that are non-residential or non-habitable, and where the interior space that would be subject to flooding remains unfinished and would not be used for storage of *hazardous substances*.
- b) *Wet floodproofing* measures shall incorporate at least two openings below the level of the *regulatory flood* so that water is able to freely enter and exit the structure.

5.8.4 Additions and Replacement Structures

- a) *Minor additions* to an existing building or structure and *replacement structures* are the only developments that shall be permitted to be *floodproofed* to less than the *regulatory flood* level. In all instances they should incorporate *floodproofing* measures to the extent and level possible, based on site-specific conditions. At a minimum, the *minor addition* or *replacement structures* should not be more flood vulnerable than the existing structure, in that no openings on the *minor addition* or *replacement structures* are to be below the elevation of existing openings.

5.9 Access Standards

The ability of people, vehicles and emergency services (police, firefighters, ambulance, emergency response teams, etc.) to safely enter (ingress) and exit (egress) a site during or in response to a natural hazard event, such as a flooding or erosion event, is an important factor when considering development activities. Provincial access standards require that methods or procedures be available to ensure safe vehicular and pedestrian movement, and access for the maintenance and repair of protection works and property, during times of flooding and erosion hazards.

Where the policies of Sections 4 and 5 require that *safe access* and/or an *access allowance* be provided for a development or other activity affected by flooding or erosion, the following will be required.

5.9.1 Safe Access for New Development

- a) Access shall be provided that ensures vehicles, pedestrians and emergency services have access to (ingress) and from (egress) a site that is safe from risks associated with natural hazards.
- b) Access for pedestrians will generally be considered safe where the following are achieved at the subject site and along a public roadway, or other route acceptable to the HCA, that allows pedestrians to safely exit the area(s) affected by flooding or erosion:
 - i. flood depths do not exceed 0.8 m;
 - ii. flood velocities do not exceed 1.7 m/s;
 - iii. flood depth/velocity products do not exceed 0.4 m²/s; and
 - iv. access through areas susceptible to erosion hazards is not required.
- c) Access for private vehicles and emergency services vehicles (i.e. paramedics, ambulance, police) will generally be considered safe where the following are achieved at the subject site and along a public roadway, or other route acceptable to the HCA, that allows vehicles to safely enter and exit the areas affected by flooding or erosion:
 - i. flood depths do not exceed 0.3 m;
 - ii. flood velocities do not exceed 4.5 m/s; and
 - iii. access through areas susceptible to erosion hazards is not required.
- d) Access for diesel fire trucks will generally be considered safe where the flood depths do not exceed 1.2 m.
- e) *Safe access* will generally not be required for public *infrastructure*, *conservation projects*, or *accessory structures* that are approved in accordance with the policies of Section 5.

- f) In applying the criteria established in 5.9.1(b), (c) and/or (d) to confirm that safe access is provided, HCA must be satisfied that the level of ingress and egress available are appropriate for the nature of the proposed development, site conditions and potential hazards.
- g) Further to 5.9.1(f), HCA may consider alternative criteria to demonstrate *safe access* where an applicant provides confirmation from municipal emergency services that access is available that is appropriate for the nature of the proposed development, site conditions and hazards present, and that emergency services would be able to access the subject site during a natural hazard event.

5.9.2 Access Allowances

- a) An *access allowance* shall be provided that allows people, vehicles, machinery and equipment to safely access areas affected by natural hazards for the purpose of constructing, maintaining and repairing any protection works, structures and property that may be damaged or affected by natural hazards.
- b) A minimum *access allowance* of 5 m shall be provided wherever possible, and must include access from a municipal road, along one side yard of the property, to and along the *stable top of slope*, *stable toe of slope*, or *meander belt allowance* associated with a river or stream valley, watercourse or Lake Ontario shoreline, as applicable (see Figures 19 and 20).
- c) A reduction in the 5 m *access allowance* may be considered where it is demonstrated:
 - i. providing a 5 m *access allowance* is not feasible;
 - ii. the reduction in the *access allowance* would not constrain access over the long-term; and
 - iii. that the *access allowance* is appropriate for site conditions and hazards, and machinery and equipment that may be required to construct or maintain protection works, and to repair property or structures that may be damaged by natural hazards.
- d) *Access allowances* may be shared between adjacent property owners provided that the shared access is registered as an easement on property title.

5.9.3 Access for Existing Development

- a) Where there is existing development and the policies of Section 5 allow for *minor additions* and *replacement structures*, the following must be demonstrated to confirm *safe access* and *access allowances* are available:
 - i. where the criteria outlined in 5.9.1 and 5.9.2 are not met, opportunities to improve the existing access or establish an alternate access must be examined and implemented to the extent possible; and
 - ii. in no case shall access conditions for the *minor addition* or *replacement structure* be diminished or worse than existing conditions.

- b) Notwithstanding 5.9.3(a), where the policies of Section 5 allow for both the *replacement* of an existing building or structure and a *minor addition* to the same building or structure, the access standards of Section 5.9.1 and 5.9.2 must be satisfied.

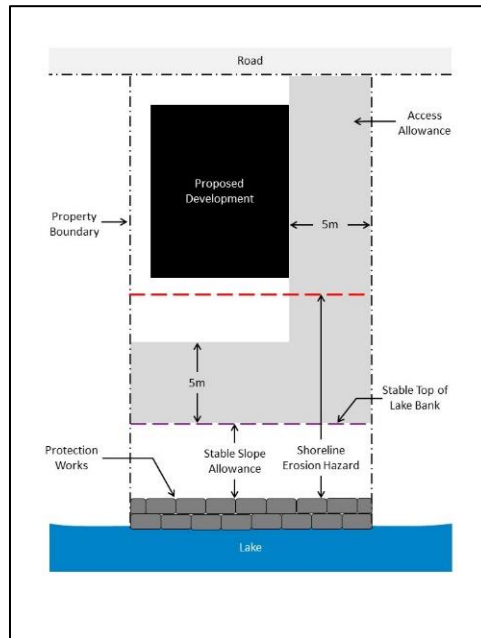


Figure 19: Shoreline Access Allowance

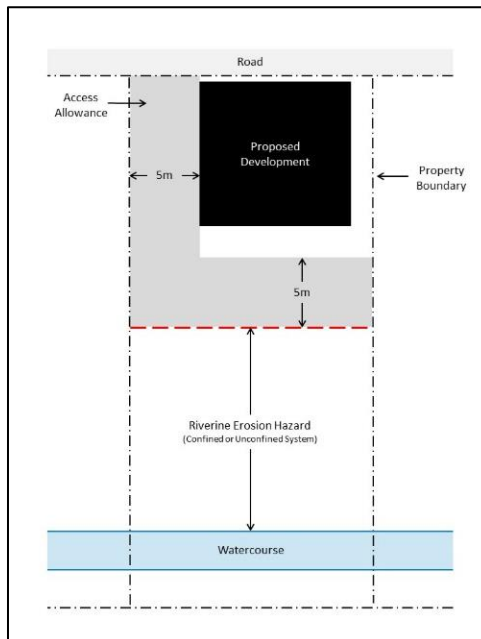


Figure 20: Riverine Access Allowance

5.10 Fill Placement and Site Grading

As defined under the *Conservation Authorities Act* and *Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits*, *development activity* includes the temporary or permanent placing, dumping, or removal of any material, originating on the site or elsewhere.

HCA supports soil conservation and the reuse of excess soil in an environmentally sustainable manner. However, the movement of *soil* and other materials, or *fill*, to or from a site requires careful review due to the potentially harmful impacts on *hazardous lands* and water resource and natural heritage systems and features that may contribute to the management of natural hazards.

Fill placement within the jurisdiction of the HCA must be in accordance with the following policies.

5.10.1 General Policies

- a) *Fill placement* shall not be permitted within *hazardous lands*, with the following exceptions:
 - i. for slope stabilization, erosion control or *floodproofing* measures required to protect existing development, in accordance with the flooding and erosion policies of Sections 5.3 and 5.4, *floodproofing* policies of Section 5.8, and the general policies of Section 5.2;
 - ii. as part of cut and fill operations, in accordance with the policies of Section 5.4.5.5;
 - iii. within the Dundas *Special Policy Areas* (SPA), in accordance with the policies of Section 5.4.5.7; or
 - iv. importation of *soil* for the purposes of agricultural soil enrichment in accordance with *normal farm practices*.
- b) Except as prohibited in policy 5.10.1(a), *fill placement* may be permitted in regulated areas where the general policies of Section 5.2 are met.
- c) HCA may require the submission of information, plans and studies to assess the potential impacts of a proposal for *fill placement*.
- d) *Fill placement* in a regulated area will require a permit. The information, plans and studies that are required to be submitted in support of a permit application will be scoped based on the specifics of the proposal, including fill source and receiving site conditions.
- e) Where proposed *fill placement* site locations are regulated jointly by both HCA and a municipal fill or site alteration by-law, and/or the Niagara Escarpment Commission, to the extent practical the proponent shall prepare comprehensive plans and reports for submission to all agencies. Joint pre-consultation with all applicable agencies will be encouraged.

5.10.2 Large-Scale Fill Placement

In addition to the policies of Section 5.10.1, the following policies will be applied when reviewing large-scale *fill placement* proposals within the jurisdiction of the HCA. For the purpose of these policies, large-scale fill applications are those defined as involving the placement, dumping or removal of 500 m³ or more of *fill*. Where site conditions warrant, HCA at its discretion may also apply the following policies to fill proposals of less than 500 m³.

- a) In addition to those studies required to address the policies in Section 5.10.1, applicants for large-scale fill proposals will also be required to complete a comprehensive Fill Management Plan. The information required for the completion of a Fill Management Plan is detailed in the *HCA Application Checklist for Fill Application Submissions*.
- b) Written permission from the HCA for a large-scale *fill placement* operation for the purposes of the temporary stockpiling of fill will only be granted to a maximum of one year. Within this period, the *fill* must either be used on-site or elsewhere under a separate permit where applicable, or a new application will be required for continued fill stockpiling. The new application will be subject to the requirements of these policies.
- c) A final site inspection and review of permit conditions shall be required for all large-scale *fill placement* operations. It will be the responsibility of the property owner or authorized agent to ensure that a final inspection with HCA enforcement staff is coordinated once all work has been completed and prior to the permit expiration date.
- d) The submission of a final post-development ('as-built') topographic survey to confirm elevations on the property will be required for all large-scale *fill placement* activities.

5.11 Development Exemptions

This section outlines minor developments and other activities that may be exempt from requiring a permit from HCA under the *Conservation Authorities Act* and *Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits*. While these activities may meet the definition of *development activity* or *interference*, any impacts associated with the activities are typically very minor, well understood and/or easily mitigated such that a permit may not be necessary.

The exemptions provided must be considered in conjunction with all other policies in Section 5, and in the case where more than one policy applies to the activity, the more restrictive policy will apply.

Subject to review and confirmation from HCA, the following activities may be exempt from requiring a permit.

- a) Any activity that may be exempted in accordance with regulations passed under Section 28 of the *Conservation Authorities Act*, including those identified in Section 5, Exceptions, of *Ontario Regulation 41/24, Prohibited Activities, Exemptions and Permits* as follows:
 - I. the construction, reconstruction, erection, or placement of:
 - i. seasonal or floating dock that is 10 m² or less, does not require permanent support structures, and can be removed in the event of flooding,
 - ii. a rail, chain-link or panelled fence with a minimum of 75 mm of width between panels, that is not within a wetland or watercourse,
 - iii. agricultural in-field erosion control structures that are not within and that do not have any outlet of water directed or connected to a watercourse, wetland or river or stream valley,
 - iv. a non-habitable accessory building or structure that is incidental or subordinate to the principal building or structure is 15 m² or less, and is not within a wetland or watercourse, or,
 - v. an unenclosed detached deck or patio that is 15 m² or less, is not placed within a watercourse or wetland and does not utilize any method of cantilevering
 - II. the installation of new tile drains that are not within a wetland or watercourse, within 30 m of a wetland or within 15 m of a watercourse, and that have an outlet of water that is not directed or connected to a watercourse, wetland or river or stream valley, or the maintenance or repair of existing tile drains;
 - III. the installation, maintenance or repair of a pond for watering livestock that is not connected to or within a watercourse or wetland, within 15 m of a wetland or a watercourse, and where no excavated material is deposited within an area where subsection 28(1) of the CA Act applies;

- IV. the maintenance or repair of a driveway or private lane that is outside of a wetland or the maintenance or repair of a public road, provided that the driveway or road is not extended or widened and the elevation, bedding materials and existing culverts are not altered;
 - V. the maintenance or repair of municipal drains as described in, and conducted in accordance with the mitigation requirements set out in the *Drainage Act* and the CA Act Protocol, approved by the Minister and available on a government of Ontario website, as it may be amended from time to time; and
 - VI. the reconstruction of a non-habitable garage with no basement, if the reconstruction does not exceed the existing footprint of the garage and does not allow for a change in the potential use of the garage to create a habitable space.
- b) Activities approved under the *Aggregate Resources Act*.
 - c) Activities undertaken by the federal or provincial Crown.
 - d) Site alteration and grading that involves:
 - I. a one-time placement of *fill* less than or equal to 10 m³ within or adjacent to a river or stream valley or within the *regulatory floodplain*, provided that the filled and re-graded area is immediately stabilized, and that the *fill* does not have an adverse impact on *Regulatory Flood* elevations;
 - II. provided (i) above is met, top dressing of existing lawns or gardens with organic material such as topsoil (50 mm depth); and
 - III. resurfacing of existing driveways, laneways and parking lots, where the final grade is generally the same as the existing grade.
 - e) The construction of an *accessory structure* in the Feeder Area lands of the Eramosa Karst ANSI, on any property for which a karst assessment has been completed and supported by HCA as part of a municipal planning process.

6 DEFINITIONS

100-year flood (One-hundred-year flood): for river, stream and small inland lake systems, means that flood, based on an analysis of precipitation, snow melt, or a combination thereof, having a return period of 100 years on average, or having a 1% chance of occurring or being exceeded in any given year.

100-year flood level (One-hundred-year flood level): for the shorelines of the Great Lakes, the peak instantaneous still water level, resulting from combinations of mean monthly lake levels and wind setups, which has a 1% chance of being equaled or exceeded in any given year.

Access allowance (erosion access allowance): the area or setback needed to ensure there is a large enough safety zone for people and vehicles to enter and exit an area during or in response to an emergency, such as a slope failure or flooding, and to provide sufficient area to access, construct and maintain protection works and property along river and stream valleys, *watercourses*, and the Lake Ontario shoreline.

Access standards: means methods or procedures to ensure safe vehicular and pedestrian movement, and access for the maintenance and repair of protection works, during times of *flooding hazards*, *erosion hazards* and/or *other water-related hazards*.

Accessory structure: a secondary, freestanding, non-habitable building or structure on the same lot as the main building to which it is subordinate, devoted exclusively to a use naturally and normally incidental to the main use of the premises. Examples of such structures include detached decks, sheds, pools, pool houses, and gazebos.

Adverse hydraulic and fluvial impacts: any increase in flood elevation or impedance of flood and ice flows and/or an increase in the risk of flooding and erosion on adjacent upstream and/or downstream properties.

Agricultural uses: means the growing of crops, including nursery, biomass, and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures, including, but not limited to livestock facilities, manure storages, value-retaining facilities, and housing for farm workers, when the size and nature of the operation requires additional employment.

Agriculture-related uses: means those farm-related commercial and farm-related industrial uses that are directly related to farm operations in the area, support agriculture, benefit from being in close proximity to farm operations, and provide direct products and/or services to farm operations as a primary activity.

Allowance (regulated allowance): the distance from a hazard or regulated feature prescribed in *Ontario Regulation 41/24* to delineate the *regulated area*.

Comprehensive study: means a study or plan undertaken by or under the direction of a public agency at a landscape scale, such as a watershed plan, subwatershed plan, *environmental assessment*, master plan, environmental implementation reports, or similar documents, that have been prepared to consider and document various alternatives and which may be part of a joint or harmonized planning process.

Confined system: means a system wherein the *watercourse* is located within a valley corridor, either with or without a *flood plain*, and is confined by valley walls. The *watercourse* can be located at the toe of the *valley slope*, in close proximity to the toe of the *valley slope* (less than 15 m), or removed from the toe of the *valley slope* (more than 15 m). The *watercourse* can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels.

Conservation projects: activities, buildings or structures for conservation or hazard management purposes, such as, but not limited to, flood and erosion control works, habitat creation and enhancement, tree and shrub planting, trails and low intensity recreation activities, cultural heritage and archaeological preservation and interpretation.

Contaminant: means any solid, liquid, gas, odour, heat, sound, vibration, radiation or combination of any of them resulting directly or indirectly from human activities that causes or may cause an adverse effect, as defined in the *Environmental Protection Act*.

Development: means the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*, but does not include:

- a) activities that create or maintain infrastructure authorized under an environmental assessment process or identified in provincial standards; or
- b) works subject to the *Drainage Act*.

Development activity: means,

- a) the construction, reconstruction, erection or placing of a building or structure of any kind;
- b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;
- c) site grading; or
- d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

Disconnected features: means those features that have, as a result of development or natural processes, become disconnected from the feature with which they were originally associated. An example of a disconnected feature is a section of *valley slope* that has been disconnected from the primary slope as a result of road construction.

Dry floodproofing: means *floodproofing* where the objective is to keep a development or structure and its contents completely dry during a flood event. There are two basic techniques to dry floodproofing:

- a. Dry passive *floodproofing* includes the use of fill, columns or design modifications to elevate openings in the structure at or above the level of the *regulatory flood*. These measures do not require flood warning or any other action to put the flood protection into effect.
- b. Dry active *floodproofing* utilizes techniques such as water tight doors or other barriers that must be manually installed to prevent water from entering openings below the level of the *regulatory flood*. Advance flood warning is almost always required in order to make the flood protection operational (i.e. closing of water tight doors, installation of waterproof protective coverings over windows, etc.).

Dwelling unit: means one or more habitable rooms, occupied or capable of being occupied as an independent and separate housekeeping establishment, in which separate kitchen and sanitary facilities are provided for the exclusive use of the occupants.

Dynamic beach hazard: means areas of inherently unstable accumulations of shoreline sediments along the *Great Lakes-St. Lawrence River System* and *large inland lakes*, as identified by provincial standards, as amended from time to time. The *dynamic beach hazard* limit consists of the *flooding hazard* limit plus a dynamic beach *allowance*. [PPS]

Ecological function: means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions. [PPS]

Environmental assessment: a study that is completed by a proponent to assess the potential environmental effects (positive or negative) of a project, pursuant to the *Environmental Assessment Act*.

Erosion access allowance: see *access allowance*.

Erosion hazard: means the loss of land, due to human or natural processes, that poses a threat to life and property. The *erosion hazard* limit is determined using considerations that include the 100-year erosion rate (the average annual rate of recession extended over a hundred-year time span), an allowance for slope stability and an *erosion access allowance*.

Essential emergency service: means services which would be impaired during an emergency as a result of flooding, the failure of floodproofing measures and/or protection works, and/or erosion. [PPS]

Fill: means *soil*, earth, sand, gravel, rubble, garbage or any other material whether similar to or different from any of the aforementioned materials, whether originating on the site or elsewhere, used or capable of being used to raise, lower or in any way affect the existing contours of the ground.

Fill placement: includes the temporary or permanent placing, dumping, or removal of any material on or from a site, as well as any associated site alteration and grading works, and where the *fill placement* is the primary activity

Flooding hazard: means the inundation, under the conditions specified below, of areas adjacent to a shoreline or a *river or stream system* and not ordinarily covered by water:

- a. Along the shorelines of the *Great Lakes-St. Lawrence River System* and large *inland lakes*, the flooding hazard limit is based on the *100-year flood level* plus an allowance for *wave action* and *other water-related hazards*.
- b. Along river, stream and small inland lake systems, the flooding hazard limit is the greater of:
 - i. The flood resulting from the rainfall actually experienced during a major storm such as the *Hurricane Hazel* Storm (1954), transposed over a specific *watershed* and combined with the local conditions, where evidence suggests that the storm event could have potentially occurred over *watershed* in the general area;
 - ii. The *100-year flood*; or
 - iii. A flood which is greater than (i) or (ii) which was actually experienced in a particular *watershed* or portion thereof as a result of ice jams and which has been approved as the standard for that specific area by the Minister of Natural Resources,

Except where the use of the *100-year flood* or the actually experienced event has been approved by the Minister of Natural Resources as the standard for a specific *watershed* (where the history of past flooding supports the lowering of the standard). [PPS]

Floodplain spill area: portions of the regulatory floodplain where flood waters are not physically contained within the river valley or stream corridor and exit to surrounding lands. As a consequence, the limit and depth of flooding are difficult to determine. Flood spill areas occur naturally, or can occur as a result of downstream barriers to the passage of flood flows, such as undersized bridges or culverts.

Floodproofing: measures taken to reduce flood damage to buildings and their contents.

Floodproofing standard: means the combination of measures incorporated into the basic design and/or construction of buildings, structures, or properties to reduce or eliminate *flooding hazards*, *wave effects* and *other water-related hazards* along the shorelines of the *Great Lakes - St. Lawrence River System* and large inland lakes, and *flooding hazards* along river, stream and small inland lake systems.

Flood fringe: means the outer portion of the *floodplain* between the *floodway* and the *flooding hazard* limit. Depths and velocities of flooding are generally less severe in the flood fringe than those experienced in the floodway. [PPS]

Floodplain: means the area, usually low lands adjoining a *watercourse*, which has been or may be subject to *flooding hazards*. [PPS]

Floodway: means the portion of the floodplain where development and site alteration would cause a danger to public health and safety or property damage. [PPS]

Great Lakes-St. Lawrence River System: means the major water system consisting of Lakes Superior, Huron, St. Clair, Erie and Ontario and their connecting channels, and the St. Lawrence River within the boundaries of the Province of Ontario. [PPS]

Green infrastructure: means natural and humanmade elements that provide ecological and hydrological functions and processes. Green infrastructure can include components such as natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces, and green roofs.

Ground water feature: refers to water-related features in the earth's subsurface, including recharge/discharge areas, water tables, aquifers and unsaturated zones that can be defined by surface and subsurface hydrogeologic investigations. [PPS]

Hazardous lands: means land that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock. [O. Reg. 41/24]

Hazardous sites: means property or lands that could be unsafe for *development* and *site alteration* due to naturally occurring hazards. These may include unstable soils (sensitive marine clays [leda], organic soils) or unstable bedrock (karst topography). [PPS]

Hazardous substance: means substances which, individually, or in combination with other substances, are normally considered to pose a danger to public health, safety and the environment. These substances generally include a wide array of materials that are toxic, ignitable, corrosive, reactive, radioactive or pathological. [PPS]

Hurricane Hazel: means a storm occurring in October 1954 in Southern Ontario, whose quantity and distribution is defined in *Ontario Regulation 41/24*, and which is used as the riverine flood event standard for all *watersheds* in the jurisdiction of the HCA with the exception of the numbered *watercourses* in the former City of Stoney Creek.

Hydrologic function: means the functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things. [PPS]

Impacts of a changing climate: means the present and future consequences from changes in weather patterns at local and regional levels including extreme weather events and increased climate variability. [PPS]

Infrastructure: means physical structures (facilities and corridors) that form the foundation for development. Infrastructure includes: sewage and water systems, septage treatment systems, stormwater management systems, waste management systems, electricity generation facilities, electricity transmission and distribution systems, communications/telecommunications including broadband, transit and transportation corridors and facilities, active transportation systems, oil and gas pipelines and associated facilities. [PPS]

Institutional use: means land uses where there is a threat to the safe evacuation of vulnerable populations such as older persons, persons with disabilities, and those who are sick or young, during an emergency as a result of flooding, failure of floodproofing measures or protection works, or erosion. [PPS]

Interference: any anthropogenic act or instance which hinders, disrupts, degrades or impedes in any way the natural features or hydrologic and ecologic functions of a *wetland* or *watercourse*.

Low impact development: means an approach to stormwater management that seeks to manage rain and other precipitation as close as possible to where it falls to mitigate the impacts of increased runoff and stormwater pollution. It typically includes a set of site design strategies and distributed, small-scale structural practices to mimic the natural hydrology to the greatest extent possible through infiltration, evapotranspiration, harvesting, filtration, and detention of stormwater. Low impact development can include, for example: bioswales, vegetated areas at the edge of paved surfaces, permeable pavement, rain gardens, green roofs, and exfiltration systems.

Mitigated erosion hazard: the reduction in the erosion allowance component of the *erosion hazard* that is provided as a result of the installation of protection works that are designed and installed in accordance with the *protection works standard*, and represents the area within the *erosion hazard* limit where it is deemed safe for some forms of development to occur.

Meander belt allowance: means the setback that keeps *development* from being affected by river and stream meandering (this includes allowance for the 100-year erosion rate). [MNR, 2001]

Minor addition: means any construction occurring on an existing building or structure that increases the total area of that building or structure by less than 50% of the *original ground floor area* of the existing structure, and which does not increase the number of *dwelling units*, as existed on October 6, 2005.

Natural heritage features or areas: means features and areas, including significant wetlands, significant coastal wetlands, fish habitat, significant woodlands, significant valleylands, significant habitat of endangered species and threatened species, significant wildlife habitat, and significant Areas of Natural and Scientific Interest, which are important for their environmental and social values as a legacy of the natural landscape of an area. [PPS]

Natural heritage system: means a system made up of *natural heritage features and areas*, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state. [PPS]

Negative impacts: means

- a. In regard to water, the degradation to the *quality and quantity of water*, *sensitive surface water features* and *sensitive ground water features*, and their related *hydrologic functions*, due to single, multiple or successive *development* or *site alteration* activities; and
- b. In regard to other *natural heritage features and areas*, the degradation that threatens the health and integrity of the natural features or *ecological functions* for which an area is identified due to single, multiple or successive *development* or *site alteration* activities. [PPS]

Normal farm practices: means a practice, as defined in the *Farming and Food Production Protection Act*, 1998, that is conducted in a manner consistent with proper and acceptable customs and standards as established and followed by similar agricultural operations under similar circumstances; or makes use of innovative technology in a manner consistent with proper advanced farm management practices. Normal farm practices shall be consistent with the *Nutrient Management Act*, 2002 and regulations made under that Act.

One zone area: means the approach whereby the entire *floodplain*, as defined by the *regulatory flood*, is treated as one unit (the *floodway*) and all development is prohibited or restricted.

Original ground floor area: means the total habitable main floor area of a building (excluding decks, patios, garages and other *accessory structures*) as existed at the time of the original construction date of the building.

Other water-related hazard: means water-associated phenomena other than *flooding hazards* and *wave effects* which act on shorelines. This includes, but is not limited to ship-generated waves, ice piling and ice jamming. [PPS]

Protection works standards: means the combination of non-structural or structural works and allowances for slope stability and flooding/erosion to reduce the damage caused by *flooding hazards*, *erosion hazards* and *other water-related hazards*, and to allow access for their maintenance and repair. [PPS]

Provincial standards: the most recently approved legislation, regulations, policies, manuals and technical guidelines administered or prepared by the province.

Regulated allowance: see *allowance*.

Regulated area: the areas over which a conservation authority has jurisdiction to prohibit certain activities, as described in the *Conservation Authorities Act* and *Ontario Regulation 41/24*.

Regional storm: means the rainfall event and soil conditions existing during *Hurricane Hazel*, transposed over a specific *watershed* and combined with local conditions.

Regulatory flood: means the resulting flood from the applicable storm event standard; the greater of the *Regional storm* or 100-year storm utilized for a particular area

Regulatory floodplain: the area adjacent to a *watercourse* that would be inundated by a flood resulting from the most severe of the *Hurricane Hazel* flood event standard (*Regional Storm*) or the *100-year flood* event standard, whichever is greater.

Regulatory storm – means the applicable flood or storm standard utilized to determine the maximum susceptibility to flooding of lands or areas within the *watershed*.

Remediation – the construction or modification of *infrastructure* or land for the purpose of reducing or eliminating risk due to natural hazards.

Replacement (Replacement structure): means the restoration, repair or reconstruction of a building or structure to its original form (i.e. same dimensions, square footage, building footprint and use), but does not include reconstruction on remnant foundations or of derelict or abandoned buildings or structures.

Safe access (Safe ingress/egress): vehicular and pedestrian access to (ingress) and from (egress) a site is safe from the risks due to flooding or erosion hazards, in consideration of the nature of the development and based on *provincial standards*.

Sensitive: in regard to *surface water features* and *ground water features*, means features that are particularly susceptible to impacts from activities or events including, but not limited to, water withdrawals, and additions of pollutants. [PPS]

Sinkhole: means a topographically closed depression, commonly circular or oval in plain view; commonly referred to as dolines.

Site Alteration: means activities, such grading, excavation and the placement of *fill* that would change the landform and natural vegetative characteristics of a site. [PPS]

Soil: means unconsolidated naturally occurring mineral particles and other naturally occurring material resulting from the natural breakdown of rock or organic matter by physical, chemical or biological processes that are smaller than 2 millimetres in size or that pass the US #10 sieve [O. Reg. 153/04]

Special Policy Area (SPA): means an area within a community that has historically existed in the *floodplain* and where site-specific policies, approved by both the Ministers of Natural Resources and Municipal Affairs and Housing, are intended to provide for the continued viability of existing uses (which are generally on a small scale) and address the significant social and economic hardships to the community that would result from strict adherence to provincial policies concerning *development*. The criteria and procedures for approval are established by the Province. A Special Policy Area is not intended to allow for new or intensified *development* and *site alteration*, if a community has viable opportunities for *development* outside the *flood plain*. [PPS]

Stable slope allowance: means the setback that ensures safety if slumping or slope failure occur. Refers to the suggested angle of stability for a slope is 3:1 (horizontal: vertical) or approximately 18 degrees. The stable slope allowance is a horizontal allowance measured landward from the *toe of slope* that is relative to the height of the slope. [MNR, 2001]

Stable toe of slope: means,

- a) the physical *toe of slope* where the existing toe is stable and not impacted by erosion; or
- b) the landward limit of the *toe erosion allowance* where the existing slope is unstable and/or impacted by erosion.

Stable top of slope/bank (long term stable slope): means,

- a) the physical *top of slope* where the existing slope is stable and not impacted by toe erosion; or
- b) the landward limit of the *toe erosion allowance* plus the *stable slope allowance* where the existing slope is unstable and/or impacted by erosion.

Surface water feature: refers to water-related features on the earth's surface, including headwaters, rivers, stream channels, inland lakes, seepage areas, recharge/discharge areas, springs, *wetlands*, *sinkholes*, and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics. [PPS]

Toe erosion allowance: means the setback that ensures safety if the *toe of slope* adjacent to the river or stream erodes and weakens the bank, increasing the risk of slumping. [MNR, 2001]

Toe of slope (a.k.a. base of slope): means the point of the slope where the downward inclination of the land levels off or the upward inclination of the land begins.

Top of slope (a.k.a. crest of slope, top of bank): means the point of the slope where the downward inclination of the land begins or the upward inclination of the land levels off.

Two zone area: means the approach whereby certain areas of the *floodplain* are considered to be less hazardous than others such that development potentially could safely occur. The *flood fringe* defines that portion of the *floodplain* where development may be permitted, subject to appropriate *floodproofing*. The *floodway* defines that portion of the *floodplain* wherein development is prohibited or restricted.

Unconfined system: means a system wherein the *watercourse* is not located within a valley corridor with discernible slopes, but relatively flat to gently rolling plains and is not confined by valley walls. The *watercourse* can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels.

Valley slope: refers to the area between *top of slope* and *toe of slope*.

Valleylands: means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year. [PPS]

Watercourse: means a defined channel, having a bed and banks or sides, in which a flow of water regularly or continuously occurs. [O. Reg. 41/24]

Watershed: means an area that is drained by a river and its tributaries. [PPS]

Water resource systems: means a system consisting of ground water features and areas, surface water features (including shoreline areas), natural heritage features and areas, and hydrologic functions, which are necessary for the ecological and hydrological integrity of the watershed. [PPS]

Wave effects: means the movement of water up onto a shoreline or structure following the breaking of a wave, including *wave uprush*, *wave setup* and water overtopping or spray; the limit of wave effects is the point of furthest landward horizontal movement of water onto the shoreline. [PPS]

Wave overtopping: essentially occurs when the height of the natural shoreline, or of the protection work, above the still water level is less than the limit of uprush. As a result, waves overtopping the protection work can cause flooding of the onshore and can threaten the structural stability of protection works. [MNR, 2001]

Wave setup: means the mean increase in water level caused by the onshore transport of water due to waves breaking at the shoreline. [MNR, 2001]

Wave uprush: means the rush of water up onto a shoreline or structure following the breaking of a wave; the limit of wave uprush is the point of furthest landward rush of water onto the shoreline. [MNR, 2001]

Wet floodproofing: means *floodproofing* that involves designing a structure using materials, methods and design measures that maintain structural integrity by avoiding external unbalanced forces from acting on buildings during and after a flood, to reduce flood damage to contents, and to reduce the cost of post flood clean up. Buildings or structures are designed so as to intentionally allow flood waters to enter and exit. These *floodproofing* measures require that the interior space below the level of the *regulatory flood* remain unfinished, be non-habitable, and be free of service units and panels.

Wetlands: means lands that,

- a) Is seasonally or permanently covered by shallow water or has a water table close to or at its surface;
- b) directly contributes to the hydrological function of a *watershed* through connection with a surface *watercourse*;
- c) has hydric soils, the formation of which has been caused by the presence of abundant water; and
- d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water,

But does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d).
[O. Reg. 41/24]

7 SELECTED BIBLIOGRAPHY

- Brunton, F. (2013). *Karst and Hazards Lands Mitigation: Some Guidelines for Geological and Geotechnical Investigations in Ontario Karst Terrains*
- Buck, M.J., Worthington, R.H., and Ford, D.C. (2003). *Earth Science Inventory and Evaluation of the Eramosa Karst Area of Natural and Scientific Interest*.
- Central Lake Ontario Conservation Authority. (2024). *Policy and Procedural Document For Land Use Planning and Regulation*.
- City of Hamilton. (2013). *Urban Hamilton Official Plan*.
- City of Hamilton. (2012). *Rural Hamilton Official Plan*.
- Conservation Halton. (2025). *Policies and Guidelines for the Administration of Part VI of the Conservation Authorities Act and Ontario Regulation 41/24 and Land Use Planning Policy Document*.
- Conservation Ontario. (2024). *Interim Guidelines to Support Conservation Authority Administration of Ontario Regulation 41/24*.
- Crins, W.J., Gray, P.A., Uhlig, P.W.C., and Wester, M.C. (2009). *The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions*.
- Ducks Unlimited. (2010). *Southern Ontario Wetland Conversion Analysis*.
- Government of Canada, Office of the Auditor General of Canada. (2022). *Biodiversity in Canada, Commitments and Trends*.
- Government of Ontario. (2020). *Protecting People and Property: Ontario's Flooding Strategy*.
- Government of Ontario. (2015). *Wetland Conservation in Ontario: A Discussion Paper*.
- Grand River Conservation Authority. (2024). *Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation, Ontario Regulation 41/24*.
- Hamilton Conservation Authority. (2024). *Hamilton Conservation Authority Invasive Species Strategy*.
- Hamilton Conservation Authority. (2024). *Hamilton Conservation Authority Watershed-based Resource Management Strategy*.
- Hamilton Conservation Authority. (2014). *Natural Areas Inventory, 3rd edition*.

- Hamilton Conservation Authority. (2012). *Spencer Creek Stewardship Action Plans*.
- Hamilton-Halton Source Protection Region. (2022). *Assessment Report Hamilton Region Source Protection Area*.
- Hamilton-Halton Source Protection Region. (2006). *Preliminary Draft Watershed Characterization Report, Hamilton Conservation Authority Watershed*.
- Henson, B.L., Brodribb, K.E., and Riley, J.L. (2005). *Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 1*.
- Henson, B.L., and Brodribb, K.E. (2005). *Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries*.
- Insurance Bureau of Canada. (2018). *Combatting Canada's Rising Flood Costs: Natural infrastructure is an underutilized option*.
- International Joint Commission. (2014). *Lake Ontario - St. Lawrence River Plan 2014*.
- McNeil, D. (2019). *An Independent Review of the 2019 Flood Events in Ontario, Ontario's Special Advisor on Flooding Report to Government*.
- Ministry of Environment, Conservation and Parks. (2022). *Subwatershed Planning Guide (Draft)*.
- Ministry of Municipal Affairs and Housing. (2024). *Provincial Planning Statement*.
- Ministry of Municipal Affairs and Housing. (2005). *Greenbelt Plan*.
- Ministry of Natural Resources and Conservation Ontario. (2008). *Draft Guidelines to Support Conservation Authority Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation*.
- Ministry of Natural Resources. (2002). *Technical Guide River & Stream Systems: Erosion Hazard Limit*.
- Ministry of Natural Resources. (2002). *Technical Guide River & Stream Systems: Flooding Hazard Limit*.
- Ministry of Natural Resources. (2001). *Understanding Natural Hazards: Great Lakes-St. Lawrence River System and large inland lakes, river and stream systems and hazardous sites*.
- Ministry of Natural Resources and Watershed Science Centre. (2001). *Adaptive Management of Stream Corridors in Ontario*.

Ministry of Natural Resources and Watershed Science Centre. (2001). *Great Lakes-St. Lawrence River System and large inland lakes Technical Guides*.

Ministry of Natural Resources. (1996). *Hazardous Sites Technical Guide*.

Ministry of Natural Resources & Ministry of Environment and Energy. (1993). *Subwatershed Planning*.

Ministry of Natural Resources. (1989). *Great Lakes System Flood Levels and Water Related Hazards*.

Niagara Escarpment Commission. (2017). *Niagara Escarpment Plan*.

Niagara Peninsula Conservation Authority. (2024). *Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority*.

Toronto and Region Conservation Authority. (2014). *The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority*.

Zuzek Inc. (2025). *Hamilton Conservation Authority Shoreline Management Plan*.