Grand River Conservation Authority

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Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation

Ontario Regulation 150/06

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Share the Resources Share the Responsibility

THE GRAND - A Canadian Heritage River

Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation

Ontario Regulation 150/06

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1 Introduction

1.1 The Grand River *Watershed*

The Grand River *watershed* is located in southwestern Ontario. The Grand River and its major tributaries, the Speed, Eramosa, Nith and Conestogo Rivers drain an area of just over 6800 km^2 – the largest direct drainage basin to Lake Erie on the Canadian side of the border with the United States (**Figure 1**).

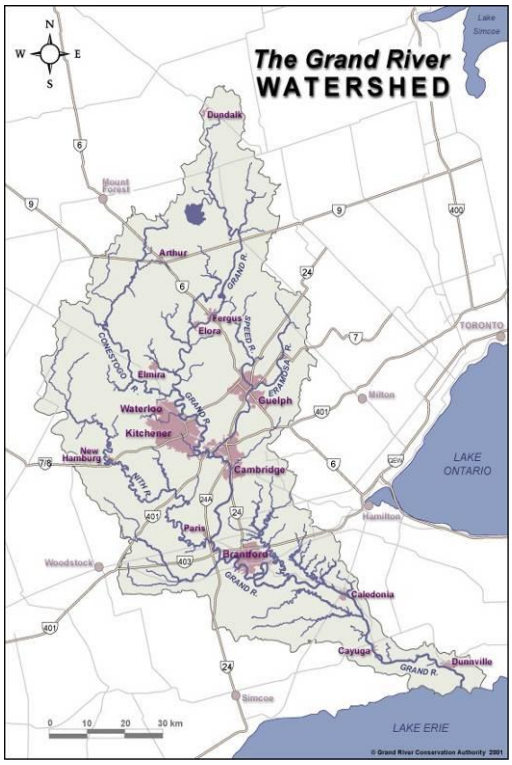

Figure 1. The Grand River Watershed

In 2007, approximately 925,000 people resided within the Grand River *watershed*, the majority living in the cities of Kitchener, Waterloo, Cambridge, Guelph and Brantford. About 3 per cent of the land use is urban, 79 per cent is rural and agricultural and 18 per cent is natural area. The *watershed* represents a diverse area, ranging from intense agricultural production to large, and rapidly expanding urban areas.

Approximately 82 per cent of the population of the Grand River *watershed* relies on groundwater for water supply, while the remainder depends on surface water sources, mostly the Grand River. The City of Brantford and the Six Nations of the Grand River Territory extract 100 per cent of their domestic water supply from the Grand River.

According to the 2006 census, the Regional Municipality of Waterloo was the fourth–fastest growing urban area in the province, with a growth rate of nearly nine per cent between the years 2001-2006. The Growth Plan for the Greater Golden Horseshoe, released by the province in 2006, anticipates continued high rates of growth and intensification of use in the *watershed's* cities over the next 25 years.

The wise management of our natural resources is essential to ensure a sustainable and healthy *watershed* which continues to meet the ongoing needs of a growing population.

1.2 Role of the Grand River Conservation Authority

The *Conservation Authorities Act* was passed in 1946 by the Ontario government in response to severe flooding and erosion problems experienced throughout the province. This legislation provided terms of reference and guidelines for *watershed* municipalities to voluntarily establish *watershed* partnerships for managing land and water resources.

The Grand River Conservation Authority (GRCA) has a long history.[1] Formed in 1948, its governing body is comprised of 26 representatives appointed by 34 member municipalities. This board approves the GRCA budget and policies and guides its activities.

> **The objectives of the Authority are to establish and undertake in the area over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals** (Conservation Authorities Act, RSO 1990, c. 27, s. 20).

To fulfill its mandate, the GRCA works closely with all levels of government to *enhance watershed* health by coordinating and implementing a variety of programs and services with the goals to:

- facilitate *watershed* planning,
- *enhance* water quality,
- maintain reliable water supply,
- reduce flood damages,
- *protect* natural areas and biodiversity,
- provide environmental education, *and*
- provide environmentally responsible outdoor recreational opportunities.

1.3 Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation

The *Conservation Authorities Act* first empowered conservation authorities to make regulations to prohibit *filling* in floodplains below the high water mark in 1956. These powers were broadened in 1960 to prohibit or regulate the placing or dumping of *fill* in defined areas where, in the opinion of the conservation authority, the control of flooding, *pollution* or the *conservation of land* may be affected (R.S.O. 1960, c. 62, s. 20 (1)). In 1968, an amendment to the *Conservation Authorities Act* (Statutes of Ontario, 1968, c. 15) further extended the power of Conservation Authorities to prohibit or control construction and alteration to waterways, in addition to *filling*.

In 1998, the *Conservation Authorities Act* was changed as part of the *Red Tape Reduction Act* (Bill 25), to ensure that regulations under the Act were consistent across the province and complementary with contemporary provincial policies.[2] To better reflect provincial direction and to strengthen protection of public safety and the environment, the *Conservation Authorities Act* was modified to enable conservation authorities to enact the *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation* (Ontario Regulation 97/04) to replace the *Fill, Construction and Alteration to Waterways Regulation* (R.R.O. 1990, Regulation 149 as amended by Ontario Regulation 142/98). All

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[1] **Under the terms of the *Conservation Authorities Act*, the Grand Valley Conservation Authority was formed in 1948. The Authority, as it exists today, was established in 1966 through the amalgamation of the Grand River Conservation Commission (1938) and the Grand Valley Conservation Authority (1948).**

[2] **The policies for administering the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulations* complement the Ontario Provincial Policy Statement, 2005 - Section 3.0, Protecting Public Health and Safety.**

applications for permission received after May 4, 2006, are processed subject to the provisions of the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation*.[3]

Ontario Regulation 97/04 allows conservation authorities to prevent or restrict *development* in areas where the control of flooding, erosion, dynamic beaches, *pollution* or the *conservation of land* may be affected by *development*, in order to prevent the creation of new hazards or the aggravation of existing ones.

The Conservation Authority can:

- **prohibit or regulate development in river or stream valleys, wetlands, shorelines and hazardous lands,**

  and

- **prohibit or regulate the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or for changing or interfering in any way with a wetland.**

If it can be demonstrated to the satisfaction of the conservation authority that the proposed work will not affect the control of flooding, erosion, dynamic beaches or *pollution* or the *conservation of land*, a conservation authority may grant permission for the proposed work.

Pollution, as defined in the *Conservation Authorities Act*, means any deleterious physical substance or other contaminant that has the potential to be generated by *development* in an area to which the regulation applies (Conservation Authorities Act, RSO 1990, c. 27, s. 28 (25)).

Conservation of land is broadly interpreted to mean the protection, preservation, management, or restoration of lands within the *watershed ecosystem* (Conservation Ontario, 2006).

The Minister of Natural Resources approved *Ontario Regulation 150/06*, for the GRCA, consistent with *Ontario Regulation 97/04*, on May 4, 2006.[4] This regulation is entitled the *Development, Interference with Wetlands and Alteration to Shorelines and Waterways Regulation* (hereafter referred to as the *Regulation*).

Permission from the GRCA is required to develop in *river* or stream valleys, *wetland*s, shorelines or *hazardous land*s; alter a *river*, *creek*, *stream* or *watercourse*; or interfere with a *wetland*.

The GRCA policies for the administration of the *Regulation* are outlined in Sections 7, 8 and 9. **Figure 2** illustrates the legislative context within which these policies fit.

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[3] **Applications submitted prior to May 4, 2006 and completed to the satisfaction of the Grand River Conservation Authority are processed under the provisions of the *Fill, Construction and Alteration to Waterways Regulation*. Applications submitted prior to May 4, 2006 but not completed to the satisfaction of the Grand River Conservation Authority are processed under the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation.***

[4] **The first regulation administered by the Grand Valley Conservation Authority, the predecessor to the Grand River Conservation Authority, was in 1960 (Regulation 110). Regulation 110 enabled the GRCA to prohibit the dumping of fill below the "high water mark". In 1970, the province passed the *Fill, Construction and Alteration to Waterways Regulation* (Ontario Regulation 41/70), which empowered the GRCA to prohibit construction in areas below the "high water mark" of any watercourse and filling in defined areas. The term "high water mark" was later modified in 1974 (Ontario Regulation 356/74) to mean the area susceptible to flooding during a *Regional Storm* – a storm the magnitude of Hurricane Hazel (1954) centred over the Grand River watershed.**

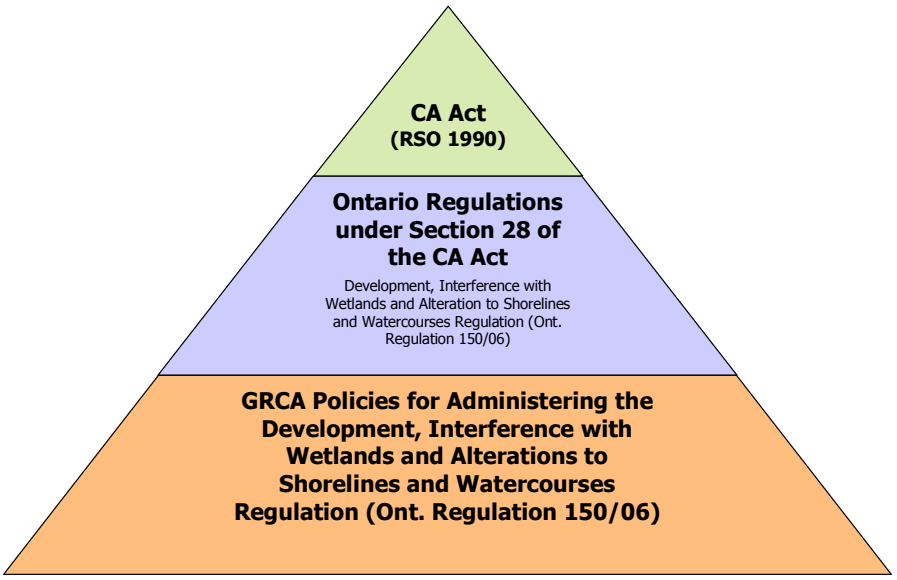


Figure 2. Hierarchy of Legislation and Policies

2 Policy Objectives

Policy objectives related to the administration of the *Regulation* include, but are not limited to:

- prevent loss of life, minimize property damage and social disruption, and avoid public and private expenditure for emergency operations, evacuation and restoration due to natural hazards and associated processes,
- prohibit *development* which, singularly or cumulatively, may restrict riverine channel capacities to pass flood flows, reduce storage capacity in floodplains and *wetland*s resulting in increased flood levels, and *create* potential danger to up*stream* and downstream landowners,
- prohibit *development* of flood and erosion susceptible *river* or *stream* valleys and shorelines which may increase hazard risk, *create* new hazards or aggravate existing hazards which would in future years require expensive protection measures,
- prevent interference with the *hydrologic function*s of *wetland*s throughout the Grand River *watershed*,
- avoid the degradation and loss of *significant natural features* and hydrologic and *ecological function*s in *river* or stream valleys, *wetland*s, shorelines and *hazardous land*s, and promote restoration and enhancement, wherever possible,
- prevent *pollution* of surface and ground waters associated with *development* in *river* or stream valleys, *wetland*s, shorelines and *hazardous land*s, *and*
- reduce potential nuisances associated with *development* by limiting the potential for floating objects and debris during flood events.

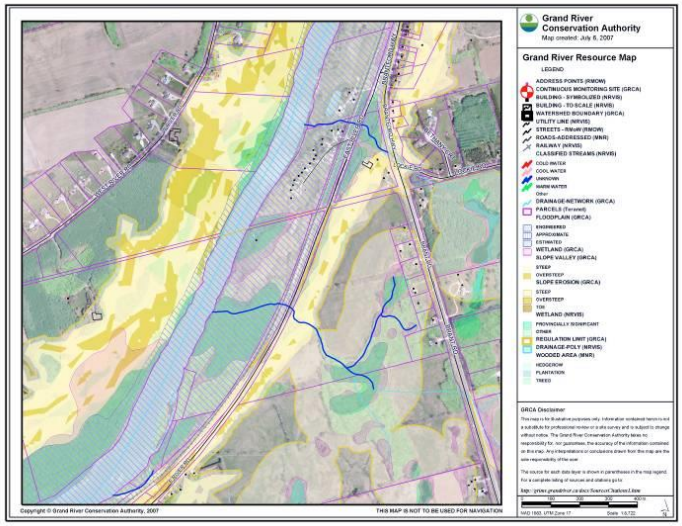
3 Intent

This document outlines the policies followed by the GRCA in making decisions regarding the outcome of all applications made under the *Regulation.* This will ensure a consistent, timely and fair approach to the review of applications, staff recommendations, and GRCA decisions, and efficient and effective use and allocation of available resources.

4 Areas Regulated

The *Regulation* pertains to areas that are *river* or stream valleys, *wetland*s and other areas where *development* could interfere with the *hydrologic function* of a *wetland*, adjacent or close to the shoreline of Lake Erie and inland lakes, and *hazardous land*s. The *Regulated Area* represents the greatest extent of the combined hazards plus a prescribed allowance as set out in the *Regulation.*

Areas regulated under Ontario Regulation 150/06 have been mapped according to the criteria and standards outlined in the Grand River Conservation Authority Reference Manual Determination of Regulation Limits (December 2005) as approved by the Ontario Ministry of Natural Resources and Forestry and Conservation Ontario.



Existing mapping is accurate to the scale at which the mapping was undertaken. Modifications to the extent of the *Regulated Area* may be made where more detailed studies determine a more precise boundary.

It is important to note that existing mapping *does not* delimit the extent of all of the areas regulated by the *Regulation*. Mapping will be updated by the GRCA as more detailed information becomes available.

The Regulation applies to all areas described by the Regulation, whether mapped or not.

The *Regulation* does not:

- limit the use of water for domestic or livestock purposes,
- interfere with the rights or powers conferred upon a municipality in respect of the use of water for municipal purposes,
- interfere with any rights or powers of any board or commission that is performing its functions for or on behalf of the Government of Ontario, or
- interfere with any rights or powers under the *Electricity Act* or the *Public Utilities Act*,
- apply to activities approved under the *Aggregate Resources Act* (*Conservation Authorities Act*, RSO 1990, c. 27, s. 28 (10, 11)).

Works for which permission is required under this *Regulation* may also be subject to other legislation, policies and standards that are administered by other agencies and municipalities such as the provincial *Planning Act*, *Drainage Act*, and *Environmental Assessment Act* or the federal *Fisheries Act*, among others. It is the responsibility of the applicant to ensure that all other necessary approvals are obtained prior to undertaking any works for which a permit under this *Regulation* has been obtained.

5 Activities Regulated

The Regulation gives the GRCA the mandate to prohibit or regulate *development* in *river* or stream valleys, *wetland*s, Lake Erie shorelines, inland lakes and *hazardous land*s within the Grand River *watershed*.

***Development* means:**

- **the construction, reconstruction, erection or placing of a building or structure of any kind,**
- **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,**
- **site grading, or**
- **the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere** (Conservation Authorities Act, R.S.O. 1990, c. 27, s. 28 (25)).

The *Regulation* also gives the GRCA the authority to prohibit or regulate *alterations* which would result in the straightening, changing, diverting or interfering in any way with the existing channel of a river, *creek*, *stream*, *watercourse* or changing or interfering in any way with a *wetland*.

The GRCA interprets *development* to mean works that by their scale or scope could have measurable impacts on flooding, erosion, dynamic beaches, *pollution* or the *conservation of land*. With the *exception of activities within wetlands*, the GRCA will generally not require permission for the following activities, including but not limited to:

- non-habitable *accessory buildings* associated with existing residential uses less than 10 square metres (108 square feet),
- maintenance and upkeep of existing buildings and structures which do not change the existing footprint (e.g. *replacement* of windows, siding, roofs, stairs, etc.),
- unenclosed decks and patios associated with existing uses,
- *replacement* of existing service connections (e.g. telephone, cable, water, sewer),
- seasonal or floating docks that do not require permanent structures to support them and that can be moved in the event of flooding,
- non-structural agricultural uses such as cropping, pasturing, and woodlot management,
- minor works such as landscaping or grading (excavation or *filling*) in an area of less than 1 hectare (2.5 acres) to a depth of less than 150 mm (6 inches) or a volume of less than 10 cubic metres (one standard dump truck load),[5]
- minor alterations and on-going maintenance to existing *dam*s in *watercourse*s that would not affect the control of flooding, erosion, *pollution* or the *conservation of land* and that would not result in changes in the capacity to pass *river* flows or impacts on integrity of the structure or in-water works,
- on-going maintenance to stormwater management facilities that would not affect the control of flooding, erosion, *pollution* or the *conservation of land*,
- on-going operations associated with existing commercial/industrial uses that have been previously approved by the GRCA,
- municipal water monitoring wells that would not affect the control of flooding, erosion, *pollution* or the *conservation of land*, *or*

[5] **This policy does not apply to the filling or excavation of a site on multiple occasions over an extended period of time. The cumulative impacts of such works may have measurable impacts on flooding, erosion, dynamic beaches, pollution or *conservation of land* and will require permission from the GRCA.**

- other non-structural uses such as gardens, nurseries, open arboretums and forestry/wildlife management.[6]

Development in areas defined in the *Regulation*, *interference* with *wetland*s or *alterations* to *river*, *creek*, *stream* or *watercourse* channels requires permission from the GRCA. Each application will be evaluated on its own merits, on a case-by-case basis, consistent with the policies outlined in Sections 7, 8 and 9.

Development and/or interference which are undertaken in *Regulated Areas* without permission of the GRCA are in violation of the *Conservation Authorities Act.* The landowner may be subject to a fine of not more than $10,000 or to a term of imprisonment of not more than three months (*Conservation Authorities Act*, R.S.O. 1990, c. 27, s. 28, ss. 16). In addition, if convicted, the *development*/interference may be required to be removed at the expense of the landowner. The landowner may also be required to rehabilitate the impacted area in a manner prescribed by the courts (*Conservation Authorities Act*, R.S.O. 1990, c. 27, s. 28, ss. 17).

6 GRCA's Regulatory vs. Plan Review Function

In addition to its regulatory role under the *Conservation Authorities Act*, the GRCA has a significant advisory role to *watershed* municipalities under the *Planning Act*. In 1995, the Ministry of Natural Resources and Forestry delegated the responsibility for municipal plan input and review for natural hazards to the GRCA. This means that GRCA staff review and comment on municipal policy documents and *development* proposals to ensure that they are consistent with the Ontario Provincial Policy Statement, 2005 - Section 3.0, Protecting Public Health and Safety.

Through Memoranda of Agreements, the GRCA also provides a range of planning advisory services to member municipalities. In this capacity, the GRCA staff provide technical input regarding potential environmental impacts and advice about how damaging impacts can be avoided or reduced.[7] GRCA comments apply to a range of matters including but not limited to natural hazards, natural heritage, and water quality and quantity. These comments are consistent with the GRCA policies for the administration of the *Regulation* and for plan review.

The GRCA also reviews and comments on municipal policy and planning documents, *development* proposals under the *Planning Act* and other provincial legislation (e.g. *Aggregate Resources Act*, *Drainage Act*, *Environmental Assessment Act*) from a *watershed* perspective. GRCA comments reflect the GRCA's broad goals and objectives for managing the natural resources of the Grand River *watershed*.[8]

The policies contained in Sections 7, 8 and 9 apply specifically to the GRCA's regulatory role under the *Conservation Authorities Act*. These policies must be considered in their entirety, since activities that fall within the mandate of the *Regulation* may influence *river* or stream valleys, *wetland*s, shorelines and *hazardous land*s and alteration to *watercourse*s, either singly or in combination. Where more than one hazard exists in an area subject to a proposed activity that falls within the scope of the *Regulation*, the relevant policies will be applied jointly.

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[6] It is recommended that any person undertaking work in areas defined by the *Regulation* contact the GRCA prior to the activity being carried out in order to determine whether or not the work requires permission from the GRCA.

[7] Memoranda of Agreement with the member municipalities differ depending on the in-house staff expertise and resource issues of concern within the municipality.

[8] As custodian of the Canadian Heritage River designation for the Grand River and its major tributaries, the GRCA also provides comments with respect to significant human heritage resources that are important to maintaining the national status.

7 General Policies to Prohibit or Regulate Development

7.1 General Policies

Within areas defined by the *Regulation* (*Regulated Area)* including *river* or stream valleys and an allowance; *wetland*s or other areas where *development* could interfere with the *hydrologic function* of a *wetland* (areas of interference); lands adjacent or close to the shoreline of Lake Erie and inland lakes and an allowance; *watercourse*s, or *hazardous land*s, the following general policies will apply:

7.1.1 ***Development, interference*** or ***alteration*** will not be permitted within a *Regulated Area*, except in accordance with the policies in Sections 7, 8 and 9.

7.1.2 ***Development, interference*** *or* ***alteration*** within a *Regulated Area* may be permitted where it can be demonstrated through appropriate technical studies and/or assessments, site plans and/or other plans as required by the GRCA that:

a) the risk to public safety is not increased,

b) susceptibility to natural hazards is not increased or new hazards created,

c) there are no *adverse hydraulic or fluvial impacts* on *river*s, *creek*s, *stream*s, or *watercourse*s,

d) there are no adverse impacts on the natural shoreline processes of Lake Erie,

e) grading (e.g. placing and removing *fill*) is minimized and maintains *special policy area*s and floodplain flow regimes for a range of rainfall events, including the *Regional Storm*,

f) there are no negative or adverse hydrologic impacts on *wetland*s,

g) *pollution*, sedimentation and erosion during construction and post construction is minimized using *best management practices* including site, landscape, infrastructure and/or facility design (whichever is applicable based on the scale and scope of the project), construction controls, and appropriate remedial measures,

h) intrusions on *significant natural features* or hydrologic or *ecological function*s are avoided, and no adverse impacts to *significant natural features* or hydrologic or *ecological function*s will occur,

i) *groundwater discharge* areas which support *significant natural features* or hydrologic or *ecological function*s on-site and adjacent to the site are avoided,

j) *groundwater recharge* areas which support *significant natural features* or hydrologic or *ecological function*s on-site and adjacent to the site will be maintained or enhanced,

k) *access* for emergency works and maintenance of flood or erosion control works is available,

l) works are constructed, repaired and/or maintained according to *accepted engineering principles* and approved engineering standards or to the satisfactions of the GRCA, whichever is applicable based on the scale and scope of the project, *and*

m) the control of flooding, erosion, dynamic beaches, *pollution* or the *conservation of land* is not adversely affected during and post *development*, interference or alteration.

7.1.3 Notwithstanding in a *Regulated Area* may be permitted subject to supplementary policies or stand-alone policies as specified in Sections 8 and 9.

7.1.4 Applications for permission to undertake ***development, interference*** or ***alteration*** in *Regulated Areas* must be accompanied by appropriate technical studies and/or assessments, site plans and/or other plans as required by the GRCA. These studies/plans will demonstrate to the satisfaction of the GRCA, how the applicable policies in Sections 7, 8 and 9 will be met.

7.1.5 Technical studies and/or assessments, site plans and/or other plans submitted as part of an application for permit to undertake ***development, interference*** or ***alteration*** in *Regulated Areas* must be completed by a *qualified professional* to the satisfaction of the GRCA in conformance with the most current technical guidelines approved by the GRCA.

7.2 Prohibited Uses

7.2.1 Notwithstanding Sections 7.1.2-7.1.3 – General Policies, ***development*** will not be permitted within a *Riverine Flooding* or *Erosion Hazard* or *wetland* where the use is:

a) an institutional use associated with hospitals, nursing homes, pre-school, nurseries, day care or schools, where there is a threat to the safe evacuation of the sick, the elderly, persons with disabilities or the young,

b) an essential emergency service such as fire, police, ambulance or electrical substation,

c) associated with the disposal, manufacture, treatment, transfer or storage of *hazardous substances*,

d) associated with the outdoor storage of any materials, either temporary or permanent, *or*

e) associated with an *assisted living facility*.

7.3 Validity of Permits

7.3.1 A permit issued by the Grand River Conservation Authority will be valid for a period up to and including 24 months (two years).

7.3.2 Notwithstanding Section 7.3.1, a permit issued by the Grand River Conservation Authority may be valid for a period up to and including 60 months (5 years) for large-scale public infrastructure where it can be demonstrated that multiple approvals taking greater than 24 months are required.

8 Specific Policies to Prohibit or Regulate Development

8.1 River or Stream Valleys - Riverine Flooding Hazards

Defining the Riverine Flooding Hazard

Flooding of *river* or *stream* systems typically occurs following the spring freshet and may occur again as a result of extreme rainfall events in the summer or fall. *River*s naturally accommodate flooding within their valleys.

Historically, *development* occurred in floodplain areas because of the availability of water for power, transportation, energy, waste assimilation, and domestic and industrial consumption. However, floodplain *development* is susceptible to flooding which can result in property damage and/or loss of life.

For the Grand River *watershed*, the *Riverine Flooding Hazard* is based on the greater of the Hurricane Hazel storm event (the *Regional Storm*) or the 100-Year return period flood.[9] The flood produced through these calculations is called the *Regulatory Flood*, the limits of which define the extent of the *Riverine Flooding Hazard*.

Where the *Riverine Flooding Hazard* is determined by an engineering study using provincial standards and criteria, a 5 metre (16 foot) allowance is added. Where the *Riverine Flooding Hazard* is approximated or estimated,[10] a 15 metre (50 foot) allowance is added.[11] In *headwater* areas, an allowance of 15 metres (50 feet) from the channel bank defines the *Regulated Area.*

The allowance is included to address limitations in base mapping scale and accuracy and consider activities directly adjacent to the *Riverine Flooding Hazard*, which could aggravate or increase the hazard risk.

The *Regulated Area* includes the *Riverine Flooding Hazard* (also referred to as the *Regulatory Floodplain*) and the *allowance* (**Figure 3**).

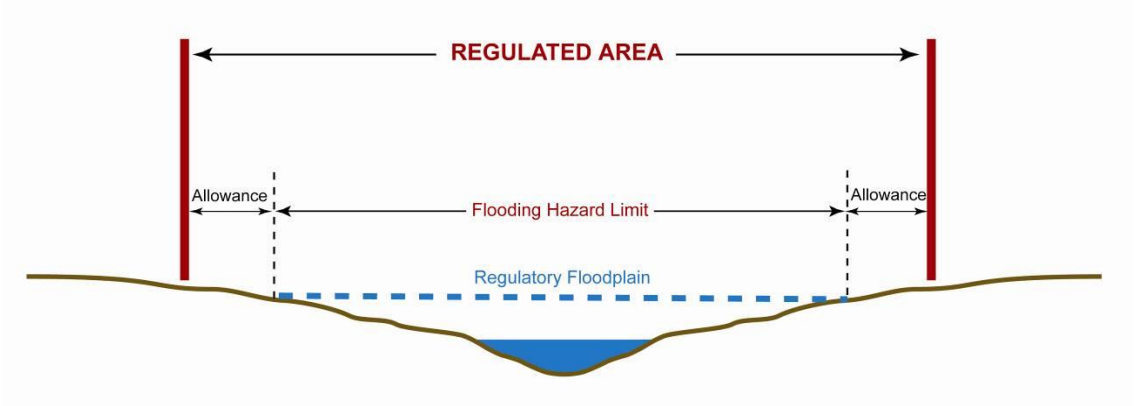

Figure 3. Riverine Flooding Hazard – Regulated Area for One-Zone Policy Areas

[9] **The 100 year flood level is used only where it is greater than that calculated for the *Regional Storm*, typically in upper reaches of tributary streams.**

[10] ***Riverine Flooding Hazards* are approximated where there is some level of site-specific engineering analysis that does not meet complete mapping standards. *Riverine Flooding Hazards* are estimated in areas where detailed mapping and analysis are limited, using criteria based on drainage area, valley characteristics and backwater conditions.**

[11] **Local drainage issues not associated with the *Riverine Flooding Hazard* are not subject to the *Development, Interference with Wetlands and Shorelines and Alteration to Watercourses Regulation.***

Most *regulated area*s within the Grand River and its tributaries associated with the *Riverine Flooding Hazard* are *One-Zone Policy Areas*. In a *One-Zone Policy Area*, the entire *Regulatory Floodplain* is considered the *floodway*.

Exceptions to the *One-Zone Policy Area* may exist in urban areas where a *Two-Zone* or *Special Policy Area* may be selectively applied. Both approaches allow for limited *development* in the *flood fringe*. The *flood fringe* is the outer portion of the floodplain between the *floodway* and the *Riverine Flooding Hazard* limit where the depths and velocities of flooding are less severe than those experienced in the *floodway* (**Figure 4**).

A *Two-Zone Policy Area*[12] permits new *development* or re*development* in the *flood fringe* provided that it is protected to the level of the *Regulatory Flood*. A *Two-Zone Policy Area* may be considered where the GRCA in cooperation with the municipality, after due consideration of local circumstances, agrees that application of the concept is suitable. The feasibility of a *Two-Zone Policy Area* requires the examination of a number of factors and implementation requires the assurance that various conditions will be complied with.

The application of a *Two-Zone Policy Area* is not intended to be on a lot-by-lot basis, but on a sub*watershed* or major reach basis. Where the GRCA and the municipality agree to the use of a *Two-Zone Policy Area*, appropriate official plan designations and zoning must be put into place. The regional engineer of the Ministry of Natural Resources and Forestry must also be involved in decision making regarding the potential application of a *Two-Zone Policy Area.*

Application of a *Special Policy Area*[13] permits new *development* or re*development* in the *flood fringe* and *floodway* where strict adherence to the *One-Zone* or *Two-Zone* approach would not provide sufficient *development* capability to maintain community viability. Where a *Special Policy Area* is applied, the municipality, GRCA and the Province of Ontario agree to relax provincial flood proofing and technical standards and accept a higher level of risk.

Special Policy Area application is limited to areas of historic *development* that qualify on the basis of community and technical criteria. Application of a *Special Policy Area* requires the approval of the Province of Ontario (Ministry of Municipal Affairs and Housing and Ministry of Natural Resources and Forestry) and suitable policies and standards must be incorporated into the municipality's official plan and zoning regulations. Procedures for approval as specified by the Province must be adhered to.

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[12] **In a *Two-Zone Policy Area*, the *floodplain* is divided into two distinct sections – the *floodway* and the *flood fringe.* The *floodway* is that area of the *floodplain* that is required to pass the flows of greatest depth and velocity. The *flood fringe* lies between the *floodway* and the edge of the *floodplain.* Depths and velocities of flooding in the *flood fringe* are much less than those in the *floodway*. The technical considerations used to determine the *floodway-flood fringe* delineation and the suitability of applying a Two-Zone policy are described in the Ministry of Natural Resources and Forestry Technical Guide River and Stream Systems Flooding Hazard Limit (2002).**

[13] **Designated *Special Policy Areas* (SPAs) allow for new development that would not be otherwise permitted. Each SPA has its own development criteria. Copies of the specific policies may be obtained at the GRCA office and at local municipal offices. Considerations for development in SPAs include structural flood proofing, safe *access* and egress, and the nature of land use. The constraints to development are outlined in each SPA agreement. The following areas have SPAs: Brantford, Cambridge (Galt), Drayton, Dunnville, Guelph, New Hamburg, Paris, and Waterloo (Laurel Creek).**

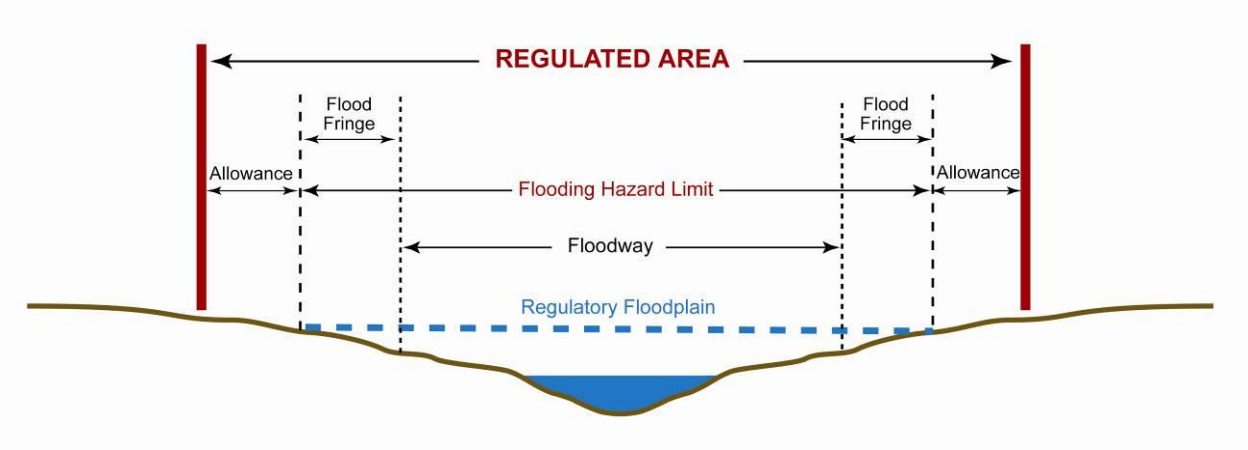

Figure 4. Riverine Flooding Hazard – Two Zone Policy Area

Regardless of the approach applied, *development* within the *Riverine Flooding Hazard* and related *allowances* connected with all *watercourse*s in the Grand River *watershed* requires permission from the GRCA.

<u>Policies for One-Zone Policy Areas (excluding allowances)</u>

The following policies apply to *development* proposed in a *One-Zone Policy Area* subject to a *Riverine Flooding Hazard*, excluding *allowances.*

8.1.1 ***Development*** will not be permitted within the *Riverine Flooding Hazard* except in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies and Sections 8.1.2-8.1.29 – Policies for One-Zone Policy Areas.

Existing Uses

8.1.2 ***Development*** associated with existing uses located within a *Riverine Flooding Hazard* may be permitted in accordance with the policies *in Sections 7.1.2-7.1.3 – General Policies,* and where it can be demonstrated that:

a) there is no feasible alternative site outside the *Riverine Flooding Hazard,*

b) the site is not subject to *frequent flooding,*[14]

c) ingress and egress is "dry" where this standard can be practically achieved, or floodproofed to an elevation which is practical and feasible, but no less than "safe",

d) *floodproofing* is undertaken to the extent practical, where *floodproofing* to the elevation of the *Regulatory Flood* is not technically feasible, *and*

e) there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

Residential

8.1.3 ***Ground Floor Additions*** to existing residential buildings or structures may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that:

[14] **Frequent flooding means that a site is subject to the 1:25 year flood event or a more regular flood event.**

a) the ground floor addition is 50 percent or less of the original[15] habitable ground floor area to a maximum footprint of 46.5 m^2 (500 ft^2) or in the case of multiple additions, all additions combined are equal to or less than 50 per cent of the original habitable ground floor area to a maximum footprint of 46.5 m^2 (500 ft^2).

b) the number of *dwelling unit*s is the same,

c) all *habitable floor space* is at or above the existing ground floor elevation, *and*

d) no basement is proposed and any crawl space is non-habitable and designed to facilitate services only.

8.1.4 An ***Additional Storey*** to existing residential buildings or structures may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that the number of *dwelling unit*s is the same.

8.1.5 ***Replacement***[16] of residential buildings or structures damaged or destroyed by causes other than flooding may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) the building or structure to be replaced is relocated outside the *Riverine Flooding Hazard* or where this is not feasible, the building or structure is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent, wherever possible,

b) the number of *dwelling unit*s is the same or less,

c) the new building or structure is the same size or larger to a maximum of 50 percent of the original habitable ground floor area or a footprint of 46.5 m^2 (500 ft^2), whichever is the lesser and the use is the same,

d) the building or structure is floodproofed to the elevation of the *Regulatory Flood*,

e) ingress and egress is "dry" where this standard can be practically achieved, or floodproofed to an elevation which is practical and feasible,

f) no basement is proposed and any crawl space is non-habitable and designed to facilitate services only,

g) electrical, mechanical and heating services are located above the level of the *Regulatory Flood*, wherever possible, *and*

h) there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

8.1.6 ***Relocation*** of existing residential buildings and structures may be permitted in accordance with the policies in Section 8.1.5 – Policies for One-Zone Policy Areas, provided that the risk of flooding and property damage is reduced to the greatest extent wherever possible, through relocation.

8.1.7 ***Non-Habitable Accessory Buildings or Structures*** associated with an existing residential use such as detached garages, tool sheds, gazebos and other similar structures, may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated that:

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[15] **The habitable ground floor area existing in 1970 will be considered the "original" ground floor area for the purpose of this calculation. The year 1970 is used since it was the first year that the *Fill, Construction and Alteration to Waterways Regulation* was administered by the GRCA (Ontario Regulation 41/70).**

[16] **Replacement does not include reconstruction on remnant foundations or derelict or abandoned buildings or structures.**

a) there is no feasible alternative site outside the *Riverine Flooding Hazard*,

b) the site is not subject to *frequent flooding*,

c) the building or structure is greater than 10 m^2 (108 ft^2) but less than or equal to 46.5 m^2 (500 ft^2)

d) the building or structure is securely anchored such that it does not obstruct downstream culverts during a flood event where applicable,

e) *floodproofing* is undertaken to the extent practical, where *floodproofing* to the elevation of the *Regulatory Flood* is not technically feasible, *and*

f) there is no opportunity for conversion into *habitable floor space* in the future.

8.1.8 ***Above or Below Ground Swimming Pools*** may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and provided that:

a) *floodproofing* of electrical facilities to the elevation of the *Regulatory Flood* is undertaken, *and*

b) all *fill*, except that approved for landscaping, is removed from the *Riverine Flooding Hazard.*

Rural Residential

8.1.9 ***Non-Habitable Accessory Buildings or Structures*** associated with an existing rural residential may be permitted in accordance with the policies in Section 8.1.8 – Policies for One-Zone Policy Areas, with the exception of c), *and* where it can be demonstrated that the building or structure is greater than 10 m^2 (108 ft^2) but less than or equal to 100 m^2 (1,076 ft^2) or in the case of additions, the combined area of the existing building or structure and any proposed addition is equal to or less than 100 m^2 (1,076 ft^2).

Commercial/Industrial/Institutional

8.1.10 ***Additions*** to existing commercial/industrial/institutional buildings or structures may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that:

a) the addition is 50 percent or less of the original ground floor area of the building or structure to a maximum of 100 m^2 (1,076 ft^2), or in the case of multiple additions, all additions combined are equal to or less than 50 per cent of the original ground floor area of the building or structure to a maximum footprint of 100 m^2 (1,076 ft^2), *and*

b) no basement is proposed and any crawl space is designed to facilitate services only.

8.1.11 ***Accessory Buildings or Structures*** associated with commercial/industrial/institutional uses may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that:

a) the building or structure is greater than 10 m^2 (108 ft^2) but less than or equal to 100 m^2 (1,076 ft^2) or in the case of additions, the combined area of the existing building or structure and any proposed addition is equal to or less than 100 m^2 (1,076 ft^2),

b) the building or structure is securely anchored such that it does not obstruct downstream culverts during a flood event where applicable,

c) the cumulative impact of multiple *accessory buildings* or structures on the subject property is *negligible*, *and*

d) no basement is proposed and any crawl space is designed to facilitate services only.

8.1.12 ***Parking Lots*** associated with existing *non-residential uses* located wholly or partially within the *Riverine Flooding Hazard* may be permitted in accordance with the policies in Section 8.1.2 –

Policies for One-Zone Policy Areas, and where it can be demonstrated that the risk of property damage is minimized through site design and flood emergency plans.

Internal Renovations

8.1.13 ***Internal Renovations*** to existing buildings or structures which change the use or potential use of the building or structure but provide for no additional *dwelling unit*s may be permitted provided that:

a) the risks associated with flooding are low,

b) the internal renovation does not result in a new use prohibited by Section 7.2 – General Policies – Prohibited Uses

c) electrical, mechanical and heating services are located above the level of the *Regulatory flood*, wherever possible, *and*

d) there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

Stormwater Management

8.1.14 ***Stormwater Management Facilities*** may be permitted within the *Riverine Flooding Hazard* but outside of the *riparian zone* or *effective flow area*, whichever is greater, in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, provided that there is no feasible alternative site outside the *Riverine Flooding Hazard* and where it can be demonstrated that:

a) there is no loss of flood storage,

b) natural erosion and sedimentation processes within the receiving *watercourse* are not impacted,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions,

d) facilities are excavated with minimal berming, *special policy area*s and floodplain flow regimes for a range of rainfall events including the *Regional Storm* are maintained, and all excavated material is removed from the *Riverine Flooding Hazard*, *and*

e) design and maintenance performance requirements as determined by the GRCA for the receiving *watercourse* are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.[17]

Public Infrastructure

8.1.15 ***Public Infrastructure*** including but not limited to roads, sanitary sewers, utilities, water and sewage treatment plants, water supply wells, well houses, and pipelines may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, provided that there is no feasible alternative site outside the *Riverine Flooding Hazard* as determined through an *Environmental Assessment* or other *comprehensive plan* supported by the GRCA, and where it can be demonstrated that:

[17] **Stormwater management facilities are regulated through the Ministry of the Environment and Climate Change (Environmental Compliance Approval). The GRCA reviews the plans and provides comments at the plan review and/or subwatershed/master drainage planning stage. Permission from the GRCA is still required for the construction of the facility in a *Regulated Area.* The proposed works may be permitted provided that the policies in *Section 8.1.15* are met.**

a) *adverse hydraulic or fluvial impacts* are limited and any risk of flood damage to upstream or downstream properties is not increased or is minimized through site design and the affected landowner(s) is informed of the increased risk,

b) there is no loss of flood storage wherever possible, *and*

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

8.1.16 The maintenance and repair of ***Public Infrastructure*** may be permitted in accordance with the policies in *Sections 7.1.2-7.1.3 - General Policies,* and where it can be demonstrated that where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

Recreational Uses

8.1.17 ***Recreational Uses*** such as passive parks, trails and *river access* points and other uses deemed appropriate by the GRCA, but <u>not</u> including new campgrounds, new golf courses or expansions to existing golf courses, marinas or permanent docks may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) there is no feasible alternative site outside the *Riverine Flooding Hazard,*

b) there is no loss of flood storage,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site, facility and/or landscape design and appropriate remedial measures will adequately *restore* and *enhance* features and functions, *and*

d) the risk of property damage is minimized through site and facility design and flood emergency plans.

8.1.18 ***Marinas*** and ***Permanent Docks*** may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) there is no measurable loss of flood storage,

b) facilities are designed to take advantage of existing impacted or open areas on the channel bank, wherever possible,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site, facility and/or landscape design and appropriate remedial measure will adequately *restore* and *enhance* features and functions, *and*

d) the risk of property damage is minimized through site and facility design and flood emergency plans.

8.1.19 ***Golf Courses*** or ***Golf Course Expansions*** may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) all associated permanent, closed structures including clubhouses, washrooms with septic systems and maintenance buildings are located outside of the *Riverine Flooding Hazard,*

b) all greens and tees are located above the elevation of the 1:10 year flood event,

c) there is no loss of flood storage,

d) *watercourse* crossings are minimized and designed in accordance with the policies in *Section 9.1.2*,

e) the risk of property damage is minimized through site and facility design and flood emergency plans, *and*

f) the risk of *pollution* from the application of fertilizers, herbicides, pesticides or insecticides or other chemical or organic compounds is minimized and addressed in a turf management plan.

Dug-Out/Isolated Ponds

8.1.20 A new ***Dug-Out or Isolated Pond*** or a ***Redesign of an Existing Dug-Out or Isolated Pond*** may be permitted in the *Riverine Flooding Hazard* in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated that:

a) the pond is located outside of the *Riverine Erosion Hazard, and*

b) finished side slopes are stable.

8.1.21 ***Dredging*** of an existing D***ug-Out or Isolated Pond*** may be permitted where it can be demonstrated that:

a) all dredged material is removed from the *Riverine Flooding Hazard* and the *Riverine Erosion Hazard*,

b) dredging does not enlarge the pond in area or volume beyond what was previously constructed,

c) finished side slopes are stable,

d) hydrologic and *ecological function*s are *restore*d and *enhance*d to the extent possible, *and*

e) the risk of *pollution* and sedimentation during dredging operations is minimized.

Agricultural Structures

8.1.22 ***Additions*** to existing agricultural buildings or structures may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that:

a) the addition is 50 percent or less of the original ground floor area of the building or structure to a maximum of 100 m^2 (1,076 ft^2), or in the case of multiple additions, all additions combined are equal to or less than 50 per cent of the original ground floor area of the building or structure to a maximum footprint of 100 m^2 (1,076 ft^2), *and*

b) no basement is proposed and any crawl space is designed to facilitate services only.

8.1.23 ***Accessory Buildings or Structures*** associated with agricultural uses may be permitted in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, and where it can be demonstrated that:

a) the building or structure is greater than 10 m^2 (108 ft^2) but less than or equal to 100 m^2 (1,076 ft^2) or in the case of additions, the combined area of the existing building or structure and any proposed addition is equal to or less than 100 m^2 (1,076 ft^2),

b) electrical, mechanical and heating services are located above the level of the *Regulatory flood*, wherever possible

c) the building or structure is securely anchored such that it does not obstruct downstream culverts during a flood event where applicable,

d) the cumulative impact of multiple *accessory buildings* or structures on the subject property is *negligible, and*

e) no basement is proposed.

8.1.24 ***Replacement*** of agricultural buildings or structures greater than 100 m^2 damaged or destroyed by causes other than flooding may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) the building or structure to be replaced is relocated outside the *Riverine Flooding Hazard* or where this is not feasible, the building or structure is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent, wherever possible,

b) the new building or structure is the same size or larger to a maximum of 50 percent of the original habitable ground floor area or a footprint of 100 m^2 (1,076 ft^2), whichever is the lesser;

c) no basement or crawl space is proposed,

d) electrical, mechanical and heating services are located above the level of the *Regulatory Flood*, wherever possible, *and*

e) there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

8.1.25 ***Relocation*** of existing agricultural buildings and structures greater than 100 m^2 may be permitted in accordance with the policies in Section 8.1.25 – Policies for One-Zone Policy Areas, provided that the risk of flooding and property damage is reduced to the greatest extent wherever possible through relocation

8.1.26 ***Agricultural Structures*** which reduce risks associated with erosion or *pollution* or promote the *conservation of land* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

b) there is no feasible alternative site outside the *Riverine Flooding Hazard*,

c) the risk of property damage is minimized through site design and flood emergency plans, *and*

d) *floodproofing* is undertaken to the extent practical, where *floodproofing* to the elevation of the *Regulatory Flood* is not technically feasible.

Exceptions

8.1.27 Notwithstanding Section 8.1.1 – Policies for One-Zone Policy Areas, *development* in municipally designated *settlement areas* may be permitted within the *Riverine Flooding Hazard* in areas subject to less than 0.5 metres (1.64 feet) of flooding where a sub*watershed* study or other appropriate comprehensive study is undertaken on a reach basis, and where it can be demonstrated that:

a) the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, *excluding* 8.1.2 d) are met,

b) a *cut and fill balance* is applied to reconfigure the *Riverine Flooding Hazard* such that *special policy area*s and floodplain flow regimes for a range of rainfall events, including the *Regional Storm* are maintained, *and*

c) *development* is located above the elevation of the *Regulatory Flood.*

8.1.28 Notwithstanding Section 8.1.1 – Policies for One-Zone Policy Areas, *development* may be permitted on existing lots of record within the *Riverine Flooding Hazard* in *backwater areas* subject to less than 0.5 metres (1.64 feet) of flooding which have been artificially created as a result of undersized infrastructure such as culverts and bridges and where it can be demonstrated that:

a) the policies in Section 8.1.2 – Policies for One-Zone Policy Areas, *excluding* 8.1.2 d) are met,

b) grading (e.g. placing and removing *fill*) to raise the elevation of the site is minimized and does not increase upstream or downstream flood risks,

c) no basement is proposed, or where the building contains multiple units, the basement is floodproofed to the elevation of the *Regulatory flood* to provide parking below grade or common amenities, *and*

d) *development* is located above the elevation of the *Regulatory Flood.*

<u>Policies for Two-Zone Policy Areas (Excluding Allowances)</u>

8.1.29 A ***Two-Zone Policy Area*** may be applied in urban areas where:

a) the application of a *One-Zone Policy* will affect community viability in existing serviced built-up areas or where major channel enhancements or major dyke works have been carried out,

b) the application of a *Two-Zone Policy Area* is supported by the GRCA, the municipality and the Ministry of Natural Resources and Forestry after due consideration of a number of community-related and technical factors,

c) a higher level of risk is accepted by the municipality and the GRCA,

d) a hydraulic study is undertaken which determines the extent of the *floodway* and *flood fringe*, *and*

e) the municipality incorporates appropriate policies and standards into its official plan and zoning by-laws.

8.1.30 ***Development*** in the *floodway* of a *Two-Zone Policy Area* will not be permitted except in accordance with the policies in Sections 8.1.15 - 8.1.20 – Policies for One-Zone Policy Areas (stormwater management, public infrastructure, and recreational uses).

8.1.31 ***Buildings or Structures*** may be permitted within the *flood fringe* of a *Two-Zone Policy Area* provided that:

a) the building or structure is floodproofed to the elevation of the *Regulatory flood*,

b) all new *dwelling unit*s are above the elevation of the *Regulatory flood*,

c) all *habitable floor space* and electrical, mechanical and heating services are above the elevation of the *Regulatory flood*,

d) no basement is proposed, or where the building contains multiple units, the basement is floodproofed to the elevation of the *Regulatory flood* to provide parking below grade or common amenities, *and*

e) ingress and egress to the building or structure is "dry" where this standard can be practically achieved, or floodproofed to an elevation which is practical and feasible, but no less than "safe".

8.1.32 ***Development*** in the *flood fringe* of a *Two-Zone Policy Area* may be permitted in accordance with the policies and standards approved by the municipality and the GRCA.

Policies for Special Policy Areas (excluding allowances)

8.1.33 A ***Special Policy Area*** (SPA) may be allowed in urban areas where:

a) it can be demonstrated by the municipality through detailed studies and appropriate documentation that the application of a *One-Zone Policy* or a *Two-Zone Policy* is not adequate to maintain a community's social and economic viability,

b) the application of a *Special Policy Area* is supported by the GRCA, the municipality and the Ministry of Natural Resources and Forestry after due consideration of a number of community-related and technical factors,

c) a higher level of risk is accepted by the municipality, the Province of Ontario (Ministry of Municipal Affairs and Housing and Ministry of Natural Resources and Forestry) and the GRCA,

d) a hydraulic study is undertaken to determine the extent of the *floodway* and *flood fringe, and*

e) the municipality incorporates appropriate policies and standards into its official plan and zoning by-laws.

8.1.34 *Development* within a *Special Policy Area* may be permitted in accordance with the policies and standards approved by the municipality, Province of Ontario and the GRCA.

Prohibited Uses within the Riverine Flooding Hazard

8.1.35 Notwithstanding Sections 8.1.2-8.1.35, ***development*** will not be permitted within the *Riverine Flooding Hazard* as specified in *Section 7.2 - General Policies*, or where the use is:

a) a new campground or the expansion of an existing campground,

b) a new parking lot associated with residential uses in a *One-Zone Policy Area* or the *floodway* of a *Two-Zone* or *Special Policy Area*,

c) underground parking associated with any use in a One-Zone or the *floodway* of a Two-Zone Policy Area

d) a driveway or *access* way to lands outside of *Riverine Flooding Hazard* where *safe access* is not achievable and no alternative *access* way providing *safe access* is available , *or*

e) flood *protection works* and bank stabilization works to allow for future/proposed *development*.

8.1.36 *Development*, excluding non-habitable *accessory buildings* or structures associated with an existing use, will not be permitted within 15 metres (49.2 feet) of the either bank of the *watercourse* with the exception of works permitted under the provisions of Section 9.

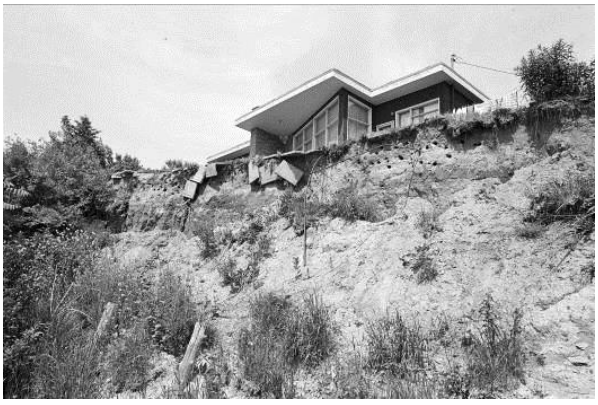
Policies for Riverine Flooding Hazard Allowances

8.1.37 ***Development within Allowances*** associated with *Flooding Hazards* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, provided that it can be demonstrated that there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

8.2 River or Stream Valleys – Riverine Erosion Hazards

Riverine Erosion Hazards

Erosion is a natural process of soil loss due to human or natural processes. The *Riverine Erosion Hazard* within *river* or *stream* valleys is that area of *river* bank and lands adjacent to *watercourse*s where erosion is actively occurring and/or where *development* could *create* slope stability issues.



The *Riverine Erosion Hazard* applies to those portions of the *valleyland* system that are both apparent (confined) and not apparent (unconfined). The extent of the hazard varies and is dependent on the characteristics of the bedrock and soils which comprise the valley slope, the degree to which the valley slope is stable or unstable, and whether or not the valley slope is subject to active erosion. Valley systems are considered to be apparent or confined where valley walls are greater than 3 metres (10 feet), with or without a floodplain.

Apparent Valleys can exhibit three different conditions within which erosion hazards exist or may develop: valley slopes which are steep but stable, valley slopes which are over steepened and potentially unstable, and valley slopes which are subject to active stream bank erosion.

Where a *watercourse* is not contained within a clearly visible valley section, valleys are *not apparent* (unconfined).

Defining the Regulated Area for Apparent Valleys (Confined Systems)

Where the valley slopes in *Apparent Valleys* have a slope inclination of 15 per cent (6.7H:1V) or greater, the limit of the *Regulated Area* is the *top of slope*[18] (which includes both the *Riverine Erosion Hazard* and *Other Valleylands (Section 8.3))* plus an allowance of 15 metres (49.2 feet).

Where the valley slopes in *Apparent Valleys* have a slope inclination of 33 $^{1}/_{3}$ per cent (3H:1V) or greater, the limit of the *Regulated Area* includes two components: the *Stable Slope Allowance* plus an *allowance* of 15 metres (49.2 feet). Where active toe erosion is present in a *Confined System*, an additional *Toe Erosion Allowance* is included, regardless of the steepness of the valley wall.

The 15-metre *allowance* helps to buffer *development* from the hazards of slope instability and to prevent the influence of *development* on the rate of slope movement. *Development* adjacent to valley slopes can cause increased loading forces on the *top of slope*, compromise slope stability or worsen erosion of the slope face, and result in the loss of stabilizing vegetation. *Allowances* also provide *access* for emergencies, maintenance and construction activities.

Defining the Riverine Erosion Hazard -Apparent Valley (Confined System) – Steep But Stable (No Toe Erosion)

For the purpose of the *Regulation*, any slope with a gradient of 20 per cent (5H:1V) or greater is identified as a *Riverine Erosion Hazard.* Where the gradient is 33 $^{1}/_{3}$ per cent (3H:1V) or less, the valley slopes typically resist slumping and rotational slippage but may become unstable as a consequence of the increased loading forces of *development*, depending on the soil structure and underlying geology.

Defining the Riverine Erosion Hazard - Apparent Valley (Confined System) – Oversteepened (No Toe Erosion)

Slopes are considered oversteepened when the gradient is 3H:1V (33 $^{1}/_{3}$ per cent slope) or greater. These slopes can be unstable.

On over steepened slopes, where the *toe of slope* is stable, the *Riverine Erosion Hazard* is defined using a *Stable Slope Angle.* The *Stable Slope Angle* is based on a stable slope gradient determined from a geotechnical study or engineering assessment.

The *Stable Slope Allowance* is the distance between the actual valley *top of slope* and the point at which a stable slope gradient, rising from the same toe position, intersects the ground surface and includes an appropriate factor of safety. This is the distance required for the slope to reach a stable slope inclination. **Figure 5** shows the two components used to establish the *Regulated Area* where slopes are oversteepened and no erosion is occurring at the toe of the valley slope.

[18] **The top of slope is the point of the slope where the downward inclination of the land begins, or the upward inclination of the land levels off. This point is situated at a higher topographic elevation of land than the remainder of the slope.**

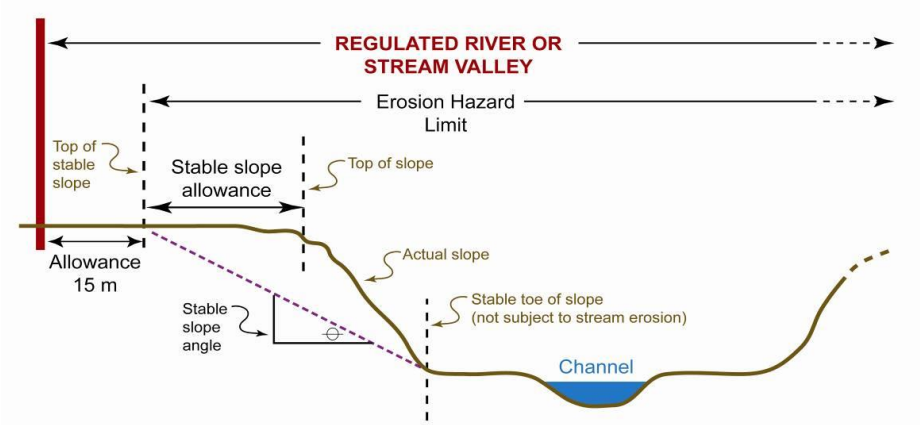


Figure 5. Riverine Erosion Hazard – Regulated Area for Apparent Oversteepened Valleys with Stable Toe

Defining the Riverine Erosion Hazard - Apparent Valley (Confined System) – Active Toe Erosion

Where valley slopes in *Apparent Valleys* are subject to active toe erosion, a *Toe Erosion Allowance* is added into the *Riverine Erosion Hazard.* The *Toe Erosion Allowance* is the distance calculated from the *toe of slope* by multiplying the average annual recession rate (as determined by an engineered study based on observation of twenty-five years or longer) over a 100 year planning horizon. This method estimates the amount of erosion that would occur over the next 100 years. In the absence of an engineering study or where the *toe of slope* is less than 15 metres (49.2 feet) from the *watercourse*, a *Toe Erosion Allowance* of 15 metres (49.2 feet) from the bank of the stream is used. **Figure 6** illustrates the three components used to establish the *Regulated Area* where slopes are oversteepened and active toe erosion is occurring.

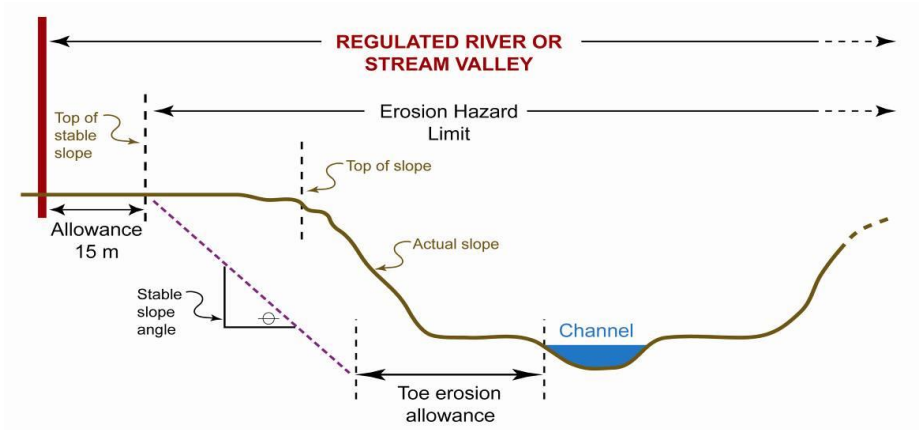


Figure 6. Riverine Erosion Hazard – Regulated Area for Apparent Oversteepened Valleys with Active Toe Erosion

Defining the Regulated Area for No Apparent Valley (Unconfined Systems)

Where there is *No Apparent Valley*, the flow of water is free to shift across the shallower land. Although toe erosion and slope stability are not deemed potential hazards, consideration for the meandering tendencies of the system must be provided. In these valley sections, the *Regulated Area* is the greater of the extent of the *Riverine Flooding Hazard* plus the prescribed allowance or the *Meander Belt Allowance* plus an allowance of 15 metres (49.2 feet).

The *Meander Belt Allowance* provides a limit to *development* within the areas where the *river* system is likely to shift. This allowance is based on twenty (20) times the bankfull channel

width, where the bankfull channel width is measured at the widest *riffle* section of the reach. A *riffle* is a section of shallow rapids where the water surface is broken by small waves. The *meander belt* is centered over the channel (**Figure 7**).

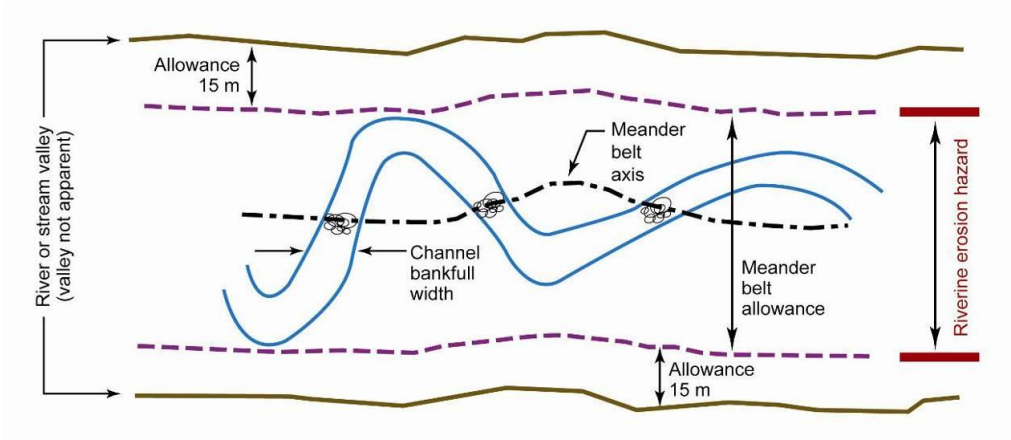


Figure 7. Riverine Erosion Hazard – Regulated Area – No *Apparent Valley*

Development within the *Regulated Area* of any *valleyland* in the Grand River *watershed* requires permission from the GRCA.

<u>Policies for Riverine Erosion Hazards and the Associated Allowance</u>

8.2.1 ***Development*** will not be permitted within the *Riverine Erosion Hazard* and the *associated allowance* except in accordance with the policies in Sections 8.2.2–8.2.22.

***Development* in the Riverine Erosion Hazard Allowance – Apparent Valleys With Slope Inclinations of 20 per cent (5H:1V) or Greater**

8.2.2 ***Development*** within the *Riverine Erosion Hazard Allowance* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where a site-specific geotechnical or engineering assessment based on established provincial guidelines and an appropriate *factor of safety* against slope failure or slipping establishes a more precise *Riverine Erosion Hazard* limit, and where it can be demonstrated that:

a) there is no feasible alternative site outside the *Regulated Area*,

b) the proposed *development* is not subject to a *Riverine Erosion Hazard* or a *Riverine Flooding Hazard*,

c) there is no impact on existing and future slope stability,

d) the risk of creating new *Riverine Erosion Hazards* or aggravating existing *Riverine Erosion Hazards* as a result of the *development* is *negligible*,

e) the potential of increased loading forces on the top of the slope is addressed through appropriate structural design,

f) the potential for surficial erosion is addressed by a drainage plan,

g) *access* into and through the valley for preventative actions or maintenance or during an emergency will not be prevented, *and*

h) an appropriate setback from the *Riverine Erosion Hazard*, as established in Sections 8.2.3-8.2.10.

8.2.3 ***Non-Habitable Accessory Buildings or Structures*** associated with an existing residential use such as tool sheds, gazebos and other similar structures, may be permitted within the *Riverine Erosion Hazard Allowance* in accordance with the policies in Section 8.2.2, provided that a *development* setback of not less than 6 metres (20 feet) is maintained from the *Riverine Erosion Hazard*, where practical.

8.2.4 ***Accessory Buildings or Structures*** associated with an existing industrial/commercial/institutional uses may be permitted within the *Riverine Erosion Hazard Allowance* in accordance with the policies in Section 8.2.2, provided that a *development* setback of not less than 6 metres (20 feet) is maintained from the *Riverine Erosion Hazard*.

8.2.5 ***Ground Floor Additions*** to existing residential buildings or structures may be permitted within the *Riverine Erosion Hazard Allowance* accordance with the policies in Section 8.2.2 provided that a *development* setback of not less than 6 metres (20 feet) is maintained from the *Riverine Erosion Hazard*.

8.2.6 ***Ground Floor Additions*** to existing industrial/commercial/institutional buildings or structures may be permitted within the *Riverine Erosion Hazard Allowance* in accordance with the policies in Section 8.2.2 provided that a *development* setback of not less than 6 metres (20 feet) is maintained from the *Riverine Erosion Hazard*.

8.2.7 ***An Additional Storey*** to existing buildings or structures within the *Riverine Erosion Hazard Allowance* may be permitted in accordance with the policies in Section 8.2.2 provided that the existing *development* setback is maintained.

8.2.8 ***Buildings or Structures*** associated with new *multi-lot* or *multi-unit* uses (residential/industrial/commercial/institutional), large-scale uses such as golf courses or commercial/institutional complexes may be permitted within the *Riverine Erosion Hazard Allowance* in accordance with the policies in Section 8.2.2, provided that all building lots or greens and fairways (in the case of golf courses) are set back, in their entirety, a minimum of 6 metres (20 feet) from the *Riverine Erosion Hazard.*

8.2.9 ***Buildings or Structures*** on single lots not associated with new *multi-lot* or *multi-unit* uses (residential/industrial/commercial/institutional), large-scale uses or commercial/institutional complexes may be permitted within the *Riverine Erosion Hazard Allowance* in accordance with the policies in Section 8.2.2, provided that a *development* setback of not less than 6 metres (20 feet) is maintained from the *Riverine Erosion Hazard*.

8.2.10 ***Replacement*** *or* ***Relocation*** of existing buildings or structures located within the *Riverine Erosion Hazard Allowance* may be permitted in accordance with the policies in Section 8.2.9.

8.2.11 ***Development*** within the *Riverine Erosion Hazard Allowance* may be permitted without a site-specific geotechnical or engineering assessment where existing geotechnical or engineering assessments based on established provincial guidelines and an appropriate *factor of safety* against slope failure or slipping undertaken in the immediate area establish that the site is not subject to a *flooding* or *erosion hazard* and it can be demonstrated that the policies in Section 8.2.2 are met.

Development Associated with Existing Uses in the Riverine Erosion Hazard – Apparent Valleys With Slope Inclinations of 20 per cent (5H:1V) or Greater

8.2.12 ***Development*** associated with *existing uses* located within the *Riverine Erosion Hazard* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated through a site-specific geotechnical or engineering assessment based on established provincial guidelines that:

a) there is no feasible alternative site outside the *Riverine Erosion Hazard,*

b) the site is not located in a high risk reach[19],

c) the proposed *development* or building or structure is located in the area of least risk,

d) the site is located in an area where the *factor of safety* is not less than 1.1-1.3 depending on the type of use and size of the building or structure,

e) there is no impact on existing and future slope stability and bank stabilization or erosion *protection works* are not required,

i) the risk of creating new *Riverine Erosion Hazards* or aggravating existing *Riverine Erosion Hazards* as a result of the *development* is *negligible*,

j) the potential of increased loading forces on the *top of slope* is addressed through appropriate structural design, *and*

k) *access* into and through the valley for preventative actions or maintenance or during an emergency will not be prevented, *and*

f) the potential for surficial erosion is addressed by a drainage plan, where applicable.

8.2.13 ***Non-Habitable Accessory Buildings or Structures*** greater than 10 m^2 (108 ft^2) but less than or equal to 46.5 m^2 (500 ft^2) associated with an existing residential use such as tool sheds, gazebos and other similar structures, may be permitted within the *Riverine Erosion Hazard* in accordance with the policies in Section 8.2.12. Additions may be permitted provided that the combined area of the existing non-habitable *accessory building or structure* and the addition is equal to or less than 46.5 m^2 (500 ft^2).

8.2.14 ***Accessory Buildings or Structures*** greater than 10 m^2 (108 ft^2) but less than or equal to 100 m^2 (1,076 ft^2) associated with an existing industrial/commercial/institutional uses may be permitted within the *Riverine Erosion Hazard* in accordance with the policies in *Section 8.2.12.* Additions may be permitted provided that the combined area of the existing *accessory building or structure* and the addition is equal to or less than 100 m^2 (1,070 ft^2).

8.2.15 ***Ground Floor Additions*** to existing residential uses may be permitted in accordance with the policies in Section 8.2.12 provided that the addition is less than 50 per cent of the original ground floor area of the building or structure to a maximum footprint of 46.5 m^2 (500 ft^2).

[19] **High risk reaches include, but are not limited to, the Grand River between where the Brantford South Access Route crosses the Grand River in the City of Brantford, downstream through the County of Brant to the border with Six Nations of the Grand River Territory.**

8.2.16 ***Ground Floor Additions*** to existing industrial/commercial/institutional uses may be permitted in accordance with the policies in Section 8.2.12 provided that the addition is less than 50 per cent of the original ground floor area of the building or structure to a maximum footprint of 100 m^2 (1,076 ft^2).

8.2.17 ***An Additional Storey*** to existing buildings or structures may be permitted in accordance with the policies in Section 8.2.12.

8.2.18 ***Replacement*** *or* ***relocation*** of existing buildings or structures may be permitted in accordance with the policies in *Section 8.2.12*.

Development – No Apparent Valley

8.2.19 ***Development*** will not be permitted within the *Riverine Erosion Hazard* where there is no *apparent valley*. A site-specific geotechnical, hydraulic or engineering assessment may be required to establish more precise limits for the *Riverine Flooding Hazard* and the *Riverine Erosion Hazard*.

8.2.20 ***Development*** proposed in an area subject to the *Riverine Flooding Hazard* but beyond the limits of the *Riverine Erosion Hazard*, may be permitted in accordance with the policies in Section 8.1 – River or Stream Valleys – Riverine Flooding Hazards.

Public Infrastructure

8.2.21 ***Public Infrastructure*** including but not limited to roads, sanitary sewers, utilities, water supply wells, well houses, and pipelines, may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and provided that: (a) there is no feasible alternative site outside the *Regulated Area* as determined by an *Environmental Assessment* or other *comprehensive plan* supported by the GRCA, and (b) a site-specific geotechnical or engineering assessment based on established provincial guidelines and an appropriate *factor of safety* establishes a more precise *Riverine Erosion Hazard*, and (c) where it can be demonstrated that:

a) there are no impacts on existing and future slope stability,

b) the risk of creating new *Riverine Erosion Hazards* or aggravating existing *Riverine Erosion Hazards* is minimized through site and infrastructure design and appropriate remedial measures,

c) the potential of increased loading forces on the *top of slope* is addressed through appropriate structural design,

d) the potential for surficial erosion is addressed by a drainage plan, *and*

e) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

Recreational Infrastructure

8.2.22 ***Recreational Infrastructure*** *which by its nature* must locate in river valleys such as fencing, stairways, and *access* points, and other recreational uses deemed appropriate by the GRCA may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated through a site-specific geotechnical or engineering assessment based on established provincial guidelines and appropriate *factor of safety* that:

a) there is no impact on existing and future slope stability,

b) the risk of creating new *Riverine Erosion Hazards* or aggravating existing *Riverine Erosion Hazards* is minimized through site and infrastructure design and appropriate remedial measures,

c) facilities are designed and constructed to minimize the risk of structural failure and/or property damage,

d) the potential for surficial erosion is addressed by a drainage plan, *and*

e) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

Prohibited Uses within the Riverine Erosion Hazard

8.2.23 Notwithstanding Sections 8.2.2-8.2.22, ***development*** will not be permitted within the *Riverine Erosion Hazard* as specified in Section 7.2 – General Policies, or where the use is:

a) a bank stabilization project intended to protect new *development*, with the exception of public infrastructure,

b) placement or dumping of *fill* not associated with works approved by the GRCA,

c) a Stormwater Management Facility, *or*

d) excavation works at the toe of a valley slope, with the exception of works which may be permitted in accordance with the policies in Section 9.1.

8.3 River or Stream Valleys – Apparent Valleys - Other Valleylands

River and *stream* valleys are complex, dynamic landscapes. The interplay between surface and ground water and the linkages, interactions and inter-dependence of aquatic environments with terrestrial environments supply hydrologic and *ecological function*s critical to sustaining *watershed ecosystem*s.

In the majority of cases, *valleyland*s within *apparent valleys* are contained within the *Riverine Flooding Hazard* and/or the *Riverine Erosion Hazard*. However, the *Regulation* also includes stable, gently sloping valley walls where the slope inclination is greater than or equal to 15 per cent (6.7H:1V) but less than 20 per cent (5H:1V) to the *top of slope*, and pockets of gently sloping land terraced between valley slopes outside of the *Riverine Flooding Hazard* and/or the *Riverine Erosion Hazard*. These areas are referred to as *Other Valleylands.*

Where *Other Valleylands* are defined by the *top of slope*, an additional 15 metre (49.2 foot) allowance is added to establish the *Regulated Area. Development* within *Other Valleylands* and the associated allowance (*Regulated Area*) requires permission from the GRCA and the following policies apply.

Policies for Other Valleylands

8.3.1 ***Development*** will not be permitted in *Other Valleylands* and the *associated allowance* except in accordance with the policies in Sections 8.3.2-8.3.3.

8.3.2 ***Development*** in *Other Valleylands* and the *associated allowance* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated through a site-specific geotechnical or engineering assessment that:

a) the proposed *development* is not subject to a *Riverine Erosion Hazard* or a *Riverine Flooding Hazard*,

b) there is no impact on existing and future slope stability and bank stabilization or erosion *protection works* are not required,

c) the potential of increased loading forces is addressed through appropriate structural design,

d) *access* into and through the valley for preventative actions or maintenance or during an emergency will not be prevented, *and*

e) the potential for surficial erosion is addressed by a drainage plan where applicable.

8.3.3 ***Development*** in *Other Valleylands and the associated allowance* may be permitted without a site-specific geotechnical study, where:

a) existing geotechnical or engineering assessments based on established provincial guidelines and an appropriate *factor of safety* against slope failure or slipping undertaken in the immediate area establish that the site is not subject to a *flooding* or *erosion hazard* and it can be demonstrated that the policies in Section 8.3.2 are met, *or*

b) in the opinion of the GRCA, the impact of the *development* on slope stability is *negligible* and the policies in Sections 7.1.2-7.1.3 General Policies are met.

8.4 Wetlands and Areas of Interference

Defining Wetlands

Wetlands are defined in the Conservation Authorities Act and means land that:

- **is seasonally or permanently covered by shallow water or have a water table close or at the surface,**
- **directly contributes to the hydrological function of a watershed through connection with a surface watercourse,**
- **has hydric soils, the formation of which have been caused by the presence of abundant water, and**
- **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 wetland characteristics (Conservation Authorities Act, R.S.O. 1990, c. 27, s. 28, ss. 25).

Wetlands are important natural features on the landscape, whether permanently or seasonally wet. Wetlands moderate water flow by absorbing much of the surface water runoff from the land and then slowly releasing it. This helps to reduce flooding and to sustain stream flows during dry spells. Many *wetland*s recharge groundwater by moving surface water into the groundwater system.

Other benefits include protecting and improving water quality, providing habitat for fish and wildlife, and providing recreational opportunities. The lands which surround *wetland*s are also important to sustaining their essential hydrologic and *ecological function*s.

Defining Areas of Interference

The areas surrounding *wetland*s where *development* could interfere with the *hydrologic function* of the *wetland* are called "areas of interference". These areas include lands that are 120 metres (394 feet) from the boundaries of *Provincially Significant Wetlands*[20] and other *wetland*s greater than or equal to 2 hectares (5 acres) or 30 metres (100 feet) from smaller, non-provincially significant *wetland*s (Ontario Regulation 150/06) as shown in **Figure 8**. These areas may be adjusted where detailed hydrologic studies define a more accurate "area of interference". [21]

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[20] ***Provincially Significant Wetlands* are generally identified and approved by the Ontario Ministry of Natural Resources and Forestry using the current Wetland Evaluation System and the Grand River Watershed Wetland Evaluation Protocol developed by GRCA, Ministry of Natural Resources and Forestry and Ducks Unlimited Canada (2005).**

[21] **Adjustments to the extent of *areas of interference* have been made to the *Regulation* limits where roads exist. Further refinements to the extent of *areas of interference* will be made where areas for protection around wetlands were established prior to May 4, 2006 and endorsed by the GRCA through the development process. Future adjustments may be made to the regulation limit after a GRCA permit has been obtained and the approved development undertaken or the subdivision or condominium plan has been registered by the municipality, whichever is applicable.**

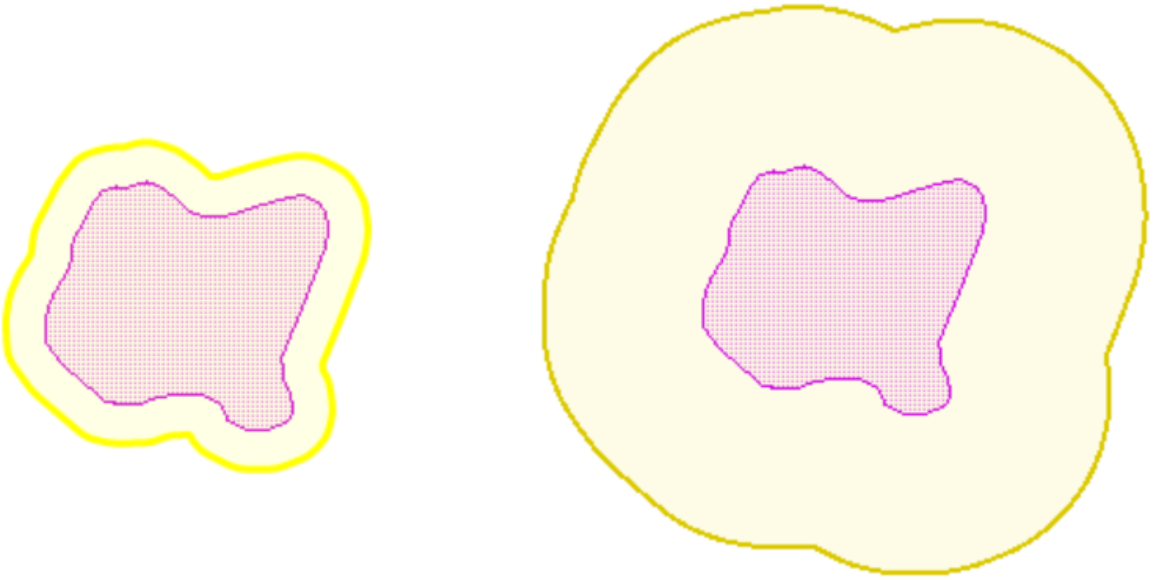

Figure 8. Wetlands and Associated *Areas of Interference*

Non-Provincially Significant
Wetland less than 2 hectares.
Area of Interference = 30 metres

Wetland greater than or equal to 2 hectares or a
Provincially Significant Wetland
Area of Interference = 120 metres

All *wetland*s and their associated areas of interference are regulated under the *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation.*

Any *development* or *interference* within *wetland*s or development in *areas of interference* requires permission from the GRCA.

Policies for Wetlands and Areas of Interference

8.4.1 ***Development/Interference*** within a *wetland* or ***development*** within an *area of interference* will not be permitted except in accordance with the policies in Sections 8.4.3-8.4.13.

8.4.2 ***Peat Extraction*** within a *wetland* will not be permitted except in accordance with the policies in Sections 8.4.4-8.4.5.

Development/Interference within Wetlands

8.4.3 ***Subdivision or Condominium Development*** within a *wetland* or an *area of interference* previously approved by a municipality under the *Planning Act* with GRCA support may be permitted provided that:

a) the proposed development met the GRCA policies in effect at the time of draft plan approval *and*,

b) the proposed *development* is modified in accordance with the policies in Section 8 – Policies for Wetlands and *Areas of Interference*, wherever possible.

8.4.4 ***Development*** within a naturally-occurring *wetland* may be permitted where the *wetland* is less than 0.5 hectares (1.24 acres), and it can be demonstrated that the *wetland* is not:

a) part of a Provincially Significant Wetland,

b) located within a floodplain or riparian community,

c) part of a Provincially or municipally designated natural heritage feature, a significant woodland, or hazard land,

d) a bog, fen,

e) fish habitat,

f) *significant wildlife habitat*,

g) confirmed habitat for a Provincially or regionally significant species as determined by the Ministry of Natural Resources and Forestry or as determined by the municipality,

h) part of an ecologically functional corridor or linkage between larger *wetland*s or natural areas,

i) part of a *groundwater recharge* area, *or*

j) a *groundwater discharge* area associated with any of the above.

8.4.5 ***Development*** within or ***interference*** with *an anthropogenic wetland* less than 2 hectares (5 acres) may be permitted where it can be demonstrated that the *wetland* functions can be maintained or enhanced elsewhere within the sub*watershed* or planning area and the *wetland* is not:

a) part of a Provincially Significant Wetland,

b) located within a floodplain or riparian community,

c) part of a Provincially or municipally designated natural heritage feature, a significant woodland, or hazard land,

d) fish habitat,

e) *significant wildlife habitat*,

f) confirmed habitat for a Provincially or regionally significant species as determined by the Ministry of Natural Resources and Forestry or determined by the municipality,

g) part of an ecologically functional corridor or linkage between larger *wetland*s or natural areas,

h) part of a *groundwater recharge* area, *or*

i) a *groundwater discharge* area associated with any of the above.

8.4.6 ***Public Infrastructure*** including but not limited to roads, sanitary sewers, utilities, water supply wells, well houses, and pipelines, **within a wetland** larger than specified in Sections 8.4.4-8.4.5 may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, provided that it can be demonstrated that:

a) an *Environmental Assessment* or other *comprehensive plan* supported by the GRCA, demonstrates that all alternatives to avoid *wetland* loss or interference have been considered and that the proposed alignment *minimizes wetland* loss or interference to the greatest extent possible, *and*

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

8.4.7 Where an *Environmental Assessment* or other *comprehensive plan* is available and supported by the GRCA as specified in Section 8.4.6, the GRCA will request a more detailed site-specific study (i.e. a *Scoped Environmental Impact Study*) consistent with the *comprehensive plan.* This study will determine a more precise area *wetland* boundary in accordance with the current Provincial Wetland Evaluation System, and demonstrate how the hydrologic and *ecological function*s of the *wetland* will be *restore*d and enhanced.

8.4.8 ***Dredging*** of existing ponds within a *wetland* may be permitted in accordance with the policies in Section 7.1.2 and Section 8.1.22, and provided that all dredged material is placed at a suitable distance from the *wetland*.

Development within Areas of Interference

8.4.9 ***Development*** within an area of interference less than or equal to 30 metres (100 feet) from a *wetland* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where an *Environmental Impact Study* demonstrates that:

a) there are no negative or adverse hydrological or ecological impacts on the *wetland*,

b) all *development* is located outside of the *wetland* and maintains as much setback as feasible,

c) *development* is located above the water table, except as specified in Section 8.4.11, *and*

d) septic systems are located a minimum of 15 metres (50 feet) from the *wetland* and 0.9 metres (3 feet) above the annual maximum water table[22].

8.4.10 ***Development*** within an area of interference between 30 metres (100 feet) and 120 metres (394 feet) from a *wetland*, which in the opinion of the GRCA may result in hydrologic impact,[23] may be permitted where an *Environmental Impact Study* demonstrates that policies in Sections 7.1.2-7.1.3 – General Policies are met.

8.4.11 ***Peat Extraction*** within an area of interference may be permitted where an *Environmental Impact Study* demonstrates that policies in Sections 7.1.2-7.1.3 – General Policies are met and the affected area is rehabilitated to *restore* and *enhance* natural features and functions.

8.4.12 An *Environmental Impact Study* may not be required in an area of interference between 30 metres (100 feet) and 120 metres (394 feet) from a *wetland* if, in the opinion of the GRCA, the potential hydrologic or ecological impacts of the proposed *development* are *negligible*. This includes but is not limited to single family residences, additions and accessory structures for which less than one (1) hectare (2.5 acres) is required for grading.

Conservation Projects within Wetlands and Areas of Interference

8.4.13 ***Wetland Conservation Projects*** within *wetlands* and *areas of interference* may be permitted where an *Environmental Impact Study* demonstrates how the hydrologic and *ecological function*s will be protected, created, *restore*d and/or enhanced.

Stormwater Management within Wetlands and Areas of Interference

8.4.14 ***Stormwater Management Facilities*** within a *wetland* may be approved for flood control purposes provided that a *comprehensive plan* supported by the GRCA, demonstrates that all

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[22] **This standard is prescribed by the Ontario Building Code.**

[23] **This includes, but is not limited to activities such as grading involving areas equal to or greater than one hectare, and municipal servicing, utility corridors, roads and infrastructure associated with *Permits to Take Water.***

alternatives to avoid *wetland* loss have been considered and a flood control structure is required to alleviate an existing flood or erosion problem of a regional scope, and where it can be demonstrated that:

a) all structural components and actively managed components of the stormwater management facility are located outside of the *wetland*,

b) a detailed study (scoped EIS) consistent with the *comprehensive plan* demonstrates how the hydrologic and *ecological function*s of the *wetland* will be protected, *restore*d and/or enhanced,

c) *pollution* and sedimentation during construction and post construction are minimized using *best management practices* including site and facility design, construction controls, and appropriate remedial measures,

d) design and maintenance requirements as determined by the GRCA are met, *and*

e) works are constructed, repaired or maintained according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

8.4.15 ***Stormwater Management Facilities*** for *water quality control* will not be permitted within a *wetland*, but may be permitted in the area of interference where it can be demonstrated that:

a) all structural components and actively managed components of the stormwater management facility including constructed *wetland*s, are located outside of the *wetland*,

b) a detailed study demonstrates how the hydrologic and *ecological function*s of the *wetland* will be protected, *restore*d and/or enhanced,

c) *pollution* and sedimentation during construction and post construction are minimized using *best management practices* including site and facility design, construction controls, and appropriate remedial measures,

d) design and maintenance requirements as determined by the GRCA are met, *and*

e) works are constructed, repaired or maintained according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

8.5 Lake Erie Shoreline

About 26 kilometres (16 miles) of Lake Erie shoreline is within the jurisdiction of the GRCA. For the purposes of defining the extent of the *Regulated Area*, a 15 metre (50 foot) allowance is added to the furthest landward extent of the *flooding hazard*, *erosion hazard* or *dynamic beach hazard*.

A *Shoreline Management Plan (SMP)* was completed by Shoreplan Engineering in May 1994 and subsequently adopted by the GRCA. The plan lays out the technical basis and recommended management plan for the lakeshore. The *Lake Erie Shoreline Erosion Hazard* and *Lake Erie Dynamic Beach Hazard* are determined based on information from the *Shoreline Management Plan* and updated shoreline mapping.

Lake Erie Shoreline Flooding Hazard

Flooding from Lake Erie affects the entire shoreline area, backshore areas, and also extends up the lower portions of the Grand River and its tributaries upto and including the Town of Dunnville. The *Lake Erie Flooding Hazard* limit is based on the 100 year flood limit including *wave uprush* and *other water-related hazards* (**Figure 9**).

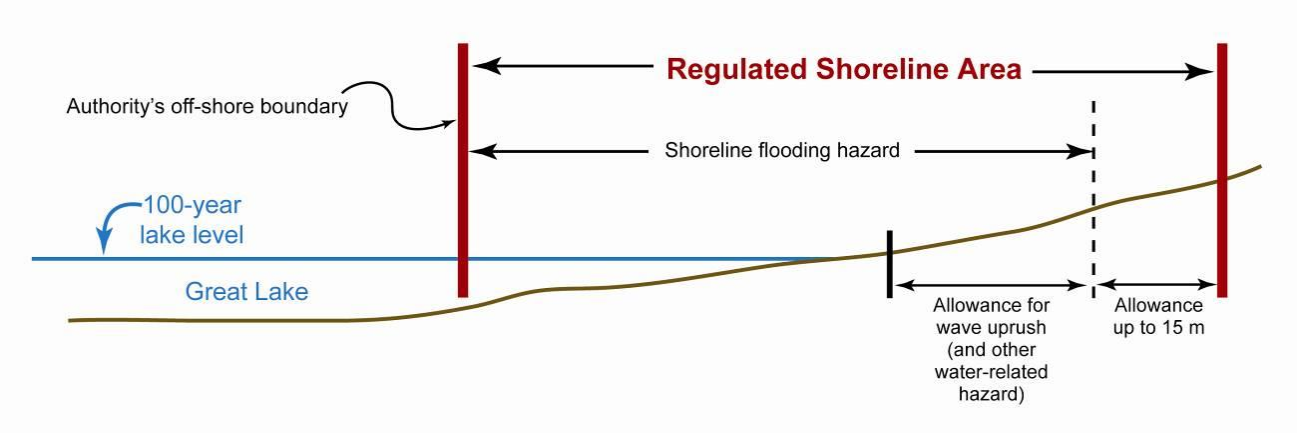

Figure 9. Lake Erie Shoreline Flooding Hazard - Regulated Area

Lake Erie Shoreline Erosion Hazard

The *Lake Erie Shoreline Erosion Hazard* is defined as the average annual rate of recession extended over a 100 year period. The erosion hazard is determined using a stable slope allowance (equal to the horizontal distance measured landward from the *toe of slope* equal to three (3) times the height of the cliff, bluff or bank) and an erosion allowance equal to 100 times the average annual recession rate (**Figure 10**).

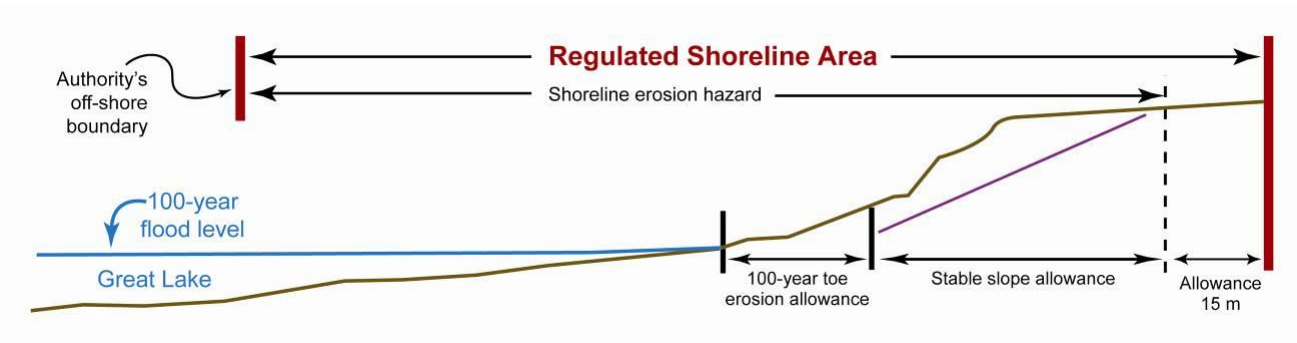

Figure 10. Lake Erie Shoreline Erosion Hazard - Regulated Area

Lake Erie Dynamic Beach Hazard

The *Lake Erie Dynamic Beach Hazard* is that portion of a shoreline where accumulated unconsolidated sediment continuously moves as a result of naturally occurring processes associated with wind and water and changes in the rate of sediment supply. The extent of the *dynamic beach hazard* is defined as the extent of the *flooding hazard* plus a dynamic beach allowance as identified in the *Lake Erie Shoreline Management Plan*. The *Lake Erie Shoreline Management Plan* identifies five (5) reaches containing dynamic beaches, four (4) of which do not form the furthest landward extent of the shoreline hazard due to extensive backshore flooding and *wetland* areas (**Figure 11**).

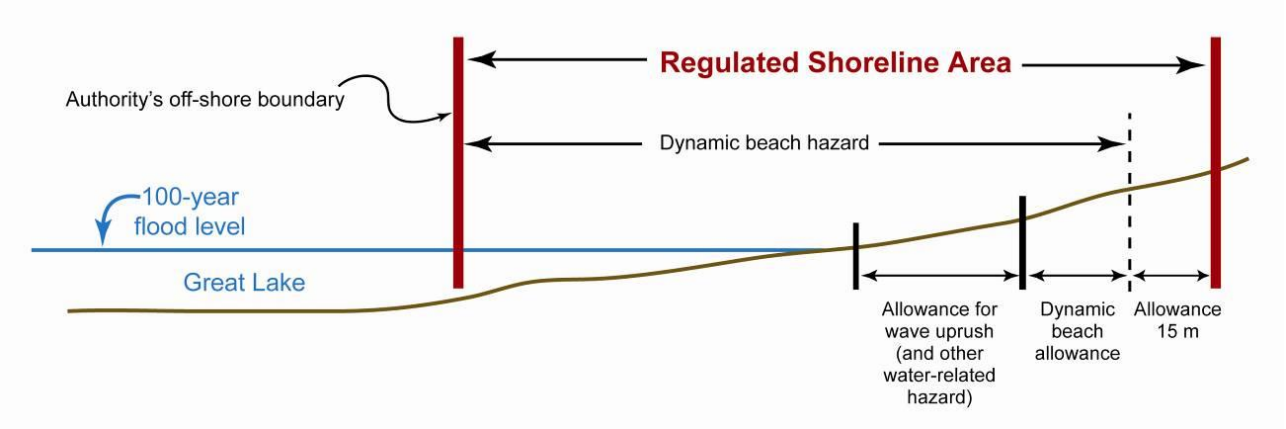

Figure 11. Lake Erie Dynamic Beach Hazard - Regulated Area

Any *development* adjacent or close to the shoreline of Lake Erie within the *Regulated Area* requires permission from the GRCA.

<u>Policies for Lake Erie Shoreline</u>

8.5.1 ***Development*** within the *Regulated Area* associated with the Lake Erie shoreline will not be permitted except in accordance with the recommendations of the currently-approved Shoreline Management Plan for the applicable shoreline reach and the policies in Sections 8.5.2-8.5.13.

Development – Lake Erie Shoreline Flooding or Erosion Hazard

8.5.2 ***Development*** associated with existing uses located within *Lake Erie Shoreline Flooding or Erosion Hazards* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where there is no feasible alternative site outside the *flooding or erosion hazard*, provided that it can be demonstrated that:

a) the proposed *development* is located in an area of least (and acceptable) risk,

b) *floodproofing* standards, *protection works* standards and *access* standards as determined by the GRCA are met,

c) *protection works* are designed to *create* or *restore* aquatic habitats to the extent possible,

d) no basement is proposed in the *flooding hazard* and any crawl space is non-habitable and designed to facilitate services only, *and*

e) a maintenance *access* of at least 5 metres (16 feet) is retained to and along existing shoreline *protection works*.

8.5.3 ***Ground Floor Additions*** to existing buildings or structures may be permitted in accordance with the policies in Section 8.5.2 – Policies for Lake Erie Shoreline, and where it can be demonstrated that:

a) the ground floor addition is 50 percent or less of the original[24] habitable ground floor area to a maximum footprint of 46.5 m^2 (500 ft^2) or in the case of multiple additions, all additions combined are equal to or less than 50 per cent of the original habitable ground floor area to a maximum footprint of 46.5 m^2 (500 ft^2).

b) the number of *dwelling unit*s is the same,

c) all *habitable floor space* is at or above the existing ground floor elevation, *and*

d) no basement is proposed.

8.5.4 An ***Additional Storey*** to an existing building or structure may be permitted in accordance with the policies in Section 8.5.2 – Policies for Lake Erie Shoreline, and where it can be demonstrated that the number of *dwelling unit*s is the same.

8.5.5 ***Non-Habitable Accessory Buildings or Structures*** greater than 10 m^2 (108 ft^2) associated with an existing uses such as detached garages, tool sheds, gazebos and other similar structures within lands subject to the *Lake Erie Shoreline Flooding or Erosion Hazard* may be permitted in accordance with the policies in Sections 8.5.2 - Policies for Lake Erie Shoreline, and where it can be demonstrated that there is no opportunity for conversion into habitable space in the future.

8.5.6 ***Replacement*** of buildings or structures other than those destroyed by flooding or erosion within lands subject to the *Lake Erie Shoreline Flooding or Erosion Hazard* may be permitted in accordance with the policies in Section 8.5.2, and where it can be demonstrated that:

a) the building or structure to be replaced is relocated to an area within the existing lot where the risk of flooding, erosion and/or property damage is reduced to the greatest extent, wherever possible,

b) the number of *dwelling unit*s is the same or less,

c) the new building or structure is the same size or smaller than the ground floor area of the former building or structure and the use is the same,

d) the ground floor elevation is at or exceeds that of the former building or structure, where it is not practical to raise it to the level of the *Shoreline Flooding Hazard*,

e) the elevation for ingress and egress is the same or higher than that which was available with the original building or structures, *and*

f) no basement is proposed and any crawl space is non-habitable and designed to facilitate services only.

8.5.7 ***Relocation*** of existing buildings and structures within lands subject to *Lake Erie Shoreline Flooding or Erosion Hazard* may be permitted in accordance with the policies in Section 8.5.6 provided that the risk of flooding, erosion and/or property damage is reduced through relocation.

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[24] The habitable ground floor area existing on May 4, 2006 will be considered the "original" ground floor area for the purpose of this calculation. May 4, 2006 was the date that the *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses, Ontario Regulation 150/06* was approved which broadened the regulatory mandate of the Grand River Conservation Authority to include the Lake Erie shoreline.

8.5.8 ***Development***[25] within *Lake Erie Shoreline Flooding or Erosion Hazards* may be permitted in accordance with the policies *Section 8.5.2 – Policies for Lake Erie Shoreline*, provided that it can be demonstrated that:

a) there is no feasible alternative site outside of the *flooding or erosion hazard*, *and*

b) vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies,

8.5.9 ***Public Infrastructure*** including but not limited to roads, sanitary sewers, utilities, water and sewage treatment plants, water supply wells, well houses, and pipelines may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, provided that there is no feasible alternative site outside the *Shoreline Flooding or Erosion Hazards* as determined through an *Environmental Assessment* or other *comprehensive plan* supported by the GRCA, and where it can be demonstrated that:

a) adverse impacts on shoreline processes are limited and any risk of flood or erosion damage to neighbouring properties is not increased, *and*

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s or shoreline functions and processes are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

8.5.10 The maintenance and repair of ***Public Infrastructure*** may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s or shoreline functions and processes, are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

8.5.11 ***Shoreline Protection Works*** to protect existing *development* and other uses deemed appropriate by the Grand River Conservation Authority to protect again the shoreline flooding and erosion hazards may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated that:

a) all feasible alignments have been considered through an Environmental Assessment supported by the GRCA or other site specific technical studies, whichever is applicable based on the scale and scope of the project,

b) *floodproofing* standards, *protection works* standards and *access* standards as determined by a qualified engineer and supported by the GRCA are met,

c) *protection works* are designed to *create* or *restore* aquatic habitats to the extent possible,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s or shoreline functions and processes are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

d) maintenance requirements are minimized,

e) a maintenance *access* of at least 5 metres (16 feet) is retained to and along existing and proposed shoreline *protection works*.

[25] **Development includes marinas and other recreational facilities.**

Development – Lake Erie Shoreline Flooding or Erosion Hazard Allowance

8.5.12 ***Development*** within the *Lake Erie Shoreline Flooding or Erosion Hazard Allowance* may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated that:

a) the potential for surficial erosion is addressed by a drainage plan, and

b) a maintenance *access* of at least 5 metres (16 feet) is retained to and along existing and proposed shoreline *protection works*.

Internal Renovations

8.5.13 ***Internal Renovations*** to existing buildings and structures within the *Lake Erie Shoreline Regulated Area* which change the use or potential use of the building or structure but provide for no additional *dwelling unit*s may be permitted provided that the internal renovation does not result in a new use prohibited by Section 7.2.

Prohibited Uses within Lake Erie Flooding or Erosion Hazards

8.5.14 Notwithstanding Sections 8.5.2-8.5.7, ***development*** will not be permitted in accordance with the policies in Section 7.2 – General Policies, or where the proposed location is:

a) on lands within dynamic beach hazard and its associated allowance,

b) used for new and/or the expansion of existing campgrounds or trailer parks,

c) used for a Stormwater Management Facility,

d) used for underground parking, *or*

e) within areas that would be rendered inaccessible to people or vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards unless *safe access* is available.

8.6 Inland Lakes

Lands that are adjacent or close to the shorelines of inland lakes that have a surface area of greater than 2 hectares (5 acres) and less than 100 km^2 (39 $mile^2$) and/or that respond to a single runoff event could be affected by flooding or erosion. These lands are within the jurisdiction of the GRCA. Any *development* proposed adjacent to an inland lake will require permission from the GRCA.

Policies for Inland Lakes

8.6.1 ***Development*** along inland lake shorelines that are impacted by flooding or erosion hazards will not be permitted except in accordance with the policies in Sections 8.1 and 8.2, where applicable.

Prohibited Uses along Inland Lake Shorelines

8.6.2 Notwithstanding Section 8.6.1, ***development*** will not permitted in accordance with the policies in Section 7.2 – General Policies, or within 15 metres (50 feet) of the average annual high water mark of the lake with the exception of water control structures (Section 9.1.3).

8.7 Water Management Reservoirs – Belwood and Conestogo Lakes

The Grand River Conservation Authority owns the land adjacent to Belwood and Conestogo Lakes. This land was acquired for dam and reservoir construction, which was completed in 1942 and 1958, respectively. Subsequent to construction, a decision was made to allow *access* to lands adjacent to the reservoirs for recreational purposes including public *access* and cottage lots. This was done with the understanding that the *dam*s and reservoirs would be operated primarily for water management purposes to prevent downstream flooding during the spring snowmelt and extreme rainfall events and to augment low river flows in the summer to ensure adequate water quality and quantity in downstream communities who use the *river* for water supply.

To ensure that the Grand River Conservation Authority is able to meet water quality, water quantity and water supply needs throughout the year, the Authority must have the ability to raise and lower reservoir levels as required. Lands below the maximum operating elevation for the reservoirs are essential for flood storage purposes during extreme flood events. The maximum operating elevation that is needed for water management purposes is 425.38 metres (1395.60 feet) at Belwood reservoir and 393.50 metres (1291.01 feet) at the Conestogo reservoir.

The extent of the flood hazard adjacent to Belwood and Conestogo Lakes is different than that for inland lakes and is defined by the elevation of the *top of dam*, which is 426.72 metres (1400 feet) at the Shand Dam (Belwood) and 395.00 metres (1295.93 feet) at the Conestogo Dam. *Development* within the flood hazard above the maximum operating elevation is limited. In addition, lands above the elevation of the flood hazard may be subject to an erosion hazard. The *Regulation Limit* around the reservoirs is defined as the furthest limit of the flood and erosion hazard plus an allowance as prescribed in *Ontario Regulation 150/06.*

Any *development* on cottage lots owned by the Grand River Conservation Authority adjacent to Belwood and Conestogo Lakes will require permission from the GRCA under *Ontario Regulation 150/06.*

<u>Policies for Lake Belwood and Conestogo Lake</u>

General

8.7.1 ***General repairs*** to existing cottages will be permitted.

8.7.2 Where cottage lots are located within the *Regulation Limits* defined by Ontario Regulation 150/06, all *building* or *site alteration* must be in accordance with the *Grand River Conservation Authority Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation,* Sections 7.1.2-7.1.3 – General Policies.[26]

Cottages Below the Top of Dam

8.7.3 **Additions** may be permitted, between the maximum operating elevation and the top of dam, where it can be demonstrated that:

a) the footprint of the cottage is not expanded to an area greater than 139.4 m^2 (1,500 ft^2), not including decks or an attached garage,
b) the addition does not block the view of the lake from adjacent cottages,
c) the addition does not move the cottage footprint closer to the reservoir,
d) the ground floor elevation is at or exceeds that of the existing cottage, *and*

[26] **Other stipulations for development on cottage lots may be required in accordance with the Grand River Conservation Authority Cottage Lot Site Development Policy approved on May 28, 2009**.

e) any attached garage as an addition, is less than or equal to 58 m^2 (625 ft^2) and is not habitable.

8.7.4 ***Non-Habitable Accessory Buildings*** less than or equal to 10 m^2 (108 ft^2) associated with an existing cottage located between the *maximum operating elevation* and the *top of dam*, may be permitted where it can be demonstrated that:

a) the building is not used for habitation,
b) the building does not block the view of the lake from adjacent cottages,
c) the building is not used to store fuels, solvents, chemicals, paints, solid waste, or any other hazardous materials,
d) the building or structure is securely anchored, *and*
e) electrical services are located above the *top of dam*.

Cottages Above the Top of Dam

8.7.5 ***Non-Habitable Accessory Buildings*** associated with an existing cottage located *above the top of dam*, may be permitted where it can be demonstrated that:

a) the *accessory building* is:
   - less than or equal to 58 m^2 (625 ft^2) in the case of a garage,
   - less than or equal to 11.1 m^2 (120 ft^2) in the case of a shed; or
   - less than or equal to 27 m^2 (290 ft^2) in the case of a boathouse, *and*
b) the building does not block the view of the lake from adjacent cottages.

8.7.6 ***New Cottages*** located *above the top of dam* may be permitted where it can be demonstrated that:

a) all applicable polices for *development* within the *Regulated Limits*, in accordance with Sections 7, 8 and 9 have been met,
b) the footprint of the new cottage is less than or equal to 139.4 m^2 (1,500 ft^2), excluding decks or attached garages,
c) the cottage does not block the view of the lake from the adjacent cottages,
d) any attached garage is less than or equal to 58 m^2 (625 ft^2) and is not habitable,
e) no habitable basement is proposed, *and*,
f) a class 4 or tertiary sewage system is installed in accordance with provincial standards in a location suitable to the Grand River Conservation Authority.

8.7.7 ***Additions*** may be permitted to existing cottages *above the top of dam*, where it can be demonstrated that:

a) all applicable polices relating within *Regulated Limits*, in accordance with Sections 7, 8 and 9 have been met,
b) the footprint of the cottage is not expanded to an area greater than 139.4m^2 (1,500 ft^2), not including decks or an attached garage,
c) the addition does not block the view of the lake from adjacent cottages, *and*
d) any attached garage as an addition, is less than or equal to 58 m^2 (625 ft^2) and is not habitable.

Replacement

8.7.8 ***Replacement Cottages*** may be permitted, *except in areas below the maximum operating elevation*, where it can be demonstrated that:

a) *development* within the flooding hazard is in accordance with the policies in Section 8.1.2 – Policies for One-Zone Policy Areas,
b) the *replacement* cottage is relocated above the *top of dam* or where this is not feasible or where this causes the view of the lake to be impaired, the footprint of the *replacement* building is located no closer to the reservoir than the original building,

c) the footprint of the *replacement* cottage is less than or equal to 139.4 m^2 (1,500 ft^2), excluding decks or attached garages,
d) any attached garage is less than or equal to 58 m^2 (625 ft^2) and is not habitable,
e) no habitable basement is proposed,
f) a class 4 or tertiary sewage system is installed in accordance with provincial standards in a location suitable to the Grand River Conservation Authority,
g) the *replacement* cottage is floodproofed to the *top of dam*, where applicable,
h) all electrical, mechanical and heating services are located above the *top of dam*, wherever possible, *and*
i) all applicable polices relating within *Regulated Limits*, in accordance with Sections 7, 8 and 9 have been met,

8.7.9 ***Replacement of Sewage Systems*** already located *between the maximum operating elevation and the top of dam* may be permitted where it can be demonstrated that:

a) there is no other suitable location on the lot above the *top of dam* that will accommodate the system,
b) the sewage system is upgraded to a class 4 or a tertiary sewage system in accordance with provincial standards in a location suitable to the Grand River Conservation Authority, *and*
c) the base or bottom of the sewage system is buried at an elevation that is above the *maximum operating elevation.*

Setbacks

8.7.10 A minimum setback of 1.5 metres (5 feet) between any structure and the cottage lot side yard boundaries shall be maintained as identified in Schedule "D" of the *Cottage Lot Program Lease*, subject to topographic features or other features of the land.

Docks

8.7.11 Docks will be constructed in accordance with the *Grand River Conservation Authority Boat Ramp Policy* and in a way that they can be adjusted to changing reservoir levels.

8.8 Hazardous Lands

Hazardous land is defined as land that could be unsafe for *development* because of naturally-occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock (*Conservation Authorities Act*, R.S.O. 1990, c. 27, s. 28, ss. 25).

The Grand River *watershed* contains other *hazardous land*s including organic soils and unstable bedrock such as the *karst* formations. Organic and peat soils, formed by the decomposition of vegetative and organic materials into humus can release humic acids to the ground water system and *create* highly combustible methane gas. Peat and other organic soils also lack soil structure making them susceptible to erosion and unable to support structure because they compress easily.

Any *development* within *hazardous land*s requires permission from the GRCA.

<u>Policies for Hazardous Lands</u>

8.8.1 ***Development*** within *hazardous land*s will not be permitted except in accordance with the policies in *Section 8.8.2.*

Development in Hazardous Lands

8.8.2 ***Development*** may be permitted within *hazardous land*s in accordance with the policies in Section 7.1.2-7.1.3 – General Policies, and where a technical site-specific study and/or an *Environmental Impact Study* establishes a more precise hazard land boundary and where it can be demonstrated that:

a) there is no feasible alternative site outside the *Regulated Area, and*

b) the risk of instability which would result in structural failure or property damage is minimized.

Prohibited Uses in Hazardous Lands

8.8.3 Notwithstanding Section 8.8.2, ***development*** will not permitted in accordance with the policies in Section 7.2 – General Policies.

9 Policies for the Straightening, Changing, Diverting or Interfering With the Existing Channel of a River, Creek, Stream, Watercourse

9.1 Straightening, Changing, Diverting or Interfering with an Existing Channel

The area along both sides of any *river*, *creek*, *stream* or *watercourse*, called the *riparian zone*, not only provides habitat for a wide range of flora and fauna, it also filters surface runoff before it reaches open waterways. As runoff passes through, the *riparian zone* retains excess nutrients, some pollutants and reduces the sediment flow. A healthy zone can also keep *stream* flow going even during the dry seasons, by holding and releasing groundwater back into the *stream*. This interface between terrestrial and aquatic environments acts as a sponge for storing water, which in turn helps to reduce flooding and shelters the banks against shoreline erosion. Alterations to the channel of a *watercourse* can negatively impact the hydrologic and ecological features and functions provided by *riparian zone*s.

Any alteration to the channel of a *river*, *creek*, *stream* or *watercourse* requires permission from the GRCA. This includes activities such as, but not limited to, culvert placement or *replacement*, bridge construction, bed level crossings, piping of *watercourse*s, installation or maintenance of pipeline crossings, cable crossings, construction or maintenance of by-pass, connected or online ponds, straightening and diversions as well as any work on the bed or the banks of the *watercourse* such as bank protection projects.

Policies for the Straightening, Changing, Diverting or Interfering With the Existing Channel of a River, Creek, Stream, or Watercourse

9.1.1 ***Straightening, changing, diverting*** or ***interfering*** with existing *river*, *creek*, *stream* or *watercourse* channel is not permitted except as specified in *Sections 9.1.2-9.1.17.*

Crossings

9.1.2 ***Crossings*** including but not limited to bridges, culverts, pipelines, channel *enclosure*s of less than 20 metres (66 feet) and causeways may be permitted to be constructed, replaced or upgraded in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies and Sections 8.1.16-8.1.17 and/or Section 8.2.21 where appropriate, and provided that all feasible alternative sites and alignments have been considered through an *Environmental Assessment* supported by the GRCA

or through site-specific studies, whichever is applicable based on the scale and scope of the project,[27] and where it can be demonstrated that:

a) crossings avoid any bends in the *watercourse* to the extent practical,

b) crossings are located to take advantage of existing impacted or open areas on the channel bank or valley slope, wherever possible,

c) crossing structures avoid the *Riverine Erosion Hazard* in order to accommodate natural *watercourse* movement, wherever possible,

d) the risk of flood damage to upstream or downstream properties is reduced through site and infrastructure design, wherever possible,

e) there is no inhibition of fish passage,

f) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

g) physical realignments or alterations to the *river*, *creek*, *stream* or *watercourse* channel associated with a new crossing are avoided or are in accordance with the policies in *Section 9.1.16, and*

h) maintenance requirements are minimized.

Water Control Structures

9.1.3 ***Water Control Structures*** to protect existing *development* or other uses deemed appropriate by the GRCA from the *Riverine Flooding Hazard* including dykes and berms, but excluding stormwater management facilities and *dam*s, may be permitted to be constructed maintained or repaired in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where it can be demonstrated that:

a) all feasible alignments have been considered through an *Environmental Assessment* supported by the GRCA or other site specific technical studies, whichever is applicable based on the scale and scope of the project, *and*

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions.

Dams

9.1.4 ***Dams*** which by their nature must be located within or directly adjacent to a *river*, *stream*, *creek* or *watercourse*, including *stormwater management facilities*, may be permitted where it can be demonstrated that:

a) all feasible alternative sites and alignments have been considered through an *Environmental Assessment* supported by the GRCA or through site-specific studies, whichever is applicable based on the scale and scope of the project,

b) the water management benefits of the *dam* or stormwater management facility are demonstrated to the satisfaction of the GRCA,

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[27] **A study to address all feasible sites and alignments may not be required for the replacement, maintenance or upgrading of existing crossings.**

c) *pollution*, sedimentation and erosion during construction and post construction are minimized using *best management practices* including site, landscape, infrastructure design, construction controls, and appropriate remedial measures,

d) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized, and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions, *and*

e) works are constructed according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

9.1.5 ***Alterations***[28] to existing ***Dams*** may be permitted where it can be demonstrated that:

a) *pollution*, sedimentation and erosion during construction and post construction are minimized using *best management practices* including site, landscape, infrastructure design, construction controls, and appropriate remedial measures,

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized, and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions,

c) there are no adverse impacts on the capacity of the structure to pass flows

d) the integrity of the original structure is maintained or improved

e) works are altered according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

9.1.6 The ***Retirement of Dams***[29] or the ***Removal of Dams*** which are structurally unsound or no longer serve their intended purpose, located within a *river*, *stream*, *creek* or *watercourse* may be permitted where an *Environmental Assessment* or a detailed decommissioning plan supported by the GRCA demonstrates that:

a) all potential hydrologic and ecological impacts have been identified and considered,

b) *significant natural features* and hydrologic and *ecological function*s within or adjacent to the *river*, *creek*, *stream* or *watercourse* are *restore*d and enhanced through the retirement or removal of the structure and a site restoration plan supported by the GRCA,

c) the risk of *pollution* and sedimentation during and after retirement or removal is addressed through a draw down plan supported by the GRCA, *and*

d) susceptibility to natural hazards is not increased or new hazards created.

Conservation Projects within or Adjacent to a River, Creek Stream or Watercourse

9.1.7 ***Conservation Projects*** such as *stream* rehabilitation works, small impoundments and

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[28] **Alterations to existing dams in watercourses that, in the opinion of the GRCA, would not affect the control of flooding, erosion, pollution or the *conservation of land* and that would not result in changes in the capacity to pass river flows or impacts on integrity of the structure or in-water works do not require a permit under *Regulation 150/06*.**

[29] **Retirement of a dam refers to a situation in which its original purpose or use is no longer necessary and its operation is cancelled. Some retirement activities may involve the demolition of a structure or a change in the purpose, use, capacity or location of a structure.**

realignments which *restore* or *enhance watercourse* morphology or aquatic health and habitat may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and provided that:

a) the hydrologic and ecological benefits of the project are demonstrated to the satisfaction of the GRCA,

b) *stream* bank stability is enhanced,

c) *significant natural features* and hydrologic and *ecological function*s are *restore*d and enhanced using *best management practices* including site and/or infrastructure design and appropriate remedial measures,

d) natural channel design principles are followed to the extent possible, *and*

e) maintenance requirements are minimized.

Erosion and Sediment Control Structures

9.1.8 ***Erosion and Sediment Control Structure***s to protect existing *development* and other uses deemed appropriate by the GRCA may be permitted in accordance with the policies in Sections 7.1.2-7.1.3 - General Policies, and where it can be demonstrated that:

a) erosion risk on adjacent, upstream and/or downstream properties is reduced or erosion and sedimentation processes are controlled to reduce existing or potential impacts from adjacent land uses, whichever is appropriate,

b) natural channel design principles are followed to the extent possible,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized, and it can be demonstrated that *best management practices* including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions, *and*

d) maintenance requirements are minimized.

Maintenance of Dams or Erosion and Sediment Control Structures

9.1.9 The maintenance and repair of ***Dams*** or ***Erosion and Sediment Control Structure***s may be permitted where it can be demonstrated that:

a) *pollution* and sedimentation during maintenance and repair activities is minimized using best management practices including site and infrastructure design, construction controls and appropriate remedial measures,

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized, and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will adequately *restore* and *enhance* features and functions,

c) susceptibility to natural hazards is not increased or new hazards created, *and*

d) works are maintained or repaired according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA based on the scale and scope of the project.

Ponds

9.1.10 ***Connected Ponds*** with no water intakes from the *watercourse* but which outflow into the *watercourse* may be permitted provided that the provisions of Sections 7.1.2-7.1.3 – General Policies are met and a site plan and/or other site-specific study demonstrates that:

a) there is no negative impact on the downstream water quality or thermal regime, *and*

b) maximum berm heights above existing grades do not exceed 0.3 metres (1 foot) within the *Riverine Flooding* or *Erosion Hazard* and all remaining *fill* is removed from the hazard area.

9.1.11 ***Bypass Ponds***[29] connected to *watercourse*s created as part of site restoration plan or a conservation project may be permitted subject to the provisions of Section 9.1.10, and where it can be demonstrated that the water intake is set above the elevation that permits continuous flow (i.e., refreshing of the pond will depend on increased *stream* flows from snow melt and rainfall events).

9.1.12 ***On-Line Ponds***[30] in a *river*, *creek*, *stream* or *watercourse* are not permitted except as specified in Sections 9.1.4 and 9.1.11.

9.1.13 ***On-Line Ponds*** at the very upstream end of *watercourse*s may be permitted for *wetland restoration* and *fish and wildlife habitat enhancement* in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies and where a site plan and/or other site-specific study demonstrates that:

a) there is no negative impact on the downstream thermal regime,

b) there is no inhibition of fish passage, *and*

c) there are no negative impacts on areas of *groundwater recharge*/*discharge*.

9.1.14 ***Dredging*** of an existing connected, bypass or on-line pond may be permitted in accordance with the policies in Section 8.1.22.

Dredging of a River, Creek, Stream or Watercourse

9.1.15 ***Dredging*** of a *river*, *creek*, *stream* or *watercourse* may be permitted to improve hydraulic characteristics and fluvial processes or to improve aquatic habitat or water quality in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies, and where a dredging plan and/or other site-specific study demonstrates that:

a) *stream* bank stability is enhanced,

b) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological function*s are minimized and it can be demonstrated that best management practices including site design and appropriate remedial measures will adequately *restore* and enhance features and functions, *and*

c) all dredged material is removed from the *Riverine Flooding* and *Erosion Hazard* and safely disposed of in accordance with the policies in provincial guidelines.

Realignment, Channelization or Straightening

9.1.16 ***Realignment, channelization or straightening*** of a *river*, *creek*, *stream* or *watercourse* may be permitted to improve hydraulic characteristics and fluvial processes or to improve aquatic habitat or water quality in accordance with the policies in Sections 7.1.2-7.1.3 – General Policies and where a site plan and/or other site-specific study demonstrates that:

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[29] **A bypass pond is created by diverting some of the flow from a natural watercourse into an adjacent pond. The outlet of this type of pond usually returns water to a natural watercourse.**

[30] **An on-line pond is built by digging-out or dredging an area within an existing watercourse or by damming a watercourse.**

a) all feasible alternative alignments have been considered through an *Environmental Assessment* supported by the GRCA or through site-specific studies, whichever is applicable based on the scale and scope of the project,

b) *stream* bank stability is enhanced,

c) where unavoidable, intrusions on *significant natural features* or hydrologic or *ecological functions* are minimized and it can be demonstrated that best management practices including site design and appropriate remedial measures will adequately *restore* and *enhance* features and functions, *and*

d) natural channel design principles are followed to the extent possible.

Enclosures

9.1.17 ***Enclosures*** of *creeks*, *streams* or *watercourses* may be permitted where there is a risk to public safety and/or potential property damage and where a site specific study demonstrates that:

a) all feasible options and methods have been explored to address the hazard (s) and the *enclosure* is supported by the GRCA,

b) the risk to public safety is reduced,

c) susceptibility to natural hazards is reduced and no new hazards are created,

d) there are no negative or adverse hydrologic impacts on *wetlands*,

e) *pollution*, sedimentation and erosion during construction and post construction is minimized using *best management practices* including site and infrastructure design, construction controls, and appropriate remedial measures,

f) intrusions within or adjacent to the *river*, *creek*, *stream* or *watercourse* are minimized and it can be demonstrated that *best management practices* including site design and appropriate remedial measures will adequately *restore* and *enhance* features and functions to the extent possible,

g) there is no negative impact on the downstream thermal regime,

h) there is no inhibition of fish passage, *and*

i) works are constructed, repaired and/or maintained according to *accepted engineering principles* and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

10 Definitions

Accepted Engineering Principles means those current coastal, hydraulic and geotechnical engineering principles, methods and procedures that would be judged by a peer group of qualified engineers (by virtue of their qualifications, training and experience), as being reasonable for the scale and type of project being considered, the sensitivity of the locations, and the potential threats to life and property.

Accepted Scientific Principles means those current principles, methods and procedures which are used and applied in disciplines including but not limited to geology, geomorphology, hydrology, botany, and zoology, and that would be judged by a peer group of qualified specialists and practitioners (by virtue of their qualifications, training and experience), as being reasonable for the scale and type of project being considered, the sensitivity of the locations, and the potential threats to life and property.

Access (Ingress/Egress) means standards and procedures applied in engineering practice associated with providing safe passage for vehicles and people to and from a shoreline or river-side property during an emergency situation as a result of flooding, other water related hazards, the failure of *floodproofing*, and/or *protection works*, and/or erosion that have been reviewed and approved by the Grand River Conservation Authority and/or the Ontario Ministry of Natural Resources and Forestry.

Accessory Building or Structure means a use or a building or structure that is subordinate and exclusively devoted to a main use, building or structure and located on the same lot.

Adverse Hydraulic and Fluvial Impacts means flood elevations are not increased, flood and ice flows are not impeded and the risk of flooding to and erosion on adjacent upstream and/or downstream properties is not increased.

Apparent Valley or Confined Valley means that part of the *valleyland* system where the valley walls are greater than 3 metres (10 feet), with or without a floodplain.

Anthropogenic means created by a human.

Assisted Living Facility means a multiple residential unit that is constructed with limited kitchen facilities in the unit(s) or a group home, where individuals who require full or partial assistance with activities of daily living (e.g. bathing, toileting, ambulating, self administration of medications, etc.) reside.

Aquifer means an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, silt or clay).

Areas of Interference means those lands where *development* could interfere with the *hydrologic function* of a *wetland*.

Backwater Area means a section of *watercourse* with an elevation that is increased above normal because of a downstream human-made obstruction such as a narrow bridge opening or culvert that restricts natural water flow.

Bankfull Width means the formative flow of water that characterizes the morphology of a fluvial channel. In a single channel *stream*, "bankfull" is the discharge, which just fills the channel without flowing onto the floodplain.

Best Management Practices (BMPs) means methods, facilities and structures which are designed to protect or improve the environment and natural features and functions from the effects of *development* or interference.

Comprehensive Plan means a study or plan undertaken at a landscape scale such as a *watershed*/sub*watershed* plan, an *Environmental Assessment*, a detailed *Environmental Implementation Report (EIR)* that has been prepared to address and document various alternatives and is part of a joint and harmonized planning or *Environmental Assessment* process, or a community plan that includes a comprehensive *Environmental Impact Statement*.

Conservation of land means the protection, preservation, management, or restoration of lands within the *watershed ecosystem*.

Create in the context of *wetland*s means the *Development* of a *wetland* through the manipulation of physical, chemical, or biological characteristics where a *wetland* did not previously exist.

Creek means a natural *stream* of water normally smaller than and often tributary to a *river*.

Cumulative Effects means the combined effects of all activities in an area over time and the incremental effects associated with individual project in an area over time.

Cut and Fill Balance means all *fill* placed at or below the flood elevation is balanced with an equal amount of soil material removal within a defined reach of a *watercourse*.

Dam means a structure or work holding back or diverting water and includes a dam, tailings *dam*, dyke, diversion, channel, artificial channel, culvert or causeway (Lakes and Rivers Improvement Act, R.S.O. 1990 c. L3, s. 1)

Development means:

- the construction, reconstruction, erection or placing of a building or structure of any kind,
- 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 unit*s in the building or structure,
- site grading, or
- the temporary or permanent placing, dumping or removal of material, originating on the site or elsewhere.

Drainage Area means, for a point, the area that contributes runoff to that point.

Dug-out or Isolated Ponds mean anthropogenic waterbodies that are created by excavating basins with no inlet or outlet channels and in which surface and ground water collect.

Dwelling unit means a *suite* operated as a housekeeping unit, used or intended to be used as a domicile by one or more persons and usually containing cooking, eating, living, sleeping and sanitary facilities.

Ecological function means the natural processes, products or services that living and non-living environments provide or perform within or between species, *ecosystem*s and landscapes. These may include biological, physical and socio-economic interactions.

Ecosystem means systems of plants, animals and micro-organisms together with non-living components of their environment, related ecological processes and humans.

Effective Flow Area means that part of a *river*, *stream*, *creek* or *watercourse* where there are significant flow velocities and most of the flow discharge is conveyed.

Enclosure means a pipe or other conduit for carrying a *creek*, *stream* or *watercourse* underground.

Endangered Species means any indigenous species of fauna or flora which on the basis of the available scientific evidence is facing imminent extinction or extirpation.

Enhance in the context of *wetland*s means the altering of an existing functional *wetland* to increase or improve selected functions and benefits.

Environmental Assessment means a process that is used to predict the environmental, social and economic effects of proposed initiatives before they are carried out. It is used to identify measure to mitigate adverse effects on the environment and can predict whether there will be significant adverse environmental effects, even after the mitigation is implemented.

Environmental Impact Statement (EIS) means a report prepared to address the potential impacts of *development* or *interference* on natural features and *ecological function*s. There are three types:

- a *Comprehensive EIS* is a landscape scale, *watershed* or sub*watershed* study which sets the width of setbacks and offers guidance for the investigation, establishment and maintenance of buffers.
- a *Scoped EIS* is an area or site-specific study that addresses the potential negative impacts to features described previously in a comprehensive study.
- a *Full EIS* is an area or site-specific study prepared, in the absence of a comprehensive study to address possible impacts from a *development*. Due to the lack of guidance from a comprehensive study, the full EIS is typically much more detailed than a scoped study, and will also include statements to address possible negative impacts at a regional scale.

Existing Use means the type of activity associated with an existing building or structure or site on the date of a permit application.

Factor of Safety means the ratio of average available strength of the soil along the critical slip surface to that required to maintain equilibrium. The design minimum factors of safety are provided by the Ministry of Natural Resources and Forestry Technical Guide for River and Stream Systems (2002). The higher factor of safety is used in complex geotechnical conditions or where there are g*eologically metastable materials*.

Land-Uses	Design Range in Factor of Safety
Passive: no buildings near slope: farm field; bush; forest; timberland; and woods.	**1.10**
Light: no habitable structures near slope: recreational parks; golf courses; buried small utilities; tile beds; barns; garages; swimming pool; sheds; satellite dishes; and dog houses.	**1.20 to 1.30**
Active: habitable or occupied structures near slope: residential, commercial and industrial buildings; retaining walls; decks; stormwater management facilities; and, storage/warehousing of non-hazardous substances.	**1.30 to 1.50**
Infrastructure and Public Use: public use structures or buildings (i.e. hospitals, schools, stadiums); cemeteries; bridges; high voltage power transmission lines; towers; storage/warehousing of hazardous materials; and, waste management areas.	**1.40 to 1.50**

Fill means any material used or capable of being used to raise, lower or in any way affect the contours of the ground, whether on a permanent or temporary basis, and whether it originates on the site or elsewhere.

Flood Fringe means the outer portion of the *floodplain* between the *floodway* and the *Riverine Flooding Hazard* limit where the depths and velocities of flooding are less severe than those experienced in the *floodway*.

Floodproofing means structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structures or properties to protect them from flood damage.

Floodway for river, *stream*, *creek*, *watercourse* or inland lake systems means the portion of the floodplain where *development* would cause a danger to public health and safety or property damage.

- where the one-zone concept is applied, the *floodway* is the entire contiguous floodplain.
- where the two-zone concept or *special policy area* concept is applied, the *floodway* is the contiguous inner portion of the floodplain, representing that area required for the safe passage of flood flow and/or that area where flood depths and/or velocities are considered to be such that they pose a potential threat to life and/or property damage. Where the two-zone concept or *special policy area* applies, the outer portion of the *floodplain* is called the *flood fringe.*

Frequent Flooding means that a site is subject to the 1:25 year flood event or a more regular flood event.

Geologically Metastable Material means a material susceptible to earth flow or where low safety factors may lead to creep movements and progressive softening.

Groundwater Discharge means the flow of water from an *aquifer*. Discharge areas are locations at which ground water leaves the *aquifer* and flows to the surface. Ground water discharge occurs where the water table or *potentiometric surface* intersects the land surface. Where this happens, **springs** or **seeps** are found. Springs and seeps may flow into fresh water bodies, such as lakes or *stream*s, or they may flow into saltwater bodies.

Groundwater Recharge means downward movement of water through the soil to the groundwater or the process by which external water is added to the zone of saturation of an *aquifer*, either directly into a formation or indirectly by way of another formation. Most areas, unless composed of solid rock or covered by *development*, allow a certain percentage of total precipitation to reach the water table. The sustainable yield of an *aquifer* is mainly controlled by the amount of recharge it receives. If total

discharges (natural discharge plus water use from human activities) exceed recharge, water levels in an *aquifer* will decline. This decline will continue until a new balance is reached between total discharge and recharge, or the *aquifer* becomes depleted to the point where further withdrawals are no longer feasible.

Quantifying recharge is not easy, because it depends on a number of variables including:

- soil type
- geology and hydrogeology
- precipitation (including amount, type, and melt rate for snow)
- prior soil moisture conditions
- runoff
- topography
- evapotranspiration.

For a given climatic condition, recharge is much higher in areas of coarse sands and gravels than in areas of low-permeability clays.

Habitable Floor Space means any area that has the potential to be used as or converted to residential living space, including basements.

Hazardous Land means land that could be unsafe for *development* because of naturally-occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock.

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

Headwater means the source and extreme upper reaches of a *river*, *creek*, *stream* or *watercourse*.

Hydrologic Function means the functions of the hydrologic 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.

Hydrologic Study means a report prepared to address the potential impacts of *development* and interference on the *hydrologic function*s of a *wetland* or other natural feature.

Karst means an area of irregular limestone in which erosion has produced fissures, sinkholes, underground *stream*s, and caverns.

Lake Erie Dynamic Beach Hazard means that portion of the Lake Erie shoreline where accumulated unconsolidated sediment continuously moves as a result of naturally occurring processes associated with wind and water and changes in the rate of sediment supply. The extent of the *dynamic beach hazard* is defined as the extent of the *flooding hazard* plus an allowance as identified in the *Lake Erie Shoreline Management Plan*.

Lake Erie 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 one hundred year time span), an allowance for slope stability, plus a 15 metre allowance.

Lake Erie Flooding Hazard means the inundation, under the 100 year flood including *wave uprush* and *other water-related hazards.*

Meander Belt means the area of land in which a *watercourse* channel moves or is likely to move over a period of time.

Meander Belt Allowance means a limit for *development* within the areas where the *river* system is likely to shift. It is based on twenty (20) times the bankfull channel width where the bankfull channel width is measured at the widest *riffle* section of the reach. A *riffle* is a section of shallow rapids where the water surface is broken by small waves. The *meander belt* is centred over a *meander belt axis* that connects the *riffle* section of the *stream*.

Meander Belt Axis means the line or "axis" that the *meander belt* is centred over which connects all the *riffle* sections of a *stream*.

Multi-lot means four lots or more.

Multi-unit means any building or structure or portion thereof that contains more than one unit for any use (e.g. a residential *dwelling unit*, an industrial/commercial/institutional space designed or intended to be occupied or used for business, commercial, industrial or institutional purposes).

Negligible means not measurable or too small or unimportant to be worth considering.

Non-Apparent Valley or Unconfined Valley means that part of the *valleyland* system where a *river*, *creek*, *stream* or *watercourse* is not contained within a clearly visible valley section.

One Hundred Year Erosion Rate means the predicted lateral movement of a *river*, *creek*, *stream* or *watercourse* or inland lake over a period of one hundred years.

Other Water-Related Hazards means water-associated phenomena other than *flooding hazards* and *wave uprush* which act on shorelines. This includes, but is not limited to ship-generated waves, ice piling and ice jamming.

Oversteepened Slope means a slope which has a slope inclination equal to or greater than 33 $^{1}/_{3}$ per cent (3H:1V).

Pollution means any deleterious physical substance or other contaminant that has the potential to be generated by *development*.

Potentiometric Surface means the potential level to which water will rise above the water level in an *aquifer* in a tightly cased well that penetrates a confined *aquifer*; if the potential level is higher than the land surface, the well will overflow**.**

Protect in the context of *wetland*s, means the preservation of *wetland*s in perpetuity through implementation of appropriate physical and/or legal mechanisms (e.g. ecological buffers, *development* setbacks, zoning, fencing, conservation easements, etc.).

Protection Works means structural or non-structural works which are intended to appropriately address damages caused by flooding, erosion and/or *other water-related hazards*.

Qualified Professional means a person with specific qualifications, training, and experience authorized to undertake work in accordance with the policies in *accepted engineering* or *scientific principles*, provincial standards, criteria and guidelines, and/or to the satisfaction of the GRCA.

Regulated Area means the area encompassed by all hazards and *wetland*s, plus any allowances.

Regulatory Flood means the inundation under a flood resulting from the rainfall experienced during the Hurricane Hazel storm (1954) or in limited situations in *headwater stream*s, the 100 year flood, wherever it is greater, the limits of which define the *riverine flooding hazard.*

Replacement means the removal of an existing building or structure and the construction of a new building or structure. *Replacement* does not include reconstruction on remnant foundations or derelict or abandoned buildings or structures.

Restore in the context of *wetland*s means the re-establishment or rehabilitation of a former or degraded *wetland* with goal of returning natural or historic functions and characteristics that have been partially or completely lost by such actions as *filling* or draining.

Riffle means a section of shallow rapids where the water surface is broken by small waves.

Riparian Vegetation means the plant communities in the *riparian zone*, typically characterized by hydrophilic plants.

Riparian Zone means the interface between land and a flowing surface water body. Riparian is derived from Latin *ripa* meaning river bank.

River means a large natural *stream* of water emptying into an ocean, lake, or other body of water and usually fed along its course by converging tributaries.

Riverine Erosion Hazard means the loss of land, due to human or natural processes, that poses a threat to life and property. The *riverine erosion hazard* limit is determined using considerations that include the 100 year erosion rate (the average annual rate of recession extended over a one hundred year time span), an allowance for slope stability, plus a 15 metre allowance or, in unconfined systems, the *meander belt allowance* plus a 15 metre allowance.

Riverine Flooding Hazard means the inundation, under a flood resulting from the rainfall experienced during the Hurricane Hazel storm (1954) or in limited situations in headwater streams, the 100 year flood, wherever it is greater.

Riverine Hazard Limit means the limit which encompasses the *flooding* and *erosion hazards* and the river, *creek*, *stream* or *watercourse*.

Safe Access means locations where during the *Regulatory Flood*, the flow velocity does not exceed 1.7 m/s, the product of depth and velocity does not exceed 0.4 m^2/s, the depth of flooding along *access* routes to residential units does not exceed 0.8 metres or 1.2 metres along access routes to commercial or industrial buildings or structures, and the depth of flooding adjacent to residential units does not exceed 1.2 metres or 2.0 metre adjacent to commercial or industrial buildings or structures.

Settlement Area means urban areas and rural settlement areas within municipalities (such as cities, towns, villages and hamlets) that are:

- built up areas where *development* is concentrated and which have a mix of land uses; and,
- lands which have been designated in an official plan for *development* over the long term planning horizon.

Significant Natural Features means features and areas including all *wetland*s, fish habitat, *valleyland*s, habitat of *endangered species*, *significant wildlife habitat*, confirmed habitat for provincially or regionally significant species, part of an ecologically functional corridor or linkage between natural areas, or any other features or areas that are considered ecologically important in terms of contributing to the quality and diversity of an identifiable geographic area or natural heritage system.

Significant Wildlife Habitat means locations which include:

- seasonal concentrations of animals,
- rare vegetation communities or specialized habitats for wildlife,
- habitats of species of conservation concern (excluding habitats of endangered and threatened species), and
- wildlife movement corridors.

Special Policy Area means an area within a community that has historically existed in the floodplain and where site-specific policies, approved by the Ministers of Natural Resources and Forestry, Municipal Affairs and Housing, GRCA and the municipality 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 the provincial policies concerning *development*. The Province establishes the criteria and procedures for approval.

A *Special Policy Area* is not intended to allow for new or intensified *development*, if a community has feasible opportunities for *development* outside the floodplain.

Stage-Storage Discharge Relationship means the relationship of flood storage and flood elevation values at various flood flow rates within a particular *watercourse*/floodplain reach. This relationship is used as a factor to determine whether the hydraulic function of the floodplain is preserved.

Stream means a flow of water in a channel or bed, as a brook, rivulet, or small river.

Thermal Impact means the impairment of water quality through temperature increase or decrease. Changes in temperature can also effect species composition of plants, insects and fish in a water body.

Toe of Slope means the lowest point on a slope, where the surface gradient changes from relatively shallow to relatively steep.

Top of Slope means the point of the slope where the downward inclination of the land begins, or the upward inclination of the land levels off. This point is situated at a higher topographic elevation of land than the remainder of the slope.

Valleyland means land that has depressional features associated with a *river* or *stream*, whether or not it contains a *watercourse*.

Watercourse means an identifiable depression in the ground in which a flow of water regularly or continuously occurs.

Watershed means an area that is drained by a *river* and its tributaries.

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.

Wetland means land that:

- is seasonally or permanently covered by shallow water or has a water table close or at the surface
- directly contributes to the hydrological function of a *watershed* through connection with a surface *watercourse*,
- has hydric soils, the formation of which have been caused by the presence of abundant water, and
- 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 *wetland* characteristics

11 Links to Key References

Provincial Legislation and Regulations – www.e-laws.gov.on.ca

Federal Legislation and Regulations - http://laws.justice.gc.ca/en/

Conservation Authorities Act – http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90c27_e.htm

Ontario Regulation 150/06 – http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_060150_e.htm

Provincial Policy Statement - http://www.mah.gov.on.ca/Page215.aspx