



# Development, Interference with Wetlands and Alteration to Shorelines and Watercourses

## Regulation Policies

Adopted by MVCA Board of Directors  
Updated September 2019



## **Notes to Readers**

This document was prepared under direction of the Board of Directors of Mississippi Valley Conservation Authority (MVCA) to provide clarification and consistency in the implementation of Ontario Regulation 153/06, *MVCA's Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation*, adopted pursuant to S. 28 of the Conservation Authorities Act of Ontario. It received approval from the Board of Directors on February 18, 2015.

A definition is provided in Appendix A for all of those terms and phrases that appear throughout this document in normal (not bold) italics.

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## **1.0 Background**

In Ontario, water and related land management are the responsibility of Conservation Authorities working in partnership with municipalities. A principal mandate of Conservation Authorities is to prevent the loss of life and property due to flooding and erosion, and to conserve and enhance natural resources. The Development, Interference with Wetlands & Alterations to Shorelines & Watercourses Regulation is a key tool in fulfilling this mandate because it allows the Conservation Authority to regulate development in areas where the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected.

MVCA's authority to implement the Development Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation is provided under Section 28 of the Conservation Authorities Act. There are a number of other provincial acts and related regulations and policy statements which deal with planning, development and activities associated with water resources. They include among others: the Planning Act, the Building Code Act, the Public Lands Act, the Lakes and Rivers Improvement Act, the Ontario Water Resources Act, and the Drainage Act. Policies and regulations made by the Conservation Authority do not take precedence over the regulations or policy statements made under these acts or any other regulations. As such, recommendations or approvals granted by the Mississippi Valley Conservation Authority, under the following policies, do not preclude compliance with any other applicable regulations or agency requirements.

### **1.1 Conservation Authorities Act**

The Conservation Authorities Act was originally created in 1946 in response to emergency situations and land conservation problems resulting from flooding and erosion. The Act recognizes that these and other natural resource initiatives are most effectively managed on a watershed basis. The Act provides Conservation Authorities with the legislative responsibility to regulate certain development activities in and adjacent to watercourses (including valley lands), wetlands, shorelines of inland lakes and hazardous lands (unstable soils and bedrock). The development activities that are subject to the regulation are described in Section 3.3 In general, permits (permissions) may be granted where, in the opinion of the CA, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land is not affected.

Mississippi Valley Conservation Authority adopted its first "Fill, Construction and Alteration to Waterways" Regulation in 1988. In the late 1990's, as part of the Red Tape Reductions Act initiative, the provincial government undertook a review of the Conservation Authorities Act and its associated Section 28 regulations. While the Red Tape Reductions Act was primarily aimed at streamlining and bringing clarity and consistency to existing provincial government acts and regulations, another key objective was to maintain and improve upon legislation that protects public health, safety and the environment.

Revisions to the Conservation Authorities Act were approved by the Ontario Legislature in December 1998. The revisions to the act brought about changes in a both what and where

Conservation Authorities can regulate, by providing more concise and broadened definitions for identifying flood and erosion susceptible areas and by expanding the regulated areas to include wetlands. A new process for approving and amending Conservation Authority Section 28 Regulations was also introduced. While traditionally, Section 28 regulations described regulated activities in terms of "fill, construction and alteration to waterways", the regulated activities are now phrased in terms of "development, interference with wetlands and alterations to shorelines and watercourses". The Fill, Construction and Alteration to Waterways Regulation, was amended and renamed the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation, Ontario Regulation 97/04.

## **1.2 Planning Act and Provincial Policy Statement (PPS)**

The Provincial Policy Statement (PPS) 2014 provides policy direction on matters of provincial interest related to land use planning and development. The Provincial Policy Statement (PPS) is referenced when a Planning Act application such as a severance, a plan of subdivision or a zoning by-law or official plan amendment is considered. It provides guidance on planning matters related to Natural Hazards and Natural Heritage as well as other planning matters of provincial interest. The PPS states that development shall generally be directed to areas outside hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards. It also directs that development shall not be permitted within *provincially significant wetlands*, and that development may only be permitted on lands adjacent to the wetland where it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Section 3 of the Planning Act requires that a decision of the council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, including the Municipal Board, in respect of the exercise of any authority that affects a planning matter "shall be consistent" with the policy statement. It also requires that comments, submissions or advice that affect a planning matter that are provided by the council of a municipality, a local board, a planning board, a minister or ministry, board, commission or agency of the government "shall be consistent with" the policy statement.

## **1.3 Relation of Regulation to Planning Act and PPS**

The following regulation policies have been developed to reflect the intent of the PPS and other related provincial and municipal guidelines and policies. It is the Authority's intent to administer this regulatory program in a manner that is consistent with the Provincial Policy Statement of 2014 and compatible with municipal requirements related to the undertaking of development adjacent to the shorelines of lakes, rivers and streams.

Staff responsible for the Section 28 applications must note that the principle of development will be established through prior approval of related planning applications where necessary, in advance of Section 28 approval from MVCA. The principal of development is established through the Planning Act approval process, whereas the CA permitting process provides for technical implementation of matters pursuant to Section 28 of the CA Act. Concerns regarding

the principle of development should be conveyed to the municipality/ planning approval authority during the Planning Act approvals process and are not normally addressed through the CA permitting process. Conversely, municipalities in their planning approval role should recognize that the principle of development should be addressed first through the Planning Act process. Landowners who are interested in undertaking development activities that may be subject to the CA Regulations should first review and address the requirements for any approvals under the Planning Act.

It should be noted that approval of any work under the Regulation does not exempt the landowner/applicant from obtaining other necessary permits from other approval bodies or individuals, public or private.



## **2.0 Program Objectives**

In implementing the policies of this document, the Authority will provide an objective, impartial and consistent review of all applications submitted under the regulation. The objectives of the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" Regulation program are to:

- a) Prevent loss of life as a result of flood or erosion hazards.
- b) Minimize property damage and social disruption resulting from flooding or erosion.
- c) Minimize public and private expenditure for emergency operations, evacuation, disaster relief and restoration.
- d) Prevent hazardous development within flood plains, flood and erosion susceptible shorelines and unstable slopes which in the future years may require expensive protection measures.
- e) Ensure that development does not increase risks to upstream and downstream landowners.
- f) Prevent the filling and/or draining of natural storage areas, and development that may limit flood plain storage capacity, increase flood elevations and/or decrease slope stability.
- g) Prevent pollution or other degradation of rivers and other water bodies, and existing and potential aquifer and aquifer recharge areas where the location of such resources is known.
- h) To apply this regulation in a manner that complements the Ontario government's "Provincial Policy Statement" made under the authority of section 3 of the Planning Act (as approved by the Lieutenant Governor in Council) as well as their attendant Implementation and Technical Guidelines.

## **3.0 Section 28 Regulations**

### **3.1 Powers Under Section 28 Regulation**

Conservation Authorities powers under the regulation include the ability to:

- a) Prohibit, regulate or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland.
- b) Prohibit, regulate or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development. (Conservation Authorities Act, R.S.O. 1990 Chapter 27, S. 28)

### **3.2 Areas Subject to the Regulation**

The regulation applies to the following:

**(i) Hazardous Lands:**

As defined under the Conservation Authorities Act, hazardous land means lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock.

In accordance with the “Mississippi Valley Conservation - *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation (Generic Regulation) Implementation Policy (Approved by the Board of Directors on November 10th, 2005)*, under this regulation, MVCA will regulate development in hazardous lands where there is engineered flood plain mapping. The extent of regulated area associated with hazardous lands is identified by a Regulation Limit. The Regulation Limit has been mapped for all watercourses in MVCA's watershed for which engineered flood plain mapping is available as listed in Appendix B.

**(ii) Wetlands:**

Under this regulation, MVCA will regulate development in and adjacent to all provincially significant wetlands.

As defined under Section 28 of the Conservation Authorities Act, a “wetland means land that:

- a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface;
- b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse;

- c) has hydric soils, the formation of which has been caused by the presence of abundant water; and
- d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d). ("terre marécageuse") 1998, c. 18, Sched. I, s. 12."

The regulation applies to development activities, as defined in Section 3.3 that may result in interference with the hydrologic functions of a wetland.

**(iii) Shorelines and Watercourses:**

This component of the regulation applies to all watercourses or parts of watercourses including lake shorelines within the Mississippi Valley Conservation watershed. These areas are not required to be defined through mapping or schedules.

### **3.3 Activities Subject to the Regulation**

Mississippi Valley Conservation Authority regulates the following activities:

**(i) Development**

Development activities are regulated in all hazardous lands, wetlands and lands adjacent to wetlands as delineated by the Regulation Limit and are shown on map schedules prepared by the Authority. The Regulation applies to the following development activities as defined under the Conservation Authorities Act:

- a) the construction, reconstruction, erection or placing of a building or structure of any kind;
- b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;
- c) site grading; or
- d) the temporary or permanent placing, dumping or removal of any material, origination on the site or elsewhere. (*Conservation Authorities Act, R.S.O. 1990 Chapter 27, S. 28*)

**(ii) Alterations to Shorelines and Watercourses**

Activities that are regulated include straightening, changing, diverting or interfering with the existing channel of a river, creek, stream or watercourse.

**(iii) Interference with Wetlands**

Interference with wetlands includes any development activities as listed above that may result in impacts to the hydrologic or hydrogeologic function of the wetland.

## **4.0 Section 28 Policies**

### **4.1 General Policies Regarding Implementation/Interpretation**

The implementation of this policy document will be guided by the following general policies:

- (i) Development activity will not be undertaken in a regulated area without written permission from the Authority with the exception of the activities specifically identified under Section 5.1 that are deemed to have permission by the approval of these policies by the MVCA Board of Directors, as specifically identified under Section 5.1.
- (ii) Where the regulated lands contain more than one regulated feature (i.e. part of a Provincially Significant Wetland that is also within the regulatory flood plain), the more restrictive policies will apply.
- (iii) The Appendices form part of the policies of this document.

**Note:** *With the exception of works falling under Section 10.0 (Alterations to Shorelines and Watercourses), where feasible, with the exception of watercourse alterations, the Authority will encourage the implementation of a minimum setback of 30 metres from the high water mark of any watercourse or wetland for new (constructed and/or hardened) development. Exceptions may be considered on a site-specific basis in areas of existing development, where the works will not encroach into the setback any further than the existing building/structure and where because of the size, configuration and physical layout of the property, no other alternative exists. Additional setbacks may be required as per other agency approvals, by-laws, regulations or guidelines.*

## **5.0 Hazardous Lands - General Policies**

As defined under the *Conservation Authorities Act*, hazardous land means lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock. The following policies generally apply to all flood and/or erosion prone lands that are subject to this regulation. Additional policies for new and existing development are presented for each classification of hazard land further on in this document. The policies under this section do not apply to wetlands (See Section 9 for wetland policies).

### **Consistency with Provincial Policy Statement**

These policies are intended to be consistent with the Section 3.1 of the Ontario government's "Provincial Policy Statement" issued under Section 3 of the Planning Act on March 1, 2005 and the "Technical Guide: River & Stream Systems Planning Policy Statement - Implementation Guidelines" (M.N.R., 2002). MVCA staff may also refer to the Technical Guide for guidance on more specific matters that may arise through the implementation of these policies.

### **5.1 Activities Deemed to Have Permission By Approval of These Policies**

- (i) The policies under this section do apply to regulated areas associated with wetlands. (See Section 9 for wetland policies)
- (ii) The following activities or works that are passive in nature and would not pose a threat to public safety if subject to flooding or erosion may be permitted within the Regulation Limit and by the approval of this policy document have the permission of Authority under Section 28 of the *Conservation Authorities Act*:
  - a) Passive non-structural activities involving no grading or alteration to the landscape, such as public or private recreation areas, agricultural crop land, or grazing.
  - b) Small Accessory Structures - non-habitable accessory structures with a gross floor area less than 10 square metres, but the Authority encourages that a minimum 7.5 m setback from the top of slope or the toe of a valley slope and/or a 15 m setback from the channel bank of any watercourse is maintained.
  - c) Fencing is considered exempt from permission required under the Section 28 regulation. However, where fencing is required in a regulated area where it could aggravate potential flood or erosion hazards, MVCA will recommend that the fencing is constructed in such a manner that it will not impede the conveyance of flow and will limit the potential for collection of debris during high flow/flooding events. Stone or concrete walls are not included under this exemption.
  - d) Minor Fill Placement - A onetime placement of fill, less than or equal to 10 m<sup>3</sup> in volume provided the following criteria are met:

- a minimum setback of 7.5 m from the top of slope and a minimum setback of 15 m from the channel bank of any watercourse, is maintained:
  - the filled and re-graded area is immediately stabilized: and
  - the fill does not have an effect on Regulatory Flood elevations as demonstrated to the satisfaction of the Authority.
- e) Resurfacing of existing driveways and parking lots, where the final grade is within 50 mm of the existing grade.
- f) The repair of an existing foundation.
- g) Floating docks or docks supported by pipes or stilts (less than 15 centimeters in diameter).
- h) Other minor *development* activities that, based on the size and scale of the proposal and the specific site conditions, the authority determines will not result in a negative impact to flood, erosion or the conservation of land.

## 5.2 Prohibited Uses

- (i) Due to potential public safety concerns, the following uses, will be prohibited within the regulatory flood plain, the *stable slope limit* and the erosion hazard limit:
- a) uses associated with the manufacture, collection, storage, disposal, and/or consumption of hazardous substances that may pose an unacceptable threat to public safety if they were to escape their normal containment/use as a result of flooding, failure of flood-proofing and/or protection works and/or erosion;
- b) institutional and associated uses such as hospitals, nursing homes, pre-schools, day cares and schools, which may pose a significant threat to the safety of the inhabitants if involved in an emergency evacuation situation as a result of flooding, failure of flood-proofing and/or protection works, and/or erosion;
- c) uses associated with essential services such as those provided by fire, police and ambulance stations and electrical substations that may be impaired during a flood emergency as a result of flooding, failure of flood-proofing, and/or protection works;
- d) new stormwater management facilities

### 5.3 General Policies for Fill Placement, Excavation and Lot Grading

Activities subject to this section include but are not limited to placement of fill, excavations, stockpiling, site grading, the installation of sewage disposal systems, and other grade altering activities. The following policies apply to fill placement, excavation and lot grading where permitted by other policies within this document.

- (i) Fill placement may be considered on flood plain lands only if flood plain storage volume impacts are addressed and upstream and downstream water levels and/or flow velocities related to increased flood risk or damage are unaffected. An acceptable hydraulic analysis may be required, at the discretion of the Authority, to ensure that these matters have been addressed.
- (ii) Fill placement, excavation and lot grading activities must not adversely affect the flood and/or erosion susceptibility of buildings or properties located at the fill site, or upstream or downstream of the fill site.
- (iii) Only clean fill may be placed.
- (iv) Controls will be required to ensure that sediment transport from the fill site into adjacent watercourse, wetlands and other water bodies shall not occur. These controls must be in place before and during construction and until the site is permanently stabilized.
- (v) For regulated areas in which fill placement, excavation or lot grading activities could result in slope instability, geotechnical analysis may be required at the landowner/applicant's expense.
- (vi) Permitted fill placement, excavation and lot grading activities may be seasonally restricted and subject to a specified time frame.
- (vii) Upon completion of a permitted fill placement, excavation and lot grading activities, the landowner/applicant may be required to submit a plan to the Authority showing that finished grades are in accordance with the grading plan approved by the Authority. This plan shall be prepared and certified by a Professional Engineer or Ontario Land Surveyor and must be referenced to geodetic datum. The submission must be received within 30 days following completion of the fill operation.
- (viii) Fill placement, excavation and lot grading activities will not be permitted where it may result in pollution and/or adversely affect conservation of land.
- (ix) The authority may waive any of the above requirements where there will clearly be no detrimental effects on the control of flooding, pollution or the conservation of land.



- (x) Filling fill placement, excavation and lot grading activities for septic systems must be limited to the required area and depths as specified by the approving agency under Part 8 of the Ontario Building Code (OBC).
- (xi) Under certain circumstances an incrementally balanced cut and fill may be considered according to the guidelines set out under Appendix D.
- (xii) Fill imported on site for grading, backfilling, flood proofing or road construction may require confirmation for suitability by a Professional Engineer or a Professional Geoscientist licensed in the Province of Ontario.

# 6.0 Flood Plain Policies

## 6.1 General Flood Plain Policies

- (i) The limits of the regulatory flood plain are defined by the 100 year flood level.
- (ii) With the exception of those areas subject to the policies under 6.1(iii) and 6.3, the flood plain shall consist of one zone defined by the Regulatory Flood Standard. Where the one zone concept is applied, the entire flood plain is treated as floodway (Figure 1.)

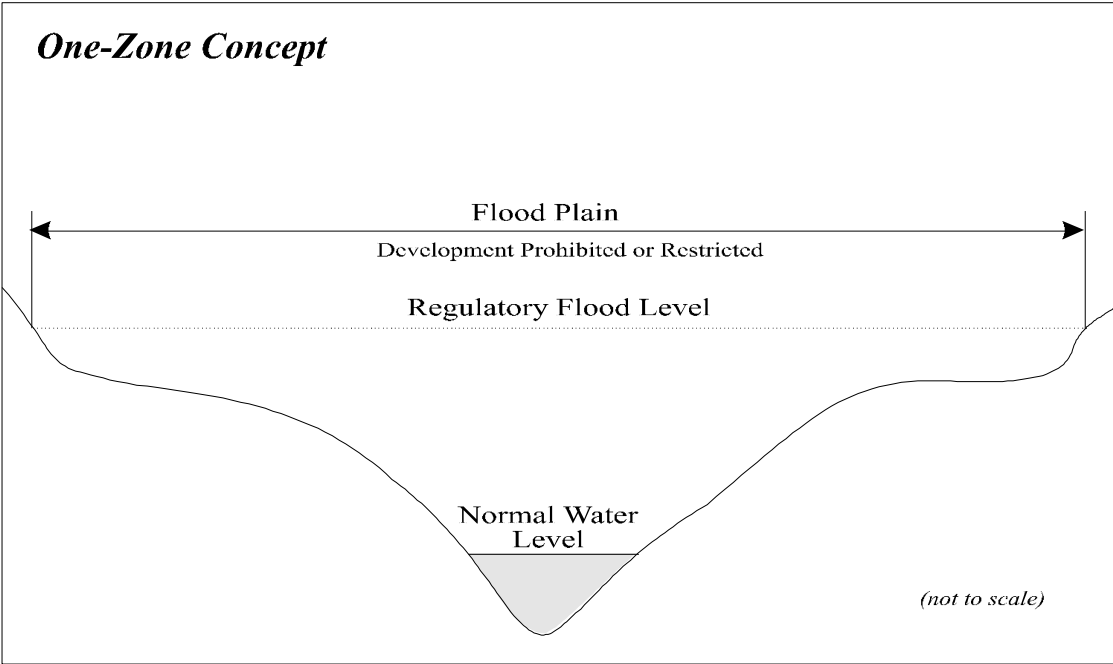


Figure 1. One-Zone concept flood plain and regulatory flood levels

- (iii) The two-zone (floodway-flood fringe) concept shall be applied only in specific areas where it has been adopted by the Conservation Authority, in cooperation with the member municipality. The areas where the two-zone concept has been adopted are described in Appendix E.
- (iv) For proposals involving a building, where the exterior wall or a portion of that wall abuts the limit of the regulatory flood plain or a portion of the building encroaches into the flood plain the following shall apply:
  - a) Where the existing grades are such that the structure would be subject to greater than 0.3 m (1 ft) depth of flooding during a 1:100 year flood event or more than 50% of the existing footprint is in the floodplain, the structure will be considered as flood susceptible and the flood plain policies under Section 6 of this document shall apply.

- b) Where the existing structure would be subject to less than 0.3 m (1 ft) depth of flooding during a 1:100 year flood event and less than 50% of the existing footprint is in the floodplain, the Authority may consider permitting expansions, enlargement or redevelopment of the existing structure in accordance with the policies under 6.3.3, 6.3.4, 6.3.5 and 6.3.6.

### 6.1.1 Agricultural Uses

- (i) Within the flood hazard limits (regulatory flood plain and associated regulation limits), the use of land for ongoing cropland, grazing, orchards and nurseries, and associated activities such as plowing and fencing, are not considered *site alterations*.
- (ii) The construction of farm buildings (excluding residences, commercial greenhouses and large-scale enclosed livestock facilities) may be considered within the flooding hazard limit, where there is no reasonable site for the proposed works outside of the flooding hazard limit and where the buildings will be floodproofed.

### 6.1.2 Parking Lots, Driveways and Roads

- (i) A parking lot, driveway or road may be permitted within the flood hazard limits (regulatory flood plain and associated regulation limits) subject to the following criteria:
  - a) where the floodplain is within an *apparent valley*, a parking lot, driveway or road is permitted only within a property containing existing development where there is acceptable access to the site;
  - b) where the floodplain is within a *non-apparent valley*, the parking lot, driveway or road must be located outside of the *meander belt allowance*;
  - c) the existing pre-development grade is not more than 0.3 metres below the regulatory flood elevation;
  - d) the parking lot, driveway or road is designed to account for access and egress under regulatory flood conditions;
  - e) driveways and access routes to access high points of land completely surrounded by the Regulatory flood plain within flood susceptible properties shall not be permitted;
  - f) to minimize the amount of fill and grading used in the construction of the parking lot, driveway or roadway, the Authority will require at-grade construction wherever feasible.

## 6.2 Floodway Policies

The policies under this section apply to:

- a) The entire flood plain in all areas where the *One-Zone concept* is applied.
- b) The *floodway*, as defined in Appendix A, in all areas where the *Two-Zone concept* is applied (Appendix E).

### 6.2.1 Fill and Lot Grading in the Floodway

Excessive filling in the flood plain can result in negative impacts on water flow and storage capacity of the flood plain which can cause or increase flooding and/or erosion on other nearby properties. Excessive filling in the flood plain can also cause sedimentation which can impact water quality. To prevent these negative impacts, fill placement and lot grading activities within the floodway are generally restricted to what is required for floodproofing purposes. The placement of excessive fill for landscaping purposes is generally not permitted.

In addition to policies 5.3, proposals involving fill and/or lot grading in the floodway shall be subject to the following:

- (i) Fill and lot grading activities shall not be permitted within a floodway except as permitted under, or in association with, the following policies.
- (ii) Minor site grading, without the introduction of new material, may be permitted provided there is no change in the flood-fringe or floodway designation. A vegetated buffer in the near shore riparian area must be maintained or established.
- (iii) Fill placement and lot grading may be permitted for flood-proofing purposes to the minimum amount required in accordance with guidelines under Appendix C in relation to constructed development as permitted in accordance with the policies under Section 6.2.3 (minor additions) and Sections 6.2.6 and 6.2.7 (replacement buildings).
- (iv) Fill placement and lot grading may be permitted and site-servicing works including access as permitted under Section 6.1.2 (see floodproofed access requirements under Appendix C) or the replacement of a sewage disposal system if an alternative site outside of the flood plain does not exist.
- (v) Fill placement and lot grading for septic systems shall be limited to the required area and depths as specified by the septic system approval agency.
- (vi) The placement of fill at the shoreline for shoreline stabilization and/or erosion control purposes may be permitted in accordance with the policies under Section 10.

## 6.2.2 New Buildings

- (i) New buildings (including residential, commercial, industrial and institutional uses) shall not be permitted in the floodway except as permitted under Section 6.2.9, 6.2.10, and 6.2.14.

## 6.2.3 Minor Additions to Existing Buildings

- (i) An enclosed minor addition onto an existing building may be permitted in any part of the flood plain including the floodway where it can be demonstrated that:
  - a) the size of the addition does not exceed 20% of the gross floor area of the existing building 20 square metres (215 square feet), whichever is lesser;
  - b) the number of *dwelling units* is not increased;
  - c) all habitable floor space is at or above the existing ground floor elevation, no basement is proposed and any crawl space is non-habitable and designed to facilitate services only in accordance with floodproofing requirements under Appendix C.
- (ii) An addition resulting in an increase of between 20% and 50% in gross floor area but not exceeding 50 square metres (538 square feet) may be permitted in the floodway provided all of the following provisions are met:
  - a) the addition meets the floodproofing provisions outlined in Appendix C; and
  - b) the number of *dwelling units* is not increased;
  - c) access is safe as per Appendix C.2 (Safe Access / Egress).
- (iii) Additions that will result in a cumulative enlargement exceeding i) and/or ii) above, as based on the original gross floor area, shall not be permitted (in the floodway). This will be determined based on the total floor area of all additions constructed after the date that the original MVCA Regulation came into effect on May 15, 1988.
- (iv) Where possible, the addition shall be located outside the flood plain or to the least flood susceptible location within the property.
- (v) Additions that are open and peripheral in nature such as an open deck or carport shall be subject to the policies under Section 6.2.4(attached) and 6.2.11(detached).

Note: In reviewing such applications, MVCA will strive to ensure that the resulting lot coverage meets with the applicable municipal Zoning By-law provisions as established by the specific municipality.

#### 6.2.4 Open Additions (attached)

The following policies apply to any addition designed as an open construction, such as a deck, porch, and carport or above grade patio that is to be attached to an existing structure. For the purposes of these policies, an open structure is defined as a structure with no walls, except for visual partitions and railings, which is constructed on piers or an above-grade foundation, for use as outdoor living area or storage area.

- (i) An open addition onto an existing building maybe permitted in the floodway subject to all of the following criteria:
  - a) the total building area of all attached open structures (existing and new) shall not exceed 20 square metres. Where there are existing open structures attached to the building that already exceed 20 square metres in building area, additional open structure shall not be permitted;
  - b) the structure is properly anchored to the ground to prevent flotation in the event of a flood;
  - c) water storage will not be reduced and flood flows not be impeded;
  - d) it is designed to allow for the free flow of water, under, over and around the structure.
- (ii) The enclosure of an existing open addition shall be treated as a minor addition and shall be subject to the policies of Section 6.2.3. Enclosure is defined as any of the following activities:
  - a) the construction of a foundation under the structure, and/or
  - b) the construction of walls on any side(s) of the structure.
- (iii) The extension of a roof or awning over on open addition is permitted.
- (iv) Open structures that are not attached to the main building are subject to the policies under Section 6.2.10.

### **6.2.5 Major Additions to Existing Buildings**

- (i) The following additions are not permitted in the floodway:
  - a) an addition greater than 50% of the original *gross floor area* of the building, and/or
  - b) an addition that is greater than 50 square metres.
- (ii) All additions constructed after May 15, 1988 will be counted toward the maximum allowable increase in floor area and footprint.

### **6.2.6 Replacement of Buildings Destroyed by Fire or Natural Causes**

Any building located in the flood plain that has been destroyed by forces beyond the owner's control, other than flooding, may be rebuilt provided all of the following criteria are met:

- (i) The former building was in a habitable condition prior to its destruction and the permit application for reconstruction/replacement of the destroyed building is received by Mississippi Valley Conservation Authority within 18 months of the date that the structure was destroyed. Evidence of this must be provided by the landowner/applicant to the satisfaction of the Authority.
- (ii) Buildings located in the floodway will be permitted to be replaced subject to the following:
  - a) the replacement building is designed so that it is not more flood susceptible than the original building (i.e. the floor elevation of the replacement dwelling is at the same elevation or higher than the original building;
  - b) the gross floor area and the footprint of the replacement building is the same or less than the original building;
  - c) the resulting use of the replacement building is the same or a less intensive than the use of the original building; and
  - d) the replacement building contains the same number of, or fewer, dwelling units.
- (iii) Proposals involving the reconstruction of an existing building to a larger size will be subject to the policies for additions under 6.2.3 and 6.2.4.
- (iv) The replacement/reconstruction of a building destroyed as a result of natural flooding from the watercourse will be considered as new construction and the corresponding policies for new buildings shall apply.

The Authority will require, where possible, that the replacement building be floodproofed to the regulatory flood standard or that it be relocated outside the flood plain or to the least flood susceptible location within the property.

### **6.2.7 Replacement/Reconstruction of Existing Buildings**

The following section applies to the voluntary replacement/reconstruction of existing buildings that have not been destroyed by fire or natural causes. This does not apply to derelict abandoned buildings. In reviewing proposals to reconstruct existing buildings located in the *floodway*, it is the Authorities goal to achieve a net gain in terms of reducing the level of risk associated with the development. It is the intent of the Authority to allow the continued existing use of the building provided the following policies are addressed:

- (i) The Authority strongly encourages, where possible, that the replacement building be located outside the flood plain or to the least flood susceptible location within the property.
- (ii) Proposals involving the reconstruction of an existing building to the same or smaller gross floor area and the same or smaller footprint of the original building shall be permitted provided the number of dwelling units is not increased.
- (iii) Proposals involving the reconstruction of an existing building to a larger size will be subject to the policies for additions under 6.2.3, 6.2.4 and 6.2.5.
- (iv) The reconstruction must be floodproofed in accordance with the floodproofing guidelines outlined in Appendix C.
- (v) For buildings that have been demolished prior to the date of submission of the application, the landowner/applicant must provide proof to the satisfaction of the Authority, confirming that the building existed within the 18 months prior to the date of the submission of the application and confirming the gross floor area and location of the building.
- (vi) Permission will not be granted for the reconstruction of derelict abandoned buildings in the floodway.

### **6.2.8 Foundation Reconstruction**

- (i) The construction of a new foundation under an existing building located within the regulatory flood plain may be permitted provided accepted floodproofing and erosion control measures are incorporated into the foundation design.
- (ii) Applications for the construction of a new foundation in combination with the construction of an addition shall also be subject to the applicable policies for additions as set out in this document.



### **6.2.9 Auxiliary Buildings**

- (i) A non-residential auxiliary building with a gross floor area larger than 10 square metres and up to 50 square metres (total of all combined auxiliary structures) may be permitted in the floodway provided that:
  - a) it is located in an area where the depth of flooding does not exceed 0.3 metres and it is firmly anchored to withstand the effects of flooding without structural damage;
  - b) it is floodproofed;
  - c) the building is one storey only and contains no living space;
  - d) the building is detached.
- (ii) Agricultural buildings may be exempt from the above requirements depending on location, use, local conditions, etc. (see also the policies under Section 6.1.1).
- (iii) The Authority will also recommend that where possible, that permitted auxiliary buildings should be located outside the flood plain or to the least flood susceptible location within the property.

### **6.2.10 Open Structures (detached)**

The following policies apply to any stand-alone (detached) structure of open construction, such as a deck, carport, gazebo or picnic shelter.

- (i) For the purposes of these policies, an open structure is defined as a structure with no walls, except for visual partitions and/or railings, for use as outdoor living area, recreational area or storage area.
- (ii) To be considered detached it must be located at least 1.5 metres from the main building. Any open structures within 1.5 metres of a building shall be considered attached and shall be subject to the policies under Section 6.2.4.
- (iii) An open structure may be permitted in the floodway provided the following policies are met:
  - a) the primary use is already established on the property (ex. there is already a dwelling on the property);
  - b) the total building area of all detached open structures (existing and new) shall not exceed 20 square metres;

- c) the structure is properly anchored to the ground to prevent flotation in the event of a flood;
  - d) the structure is designed to allow for the free flow of water, under, over and around the structure; and
  - e) water storage will not be reduced and flood flows not be impeded.
- (iv) The enclosure of an existing open structure shall not be permitted. Enclosure includes the following activities:
- a) the construction of a foundation under the structure, and/or
  - b) the construction of walls on any side(s) of the structure.
- (v) The construction/installment of a roof, awning or other covering over an open addition may be permitted.

#### **6.2.11 Institutional Uses and Emergency Services**

- (i) Development associated with institutional uses and emergency services as described under Section 5.2 are not permitted in the floodway.

#### **6.2.12 Swimming Pools**

- (i) The construction/placement of an above-ground or in-ground pool is not permitted in the floodway.

#### **6.2.13 Portable (Mobile) Buildings**

- (i) The placement of portable (mobile) building is not permitted in the floodway.

#### **6.2.14 Boathouses**

- (i) A *boathouse* with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the *floodway* provided that:
  - a) the design of the *boathouse* meets the definition of a *boathouse* in Appendix A;
  - b) the *boathouse* is one storey only and contains no living space;
  - c) the *boathouse* is detached;
  - d) electrical servicing is floodproofed;

- e) there is a maximum of one boathouse per lot.

### 6.3 Flood-fringe Policies

In areas where the *Two-Zone Concept* is applied, the *flood fringe* means the outer portion of the flood plain between the *floodway* and the regulatory flood line (Figure 2). Flood depths and velocities have a tendency to be less severe in the *flood fringe* as compared to those in the *floodway*. The *flood fringe* defines the area where development may be permitted subject to appropriate floodproofing.

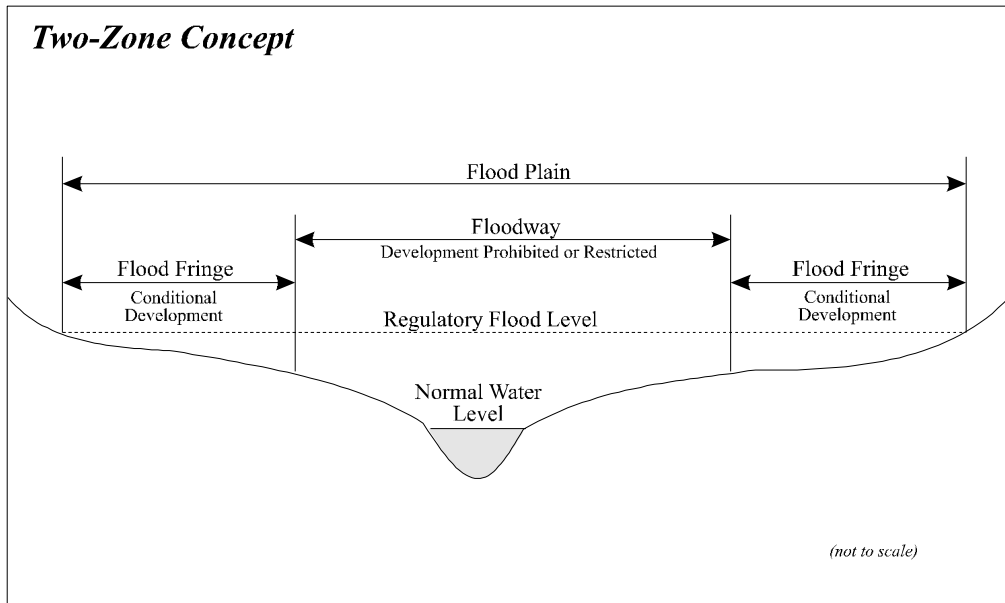


Figure 2. Two-Zone concept regulatory flood levels

The following policies apply only to the *flood fringe* portion of the flood plain in areas where the *Two-Zone concept* is applied, as described in Appendix E. For development proposed in the *floodway* portion of the flood plain, the policies for *floodway* under Section 6.2 shall apply.

#### 6.3.1 Fill and Lot Grading in the Flood Fringe

The following policies for fill placement and/or lot grading in the flood fringe are in addition to the general fill and lot grading policies under Section 5.3 and applicable policies for access/parking (6.1.2) and for floodproofing (Appendix C).

- (i) Fill placement and or lot grading for the purpose of floodproofing may be permitted in the flood fringe provided all of the following criteria can be met.
  - a) Fill placement and/or grading must be carried out in a way that will not result in additional runoff/drainage being directed onto adjacent properties.

- b) Where a lot is being filled and/or graded to an elevation that exceeds the grade of an adjacent property, and where an adequate drainage swale does not already exist, a grassed drainage swale may be required for the area between the fill area and the lot line.
- c) Where a drainage swale is required it must be designed in accordance with the guidelines under Appendix C.
- d) Fill placement and lot grading for the purpose of providing a fill apron shall also be subject to the guidelines under Appendix C.

### **6.3.2 New Residential Buildings**

The following policies apply to residential buildings and/or buildings all or part of which are used for human habitation. For commercial, industrial or agricultural buildings see the applicable policies under Section 6.3.10.

- (i) A new residential building may be permitted in the flood fringe provided that:
  - a) the building is floodproofed in accordance with the guidelines under Appendix C;
  - b) access is safe in accordance with the guidelines under Appendix C;
  - c) there is no suitable location outside the floodplain.

### **6.3.3 Minor Additions to Residential Buildings**

- (i) In two zone flood plain areas, a minor addition onto an existing building may be permitted in any part of the flood plain, subject to the following:
  - a) In the floodway, minor additions shall be subject to the policies for minor additions under Section 6.2.3.
  - b) In the flood fringe, an addition that will increase the original *gross floor area* of the existing building by less than 20%, the addition shall not be more vulnerable to flooding than the existing building (where possible protection to the *100 year flood* level should be provided).
  - c) In the flood fringe, an addition that will increase the original *gross floor area* of the existing building by 20% to 50%, to a maximum of 50 square metres, the addition shall be floodproofed in accordance with the floodproofing guidelines as outlined in Appendix C.

- d) All additions constructed after May 15, 1988 will be counted toward the maximum allowable increase in flood area and footprint.
- e) There is no suitable location outside the floodplain.

In areas serviced by private on-site services, certification from the applicable septic system approval authority as to the adequacy of the septic system to sustain the proposed use may be required.

### **6.3.4 Major Additions to Residential Buildings**

- (i) In two zone flood plain areas major additions may be permitted in the flood fringe only, subject to following:
  - a) the addition is located within the flood fringe only and no part of the addition extends into the floodway;
  - b) for an addition that will increase the original gross floor area of the existing building by 50% or 50 square metres or more, the addition must be floodproofed in accordance with the floodproofing guidelines as outlined in Appendix C and the landowner/applicant must demonstrate that every reasonable effort has been made to floodproof the original gross floor area of the building;
  - c) access is floodproofed in accordance with the guidelines of Appendix C;
  - d) there is no suitable location outside the floodplain.

In areas serviced by private on-site services, certification from the applicable approval authority as to the adequacy of the septic system to sustain the proposed use may be required.

### **6.3.5 Open Additions**

The following policies apply to any addition designed as an open construction, such as a deck, porch, and carport or above grade patio, which may be either attached or detached from the main structure. For the purposes of these policies, an open structure is defined as a structure with no walls, except for visual partitions and railings, which is constructed on piers or an above-grade foundation, for use as outdoor living area or storage area.

- (i) An open addition onto an existing building may permitted in the flood fringe subject to all of the following criteria:
  - a) the structure is properly anchored to the ground to prevent flotation in the event of a flood;
  - b) water storage will not be reduced and flood flows not be impeded;

- c) it is designed to allow for the free flow of water, under, over and around the structure.
- (ii) The enclosure of an existing open addition shall be treated as an addition and shall be subject to the applicable policies under Section 6.3.3(minor additions) or 6.3.4(major additions), depending on the size of the area to be enclosed. Enclosure is defined as any of the following activities:
  - a) the construction of a foundation under the structure, and/or
  - b) the construction of walls on any side(s) of the structure.
- (iii) The extension of a roof or awning over an open addition is permitted.

### **6.3.6 Replacement/Reconstruction of Residential Buildings**

The replacement/reconstruction of an existing residential building in the *flood fringe* shall be subject to the policies for New Residential Buildings, under Section 6.3.2, the policies for Minor Additions to Residential Buildings, under Section 6.3.3 and the policies for Major Additions to Residential Buildings, under Section 6.3.4.

### **6.3.7 Foundation Reconstruction or Replacement**

See policies under Section 6.2.8

### **6.3.8 Auxiliary Buildings**

- (i) A non-residential auxiliary building with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the flood fringe provided that:
  - a) it is firmly anchored to withstand the effects of flooding without structural damage;
  - b) it is floodproofed to the highest extent possible;
  - c) the building is one storey only and contains no living space;
  - d) the building is detached.
- (ii) Where possible, the auxiliary building shall be located outside the flood plain or to the least flood susceptible location within the property.
- (iii) Agricultural buildings may be exempt from the above requirements depending on location, use, local conditions, etc. (see also the policies under Section 6.1.1).

### **6.3.9 Open Structures (detached)**

See policies under Section 6.2.10

### **6.3.10 Commercial and Industrial Buildings**

- (i) A commercial or industrial building may be permitted in the flood fringe provided that:
  - a) the building is floodproofed in accordance with the floodproofing guidelines outlined in Appendix C;
  - b) there is no storage/ containment of hazardous materials or chemicals which could pose an unacceptable threat to public safety (ex. contamination/deterioration of water quality);
  - c) a foundation design and site grading plan is prepared by a professional engineer, at the applicant's expense, to the satisfaction of the Authority.
- (ii) The Authority will also recommend that where possible, the building shall be located outside the flood plain or to the least flood susceptible location within the property.
- (iii) Additions onto existing commercial or industrial buildings in the flood fringe shall be subject to the applicable floodproofing guidelines under Appendix C.

### **6.3.11 Portable (Mobile) Buildings**

- (i) The permanent placement of a portable (mobile) building may be permitted in the flood fringe provided that the building is floodproofed in accordance with the floodproofing guidelines as outlined in Appendix C; it is firmly anchored to withstand the effects of flooding without structural damage; and access is safe in accordance with Appendix C.
- (ii) The Authority will require that where possible, the mobile building shall be located outside the flood plain or to the least flood susceptible location within the property.

### **6.3.12 Swimming Pools**

- (i) Swimming pools will be permitted within the flood fringe area subject to the following:
  - a) where an alternative area outside of the flood plain does not exist;
  - b) electrical servicing must be floodproofed;
  - c) potential impacts to flood conveyance may impact the location and design.

Concerns regarding swimming pools in the floodplain are outlined in Appendix C.

### 6.3.13 Boathouses

- (i) A *boathouse* with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the *floodway* provided that:
  - a) the design of the *boathouse* meets the definition of a *boathouse* in Appendix A;
  - b) the *boathouse* is one storey only and contains no living space;
  - c) the *boathouse* is detached;
  - d) electrical servicing is floodproofed;
  - e) there is a maximum of one boathouse permitted per lot.

### 6.4 Safe Access/Egress Policies

In areas where the property has suitable area to construct above the 1:100 year flood plain; however, access to the property does not meet safe access standards, development may be permitted subject to the following:

- (i) a new or replacement residential building may be permitted provided that access is made safe in accordance with the guidelines under Appendix C.2.
- (ii) a minor addition onto an existing building may be permitted, subject to following:
  - a) the addition will not increase the original gross floor area of the existing building by more than 50%, to a maximum of 50 square metres,
  - b) all additions constructed after May 15, 1988 will be counted toward the maximum allowable increase in the original gross floor area.
- (iii) a major addition (i.e. greater than a 50% or 50 square metres of the original gross floor area) may be permitted, provided that access is floodproofed in accordance with the guidelines of Appendix C.2.



# 7.0 River Bank and Steep Slope Policies – Apparent Valley

The policies under this section apply in areas where there is an apparent valley and where potential erosion and/or slope instability are the operative hazards. For development within the erosion hazard (meander belt) of a not apparent river or stream valleys refer to the policies in Section 8.0.

## 7.1 General Policies

- (i) As defined in the Mississippi Valley Conservation Authority - Reference Manual for the Preparation of Regulation Schedules, February 2005 (3.2(I)) the regulation limit of banks associated with watercourses is based on three components: an erosion allowance; a stable slope limit; and a 15 m allowance setback (Figure 3).

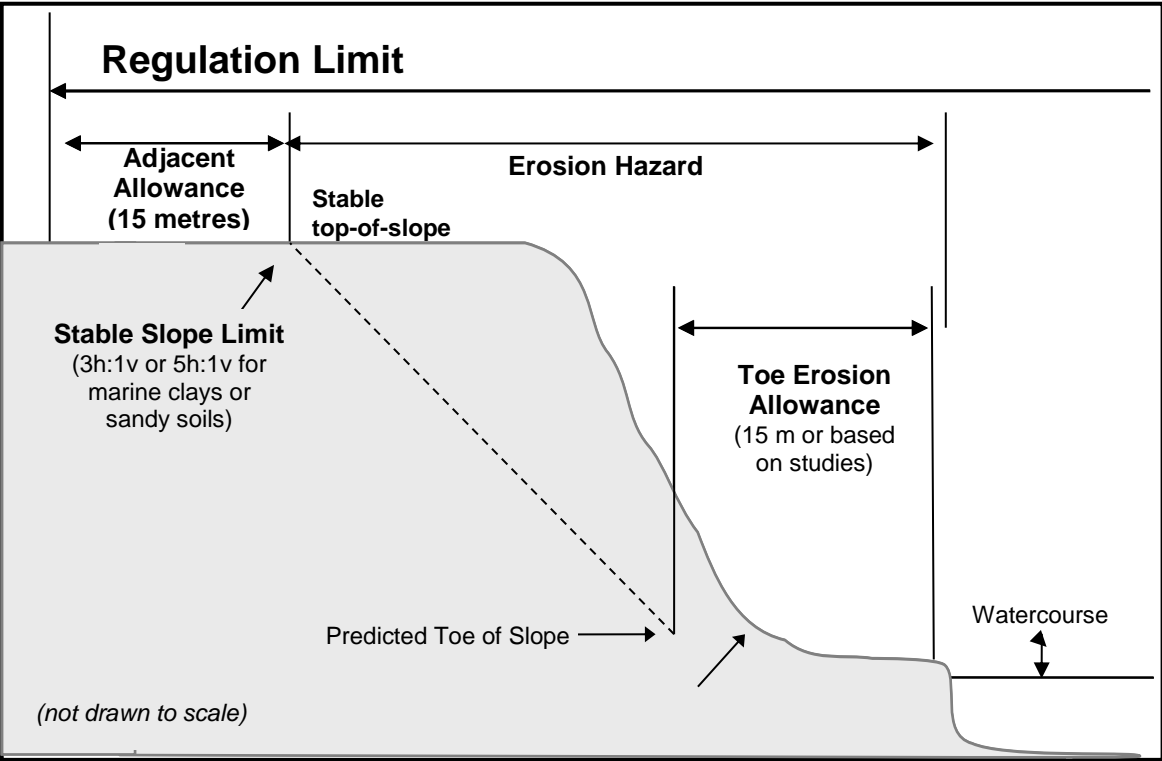


Figure 3. Cross Sectional Diagram Showing Components of Slope Regulation Limit

- (ii) Where these standard criteria for determining the hazard limits are deemed insufficient or where the identified setbacks come into question, a geotechnical slope evaluation by a Professional Engineer (Appendix F) may be required, at the landowner/applicant's expense, for any new development proposed in the vicinity of a steep bank or slope.
- (iii) Development and/or land uses that may be susceptible to damage from erosion or may cause or aggravate bank erosion or slope failure will not be permitted.

## 7.2 Development Policies

In areas of known risk where, based on soils mapping or through more detailed geotechnical analysis, the soil composition is identified as a *sensitive marine (Leda) clay*, the following shall apply:

- a) A geotechnical assessment completed by a qualified accredited professional must be carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix F must be prepared for review and approval by the Authority.

### 7.2.1 Development within 15 Metre Adjacent Allowance

- (i) Development may be permitted within the 15 metre allowance, without the need for a geotechnical assessment, subject to information and site plans being submitted to demonstrate the following:
  - a) The development does not create or aggravate an erosion hazard;
  - b) the development is set back a sufficient distance from the stable top of bank to avoid increases in loading forces on the top of the slope;
  - c) the development does not prevent access to and along the top of the valley slope (wherever feasible the development should be designed to provide a minimum 6 metre access allowance along the top of the slope);
  - d) the development does not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;
  - e) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and
  - f) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed.
- (ii) To ensure slope stability will not be compromised, standard mitigation measures may be required as part of the submitted plans and/or as conditions of approval. They may include:
  - a) measures to address potential drainage impacts;
  - b) requirements to ensure that access (for emergency vehicles, equipment and machinery for repair and maintenance work, etc.) to and along top of slope is maintained;

- c) stabilization and/or sediment control measures to prevent surficial erosion.
- (iii) Plans should be designed to maintain an access allowance along the stable top of bank in order to provide access during emergencies and for regular maintenance or repair of failed structure or slopes. In keeping with the Natural Hazard guidelines for the Provincial Policy Statement an access allowance of 6 metres from the stable top of bank is recommend as a sufficient safety zone for people, vehicles and equipment to enter and exit an area during an emergency such as a slope failure and to provide room for equipment to carry out maintenance repairs to the building or the slope.
- (iv) Where the above requirements under 7.2.1(i) have not been met to the satisfaction of the Authority, it may be a requirement that geotechnical assessment completed by a qualified accredited professional be carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix F.
- (v) Swimming pools may only be permitted subject to the following criteria :
  - a) a geotechnical assessment by a qualified engineer (at the expense of the applicant), may be required to determine the location of the stable top of bank and to determine if the proposed development would have a negative impact on slope stability; and
  - b) 6 metres setback from the stable top of bank is provided in order to provide for an erosion access allowance as per the Provincial Policy Statement.

## **7.2.2 Development within the Erosion Hazard**

### **7.2.2.1 Development Not Permitted**

- (i) Development associated with the following uses will not be permitted within the erosion hazard of an apparent river valley:
  - a) An institutional use associated with hospitals, nursing homes, preschool, school nurseries, day care and schools, where there is a threat to the safe evacuation of the sick, the elderly, persons with disabilities or the young during an emergency as a result of erosion and/or failure of protection works/measures; or
  - b) An essential emergency service such as that provided by fire, police and ambulance stations and electrical substations which would be impaired during an emergency as result of erosion, or any other hazard associated with erosion and/or as a result of failure of protection works/measures; or

- c) Uses associated with the disposal, manufacture, treatment or storage of hazardous substances.

### 7.2.2.2 Permitted Development

- (i) The following may be permitted within the erosion hazard if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution, or the conservation of land will not be affected :
  - a) Development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail systems);
  - b) Minor development associated with existing uses as per the applicable policies under section including minor additions, replacement structure, replacement septic systems;
  - c) Minor removal and placement of fill and site grading;
  - d) Stream bank, slope and valley stabilization to protect existing development or conservation or restoration projects, subject to the activity being approved through a satisfactory Environmental Assessment process for large scale projects;
  - e) Public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) subject to the activity being approved through a satisfactory Environmental Assessment process.

In all cases, the provisions for safe access as outlined in Appendix C must be met.

### 7.2.2.3 New Buildings

- (i) New buildings are not permitted within the erosion hazard of an apparent river or stream valley.
- (ii) Minor encroachments: Where there is insufficient area to place the development entirely outside of the *stable slope limit*, the authority may permit minor encroachment of part of a new building into the *stable slope limit* provided it is located where it will be least susceptible to damage and subject to the following requirements:
  - a) A geotechnical assessment completed by a qualified accredited professional must be carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix F must be prepared for review and approval by the Authority.
  - b) The new development must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation.

#### 7.2.2.4 Additions to Existing Building

- (i) Within the stable slope allowance, but outside of the toe erosion allowance, a minor addition to an existing building may be permitted subject to the following criteria:
  - a) the size of the minor addition does not exceed 20% of the original *gross floor area*, or 40 square metres whichever is less;
  - b) the addition does not extend any further into the *stable slope limit* than the existing building;
  - c) the addition does not extend into the *toe erosion allowance*;
  - d) the Authority may require that the proposal is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support both the existing dwelling and the addition.
  
- (ii) Additions exceeding 20% of the gross floor area or 40 square metres may be permitted subject to all of the following criteria being met:
  - a) the size of the minor addition does not exceed 50% of the original *gross floor area*, or 50 square metres whichever is less;
  - b) a geotechnical assessment completed by a qualified accredited professional has been carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix F must be prepared for review and approval by the Authority;
  - c) the new development must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation;
  - d) the addition does not extend any further into the *stable slope limit* than the existing building;
  - e) the addition does not extend into the *toe erosion allowance*.

### 7.2.2.5 Reconstruction/Replacement of an Existing Building

- (i) The reconstruction or replacement of a building within the erosion hazard of an apparent river or stream valley may be permitted provided that it has not been damaged or destroyed by erosion and if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or conservation of land will not be affected. The submitted plans should demonstrate that the building:
  - a) cannot be relocated to an area outside the erosion hazard and if there is no feasible alternative site, that it is located in an area of least (and acceptable) risk;
  - b) will be protected from the erosion hazard through incorporation of appropriate building design parameters; and
  - c) the replacement does not encroach any closer to the stable top of bank than the existing development at its closest point.
- (ii) Where the existing development is closer than 6 metres to the stable top of bank, the replacement structure must be situated at least 6 metres of the top of bank to provide for an erosion access allowance.
- (iii) A geotechnical study may be required at the expense of the applicant, by a qualified geotechnical engineer to determine the location of the stable top of bank and to determine if the proposed development will have a negative impact on slope stability.
- (iv) Reconstructions and replacement which propose an increase in gross floor area or footprint that exceed the original structure shall be subject to the policies for additions under Section 7.2.2.4.

### 7.2.2.6 Sewage Disposal Systems

- (i) The replacement of sewage disposal systems may only be permitted within the erosion hazard of an apparent river or stream valley where all of the following criteria can be met:
  - a) there is no feasible alternative location outside of the erosion hazard;
  - b) the septic system does not extend into the *toe erosion allowance* and it is located in the area of lowest risk;
  - c) a geotechnical assessment completed by a qualified accredited professional is carried out at the landowner's cost to confirm that the development activities will not aggravate the hazard and that the slope is stable enough to support the development that is proposed;

- d) the design of the system must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation.
- (ii) A new sewage disposal system shall not be permitted with the erosion hazard of an apparent river or stream valley.

#### **7.2.2.7 Access, Driveways, Private Roads**

- (i) Development associated with the construction of a driveway or access way through the erosion hazard of an apparent river or stream valley in order to provide access to lands outside of the apparent river or stream, valley , may be permitted subject to the following:
  - a) there is no viable alternative outside of the regulated area, and
  - b) the provisions for safe access as outlined in Appendix C are addressed.
- (ii) Depending on the site characteristic and the scale of the proposed access, the Authority may require that the application is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support both the development that is proposed.

#### **7.2.2.8 Fill Placement, Excavation or Grading Activities**

- (i) Minor lot grading excavation or fill placement may be permitted where it is undertaken in association with any of the uses permitted above and/or for slope stabilization, erosion control or floodproofing purposes may be permitted within the erosion hazard.
- (ii) Depending on the site characteristic and the scale of the proposal, the Authority may require that the application is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support both the development that is proposed.

#### **7.2.2.9 Swimming Pools**

- (i) Swimming pools shall not be permitted with the erosion hazard of an apparent river or stream valley.

## **8.0 Policies for Meander Belt (Erosion Hazard) - Not Apparent Valley**

### **8.1 Development within the Adjacent Allowance – Not Apparent Valley**

The following policies apply to the allowance adjacent to the erosion hazards associated with not apparent valleys. For development within the erosion hazard (meander belt) of a not apparent river or stream valleys refer to the policies in Section 8.2.

- (i) Development may be permitted within the allowance adjacent to the meander belt if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or the conservation of land will not be affected. The submitted plans should demonstrate that:
  - a) development does not create or aggravate the erosion hazard;
  - b) development does not prevent access to and along the meander belt;
  - c) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;
  - d) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed.

### **8.2 Development within the Erosion Hazard (Meander Belt)**

The following policies apply to the erosion hazards associated with not apparent valleys. For development within the allowance adjacent to not apparent (unconfined) river or stream valleys refer to the policies in Section 7.

#### **8.2.1 Development Not Permitted within the Erosion Hazard (Meander Belt)**

- (i) Except as permitted under 8.2.2. new development shall not be permitted within the meander belt of a not apparent river or stream valley.
- (ii) Development associated with the following activities or uses shall not be permitted within the erosion hazard (meander belt) of a not apparent river or stream valley.
  - a) institutional uses, essential emergency services and/or uses associated with hazardous substances as specified in 5.2;
  - b) stabilization works to allow for future/proposed development or to provide for an increase in development envelope/area;
  - c) stormwater management facilities.



## 8.2.2 Development Permitted within the Erosion Hazard (Meander Belt)

- (i) Notwithstanding 8.2.1 certain development within the erosion hazard (meander belt) may be permitted under the policies of 8.2.2(ii), 8.2.2.1, 8.2.2.2, 8.2.2.3 and 8.2.2.4 if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or the conservation of land will not be affected. The submitted plans should demonstrate that:
  - a) the development does not create or aggravate the erosion hazard;
  - b) the development does not prevent access to and along the meander belt;
  - c) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;
  - d) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed.
  
- (ii) Development associated with the following activities/uses may be permitted within the erosion hazard (meander belt) of a not apparent river or stream valley subject to the activity being approved through a satisfactory Environmental Assessment process (if required):
  - a) development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail systems);
  - b) public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) subject to the activity being approved through a satisfactory Environmental Assessment process (if required);
  - c) stream bank, slope and valley stabilization to protect existing development or for conservation or restoration projects subject to the activity being approved through a satisfactory Environmental Assessment process (if required);
  - d) minor removal of fill or placement of fill or site grading, as specified in 5.1.d) and subject to policies 8.2.1.

### **8.2.2.1 Access through the Erosion Hazard**

- (i) Development associated with the construction of a driveway or access way through the erosion hazard of an apparent river or stream valley in order to provide access to lands outside of the apparent river or stream valley, may be permitted where:
  - a) it has demonstrated that there is no viable alternative outside of the regulated area;  
and
  - b) the provisions for safe access as identified in Appendix C have been met.

### **8.2.2.2 Development Associated With Existing Uses**

- (i) Development associated with existing uses located within the meander belt, such minor additions, non-habitable accessory buildings, pools, landscaping retaining walls, grading, decks, etc., may be permitted where it has been demonstrated to the satisfaction of the Conservation Authority that:
  - a) there is no feasible alternative site outside of the meander belt and the proposed development is located in an area of least (and acceptable) risk;
  - b) the development will not prevent access into and through the meander belt in order to undertake preventative actions/maintenance or during an emergency;
  - c) the development will have no negative impacts on natural stream meandering/fluvial processes;
  - d) the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
  - e) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed;
  - f) non-habitable structural development would not be susceptible to stream erosion;  
and
  - g) minor additions to habitable structures would not be susceptible to stream erosion within the 100 year planning horizon.

### **8.2.2.3 Reconstruction/Relocation of a Building**

- (i) Development may be permitted for the reconstruction or relocation of a building within the meander belt provided that it has not been damaged or destroyed by erosion and if it has been demonstrated to the satisfaction of the Conservation Authority that the building:
  - a) cannot be relocated to an area outside the erosion hazard and if there is no feasible alternative site, that it is located in an area of least (and acceptable) risk; and
  - b) will be protected from the erosion hazard through incorporation of appropriate building design parameters; and
  - c) will not exceed original habitable floor area or the original footprint area of the previous structure.

## **9.0 Wetland Policies**

Wetlands have hydrologic, ecosystem and human benefits within the watershed.

*Wetlands*, from a hydrologic function perspective, retain water during periods of high water or peak flows (i.e. spring freshet and seasonal storm events) allowing the water to be slowly released into the *watercourse*, infiltrate into the ground, or evaporate; *wetlands* in the floodplain of a *watercourse* provide for the storage of flood waters and reduce energy associated with flood flows.

From an ecosystem perspective wetland functions include primary production sustaining biodiversity as well as provide wildlife habitat, habitat for species at risk, maintenance of natural cycles (carbon, water) and food chains.

From a human perspective, *wetlands* provide social and economic value such as flood attenuation, recreation opportunities, production of valuable products, improvement of water quality and educational benefits.

*Wetlands* are defined in Section 28(25) of the Conservation Authorities Act. The definition appears in the “Definitions” section of this document. The definitions also form part of the MVCA policy.

### **Provincially Significant Wetlands (PSW)**

For the purposes of administering Ontario Regulation 153/06 the MVCA policy is based on the CA Act definition of a wetland. **Provincially Significant Wetlands** evaluated by MNRF utilizing the Ontario *Wetland* Evaluation System (OWES). The evaluation system serves as a repeatable, reliable, consistent resource for implementation of the regulation. Where a wetland has been evaluated by the OWES and meets the definition of a wetland provided in the CA Act it is the intent that PSW policies will apply to these features.

### **9.1 Wetlands and Other Areas**

The following sections contain the policies for implementing Ontario Regulation 153/06 in *wetlands* and *other areas* adjacent to wetlands in the Mississippi Valley watershed.

Additionally the conservation authority plays an advisory role to municipal approval authorities through the Ontario planning and development approvals process. As such it is intended that the policies contained in this document will be complimentary to those in the PPS so as to avoid implementation conflicts. Where additional hazards exist on a site such as flood hazards or unstable soil or slope hazards, other applicable policies of this document shall also be addressed.

## 9.2 Development and Interference Within Wetlands

The policies apply as demonstrated in the accompanying diagram below.

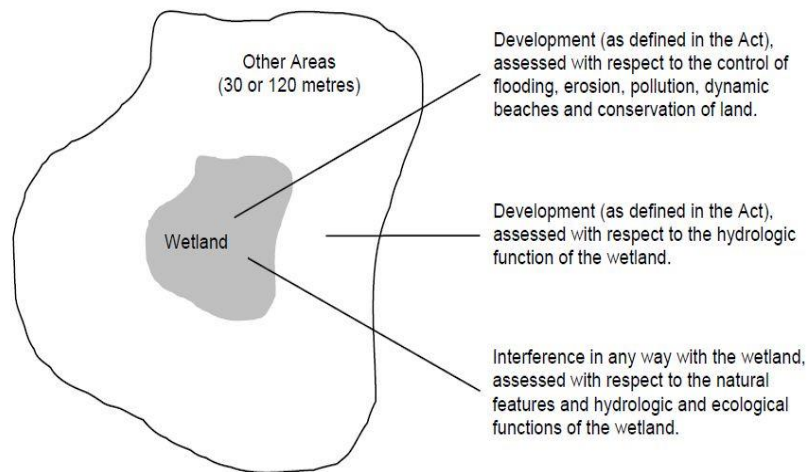


Figure 4. Three ways through which the Conservation Authorities Act and Individual CA Regulations address wetlands and other areas

### 9.3 PSW Boundaries

Wetland boundaries have been established by and are maintained by the Ministry of Natural Resources and Forestry (MNRF) based on the Ontario Wetland Evaluation System (OWES). Data is held within the provincial Land Inventory Ontario database. Should the precise location of a PSW boundary be contested, the PSW must be evaluated by a *qualified professional* trained in application of the OWES to delineate the PSW boundary. Where a wetland boundary identified on-site differs from the approved MNRF boundary, the proponent is responsible for submitting information and obtaining acceptance of the new wetland boundary from the MNRF.

The Regulations and Policies apply to all changes to PSW boundaries once approved by the MNRF. Policies will apply to new PSW's once approved by the MNRF.

**9.3.1** Development and interference in any way shall not be permitted within *Provincially Significant Wetlands*.

**9.3.2** New stormwater management facilities shall not be permitted within *Provincially Significant Wetlands*.

**9.3.3** Except as may be permitted elsewhere in this section, new ponds, new *drains* and peat extraction shall not be permitted within *Provincially Significant Wetlands*.

**9.3.4** Notwithstanding Section 9.3.1., public infrastructure (e.g. roads, sewers, flood and *erosion* control works) and various utilities (e.g. pipelines) may be permitted within *Provincially Significant Wetlands* provided that:

- a) there is a satisfactory completion of an *Environmental Assessment* under the Environmental Assessment Act; and
- b) alternative locations have been evaluated to the satisfaction of the MVCA, and it has been determined that there is no reasonable location for the infrastructure outside of the *wetland*; and
- c) the *interference* with natural features and the hydrologic and ecological functions of the *Provincially Significant Wetland* is deemed as acceptable by MVCA; and
- d) it has been demonstrated that the *control of flooding, erosion, pollution* or the *conservation of land* will not be affected, to the satisfaction of the MVCA.

**9.3.5** Notwithstanding Section 9.3.1 the following activities may be permitted within *Provincially Significant Wetlands* provided it has been demonstrated to the satisfaction of the MVCA that the *control of flooding, erosion, pollution* or the *conservation of land* will not be affected, and the interference on the natural features and hydrologic and ecological functions of the *Provincially Significant Wetland* have been deemed to be acceptable by the MVCA. Permitted activities include:

- a) conservation and restoration projects;
- b) development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail system);
- c) flood and *erosion control works* adjacent to lacustrine or riverine wetlands that are proposed to protect private land, where alternate approaches such as stewardship activities (including intensive naturalization of the riparian zone) are not feasible;
- d) *repair, renovation* or *maintenance* of *existing* marine facilities;
- e) *maintenance* of an *existing* public or private road;
- f) replacement, reconstruction or *minor additions* to *existing* structures subject to satisfaction of the following factors:
  - i. the viability of relocating the structure outside the wetland boundary is evaluated and determined to be unfeasible ; and
  - ii. any expected hydrological impacts can be *mitigated* ; and
  - iii. any expected ecological impacts can be *mitigated*.

Completion of an *Environmental Impact Study* (EIS) of a scope appropriate to the nature of the feature and the scale of the project may, however, be required at the Authority's discretion to the satisfaction of the MVCA, to identify mitigation and enhancement opportunities. Please see the Appendices to this document for information on the content and approach of an EIS or HIS.

### **9.3.6 Compensation**

Where, as set out in Sections 9.3.4 and 9.3.5, a use can be permitted. Compensation may be required as necessary to address matters related to the control of flooding, erosion, pollution and the conservation of land. The level of compensation required shall be determined based on the ecological and hydrologic characteristics of the feature affected, scope of the project and distance from the area affected. This is more likely to be permissible toward the margins of the feature. The Environmental and/or Hydrologic Impact Assessment procedures in the Appendices shall be used as a tool to justify and support any such compensation. This shall be to the satisfaction of the Conservation Authority.

### **9.3.7 Existing agricultural activities within the wetland boundary**

Except buildings and structures, these policies are not intended to limit the ability of *existing* agricultural activities to continue. No new agricultural activity is permitted within a *Provincially Significant Wetland*.

### **9.3.8 Drainage Works**

Repair and / or maintenance to *existing* drainage works under the *Drainage Act* may be permitted, provided the work results in the restoration of the drain to the specifications described in the approved Engineers Report for that drain.

New drainage works within a provincially significant wetland are not permitted. New drainage works within other wetlands may be considered where it is demonstrated that there will be no adverse effects on the ecological or hydrologic function of the feature.

## **9.4 Development within Other Areas adjacent to wetlands**

To protect a wetland feature and its functions it is important to also evaluate the impact of development on lands adjacent to the feature. The following policies apply to *other areas* adjacent to *wetlands* identified as being within 120 metres from the boundary of *Provincially Significant Wetlands*. In these areas, development will be evaluated with a view to its expected effects on interference with the *hydrologic function* of the wetland.

### **Area Within 30 Metres of the *Provincially Significant Wetland***

**9.4.1** Development shall not be permitted within 30 metres of the boundary of a *Provincially Significant Wetland*.

**9.4.2** Notwithstanding Section 9.4.1., the following developments may be permitted within 30 metres of a *Provincially Significant Wetland* if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA:

- a) *development* associated with public parks (including, for instance, passive or low intensity outdoor recreation and education, trail system);
- b) a *marine facility*;
- c) stormwater outlets;
- d) public infrastructure (e.g. roads, sewers, flood and *erosion* control works and various utilities (e.g. pipelines) that is supported by an appropriate Environmental Assessment or a Comprehensive Environmental Impact Study which demonstrates that there will be no adverse effect on the *hydrologic function* of the *wetland* to the satisfaction of the MVCA.

**9.4.3** Notwithstanding Section 9.4.1., the following additional developments may also be permitted within 30 metres of a *Provincially Significant Wetland* if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by MVCA. *Best Management Practices* as prescribed by MVCA shall be implemented to address expected interference with the hydrologic function of the wetland. The completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed development may be required as per Appendix G. Development activities include:

- a) development of a single family building and/or related auxiliary structure and associated grading activity on an existing vacant lot of record with insufficient lot depth to accommodate a setback greater than 30 metres and no alternative location options exist;
- b) *repairs*, reconstruction and/or one-time *minor additions* to existing buildings and structures;
- c) replacement or construction of a new sewage system in accordance with Part 8 of the OBC; tertiary treatment systems may be required to minimize site disturbance as well as adverse effects on the hydrologic function of the wetland);
- d) *maintenance* of existing public or private access roads;
- e) *maintenance* of existing conservation or wetland restoration projects;
- f) a one-time development involving *fill* (not to exceed 100 m<sup>3</sup>) or minor *site grading* / landscaping activities associated with an existing use.

**9.4.4** Existing agricultural activities within 30 metres of the boundary of a *provincially significant wetland*. These policies are not intended to limit the ability of existing agricultural activities to continue.



**9.4.5** Where, in the opinion of the MVCA, measures beyond standard *Best Management Practices* will unlikely mitigate expected impacts, the completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed *development* shall be required as per Appendix G.

#### **Areas between 30 and 120 Metres of a *Provincially Significant Wetland***

**9.4.6** Development may be permitted in the area between 30 and 120 metres of a provincially *significant wetland*, if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by MVCA. *Best Management Practices* as prescribed by MVCA shall be implemented to address expected interference with the hydrologic function of the wetland. The completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed *development* may be required as per Appendix G.

**9.4.7** Where no feasible alternatives exist, the following typical *developments* may be permitted in the area between 30 and 120 metres of a *provincially significant wetland* where *Best Management Practices* acceptable to MVCA are used to mitigate potential impacts to the hydrologic function of the wetland feature. Representative activities include:

- a) new single family residential dwelling and associated small accessory buildings;
- b) *repairs*, reconstruction and/or one-time *minor additions* to existing buildings and structures;
- c) new accessory structures to an existing single family residential dwelling including deck, shed, swimming pool;
- d) replacement or construction of a new sewage system in accordance with Part 8 of the OBC; where no other alternative sewage envelope exists on the property;
- e) *maintenance* of existing public or private access roads;
- f) *maintenance* of existing conservation or wetland restoration projects;
- g) a one-time development involving *fill* (not to exceed 100 m<sup>3</sup>) or minor *site grading* / landscaping activities associated with an existing use;
- h) a new agriculture building/structure or expansions to existing facilities where the gross floor area of the building is equal to or less than 500 m<sup>2</sup> (5382 ft<sup>2</sup>) in size;

- i) public infrastructure (e.g. roads, sewers, flood and *erosion* control works and various utilities (e.g. pipelines) that is supported by an appropriate Environmental Assessment or a Comprehensive EIS and impacts to the *hydrologic function* of the wetland feature are to be appropriately addressed.

**9.4.8** Existing agricultural activities in the area between 30 and 120 metres of a *provincially significant wetland*. These policies are not intended to limit the ability of *existing agricultural activities* to continue.

**9.4.9** Where, in the opinion of the MVCA, measures beyond standard *Best Management Practices* are required to mitigate expected impacts, the completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed *development* shall be required as per Appendix G.

## **9.5 MVCA Regulations Include Other Wetlands That Meet The Following Criteria:**

- Wetlands greater than 0.5 ha (1.2 acres) in size
- Wetlands that have hydraulic connectivity (i.e. connected to a waterbody/watercourse)

### **Guidelines for Non-Provincially Significant *Wetlands***

The following policies generally apply to wetlands that are greater than 0.5 hectares in size and directly contribute to the hydrological function of the watershed through a surface water connection. Wetland Screening maps based on the best available information are updated and maintained by MVCA.

#### **9.5.1 *Development and Interference within Wetlands***

- 1) In general, *development* and interference in any way shall not be permitted within *wetlands*;
- 2) In general, ponds and drains shall not be permitted within *wetlands*;
- 3) Excavation of existing ponds within a *wetland* is permitted subject to the appropriate floodplain hazard policies and provided the dredging does not have an adverse impact on the wetland feature and function and provided all dredging material is placed at a suitable distance from the wetland and the interference on the natural features and hydrologic and ecological functions of the *wetland* has been deemed to be acceptable by the MVCA;
- 4) In general, stormwater management facilities shall not be permitted within *wetlands*;
- 5) Notwithstanding Section 1.1.1, public infrastructure (e.g. roads, sewers, flood and *erosion* control works) and various utilities (e.g. pipelines) is permitted within a *wetland* if it has been demonstrated to the satisfaction of the MVCA that the control of flooding,

*erosion, pollution, or the conservation of land* will not be affected and the interference on the natural features and hydrologic and ecological functions of the *wetland* has been deemed to be acceptable by the MVCA;

- 6) Notwithstanding Section 1.1.1, *erosion* control works and conservation or restoration projects is permitted within a *wetland* if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, *erosion, pollution, or the conservation of land* will not be affected and the interference on the natural features and hydrologic and ecological functions of the *wetland* has been deemed to be acceptable by the MVCA;
- 7) Notwithstanding Section 1.1.1, development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail system) is permitted within a *wetland* if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, *erosion, pollution, or the conservation of land* will not be affected and the interference on the natural features and hydrologic and ecological functions of the *wetland* has been deemed to be acceptable by the MVCA;
- 8) *Reconstruction* of existing structures is permitted provided:
  - The replacement structure is reconstructed to its original footprint or smaller; and there is no feasible alternative location on the subject lot outside of the *wetland*.
- 9) Land uses with existing *Planning Act* approvals as of adoption of this policy are permitted. Notwithstanding Section 1.1.1, work associated with the following is permitted:
  - Works approved through existing an Municipal Class Environmental Assessment
  - Activities on Crown Land
  - Existing agricultural uses
  - Selective tree harvesting for private use
  - Accessory buildings under 10 m<sup>2</sup>
- 10) A single dwelling and accessory building is permitted on an existing vacant lot of record within a *wetland* provided:
  - a. The use, erection and location is permitted by the applicable municipal zoning by-law;
  - b. There is no alternative location for the dwelling on the subject lot outside of the *wetland*;
  - c. Hazards related to organic soils can be addressed; and
  - d. The applicant demonstrates, to the extent possible, that the *development* will not adversely affect the *wetland* feature and functions. An Environmental Impact Statement will be required to assess the ecology of the *wetland* and identify mitigation measures and best efforts to minimize impacts. If best efforts are not demonstrated to the satisfaction of MVCA, a permit may not be issued.

### **9.5.2 Development within Other Areas (Adjacent Lands to a Wetland)**

### 1.2.1 Areas within 30 Metres of a *Wetland*

- 1) In general, *development* shall not be permitted within 30 metres of the boundary of a *wetland*;
- 2) Notwithstanding Section 1.2.1.1, public infrastructure (e.g. roads, sewers, flood and *erosion* control works) and various utilities (e.g. pipelines) is permitted within 30 metres of a *wetland* if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA;
- 3) Notwithstanding Section 1.2.1.1, conservation or restoration projects is permitted within 30 metres of a *wetland* if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA;
- 4) Notwithstanding Section 1.2.1.1, *development* associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail system) is permitted within 30 metres of a *wetland* if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA;
- 5) A single dwelling on an existing vacant lot of record, minor additions to existing buildings/structures, accessory building/structures (less than 50 m<sup>2</sup>), and reconstruction of existing buildings is permitted provided it has been demonstrated to the satisfaction of MVCA that:
  - a. all *development* (including grading) is located outside the wetland and maintains as much buffer as feasible;
  - b. a minimum vegetated buffer of 15 metres from the wetlands is established;
  - c. disturbances to natural vegetation communities contributing to the hydrologic function of the wetland are avoided;
  - d. the overall existing drainage patterns will be maintained;
  - e. disturbed area and soil compaction is minimized;
  - f. where appropriate, *development* is located above the high water table;
  - g. all septic systems are located a minimum of 15 metres from the wetland and a minimum of 0.9 metres above the water table;
  - h. impervious areas are minimized;
  - i. *best management practices* are used to:
    - Maintain water balance
    - Control sediment and erosion
    - Buffer wetlands
    - Limit impact of *development* on wildlife species
- 6) Notwithstanding Section 1.2.1.1, *development* associated with the importation of *fill* for the construction of a private access road, associated filling and lot

grading is permitted within 30 metres of a *wetland* on a constrained lot if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA, the *development* does not affect the control of flooding, and MVCA *floodproofing* guidelines and access standards can be achieved. A technical study is requested to assess the hydrologic impact.

- 7) Notwithstanding Section 1.2.1.1, structural repairs to an existing *building* or *structure* is permitted within 30 metres of a *wetland* if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA;
- 8) Notwithstanding Section 1.2.1.1, *development* is permitted within 30 metres of a *wetland* if the proposed *development* does not encroach further into the setback from the *wetland boundary* than existing *development* and if the interference on the *hydrologic functions* of the *wetland* has been deemed to be acceptable by the MVCA;
- 9) In instances where there are two or more natural hazards associated with a *development* proposal, the greater setback allowance will be applied.

### **Offsetting**

Where development is permitted and it is clear that impacts to the wetland cannot be mitigated, offsetting measures will be required to address matters related to the control of flooding, erosion, pollution and the conservation of land. The level of offsetting required shall be determined based on the ecological and hydrologic characteristics of the feature affected, scope of the project and distance from the area affected. The Environmental and/or Hydrologic Impact Assessment procedures in the Appendices shall be used as a tool to justify and support offsetting measures, to the satisfaction of the Conservation Authority.

## **10.0 Alterations to Shorelines and Watercourses**

Alterations to shorelines and watercourses activities include altering, straightening, changing, diverting or interfering, in any way, with the channel of any watercourse within the watershed. This may also include shoreline rehabilitation and erosion control on lakes.

The Authority supports the application of "Natural Channel Design" principles in all proposals, public or private, in recognition of the environmental, human health, economic and aesthetic benefits of the approach. Where opportunities exist to restore, enhance or re-establish natural conditions those opportunities should be utilized as maintaining healthy and functional channel processes will serve to minimize the need for future restoration and mitigation.

The Authority's review of riverfront protection / improvement applications will be conducted in cooperation with the appropriate District / Area Office of the Ontario Ministry of Natural Resources. The Authority will consult with the Ministry of Natural Resources, the Department of Fisheries and Oceans (Canada) or other partners where proposed work may interfere with fish habitat.

### **10.1 General Policies**

- (i) Shoreline hardening techniques such as the use of concrete, steel, railway ties, gabion baskets, armour stone (cap rock, limestone blocks) and other vertical structures will generally not be permitted.
- (ii) The design of projects involving shoreline alterations where natural heritage features such Areas of Natural or Scientific Interest and shoreline wetlands may be present, will be required to take into consideration the ecological functions of the watercourse while allowing for compatible development.
- (iii) In water or near shore works may be prohibited at certain times to prevent interference with spawning, hatching and rearing of young fish. Timing restrictions may vary according to the identified nature of the fishery (cold and warm water).
- (iv) Base flows must not be adversely affected by any work.
- (v) All surplus excavated material must be immediately removed from the flood plain to an approved site (minimum 30 metres from the waterbody).
- (vi) Erosion and sediment control measures are to be in place before and during construction and until the site is permanently stabilized. This will include, where applicable, the use and maintenance of check dams, silt screens, sediment ponds, buffer strips or other effective measures.
- (vii) It is the responsibility of the landowner/applicant to provide any studies or reports necessary for the Authority's review and evaluation of the proposal.

- (viii) The Authority may waive any requirements where there will clearly be no detrimental effects on the control of flooding, pollution or the conservation of land.

## 10.2 Alterations to Shorelines

*Shorelines* are the interface where land meets a body of water. *Shorelines* are dynamic in nature and are subject to fluvial and coastal processes. They act as a natural water quality filter for surface runoff and often absorb certain nutrients and contaminants, as well as trap sediment.

Naturalized *shorelines* with an abundance of vegetation provide *erosion* protection by assisting with the mitigation of surface runoff. Plant and tree root systems also bind the soil in place preventing further *erosion* of earthen material that is often lost due to natural processes such as wave action or changes in water level.

- 1) In general, alterations to a shoreline shall not be permitted.
- 2) In general, shoreline hardening will not be permitted unless there is active erosion occurring along a shoreline or watercourse and the site is not suitable for bio-engineering or the re-establishing of natural conditions are not feasible options.
- 3) Notwithstanding Section 10.2 2), where natural conditions cannot be re-established due to active erosion or site-specific constraints, shoreline alteration proposals may be permitted provided that:
  - a) upstream water levels (backwater effects) will not be increased;
  - b) alignment will not affect river hydraulics or base flows;
  - c) proposed protection will not alter local erosion, debris accumulation or undesirable changes in local currents or sediment transport nor impact abutting shoreline properties.
  - d) where the shoreline is in the vicinity of marginally stable or unstable slope, professional geotechnical engineering input may be required at the Authority's discretion and at the landowner/applicant's expense; and
  - e) the shoreline alterations are constructed in accordance with Appendix H.
- 4) Notwithstanding Section 10.2 1) & 2), an alteration to a shoreline or development that by its nature is located along the shoreline such as the construction or reconstruction of a marine facility and erosion control measures may be permitted if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution, dynamic beaches or the conservation of land will not be adversely affected. The MVCA may request a technical study to ensure that the development is not subject to unacceptable risk. The submitted plans must demonstrate that:
  - a) the potential for surficial erosion has been considered and addressed;

- b) impacts of ice force on the development have been considered and addressed;
  - c) wave uprush impacts have been considered and addressed;
  - d) structures and erosion control measures meet requirements under Appendix H.
- 5) Notwithstanding Section 10.2 1), dredging may be permitted along the shoreline if it has been demonstrated to the satisfaction of the MVCA that the interference will not be adversely affect the natural features and hydrologic and ecological functions of the *watercourse* and the control of flooding, erosion, pollution, dynamic beaches or the conservation of land. The submitted plans must demonstrate that:
- a) all dredged material is removed from the waterbody and placed in an upland area (i.e., outside of the regulatory flood plain and/or a minimum of 30 metres from the watercourse);
  - b) the dredged material is transported in a contained fashion; and
  - c) Appropriate *erosion* and sediment control measures are implemented.

### **10.3 Channel Realignment, Road Crossings, Diversions Dams**

- (i) Projects such as channelization, bridges, culverts, dams, dykes, weirs, outlet structures, etc. and shoreline works associated with stormwater treatment facilities and other related activities will require a design prepared by a Professional Engineer, at the landowner/applicant's expense, addressing the hydrotechnical aspects of the proposal including backwater effects and upstream water levels, local streamflow velocities and erosion protection measures, and implications for lost channel and / or flood plain storage volume.
- (ii) It is advised that projects should be designed to incorporate "Natural Channel Design" features as much as possible including the creation of pools, riffles, gravel beds, and natural stream meanders. In this regard, professional ecological services may have to be retained by the proponent to ensure that the appropriate measures are incorporated into the design.



## **Appendix A: Definitions**

**Agricultural uses:** means the growing of crops, including nursery and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures.

**Agriculture-related uses:** means those farm-related commercial and farm-related industrial uses that are small scale and directly related to the farm operation and are required in close proximity to the farm operation.

**Alternative energy systems:** means sources of energy or energy conversion processes that significantly reduce the amount of harmful emissions to the environment (air, earth and water) when compared to conventional energy systems.

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

- the slope is 3 metres or greater in height
- the slope is 5 :1 or steeper

**Area of interference:** means those lands where development could interfere with the hydrologic function of a wetland.

**Areas of natural and scientific interest (ANSI):** means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.

**Basement:** one or more storeys of a building located below the first storey (Building Code).

**Bank:** means any steep acclivity, whether rising from a river, a lake or the sea, or forming the side of a ravine, or the steep side of a hillock on a plain. When we speak of the earth in general adjoining a lake or the sea, we use the word shore; but a particular steep acclivity on the side of a lake, river, or the sea, is called a bank. *The Imperial Dictionary* (1854), vol. 1, p. 154

**Best management practice (BMPs):** design, construction, and maintenance practices and criteria that can minimize the impact of a project on the hydrology and/or ecology within the Regulated area.

For wetlands a combination of site specific mitigation measures intended to reduce the effect of a development on the hydrologic function of a wetland. Such measures typically include building site selection, limitations on fill, drainage management and the preservation and

augmentation of vegetation on site to ensure that post development site conditions closely emulate the pre-development condition with no adverse hydrologic effects.

**Boathouse:** a one-storey accessory *building* that does not contain *habitable living space*; has an opening to the waterbody of an appropriate size to accommodate a boat; and is connected to the waterbody by a boat slip, boat lift, or marine railway. Any component of the boathouse that is in contact with the waterbody at any time of the year must consist of untreated material (e.g. cedar, tamarack, hemlock, rocks, plastic, etc.). Treated lumber may contain compounds that can be released into the water and become toxic to the aquatic environment.

**Building:** The Building Code Act (Ontario) defines a building as:

- a) a structure occupying an area greater than ten square metres consisting of a wall, roof and floor or any of them or a structural system serving the function thereof including all plumbing, works, fixtures and service systems appurtenant thereto;
- b) a structure occupying an area of ten square metres or less that contains plumbing, including the plumbing appurtenant thereto;
- c) plumbing not located in a structure;
  - (c.1) a sewage system; or
- d) structures designated in the building code; (“bâtiment”).

**Buffer:** An area or band of permanent vegetation, preferably consisting of native species, located adjacent to a natural heritage feature and usually bordering lands that are subject to development or site alteration. The purpose of the buffer is to protect the feature and its functions by mitigating impacts of the proposed land use and allowing an area for edge phenomena to continue. The buffer may also provide area for recreational trails and provides a physical separation from new development that will discourage encroachment. (Adapted from a definition in Fisher and Fischenich, 2000, citing Castelle et al., 1994 in Natural Heritage Reference Manual, MNR 2010)

**Carport:** A roofed enclosure used for the storage or parking of motor vehicles with a maximum 40 per cent of the total perimeter enclosed by walls, doors or windows. A minimum of 60 per cent must remain unenclosed in the form of full or half open walls.

**Conservation of Land:** For purposes of this document means the protection, management, or restoration of lands within the watershed ecosystem for the purpose of maintaining or enhancing the natural features and hydrologic and ecological functions within the watershed.

**Conservation activities:** means projects intended to maintain, enhance, or restore the functions of a wetland, or to create a wetland where one did not exist previously. Projects and

activities can include for example: plantings, wetland creation or alteration, landscaping, grading, hydrologic manipulation, and invasive species [removal](#).

**Conservation projects:** means projects intended to maintain, enhance or restore the functions of a wetland, or to create a wetland where one did not exist previously. Projects and activities can include, for example: plantings, wetland creation or alteration, landscaping, grading, hydrologic manipulation, and invasive species removal.

**Cumulative effects assessment:** cumulative effects represent the sum of all individual effects occurring over space and time, including those that will occur in the foreseeable future (Natural Heritage Reference Manual). An assessment includes consideration for the incremental effects of an action on the environment when the effects are combined with those from other past, existing and future actions (Cumulative Effects Assessment Practitioners Guide, Hegmann *et al.* 1999).

**Development:**

- a) the construction, reconstruction, erection or placing of a building or structure of any kind;
- b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;
- c) site grading; or
- d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere (S. 28 (25) CA Act of Ontario).

**“Development, Interference with Wetlands and Alterations to Shorelines and Watercourses” regulation:** A regulatory authority under Section 28 of the Conservation Authorities Act of Ontario related to activities on hazard lands, in wetlands or along watercourses as defined. Replaced the **“Fill, Construction and Alteration to Waterways”** regulation.

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

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

**Environmental Impact Study:** means a document produced by a qualified professional usually to a prescribed standard that examines the environmental consequences of a *development* project.

**Erosion:** means a continual loss of earth material (i.e. soil) over time as a result of the influence of water or wind.

**Dry floodproofing:** the object of *dry floodproofing* is to keep a development and its contents completely dry during flood events. Dry, passive floodproofing includes the use of fill, columns or design modification to elevate openings in the structure above the level of the regulatory flood so that there is no need for action to put the flood protection into effect. Dry, active floodproofing requires some action to keep the development dry during flood events by use of water tight doors and seals or sandbagging to prevent water from entering openings below the regulatory flood elevation. Dry floodproofing of structures that will have portions below the level of the regulatory flood requires additional special design attention so that the structure will resist all loads including hydrostatic pressures.

**Fill:** means any material capable of being used to raise, lower, or in any way affect the contours of the ground.

**Fill Material:** Clean material that when buried will have no adverse effect on people or the environment. Includes natural materials such as clay, soil, and rock, and other inert materials such as concrete or brick that are free of combustible, putrescible, degradable or leachable components. Fill material must not be susceptible to washout, scour, or *erosion* of any kind, must be placed to ensure the long term stability of slopes in accordance with sound engineering standards and be composed of inert material.

**Flood fringe:** the outer portion of the flood plain between the *floodway* and the regulatory flood. Flood depths are generally less severe in the flood fringe than those experienced in the *floodway*

**Floodproofing:** means a combination of structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structure or properties subject to flooding so as to reduce or eliminate flood damages and to provide for the continued occupancy of the structure throughout a flood event of the regulatory flood magnitude

**Floodway:** the channel of a watercourse and that inner portion of the flood plain where flood depths and velocities are generally higher than those experienced in the *flood fringe*. The floodway represents that area required for safe passage of flood flows and/or velocities are considered such that they pose a potential threat to life and/or property damage

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

**Gross floor area:** The total area of each floor with headroom height of 1.8 metres or greater, whether located above, at or below grade, measured from the interior of outside walls and including floor area occupied by interior walls and floor area created by bay windows.

**Habitable:** means room or space required and intended for overnight occupancy, and includes facilities for storage, heating, air-conditioning, electrical, hot water supply, plumbing, waste connections, etc. which are necessary to maintain the *habitable* condition

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

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

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

**Hydrologic Impact Study (HIS):** a site specific study produced by a qualified professional or group of professionals, usually to a prescribed standard, that examines the hydrologic consequences of a *development* project (see Appendix I).

**Hydroperiod:** means the period of time for which a given area has standing water, or water at surface.

**Individual on-site sewage services:** means individual, autonomous sewage disposal systems within the meaning of s.8.1.2, O.Reg. 403/97, under the Building Code Act, 1992 that are owned, operated and managed by the owner of the property upon which the system is located.

**Individual on-site water services:** means individual, autonomous water supply systems that are owned, operated and managed by the owner of the property upon which the system is located.

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

**Karst:** a landscape shaped by the dissolution of a layer or layers of soluble bedrock, usually carbonate rock such as limestone or dolomite. Many *karst* regions display distinctive surface features including sinkholes and fractures. See also "*hazardous land*".

**Marine facility:** a *boathouse*, boat dock, boat slip or marine railway

**Meander belt allowance:** The term *meander belt allowance* is the maximum extent that a water channel migrates. Other terms associated with meander belts are amplitude, wavelength, bend radius, bankfull width, point bars, pools, riffles and concave and convex banks. A meandering channel is a series of interconnected reaches. A reach is a length of channel over which the channel characteristics are stable or similar. For each reach, the meander belt should be centred on a line of axis drawn through the middle of the meanders or riffle zones, a line that essentially divides each of the meanders in half.

The width of a meander belt can be determined by analyzing the bankfull channel width of the largest amplitude meander. The *meander belt allowance* is defined as 20 times the bankfull channel width of the reach and centred on the meander belt axis. When determining the meander belt for these relatively straight reaches, the meander belt should be centred on the mid-line of the channel.

**Minor Additions:** Relates to limits on the type of use (i.e. residential habitable, residential non-habitable, commercial, industrial, institutional, etc. in hazardous areas. For residential uses where safe access is not available the size of the addition shall not exceed 20% of the gross floor area of the existing building or 20 square metres (215 square feet) whichever is the lesser. Where safe access is available somewhat larger additions resulting in increases of between 20% and 50% but not exceeding a maximum of 50 square metres (538 square feet) may be considered subject to applicable policies. No more than one *minor addition* will be considered per *structure*, and there can be no increase in occupancy or the number of *dwelling units*. Requirements are more specifically quantified in policy.

**Mitigation:** means a reducing of the adverse effects.

**Non-apparent valley:** are those drainage systems where the watercourse is not located within a valley corridor with discernable slopes, but relatively flat to gently rolling plains and is not confined by valley walls. The watercourse can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels.

**100 year flood:** the flood, based on analysis of precipitation, snowmelt, or a combination thereof, having a return period of 100 years on average, or having a 1% chance of occurring or being exceeded in any given year

**One-zone concept:** Using this, planning authorities determine the flooding hazards limit, based on the 100-year flood or major storm-centred event, and prohibit all development or *site alteration* within those boundaries. This is the most effective way of minimizing threats to public health or safety or property damage. The one zone concept is the preferred approach for the management of flooding hazards within river and stream systems as it provides the most cost effective means of minimizing potential threats to life and risks of property damage and

social disruption. Where the one zone concept is applied, the entire flood plain or the entire flooding hazard limit defines the *floodway* (Figure 1)

**Other water related hazards:** water associated phenomena acting on shore lands other than flooding and wave uprush. This includes, but is not limited to, wave spray, ponding due to wave overtopping, ice accumulation and ice forces.

**Peat Extraction:** Peat extraction is an activity that can have significant negative impacts on the ecological, hydrological, social and economic values of wetlands. Impacts of extraction can include loss of vegetation and associated habitat for animals (potentially including species at risk); a lowering of the water table (due to drainage), which can affect local human uses and water supplies; degraded water quality; release of sequestered carbon; degraded air quality; and increased risk of fire.

**Pond:** A body of stagnant water without an outlet, larger than a puddle and smaller than a lake; or a like body of water with a small outlet.

**Portable mobile building:** means any dwelling that is designed to be mobile, and constructed or manufactured to provide a permanent or seasonal residence for one or more persons. This includes a park model trailer.

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

**Provincially Significant Wetlands:** Wetland that have been evaluated by the Ministry of Natural Resources as Class 1, 2 and 3 wetlands, as defined in the Ontario Government - Policy Statement on Wetlands"

**Quality and quantity of water:** means a parameter measured by indicators such as minimum base flow, depth to water table, aquifer pressure, oxygen levels, suspended solids, temperature, bacteria, nutrients and hazardous contaminants, and hydrologic regime.

**Redevelopment:** means the creation of new units, uses or lots on previously developed land in existing communities, including brownfield sites.

**Regulation limit:** The Upper limit of regulatory jurisdiction for a Conservation Authority regulation as defined by Section 2 of the applicable Section 28 CA Act regulations.

**Regulatory flood plain:** The 100 Year Flood Event Standard meaning rainfall or snowmelt, or a combination of rainfall and snowmelt producing at any location in a river, creek, stream or watercourse, a peak flow that has a probability of occurrence of one per cent during any given year.

**Repair:** means to mend, remedy, restore, renovate to a good or sound state; contemplates an existing structure or thing which has become imperfect and return it to the condition in which it originally existed, as near as may be. (BLD)

**Restoration means:** to bring back to original state or bring back to a former place or condition; restoration is the act of restoring (may also apply to rebuilding or repairing). **CO**

**Riprap:** means a layer of stone of a prescribed specification to prevent the erosion of soil.

**River, stream and small inland lake systems:** means all watercourses, rivers, streams, and small inland lakes or waterbodies that have a measurable or predictable response to a single runoff event.

**Safe Access:** Vehicular and pedestrian access routes are considered safe if the depth of flooding, at the regulatory (1:100 year) flood level, along the full length of the travelled surface does not exceed 0.3 metres and the flood velocity does not exceed 1.0 metres/second.

**Sewage works:** means sewage works as defined in subsection 1 (1) of the *Ontario Water Resources Act*. (OBC Section 1.4 Defined Terms).

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

**Site alteration:** means activities such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site. (Provincial Policy Statement 2005)

**Small quantities of fill:** means a volumetric amount of *fill* not exceeding 10 cubic metres.

**Stable slope limit:** is the limit, or the setback that ensures safety if the slumping or slope failure occur. It represents the limit to which the slope would recede if it were to reach the long term stable slope inclination; at which point it would resist slumping and rotational slipping. The stability of slopes can be affected by everything from increases in loading, such as the placement of buildings, and changes in drainage patterns to erosion of the toe of a slope and loss of stabilizing vegetation on the slope face.

The stable slope allowance is determined by using a horizontal allowance measured landward from the toe erosion allowance equivalent to three times the height of the slope (3:1) OR through a valid study. The 3:1 is considered a minimum allowance.

**Structure:** means any material, object or work erected either as a unit or constructed or assembled of connected or dependent parts or elements, whether located under, on and/or above the surface of the ground. (i.e. swimming pools, hot tubs and fences)



**Toe-erosion allowance:** or the setback that ensures safety if the toe of the slope adjacent to the river or stream erodes and weakens the bank, increasing the risk of slumping. It includes:

- average annual recession rate, based on a minimum 25 years of record or data to determine the toe erosion allowance over a 100-year planning horizon;
- a 15 m toe erosion allowance measured inland horizontally and perpendicular to the toe of the watercourse slope (Figure 3) where the distance between the watercourse and the base of the valley wall is 15 metres or less (used as the default value for mapping of Regulation Limit);
- toe erosion allowance based on a valid study which is based on at least 25 years of erosion data;
- toe erosion allowance based on soil types and hydraulic processes (flow rates, volume, etc.), based on observations or analytical studies, and where the watercourse is 15 metres or less from the base of the valley wall.

**Two-zone concept:** This concept identifies the *floodway* and the *flood fringe*. The *floodway* refers to that portion of the flood plain where development and *site alteration* would cause a threat to public health and safety and property damage. In other words it is that portion of the flood plain 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 property damage. (See figure 2). The *flood fringe* is the portion of the flood plain where development may be permitted subject to certain established standards and procedures. Because conditions vary, there is no province wide standard for determining the more hazardous areas of flood plains. But some factors to take into account include depth of water: velocity of flow, combined depth and velocity, vehicle access and structural integrity. These factors along with critical depth and velocity limits are discussed in the Technical Guide, River and Stream Systems, Flooding Hazard Limit.

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

**Wet floodproofing:** involves the design of a structure to intentionally allow flood waters to enter while maintaining the structural integrity and minimizing water damage to the structure. Its use is generally limited to certain specific non-residential/*non-habitable* structures (e.g. arena, stadium, parking garage), but many of the techniques of *wet floodproofing* can be used with certain *dry floodproofing* approaches. The intent of *wet floodproofing* is to maintain structural integrity by avoiding external unbalanced forces from acting on buildings during and after a flood, to reduce flood damage to contents, and to reduce the cost of post flood clean up. As such, *wet floodproofing* requires that the interior space below the level of the regulatory flood remain unfinished, be *non-habitable*, and be free of service units and panels, thereby ensuring minimal damage. Also this space must not be used for storage or immovable or hazardous materials, that are buoyant, flammable, explosive or toxic. Furthermore, access ways into and from a wet floodproofed building must allow for safe pedestrian movement.

**Wetland:** means land that

- a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface;
- b) directly contributes to the hydrological function of a *watershed* through connection with a surface *watercourse*;
- d) has hydric soils, the formation of which has been caused by the presence of abundant water; and
- d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a *wetland* characteristic referred to in clause c) or d).

**Wetland boundary:** the point where 50% of the plant community consists of *wetland* plant species as listed in Appendix 5 of “The Ontario *Wetland* Evaluation System – Southern Manual”, Ministry of Natural Resources, 1993.

## Appendix B: Flood Plain Mapping

Watercourse	Coverage	Format	Air Photo Base	Scale	Contour Interval (m)	No. Maps
Carp Creek	Glen Cairn	orthophoto	1979	1:2,000	0.5 m	2 (CG1-2)
Carp River	Hazeldean to Ottawa River	orthophoto	1979	1:5000	1.0 m	8 (20-27)
<b>Towns/Villages:</b>	Carp	orthophoto	1979	1:2,000	0.5 m	2(C1-2)
	Fitzroy Harbour	orthophoto	1979	1:2,000	0.5 m	4(FH1-4)
Clayton & Taylor Lakes	entire lakeshore	orthophoto	1979	1:5000	1.0 m	3(12-14)
Clyde River	Cedardale, Lanark	map base	1985	1:2,000	1.0 m	5
Cody Creek	Manion Corners to Miss. River	orthophoto	1979	1:5000	1.0 m	5 (15-19)
Dalhousie Lake		map base	2003	1:3000	0.5 m	
Indian River	Clayton Lake to Mississippi R.	orthophoto	1979	1:5000	1.0 m	2 (10-11)
<b>Towns/Villages:</b>	Clayton	orthophoto	1979	1:2,000	0.5 m	1(CL1)
Kizell Drain	Kanata to Watts Creek	map base	1981	1:2,000	1.0 m	10
Mississippi Lake	entire lake shore	orthophoto	1979	1:5000	2.0 m	14
Mississippi River	Carleton Place to Ottawa River	orthophoto	1979	1:5000	1.0 m	10 (1-9A)
<b>Towns/Villages:</b>	Almonte	orthophoto	1979	1:2,000	0.5 m	2(A1-2)
	Appleton	orthophoto	1979	1:2,000	0.5 m	1(AP1)
	Blakeney	orthophoto	1979	1:2,000	0.5 m	1(B1)
	Carleton Place	orthophoto	1979	1:2,000	0.5 m	2(CP2)
	Galetta	orthophoto	1979	1:2,000	0.5 m	2(G1-2)
	Pakenham	orthophoto	1979	1:2,000	0.5 m	1(P1)
Ottawa River	entire jurisdiction	map base	1981	1:2,000	1.0 m	87
Poole & Feedmill Ck.	Stittsville	orthophoto	1979	1:2,000	0.5 m	10
Shirley's Brook	Kanata to DND property	map base	1981	1:2,000	1.0 m	14
Watts Creek	Kanata to Shirley's Bay	orthophoto	1979	1:2,000	0.5 m	6(W1-W6)

## **Appendix C: Floodproofing Guidelines and Design Standards**

"Floodproofing" encompasses all protective measures required to ensure that a building and its contents will not sustain flood damages and that continued occupancy of the building can occur at least throughout the early stages of a *100 year flood*. Since there will always be a probability of a flood event exceeding a *100 year flood*, total protection from flood damage cannot always be assured.

### **C.1 General Floodproofing Principles**

- (i) Development that, according to these policies, is permitted in the flood plain must be protected by accepted floodproofing actions or measures.
- (ii) Access for new buildings must be such that vehicular and pedestrian movement can occur during times of flooding.
- (iii) Dry, passive floodproofing must be used whenever possible.
- (iv) Residential/habitable buildings must always incorporate dry floodproofing measures.
- (v) Wet floodproofing may only be considered for non-residential/non-habitable uses and for buildings accessory to residential/habitable uses (i.e. garages).

### **C.2 Safe Access / Egress**

The Provincial Policy Statement and associated technical guideline, identify safe access as a primary consideration before approval is granted for flood plain development. The availability of safe access is directly related to flood depth and water velocity. Access is safest if it is floodproofed to the *100 year flood* level.

Access concerns include but are not limited to:

- a) vehicular access routes (municipal roadways and private rights-of way);
- b) pedestrian access routes (private laneways, driveways and walkways between residences and vehicular access routes).

### **C.2.1 Access in Flood Hazard Areas**

- (i) Where floodproofing to the regulatory flood level is not possible, vehicular access and parking lots must be designed such that the maximum depth of flooding will not exceed 0.3 metres and the maximum flood velocity will not exceed 1.0 metres/second.
- (ii) Driveways/access roads may be filled to a minimum of 0.3 metres below the Regulatory Flood Level and to a maximum of 0.3 metres above the Regulatory Flood Level, with the sides of the driveway tapering down to existing grade at a 3:1 slope angle.
- (iii) Driveway/access road side slopes should be stabilized with appropriate ground cover or another stabilization treatment.
- (iv) Access routes must be designed to allow for passage of normal flow and flood waters without obstructing or impeding flow.
- (v) An assessment by a Professional Engineer may be required, at the landowner's expense, for access in areas prone to flooding.

### **C.2.2 Access in Slope and/or Erosion Hazards**

- (i) Access must be constructed such that it is not prone to erosion or instability and will not cause or aggravate erosion or instability on neighbouring properties.

An assessment by a Professional Engineer may be required, at the landowner's expense, for access in areas prone to erosion or instability.

### **C.3 Design Requirements for Residential/Habitable Buildings**

- (i) New development, infilling, replacement and additions for a residential/habitable use must be dry, passive flood-proofed to the regulatory flood level. Where such requirements impact on, or are significantly out of context with neighbouring properties, other floodproofing approaches may be considered.
- (ii) The design requirements for dry passive floodproofing are as follows:
  - a) the underside of the floor assembly closest to grade and all building openings must be at least 0.3 metres above to *100 year flood* level;
  - b) where wave uprush may occur, the building must include measures addressing this impact, which in the MVCA watershed requires *floodproofing* to an additional 0.3 metres above the required *floodproofing* level described in a);

- c) habitable space, including a basement, is not permitted below the regulatory flood level;
- d) a crawlspace may be permitted subject to the following:
  - height must not exceed 1.8 metres
  - for a concrete slab floor the drawings must be stamped by a Professional Engineer, otherwise the floor must remain unfinished (i.e. gravel floor)
  - the minimum floor elevation must be at least the 5 year flood level;
- e) foundations, walls and floors located below the elevation of the *100 Year Flood* level must be designed to withstand hydro-static pressures associated with this flood level;
- f) materials for construction must be of a type not subject to deterioration by alternate wetting and drying;
- g) all mechanical and electrical service shutoffs must be located at least 0.3 metres above the *100 Year Flood* level.

#### **C.4 Design Requirements for Non Residential Buildings**

- (i) Buildings that are used for non-residential purposes including commercial and industrial uses may be permitted in the flood fringe subject to the following:
  - a) the building and access must be floodproofed in accordance with the methods outlined in Appendix C 2.1.;
  - b) for commercial or industrial uses, a foundation design and site grading plan must be prepared by a Professional Engineer to the satisfaction of the Authority;
  - c) any part of the building that is intended to be used for overnight occupancy must be dry-passive floodproofed to the standards required for residential uses.

Non-residential buildings intended for any of the uses listed under Section 5.2 (essential services, institutional uses and uses involving hazardous substances) are not permitted in the flood plain.

## C.5 Fill Aprons for the Floodproofing of Buildings

Excessive filling in the flood plain can have negative impacts on water flow and storage capacity of the flood plain which can cause or increase flooding and/or erosion on other nearby properties. Excessive filling in the flood plain can also cause sedimentation resulting in impacts to water quality. To reduce these negative impacts, fill placement within the flood plain is generally limited to what is required for floodproofing purposes. The placement of excessive fill for landscaping purposes is generally not permitted.

- (i) Fill placement for the purposes of floodproofing a habitable dwelling shall be limited to a fill apron extending a maximum of 4.5 metres out from the foundation walls.
- (ii) The top of the fill apron must be graded up to at least the regulatory flood level where it meets the exterior of the foundation wall, and up to a maximum of 0.15 metres above regulatory flood level.
- (iii) The fill apron must be graded away from the foundation wall at a slope no steeper than 3h:1v (horizontal:vertical).

## C.6 Drainage Swales

Where a lot is being graded to an elevation that exceeds the grade of the adjacent property the lot grading must not result in additional runoff being directed onto adjacent properties. Grassed drainage swales must be provided between the fill area and the lot line where a natural drainage swale does not already exist (see details below).

- (i) Where drainage swales are required, they should be designed to the following minimum standards (see drawing below):
  - a) The swale must be located entirely within the limits of the lot and shall not extend beyond the side yard lot lines into neighbouring properties.
  - b) The base of the swale should be to 0.2 to 0.3 metres (8 to 12 inches) in width.
  - c) The minimum depth of the swale should be 0.15 metres to a max. depth of 0.60 m.
  - d) The side slopes of the swale should not exceed a 3h:1v slope.
  - e) A 2% (50h:1v) minimum slope along the bottom of the swale is recommended for proper drainage - maximum grade of 8% (12.5h:1v).
  - f) The bottom of the swale should be graded smoothly concave.
  - g) The inside surface of the swale should be permanently stabilized with grass seed and mulch and/or other vegetation.

h) Rock check dams may be required in areas of potentially high flow.

### **C.7 Swimming Pools**

Principal objectives of the Provincial Policy Statement are to prevent loss of life and to minimize property damage. A concern with swimming pools in flood prone areas (particularly in *floodway* situations) is the potential increased risk of property damage. Damage could occur in one or more of the following scenarios:

- pool fills with silts and other debris
- vinyl liner is punctures or torn
- side walls collapse or bottom cracks / heaves due to hydrostatic pressures
- pumps, heaters and filtration equipment damaged from high water levels and silting
- storage shed or other accessory buildings damaged
- chlorine or other pool chemicals spill causing contamination
- fencing traps debris and directs flood waters onto other flood-prone land
- pool is actually dislodged (if above-ground) becoming an obstruction to flood flow

Landowners are advised that filter / heater equipment, electrical connections, chemical storage, etc. should be constructed taking local flood levels into account.



## ***Appendix D: Cut and Fill Guidelines***

### **Site Grading**

Within a floodway, MVCA may approve site grading/site alteration, in limited circumstances, in situations that meet the following conditions:

#### **1) Minor Site Grading (Cut and Fill Balance Works)**

The site grading/site alteration will be considered minor and generally can be approved without further detailed hydraulic analysis if:

- a) The modification of the flood plain is required to obtain a useable area for building above (outside) of the Regulatory (1:100 year) flood plain. (i.e. part of the property is presently outside of the Regulatory flood plain but the distribution or orientation of this area is not suitable for development.
- b) Does not create a new building area at a location that is presently totally within the flood plain.
- c) The property is located in an area of existing development.
- d) The site alteration is confined to lands with existing ground elevations that are no more than 0.3 metres lower than the estimated 1:100 year water surface elevation of the river or stream.
- e) The area of the proposed cut or fill zones will be roughly equal to one another.
- f) Safe access is available.
- g) The loss of flood plain storage volume within the 1:100 year flood plain which will result from the placement of fill shall be fully compensated for by an incrementally balanced cut (or excavation) to be carried out in close proximity to and concurrently with the placement of the fill. This cut and fill operation must occur on the same property.
- h) The resulting development meets all flood proofing requirements.

## **Appendix E: Two-Zone Areas**

The following reaches of watercourses are administered using the Two Zone Concept:

### **Constance Bay - Ottawa River**

Location: The lands within the Village of Constance Bay depicted on maps.....

Floodway: The *floodway* is defined by an elevation of less than 60.0 metres.

Flood fringe: The *flood fringe* is defined as the area between 60.0 metres and 60.9 metres (the *100 year flood* elevation)

### **Mississippi Lake**

Location: The entire lake shore of Mississippi Lake as depicted on Schedules.

Floodway: The *floodway* is defined by the elevation of 135.0 metres or less.

Flood fringe: The *flood fringe* is defined as the area between the elevations of 135.0 metres and 135.6 metres.

### **Carleton Place**

refer to River Corridor Study

### **Shirley's Brook (Klondike Area)**

refer to Kanata North Environmental Management Plan/Stormwater Management Plan

### **Stittsville**

refer to Amber lakes Flood Plain Study

### **20 and 50 Frank Nighbor Place**

## ***Appendix F: Geotechnical Evaluation Requirements***

The following is a list of the items that are required to fulfill the Mississippi Valley Conservation Authority's requirements for a geotechnical slope evaluation. All of the following items must be carried out by a qualified geotechnical engineer.

- a) Undertake a physiographic examination of the slope, through aerial photography review and field reconnaissance survey, to check for active erosion, shallow slips transitional type slopes, zones of active seepage or surficial erosion, etc. - Identify areas of potential failure and identify the mechanisms of failure.
- b) Survey and map the slope in detail.
- c) Prepare surveyed cross-sections of the slope.
- d) Carry out a field drilling program where appropriate to provide suitable assessment of the subsurface conditions of the slope including groundwater conditions (the number and depth of borings needed is to be determined by the geotechnical engineers undertaking the study).
- e) Carry out on-site testing, sampling, piezometric measurements and laboratory testing as determined appropriate by the geotechnical engineer.
- f) Analyze existing slope stability and determine the stable slope configuration for the site and appropriate development setbacks from the top and/or base of the slope based on the information obtained from items (i) to (v).
- g) Determine and map the most suitable building envelope based on item (vi) for each lot affected.
- h) Prepare a report containing the findings of the study and include: a site map, all borehole logs, test results, survey sections, a map showing lot boundaries and building envelopes, and an outline of structural, landscaping, and surface drainage measures that may be necessary as part of a future site plan agreement to maintain the long term stability of the structures and property.

NOTE: Depending on the site specific characteristics and the nature of the development proposal, additional information may be required.

## Appendix G: Environmental and Hydrologic Impact Study and Procedures

### IMPACT ASSESSMENT – WETLAND NATURAL HERITAGE FEATURES <sup>1</sup>

#### Discussion

Consistent with the conservation authority's responsibilities to address the effects of proposed development, it may be necessary to demonstrate that a development proposal will result in no negative impacts on natural heritage features and areas. From a regulatory perspective inside the wetland such negative impacts would include effects on the control of flooding, erosion, pollution and the conservation of land and would include both hydrological and ecological function. Around the wetland (within 120 metres) the CA requires that there be no adverse effects on the hydrologic function of the wetland.

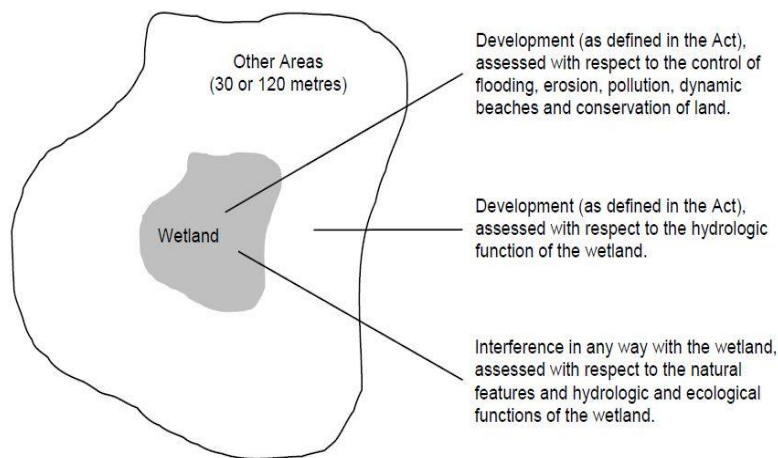


Figure 5. Three ways through which the Conservation Authorities Act and Individual CA Regulations address wetlands and other areas

The scale of the project and the characteristics of the feature will play a significant role in determining the scope of any necessary studies. In some cases, especially in more developed areas, available information <sup>2</sup> on natural heritage features may be sufficient to determine whether assessment is required. The impacts of smaller scale development (e.g. construction of a small addition or a small auxiliary building on an already developed lot) may sometimes be addressed simply by the application of best management practices. In other areas, however, determining whether an impact assessment is needed may be difficult, and a site investigation and inspection may be required to identify potentially significant natural heritage features and areas requiring further investigation and analysis.

<sup>1</sup> Most municipal Official Plans contain policies for protecting natural features. Municipal zoning documents identify specific areas to which OP protection policies apply.

<sup>2</sup> Watershed plans, municipal environmental management plans, community design plans and similar will often address the protection of natural heritage features. In other cases site specific information may have been collected associated with a specific development application.

## Methodology

To assist municipalities with administering their responsibilities under the Planning Act the Province has prepared guidelines for protecting natural heritage features. Such guidelines are contained within the Ministry of Natural Resources and Forestry (MNR) *Natural Heritage Reference Manual* (Second Edition, March 2010); these policies are heavily based on requirements contained in this document. In addition, particularly with respect to hydrologic function, it is expected that proponents will rely on guidance contained in the Ministry of the Environment (MOE) *Stormwater Management Planning and Design Manual* (March 2003) and particularly Chapter 3 of that document. Frequently CAs assist municipalities with similar responsibilities by providing advice on applications under the Planning Act for which the municipality is the approval authority. The intent with the MVCA approach is to attempt to have municipal requirements and CA requirements be as complimentary as possible so as to avoid, wherever possible, duplication of effort.

### Process for and Relationship between Impact Assessment Components

It is strongly recommended that the proponent consult with CA staff as early as possible concerning the proposed development.

### Determining an Appropriate Level of Assessment



Figure 6. Steps to determine appropriate level of assessment (MNR Natural Heritage Manual)

Once it has been established that a development application triggers the need for an impact assessment, the appropriate level of detail and effort required to assess the development impacts will vary, depending on the characteristics of the site and the proposed development.

Determining an appropriate level of assessment for an EIS or equivalent study is typically measured by factors that include the following:

- level of effort is correlated with the likelihood of a significant natural heritage feature or area being present (e.g., significant wildlife habitat is deemed to be present on the basis of factors such as the geographic range of a species or known occurrences of the species in the general area).
- the assessment effort is correlated with the level of analysis that may have occurred previously as part of a separate planning process (e.g., comprehensive studies to identify natural heritage areas and systems including significant features and areas).
- any field observations and investigations are scheduled to occur when the feature would be expected to be visible, if present.

In terms of the above factors, not all impact assessments have to be detailed and may be tailored to the situation. An appropriate level of effort for an adjacent lands study (i.e., EIS or equivalent study) could, for instance, take into account existing development, existing land use entitlements and the existing land use fabric.

A detailed assessment is appropriate, however, in cases in which:

- the potential impacts of a proposal are unknown and a precautionary approach is needed;
- impacts on natural heritage features are likely to occur;
- appropriate impact mitigation techniques may not be readily available;
- the significance level of the natural heritage feature is high;
- the planning stage for the proposed development is advanced;
- the proposal may lead to multiple or successive development or site alteration activities; and
- the potential development would result in the elimination of a significant natural heritage feature.

In situations in which comprehensive planning studies or natural heritage systems have been completed with site level information, the need for a detailed assessment may be reduced, and a more focused assessment may provide an adequate evaluation of potential impacts.

Regardless of the assessment undertaken, the level of detail must be sufficient to demonstrate that there will be no negative impacts on the natural features or their ecological functions. An impact assessment is more than a description of constraints on a property. It is an evaluation that must anticipate the implications of changes in land use and the interaction of these changes with the features and functions of an area. This requires a thorough inventory of abiotic conditions, flora and fauna; documentation of vegetation; analysis of the interrelationships among the biotic and abiotic elements of a site (i.e., its ecology); and

determination of the effect the proposed changes will have on the existing conditions. Most importantly, an EIS must determine whether the likelihood of negative impacts occurring on the natural features or their ecological functions is definite or probable if the development proceeds under a given proposed design. Decision makers need this information to determine the need for modifications to proposed plans, buffers and other mitigation strategies and to evaluate the change in the use of the land.

### **Contents of an Environmental Impact Study**

The conservation authority can provide direction on the contents of an EIS or other equivalent study for impact assessment as part of the early consultation process for evaluating and demonstrating that there will be no negative impacts on natural features (including adjacent lands) or on their ecological or hydrologic functions. Discussion between CA staff and the proponent including, where necessary, qualified professionals acting on the proponents' behalf are, however, critical to ensuring site investigations and subsequent analysis are undertaken in a useful and meaningful way.

- ◇ Specific requirements and content provisions are set out in Sections 4, 6, 13 and Appendix C of the MNRF ***Natural Heritage Reference Manual*** (Second Edition March 2010). Section 13.5 (Impact Assessment Process pp. 123 - 132) provides the primary framework for analysis.
- ◇ Hydrologic function matters need to be addressed as outlined in Figure 8 of this document; where more detailed analysis is required particular attention should be given to Chapter 3 (Water Balance, Water Quality, Erosion Control and Water Quantity) of the **MOE Stormwater Management Planning and Design Manual**, MOE March 2003.

### **Review of Assessment**

The proponent submits an impact assessment to the conservation authority. The conservation authority reviews the assessment to determine whether it is acceptable in terms of the completeness of the inventory and description of features, the thoroughness of the evaluation of potential negative impacts, the adequacy of the mitigation measures and monitoring programs identified, and so on.

The CA may request may be made that further information be provided or alternative mitigation and monitoring measures be considered. In addition MNRF and other agencies may be consulted regarding technical aspects.

Using the sample review list provided in Appendix C.2.2 can help a planning authority determine whether all issues have been adequately addressed in the impact assessment. The planning authority should review the impact assessment for completeness and technical accuracy.

### **13.5.6 Conservation Authority Decision**

In making its decision about a proposed development, the conservation authority would consider the results of the assessment review, along with its effects on acceptance from a CA policy perspective. The conservation authority's decision will in particular be based on an assessment of the effect of the proposal on the control of flooding, erosion, pollution, the conservation of land and effects with respect to the hydrologic function of the wetland. The development or interference may be approved, approved with conditions or denied.



## Contents of an Environmental Impact Study - SAMPLE CHECKLIST

### C.2.2 Sample Checklist for Use in Assessing Impacts of Development

Site-specific assessments of development impacts could include these and other types of information:

#### 1. General Information

- identity of proponent
- identity of proponent's representative (consultant)
- impact assessment submission date
- executive summary

#### 2. Background Information

- site setting
- surface and subsurface soils
- landform type
- landform position
- natural heritage area boundary
- catchment boundary
- drainage pattern
- vegetation communities
- general habitats
- critical habitats
- significant species
- land use patterns
- resource use
- type/position of the development
- summary of key ecological functions
- potential impacts
- predicted effects

#### 3. Elements of Site-Specific Assessments of Impacts

- understanding of hydrogeological setting, including fluvial geomorphology
- hydrological information and modelling
- water-balance exercise
- water-quality information
- habitat assessment details for terrestrial and aquatic systems
- modelling of habitat, if required
- ELC
- confirmation and detailed characterization of significant features
- characterization of linkages (terrestrial and aquatic)
- characterization of values
- characterization of impacts on key ecological functions
- mitigation strategy, net effects predictions and monitoring recommendations
- compatibility with planning area natural heritage systems, or other natural heritage strategies

#### 4. Site-Specific Impact Assessment Map

Depending on the type of assessment and the nature of the development, site-specific impact assessment map scales can vary (e.g., 1:10,000 to 1:2,000) and could include the following information:

- title
- north arrow
- scale
- legend: date of production/revision, identity of proponent and representative
- natural heritage area and adjacent lands
- detailed drainage patterns; inflows and outflows
- presence of control structures, culverts, etc.
- water-level gauge locations
- basins and sub-basins
- soil textures

- regional and local groundwater flow patterns including seepage zones (conceptual)
- water-quality sampling locations
- detailed terrestrial and aquatic habitat information (i.e., community boundaries)
- spot locations of significant flora and fauna
- locations of critical habitat
- general cover types of adjacent lands
- locations of terrestrial and aquatic linkages
- locations of resource harvest/use
- impact/effect identification:
  - drainage boundary change
  - outfall locations
  - detailed development footprint (e.g., pervious and impervious surfaces, lot fabric, excavation locations and depths, grading information, topsoil storage locations, stormwater management design)
  - habitat removal
  - effects on significant features (e.g., fish barriers)
  - linkage fragmentation
  - value displacement

- mitigation:
  - facility locations that use best management practices
  - protective barriers (temporary and permanent)
  - rehabilitation/enhancement measures
  - plantings
  - monitoring

Figure 7. Sample checklist for assessing impacts of development

Items identified in the checklist only represent minimum reporting requirements for the development proposals; additional requirements may be identified depending on specific site conditions encountered and the scope of the actual development proposed. Pre-consultation will determine the scale of the development impacts; a full site EIS or a comprehensive EIS may be required dependent on the nature of what is proposed and site conditions encountered.

### Step 1: Identify aspects of the Proposed Development or Alteration that could trigger impacts

- Will overland flow pathways to or from the wetland be altered by regrading of surface contours or re-routing of existing ditches or watercourses?
- Does the application involve the installation of any temporary or permanent drainage works, including surface ditches or channels and subsurface piped systems, with or without pumping equipment?
- Will the project result in the removal of native soil and its replacement by structures or materials with different water retention and hydraulic conductivity characteristics?
- Will grades be raised in such a way as to cause consolidation of subgrade materials and changes in their water retention and hydraulic conductivity characteristics?
- Will site runoff, evapo-transpiration or infiltration amounts change (annually, seasonally) due to changes in site imperviousness, land cover, or topography, or due to maintenance practices such as snow removal?
- Is the proposed development or site alteration for the purpose of establishing a land use or activity that will require the withdrawal of water from the wetland?

*If the answer to any of the questions in Step 1 is **NO**, the proposed development will be deemed to have no effect on the hydrologic functions of the wetland. No further assessment of potential impacts will be required, and permission will be granted with standard conditions requiring the application of best management practices appropriate to the proposed activities.*

*If the answer to any one of the Step 1 questions is yes, further assessment of the application's impact on hydrologic functions will be required. The required scope of the hydrologic impact assessment will be determined in consultation with CA specialists in hydrology, groundwater sciences and wetland ecology, and may include, but not necessarily be limited to the following steps.*

### Step 2: Characterize the key hydrologic characteristics and functions of the wetland, from a watershed management perspective

To understand the impact of the development on the wetland and its role in the hydrology of the catchment and sub-watershed in which it is located, the following information is required, at a minimum:

- connectivity of the wetland to the local stream fabric (in terms of streams flowing into the wetlands and streams flowing out of the wetland)
- a conceptual understanding of the surficial geology of the wetland's surroundings, the wetland's catchment area, the wetland's position within and areal extent relative to the subwatershed in which it is located; watershed report cards and associated catchment reports / data sheets may be of assistance
- a conceptual understanding of the subsurface conditions within the wetland (the nature of its substrate and underlying materials, depth to bedrock, etc.)
- an understanding of water table elevations within the wetland and adjacent areas and their normal range of fluctuation throughout a typical year; and characterization of the hydroperiod of the wetland
- if available for the subcatchment, historical streamflow and water level records should be obtained and interpreted

*Based on this information, an interpretation of the role of the wetland in moderating extreme flows (during period of heavy precipitation or snowmelt, or extended droughts) and its importance in terms of recharging ground water resources can be made.*

### Step 3: Characterize drainage and groundwater characteristics of the site

Depending on the nature of the proposed development or alterations and the aspects of it that triggered the need for a hydrologic impact assessment, the following information about the site may be needed:

- topographic mapping of the existing surface, and identification of surface flow pathways that will be interfered with or re-directed
- characterization of the subsurface determined through test pits or bore holes carried out to a depth below grade that is at least as much as the deepest excavation that is proposed as part of the undertaking; this should include classification of the soil structure and hydraulic properties as they vary with depth, observation the static water levels, and determination of flow directions (to or from the wetland) in the subsurface
- water balance calculations for the site of the proposed undertaking under existing conditions, and under the proposed conditions, and estimation of the change in infiltration, evapo-transpiration and runoff amounts from the site that can be expected on an average annual basis and during representative dry and wet years (or seasons)

### Step 4: Qualitative description of Potential Hydrologic Impacts

Based on a synthesis of the information obtained in Steps 2 and 3, the potential effects of the development on the hydrologic functions of the wetland should be described in a qualitative fashion.

### Step 5: Identification of Preventive or Mitigation Measures

Measures that are necessary to prevent or mitigate the potential for adverse effects as described in Step 4 should now be identified and incorporated into the application for permission. These could include design changes and structural or non-structural best management practices to be applied during and/or after implementation of the undertaking.

Depending on the anticipated severity or significance of the potential impacts, it may be necessary to undertake quantitative analyses to support the selection and design of proposed preventive/mitigation measures. The need for and scope of such quantitative analyses should be discussed with CA specialists in hydrology, groundwater sciences and wetland ecology prior to the analyses being undertaken.

Figure 8. Hydrologic Impact Assessment Procedures

## **Appendix H: Guidelines For In-Water and Shoreline Works**

### **Introduction**

Alterations or works within or along a watercourse or shoreline require written permission from MVCA prior to the works being undertaken, in accordance with Ontario Regulation 153/06. In-water works are often required to realign watercourse, protect shorelines, repair and replace infrastructure and for water taking activities.

These guidelines apply to in-water and shoreline works, and related activities. They will be used MVCA to review permit applications to ensure that these proposed activities meet the intent of the Section 28 Program Objectives for implementing of Ontario Regulation 153/06.

### **H.1 General Guidelines**

The following general guidelines will be considered in reviewing applications under Ontario Regulation 153/06 for all in-water, watercourse alterations and shoreline works.

- a) Base flows must not be adversely affected by any watercourse or shoreline alterations.
- b) The design of projects involving shoreline or watercourse alterations where natural heritage features, such as *Areas of Natural or Scientific Interest (ANSI)* and shoreline wetlands, may be present will be required to take into consideration the ecological functions of the watercourse and related features while allowing for compatible development.
- c) Timing windows restrict in-water work related to an activity during certain periods in order to protect fish and/or other species from impacts of works or undertakings in and around water during spawning migrations and other critical life stages. In or near-water works must respect the timing window guidelines for fish spawning and turtle nesting (as established by the Ontario Ministry of Natural Resources and Forestry) and species listed as threatened or endangered under the *Endangered Species Act* (administered by MECP) or *Species at Risk Act* (administered by DFO for aquatic species).
- d) Erosion and sediment control (ESC) measures must be installed before, during and post construction and remain until the site is permanently stabilized. ESC measures may include the use and maintenance of check dams, silt fences or barriers, inlet screens, sediment ponds, buffer strips or other effective measures deemed necessary by the MVCA. Ontario Provincial Standard Drawings (OPSD) for ESC measures can be used as a reference for installation and application of control measures.
- e) The use of materials that may result in *pollution* will not be permitted for the construction of near or in-water structures that will be temporarily or permanently inundated with water (i.e. railway ties, pressure treated lumber). Native, untreated materials (i.e. white cedar, hemlock) will be required in these applications.

- f) All on site activities, including maintenance procedures, are to be conducted in a manner that will prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water.
- g) It will be the responsibility of the landowner/applicant to provide any studies or reports necessary for the Authority's review and evaluation of the proposal.

## **H.2 Shoreline Alterations / Modifications**

These works include bio-engineering, rip-rap and vertical shoreline walls usually composed of armour stone, masonry rock, concrete, steel, wood and plastic or gabion baskets.

While vertical shore walls have short term benefits, the retention of existing emergent aquatic vegetation and planting of trees and shrubs on the shoreline bank is the preferred method of shoreline protection. Retention of existing shoreline vegetation can be an effective method of preventing erosion and shall be incorporated into shoreline alteration proposals. Rip-rap, which is the placement of clean angular stone or rock rubble on a slope, may be used in combination with bio-engineering methods where bio-engineering methods alone would be ineffective. Properly sized rip-rap placed along the waterfront over a geotextile filter fabric dissipates wave action and prevents soil particles from washing out while allowing land-based moisture to naturally infiltrate back into the waterbody.

- (i) Preservation or enhancement of natural vegetated shorelines and buffers is encouraged and may be required before other alternatives are considered.
- (ii) Where the only alternative to preventing shoreline erosion is shoreline hardening, the accepted method is rip rap, which is defined as angular blast rock backed with non-woven geotextile filter fabric, placed on a 2:1 (H:V) slope, following the natural contour of the shoreline and supplemented with native vegetation along the top.
- (iii) Where required the upland slope shall be excavated to create the appropriate slope angle. Filling, excavation or dredging of the lake or river bed to accommodate rip-rap shall not be permitted.
- (iv) The construction of vertical structures (retaining walls (concrete, armour stone), gabion baskets, etc.), will not be permitted immediately along the shoreline of a lake, river or watercourse where it can be expected that under normal conditions, the structure will be in contact or inundated by water for an extended period of time.
- (v) The replacement of a vertical structure is deemed to be new construction, in which, the reestablishment of natural conditions is required to be achieved or a less invasive form of erosion control (i.e. rip rap, bioengineering) shall be installed, if feasible.
- (vi) The construction of a vertical structure may be permitted along the shoreline of a watercourse if the following conditions are met and it has been deemed acceptable by the MVCA:
  - a) The vertical structure is located above the normal high water mark of the watercourse or an area that is seasonally or temporarily inundated with water;

- b) Encroachment on the bed of or into the watercourse will not occur to minimize placement of fill in the flood plain;
  - c) The height of the vertical structure does not exceed the existing grade of the property if it is located within an identified regulatory flood plain;
  - d) The toe of the vertical structure is protected with rip rap or a natural vegetated buffer along the base of the retaining wall;
  - e) Filter cloth shall be installed behind the shore wall to prevent the migration of fines into the water;
  - f) All backfill shall be clean imported material;
  - g) Any material excavated as part of construction should be removed off site in a contained manner and disposed of outside of the regulatory flood plains or a minimum distance of 30 metres from the watercourse; and
  - h) Construction of a vertical structure is the only effective option to repair active erosion due to the site conditions ( bank height, soil type)
- (vii) Vertical structures that exceed 1.0 metres (3.3 feet) in height, must be designed and approved by a Professional Engineer.
- (viii) Erosion control measures shall not be placed or encroach beyond the existing toe of the shoreline slope.
- (ix) Encroachment of rip-rap up to 1 metre onto the lake or riverbed may be supported if the encroachment is required to protect trees that support shoreline stabilization.
- (x) A proposal will be considered a repair if the proposed work affects less than 50% of the existing erosion protection along the shoreline and there is no change in the dimensions (width, height, length) of the existing erosion protection.