Crowe Valley Conservation

Watershed Regulations Policy Manual

CREATED FEBURARY 2014 – UPDATED JANUARY 2016

Table of Contents

List of Figures

List of Tables

This document was created with the best intentions of remaining consistent with the Policies and Procedures from the previous Crowe Valley Conservation Authority Manual as well as other Conservation Authorities. To that end the following were sourced for this document:

- Conservation Ontario and Ministry of Natural Resources "Draft Guidelines to Support Conservation Authority Administration of the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation" (2008)
- Crowe Valley Conservation Authority "Generic Regulations Policy and Procedures" (2007)
- Kawartha Conservation "Watershed Planning and Regulations Policy Manual" (2012)
- Ministry of Natural Resources "Policy and Procedures for Conservation Authority Plan Review and Permitting Activities" (2010)
- Nottawasaga Valley Conservation Authority "Planning and Regulation Guidelines" (2009)
- Lower Trent Conservation" Policies and Procedures Manual" (2005)
- Otonabee Conservation "Watershed Planning and Regulations Policy Manual" (2012)
- Quinte Conservation "Policies and Procedures Manual" (2005)
- Toronto and Region Conservation Authority "The Living Cities Policy" (2013)

This page has been left intentionally blank.

1.0 INTRODUCTION

1.1 Purpose and Scope

This document is intended to provide Crowe Valley Conservation Authority (CVCA) with a working Regulations Policy and Procedures Manual for the purposes of administering CVCA's "Regulation of Development, Interference With Wetlands and Alterations to Shorelines and Watercourses" regulation (Reg. 159/06). Further, this policy will assist Crowe Valley Conservation Authority in fulfilling its watershed management objectives. It will also provide CVCA member and staff with a clear view of the concerns regarding flood plain land development proposals.

This manual has been written to compliment The Provincial Flood Planning Policy Statement and Implementation Guidelines and will define the criteria against which CVCA administers its regulatory responsibilities under Ontario Regulation 159/06. It is intended to provide guidance and direction to CVCA staff that receive, review and evaluate applications against the policies contained within this document. The Manual will also provide information to the development community who can utilize these policies in preparing proposals for approval. Municipalities and community stakeholders can also use this Manual to coordinate their own administration or interests and can be confident that matters of stated Provincial interest have been accurately interpreted and are being applied appropriately.

Crowe Valley Conservation Authority promotes a comprehensive flood plain management program consisting of several integrated components.

1. Regulation of Development, Interference with Wetlands and Alterations to Shoreline and Watercourse regulation
2. Flood Plain Mapping
3. Municipal Plan Input and Review
4. Flood Warning/Contingency Planning
5. Information/Education Programs
6. Storm Water Management
7. Capital Works and Maintenance

It should be emphasized that flood plain management programs are undertaken in cooperation with municipalities. Municipalities have the responsibility to identify, with the assistance of the Conservation Authority, flood prone areas in their planning documents. In addition, municipalities should ensure that approval has been granted for proposed construction in areas

covered by the Regulation prior to the issuance of a building permit. By doing so, they can help ensure safe and appropriate land uses.

1.2 How to Read this Document

This document is intended to be read in its entirety and all relevant policies are to be applied to each situation. While specific policies sometimes refer to other policies for ease of use, these cross-references emphasize the need for reading this document as a comprehensive and integrated suite of policies. It should be noted that this document does not address the approval requirements for other potentially affected agencies.

Policies are in blue text and in some cases preceded by the phrase “It is the policy of CVCA”.

2.0 BACKGROUND

2.1 History of the Conservation Authorities

Conservation Authorities have a long and distinguished history in Ontario. The *Conservation Authorities Act* was created in 1946 in response to erosion and drought concerns, recognizing that these and other natural resource initiatives are best managed on a watershed basis. In 1956, in response to the severe economic and human losses associated with Hurricane Hazel (1954), amendments to the *Conservation Authorities Act* first empowered CAs to make Regulations to prohibit filling in floodplains. These Regulations were broadened in 1960 to prohibit or regulate the placing or dumping of fill in defined areas where, in the opinion of the CA, the control of flooding, pollution or the conservation of land may be affected. In 1968, amendments to the *Conservation Authorities Act* further extended the Regulations to prohibit or control construction and alteration to waterways, in addition to filling.

In 1998, the *Conservation Authorities Act* was amended as part of the *Red Tape Reduction Act* (Bill 25), to ensure that Regulations under the Act were consistent across the province and complementary to provincial policies. Significant revisions were made to Section 28, which led to the replacement of the "Fill, Construction and Alteration to Waterways" Regulation with the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" Regulation (97/04). While some CAs have been regulating wetlands, shorelines and inter-connecting channels for years, the amendments required all CAs to regulate Great Lakes shorelines, inter-connecting channels, large inland lakes and wetlands in addition to the areas and features each CA historically regulated.

In 2006, the Minister of Natural Resources approved the Development, Interference and Alteration Regulations for all CAs consistent with Ontario Regulation 97/04 of the *Conservation Authorities Act*. CVCA's individual regulation stemming from this process is Ontario Regulation 159/06, the "Crowe Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shoreline and Watercourses" Regulation. Along with providing consistent wording across the CAs and complementing municipal implementation of provincial policies under the Planning Act, the regulations afford CAs the responsibility to regulate the following components:

- development in river or stream valleys, wetlands, shorelines and hazardous lands and associated allowances;
- the straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or for changing or interfering in any way with a wetland; and
- other areas where, in the opinion of the Minister, development should be prohibited or regulated or should require the permission of the authority.

It is not necessary to map a feature before it can be regulated. The legal basis for defining regulated areas remains with the written text. While individual CA Regulations refer to maps which approximate regulation limits (and may be subject to revision), the text of the Regulation prevails. The *Guidelines for Developing Schedules of Regulated Areas* (MNR and CO, 2005) identify the requirements for the preparation of maps and/or revisions to existing maps. Detailed studies requested at the time of an application may further refine or delineate the regulated features (e.g. hazardous lands).

The hierarchy of legislation and policies described in this section are depicted in Figure 1 below.

Figure 1: Hierarchy of Legislation

2.2 Role and Mandate of Conservation Authorities

Ontario's 36 Conservation Authorities perform a number of important responsibilities:

Conservation Authorities are corporate bodies created by the province at the request of two or more municipalities in partnership with the province and in accordance with the requirements of the Conservation Authorities Act (CA Act). As watershed-based resource management agencies, each Conservation Authority is governed by the CA Act and by a Board

of Directors whose members are appointed by municipalities located within the CA's jurisdiction.

Conservation Authorities have delegated responsibilities from the Minister of Natural Resources to represent provincial interests regarding natural hazards identified in Section 3.1 of the Provincial Policy Statement, 2005 (PPS, 2005). These delegated responsibilities require CAs to review and provide comments on:

- policy documents (Official Plans and Comprehensive Zoning By-laws); and,
- applications submitted under the Planning Act as part of the Provincial One-Window Plan Review Service.

Conservation Authorities as 'public bodies' pursuant to the Planning Act, are notified of policy documents and planning and development applications as prescribed under the Act. CAs may comment as per their mandate to the municipality/planning approval authority on these documents and applications.

Conservation Authorities may perform a technical advisory role to municipalities, as determined under the terms of a service agreement with participating municipalities which may include, but is not limited to, matters related to the assessment or analysis of environmental impacts, watershed science and technical expertise associated with activities near or in the vicinity of: sensitive features such as wetlands, river and stream valleys, fish habitat or significant woodlands; hydrogeology and storm water studies; and, in some cases, septic system reviews.

Individual Conservation Authorities may enter into agreements with provincial and federal ministries and with municipalities to undertake specific regulatory/approval responsibilities (e.g. Fisheries Act Section 35; septic tank approvals under the Ontario Building Code).

Conservation Authorities are landowners, as outlined in the Conservation Ontario (CO)/Ministry of Natural Resources (MNR)/Ministry of Municipal Affairs and Housing (MMAH) Delegated Responsibilities Memorandum of Understanding (MOU) and as such, may become involved in the planning and development process, either as an adjacent landowner or as a proponent/applicant.

2.3 Legislative Authority of Conservation Authorities

2.3.1 The Conservation Authorities Act

The CA Act assigns a broad set of responsibilities to all Conservation Authorities across Ontario. The Act (Section 20) requires all CAs to design a program(s) to further the conservation, restoration and management of natural resources that fall within a specific CA jurisdiction. It defines the objects of a Conservation Authority as follows:

Section 20: The objects of an authority are to establish and undertake, in the areas over which it has jurisdiction, a program designed to further the conservation, restoration, development and management of natural resources other than gas, oil, coal and minerals.

The Act provides further direction as to how the objects of a CA are to be achieved:

Section 21: For the purposes of accomplishing its objects, an authority has power.

a. To study and investigate the watershed and to determine a program whereby the natural resources of the watershed may be conserved, restored, developed and managed[1].
b. In addition, the Act bestows regulatory responsibilities on CAs under Section 28 of the Act. Under Section 28, CAs are empowered to prepare Regulations, commonly referred to as the "Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses" (Generic or Content Regulation). These Regulations are subject to the approval of the Minister of Natural Resources.

Section 28:

(1) Subject to the approval of the Minister, an authority may make regulations applicable in the area under its jurisdiction,

a. Restricting and regulating the use of water in or from rivers, streams, inland lakes, ponds, wetlands and natural or artificially constructed depressions in rivers or streams;
b. Prohibiting, regulating or requiring the permission of the authority for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland;
c. Prohibiting or regulating or requiring the permission of the Authority for development if, in the opinion of the Authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by development.
d. Providing for the appointment of officers to enforce any regulation made under this section or Section 29;
e. Providing for the appointment of persons to act as officers with all the powers and duties of officers to enforce any regulation made under this section.

[1] Under Section 21, CAs may also purchase, acquire or dispose of personal property; use lands that are owned or controlled by the authority for purposes that are in keeping with its objects and as it considers proper; use lands owned or controlled by the authority for park or other purposes and erect or permit to be erected, buildings, booths and facilities; charge fees for services approved by the Minister; collaborate and enter into agreements with ministries and agencies of government, municipal councils, local boards and other organizations.

Each CA has developed individual regulations that govern certain activities in and adjacent to watercourses (including valley lands), wetlands, shorelines or inland lakes and the Great Lakes-St. Lawrence River System and other hazardous lands.

Crowe Valley Conservation Authority administers Ontario Regulation 159/06 which requires CVCA to regulate development and site alterations within its regulated area.

2.3.1.1 Exceptions under the Conservation Authorities Act

Section 28 of the *Conservation Authorities Act* includes the following sections dealing with exceptions:

(10) No regulation made under subsection (1),

a. shall limit the use of water for domestic or livestock purposes;
b. shall interfere with any rights or powers conferred upon a municipality in respect of the use of water for municipal purposes;
c. shall interfere with any rights or powers of any board or commission that is performing its functions for or on behalf of the Government of Ontario; or
d. shall interfere with any rights or powers under the *Electricity Act*, 1998 or the *Public Utilities Act*, 1998.

(11) A requirement for permission of an authority in a regulation made under clause (1) (b) or (c) does not apply to an activity approved under the *Aggregate Resources Act* after the *Red Tape Reduction Act*, 1998 received Royal Assent.

While Section 28 (11) provides an exemption to the requirement for a CA's permission, Section 28 (10) does not. As such, a proponent is still required to obtain permission from a CA for any development within a regulated area or interference to a wetland or watercourse associated with the items listed in Section 28 (10). However, a CA must ensure their Regulation and policies do not limit the uses or interfere with the rights or powers listed in Section 28 (10). This allows a CA to ensure that there is no interference with a wetland or watercourse or is minimized to the extent possible and that the control of flooding, erosion, dynamic beaches or pollution or the conservation of land are either not affected by the development or the impacts are minimized to the extent possible.

It should be noted that the Conservation Authorities Act does not contain a subsection that specifically "binds the Crown". Therefore, activities of Provincial Ministries, Federal Departments and Crown Agencies or "Crown Corporations" are not bound by the Act and these entities are not legally required to obtain permission under the Conservation Authorities Act. Through CVCA's policies, the CAs can invite them to voluntarily submit proposals for works through the permit review process. Although best practice would suggest that they comply to ensure a sufficient technical review of their activity, they are within their legal rights to refuse to participate in the voluntary review process.

2.3.2 The Planning Act

CAs' are involved in the review of planning applications under the Planning Act primarily in three ways: as an agency with delegated responsibilities for the review of natural hazards; as a technical advisor; and as a commenting agency.
Individual CA Regulations complement the Natural Hazard (Section 3.1), Natural Heritage (Section 2.1 – Wetlands and Valley Lands) and Water (Section 2.2) policies of the 2005 Provincial Policy Statement (PPS) under the Planning Act. Delegated responsibility for providing input with respect to provincial interests under the PPS is limited to Section 3.1 – Natural Hazards. Natural hazards include:

- Floodplain management;
- Hazardous slopes;
- Great Lakes shorelines2; and
- Unstable soils and erosion

This delegation of responsibility requires CAs to review and provide comments on policy documents (Official Plans and comprehensive Zoning By-laws) and applications submitted pursuant to the Planning Act as part of the Provincial One Window Planning Service.

CAs may also provide technical advisory services to member municipalities for planning applications. In this capacity, CA staff provide technical input regarding potential environmental impacts and advice about how negative impacts can be avoided or minimized. CA comments could apply to a range of matters including, but not limited to, natural hazards, natural heritage, and water quality and quantity.

In addition, regulations under the Planning Act (O.Reg. 545/06, 543/06 and 200/96) require municipalities to give notice to CAs regarding planning applications and changes to policy documents. In its capacity as a commenting agency, the CA may provide additional advisory comments which relate to its goals and objectives for watershed management.

2.3.3 Other Legislation

There are many other pieces of legislation that address various water and related resource management activities. Some of the key pieces of legislation include:

- Fisheries Act (Fisheries and Oceans Canada);
- Lakes and Rivers Improvement Act (MNR);
- Public Lands Act (MNR);
- Environmental Assessment Act (MOE);
- Water Resources Act (MOE); and
- Drainage Act (Ontario Ministry of Agriculture, Food and Rural Affairs).

It is important to note that CA Section 28 permission, if granted for work, does not exempt the applicant from complying with any or all other approvals, laws, statutes, ordinances, directives, regulations, etc. that may affect the property or the use of same. Alternatively, complying with or obtaining all other approvals, laws, statutes, ordinances, directives, regulations, etc. does not exempt the applicant from obtaining permission under Section 28 of the *Conservation Authorities Act*.

This page has been left intentionally blank.

3.0 POLICIES AND GUIDELINES FOR THE ADMINISTRATION OF ONTARIO REGULATION 159/06

3.1 Introduction and Objectives

A copy of the Ontario Regulation 159/06 (Crowe Valley Conservation Authority) can be found in Appendix B of this document.

The regulation states that the Conservation Authority **may** permit in writing, with or without conditions:

1. The straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse
2. The construction of a building or structure in or on a pond or swamp or in any area that is susceptible to flooding during at Regional Storm.
3. The placing or dumping of fill of any kind in any defined part of the area over which the Authority has jurisdiction where, in the opinion of the Authority, the control of flooding, pollution, or the conservation of land may be affected by the placing or dumping of fill.

To receive permission for development, it must be demonstrated in an application to the satisfaction of the CVCA that the control of flooding, erosion, pollution, dynamic beaches or the conservation of land will not be affected. These are generally referred to as the “five tests”. The control of dynamic beaches is generally applicable to the Great Lakes shorelines and large inland lakes regulated areas. To receive permission to interfere with a watercourse or wetland, it must be demonstrated in an application to the satisfaction of the CVCA, that the interference

on the watercourse or wetland is acceptable in terms of the natural features and hydrologic and ecological functions of the watercourse or wetland. To receive permission for development within "other areas" associated with wetlands, it must be demonstrated in an application that interference on the hydrologic functions of the wetland is deemed acceptable by the CVCA. Permission from the CVCA may be in the form of a formal permit or a letter of permission. For either of these types of applications, submission of technical studies may be necessary. These technical studies must be carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA. These established procedures should be in keeping with MNR's Technical Guides for Natural Hazards (MNR, 2002a; MNR, 2002b; MNR, 1996a; MNR, 1996b; and MNR 1996c), other Provincial guidelines and/or guidelines approved by the local CA Board. The CVCA may request that technical studies be carried out at the expense of the applicant.

As the expertise for reviewing technical studies varies among CAs, the CVCA may request that the study be peer-reviewed by a qualified professional at the expense of the applicant.

The objectives of the regulation are:

1. To minimize the potential for loss of life and property damage;
2. To reduce the necessity for public and private expenditures for emergency operations, evacuation and restoration of properties subject to flooding;
3. To regulate flood plain development that could limit channel capacity and increase flood flow, leading to emergency and protective measures;
4. To make information available regarding flood or erosion prone areas;
5. To regulate the drainage or filling of wetlands which may reduce natural water storage capacity;
6. To regulate development on or adjacent to potentially hazardous slopes;
7. To reduce soil erosion from valley slopes; and
8. To minimize water pollution or degradation of water quality associated with filling construction and alteration activities.

3.2 One Zone Concept

Under the one zone approach, construction activities are restricted within the Regulatory Flood Plain. Permitted development may include reconstruction or minor additions to existing structures as well as extension to existing agricultural operations. Other uses, such as open space, that is not likely to create damage to other properties from floodwater, or cause a threat to public safety, or are not of a polluting nature may be permitted within the flood plain. Examples of uses or structures that would create adverse impacts in the flood plains of our riverine systems include, but are not limited to, new buildings, swimming pools, filling activities, septic tile fields and tanks, as well as manure storage and handling facilities.

The One Zone Concept of floodplain management is applied throughout the entire Crowe Valley Conservation jurisdiction.

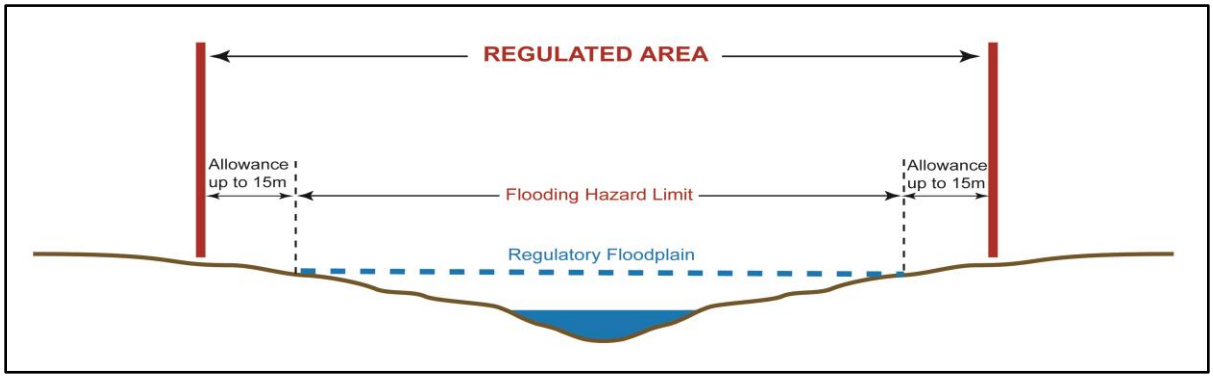


Figure 2: One Zone Floodplain Concept

3.3 Ingress/Egress

When reviewing development applications, the Authority must have regard for its objectives of preventing loss of life and minimizing property damage.

Access to and from homes, cottages, commercial establishment, or other structures are one important factor that must be considered as flooding can impair access for occupants, police, fire fighters or ambulance personnel in an emergency situation. Therefor the Authority will review accessibility for pedestrians and vehicles with regard for specific water depths and velocities. New lots proposed to be created by way of consent or plan of subdivision that will have access that crosses a flood susceptible area, must have road access that is safe. Safe access is defined as conforming to the depth and velocity criteria for pedestrians and vehicles in the following table.

Table 1: Depth and Velocity Criteria

Acceptable Vehicle Depths	Acceptable Pedestrian Depths	Acceptable Velocities
0.1m	0.1m	1.7 m/s (max allowable)
0.2m	0.2m	1.7 m/s
0.3m (max. allowable)	0.3m	1.3 m/s
	0.4m	1.0 m/s
	0.5m	0.8 m/s
	0.6m	0.7 m/s
	0.7m	0.6 m/s
	0.8m (max. allowable)	0.5 m/s

Source: Provincial Flood Plain Planning Policy Statement (1988)

-depth for vehicle access may not exceed 0.3 metres
-depth for pedestrian access may not exceed 0.8 metres
-velocities may not exceed 1.7 metres per second

Where new development requires access onto and existing flooded municipal or provincial roadway, this access must have depths and velocities less than or equal to those experienced on the existing roadway. Furthermore, if these depths and velocities exceed these criteria, then "safe" reasonable and adequate alternate access to an alternate municipal or provincial road must be available.

Note: In instances where a proponent is proposing to construct a road access down a slope or embankment to the water, the grade of the driveway cannot exceed a 10% gradient. Sediment and erosion control are key elements to be addressed when dealing with a permit application for access to the waterfront.

3.4 Areas Subject to the Regulation

Ontario Regulation 159/06 sets out areas where development is prohibited as well as setbacks from various ecological features. All areas within the jurisdiction of the Authority that are described in this section are delineated as the "Regulation Limit" shown on a series of maps filed at the head office of the Authority under the map title "Ontario Regulation 97/04: Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses". The features that are encompassed by the regulation are as follows:

River and Stream Valleys
This component of the Regulation applies to development within river and stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse, the limits of which are determined in accordance with the following rules:

- where the river or stream valley is apparent and has stable slopes, the valley extends to the stable top of bank plus 15 metres to a similar point on the opposite side;
- where the river or stream valley is apparent and has unstable slopes, the valley extends from the predicted long term stable slope projected from the existing stable slope or if the toe of slope is unstable, from the predicted location of the toe of slope as a result of stream erosion over a projected 100 year period plus 15 metres to a similar point on the opposite side;
- where the river or stream valley is not apparent, the valley extends the greater of:
    - the distance from a point outside of the edge of the maximum extent of the floodplain under the applicable flood event standard plus 15 metres to a similar point on the opposite side, and
    - the distance from the predicted meander belt of a watercourse expanded as required to convey the flood flows under the applicable flood event standard plus 15 metres to a similar point on the opposite side.

Wetlands
This component of the Regulation applies to development within a wetland or interference in any way with a wetland.

Areas of Interference
This component of the Regulation applies to development on lands within 120 metres of all provincially significant wetlands, and lands within 30 metres of non-provincially significant wetlands that could interfere with the hydrologic function of the wetland.

Hazardous Lands
This component of the Regulation applies to development within hazardous lands which is defined under Section 28 of the CA Act as land that could be unsafe for development due to naturally occurring processes associated with flooding, erosion, dynamic beaches, or unstable soil or bedrock. Unstable soil and bedrock include, but is not limited to sensitive marine clays, organic soils, and karst topography. Sensitive marine clays are not identified within the watershed. Organic soils are normally formed by the decomposition of vegetative and other organic materials. Peat soils are the most common type of organic soil in Ontario. Karst topography may be present in limestone or dolomite bedrock and are extremely variable in nature.

Lakes, Rivers, Creeks, Streams and Watercourses
This component of the Regulation applies to the straightening, changing, diversion, or interference in any way with the existing channel of a watercourse, including lakes and their shorelines that are within the CVCA watershed.
This component of the Regulation does not apply to dug-out or isolated ponds located outside of any wetland or area of interference with a wetland, river or stream valley, hazardous land associated with unstable soil or bedrock, and/or the applicable regulated allowance. For small islands it is assumed that the entire island is regulated.

3.4.1 Conflict

If there is a conflict between the description of areas described in Section 3.4 and the areas as shown on the series of maps referred to in the same section, the description of areas in Section 3.4 prevails.

3.4.2 Permission to Develop

The Authority may grant permission for development in or on the areas described in subsection 3.4 if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land (the “five tests”) will not be affected by the development. This permission will be given in writing with or without condition and is valid for a period of a maximum of 24 months.

Permits will only be granted to the landowner and are not transferrable. In the case of development proposed on common lands, a permit will be denied until acknowledgement and approval is granted from the majority (80%) of all joint owners of the land in question.

3.4.3 Application Process

The CVCA is committed to adhering to the consistent approach developed by Conservation Ontario for permitting. To this end we will work with applicants through the process to ensure understanding and a timely turnaround for all applications. We will also ensure the regulations permitting process is aligned with the approval process under the Planning Act. While the process to obtain a permit is standard, CVCA evaluates each application based on its own merits to ensure that it is consistent with the policies contained in this Manual and also to ensure it meets provincial legislation, regulations and policy.

Prior to undertaking any development, applicants are encouraged to contact the CVCA either in person, by phone or by email to determine if the property in question falls within or adjacent to a regulated area. Should a permit be required, applicants are required to complete and submit a Permit Application Form. Applicants should complete and submit the Permit Application Form along with:

- the required application fee
- property information
- concept plan
- description of the work

Permit application forms are available from the CVCA Office, via facsimile or mail and may be downloaded from the CVCA website.

Permit application fees vary depending on the nature of the application and CVCA staff can advise of the permit fee(s) that apply prior to submitting a permit application[2].
To assist CVCA in reviewing the application, proponents should submit the following information:

- property information (lot number, concession number, Township, etc.),
- a concept plan of the proposed development showing the property boundaries,
- a description of what is being planned, and
- some indication of when the work is proposed to be carried out.

CVCA will review the permit application and the information that has been submitted and will first determine if the application is complete. If an application is deemed incomplete, CVCA will require additional information so that a complete analysis can be conducted. Until such time as

[2] All application fees are established by the CVCA Board of Directors and are reviewed annually. The schedule of fees is posted on the CVCA website and is available in hard copy from the CVCA office.

this additional information is provided, applications may be put 'on hold' or returned to the applicant.

The timelines associated with CVCA's review of a permit application do not begin until a complete application has been submitted. An application will be deemed incomplete until the fee has been received.

In keeping with the standard permit process, CVCA will endeavour to make a decision (i.e., recommendation to approve or referred to a Hearing) on a complete application within 15 -20 days. This timeline will be extended for applications that are:

- are highly complex,
- require a full technical review,
- need to be supported by comprehensive analysis; or,
- do not conform to existing CA Board-approved Section 28 policies.

If the permit is granted (either with or without conditions), it is issued under the CA Act for a period of 24 months. At this time, there is no provision under the legislation to provide permit extensions. If the work covered by the permit is not completed within the 24 months, the applicant must reapply for a new permit.

All permits issued by the CVCA are subject to the Municipal Freedom of Information Protection and Privacy Act, RSO 1990, c.M.56.

Applicants should be aware that CVCA will assess any new applications against the policies that apply at the time the application is submitted. It is important to note that the applicant may be required to obtain approvals from other agencies at the federal, provincial and municipal level. Obtaining an approval from CVCA does not ensure that these other approvals will be forthcoming.

3.4.4 Hearing Process

If staff are unable to recommend permission for the proposed works (i.e. the permit) or if conditions are imposed that the applicant does not agree with, the applicant may request a hearing of the CVCA Executive Committee. The requirements associated with a Hearing are outlined in various sections of the CA Act and the "MNR/CO Hearings Guideline" that outlines the process to be followed (See Appendix D). After holding a hearing, the CVCA Executive Committee can:

- grant the permission without conditions;
- grant the permission with conditions; or,
- refuse the permission.

The decision is conveyed to the applicant in writing. If conditions are attached to the permission or if the permission is refused, CVCA will provide reasons for the decision. If, following a hearing of CVCA's Executive Committee, the permit is denied or conditions are imposed that the applicant does not agree with, the applicant has further appeal opportunities. Within 30 days of receiving the decision, the applicant may appeal in writing to the Minister of Natural Resources. Only the applicant has the ability to appeal the decision. The Office of the Mining and Lands Commissioner (MLC) is responsible for hearing all appeals. The MLC has been assigned delegated authority from the Minister of Natural Resources Act (Ontario Regulation 571/00).

The MLC may:

- uphold the decision of the Conservation Authority; or
- alter the decision of the Conservation Authority.

The MLC may issue the permit (with or without conditions) or may refuse to issue the permit. If the applicant is not in agreement with the decision of the MLC, a further appeal may be made to the Division Court, a Branch of the Superior Court of Justice. Again, only the applicant may launch an appeal.

3.4.5 Violations

All works in a regulated area require permission from CVCA. If permits are not obtained or if work is carried out that is not in keeping with the terms and/or conditions of the permit, this work is in violation of Ontario Regulation 159/06. In some cases, landowners may not be aware that permission is required from CVCA. In other cases, work is carried out by those who may be familiar with CVCA requirements and their obligations but compliance is avoided.
CVCA has the legal authority (Section 28(20) of the CA Act) to investigate an activity to determine whether or not a contravention of Ontario Regulation 159/06 has taken place. Violations of the Act may be subject to a fine or imprisonment. If convicted, contraventions must be addressed and any development/interference removed at the expense of the landowner. Depending on the nature of the contravention, landowners may also be required to undertake rehabilitation in a manner prescribed by the Court.

CVCA is committed to working with landowners. Before any work is undertaken, all landowners are encouraged to contact CVCA to obtain the necessary approvals and are encouraged to adhere to any conditions identified by CVCA.

Provided below is a diagram illustrating how CVCA staff process permit applications under Ontario Regulation 159/06.

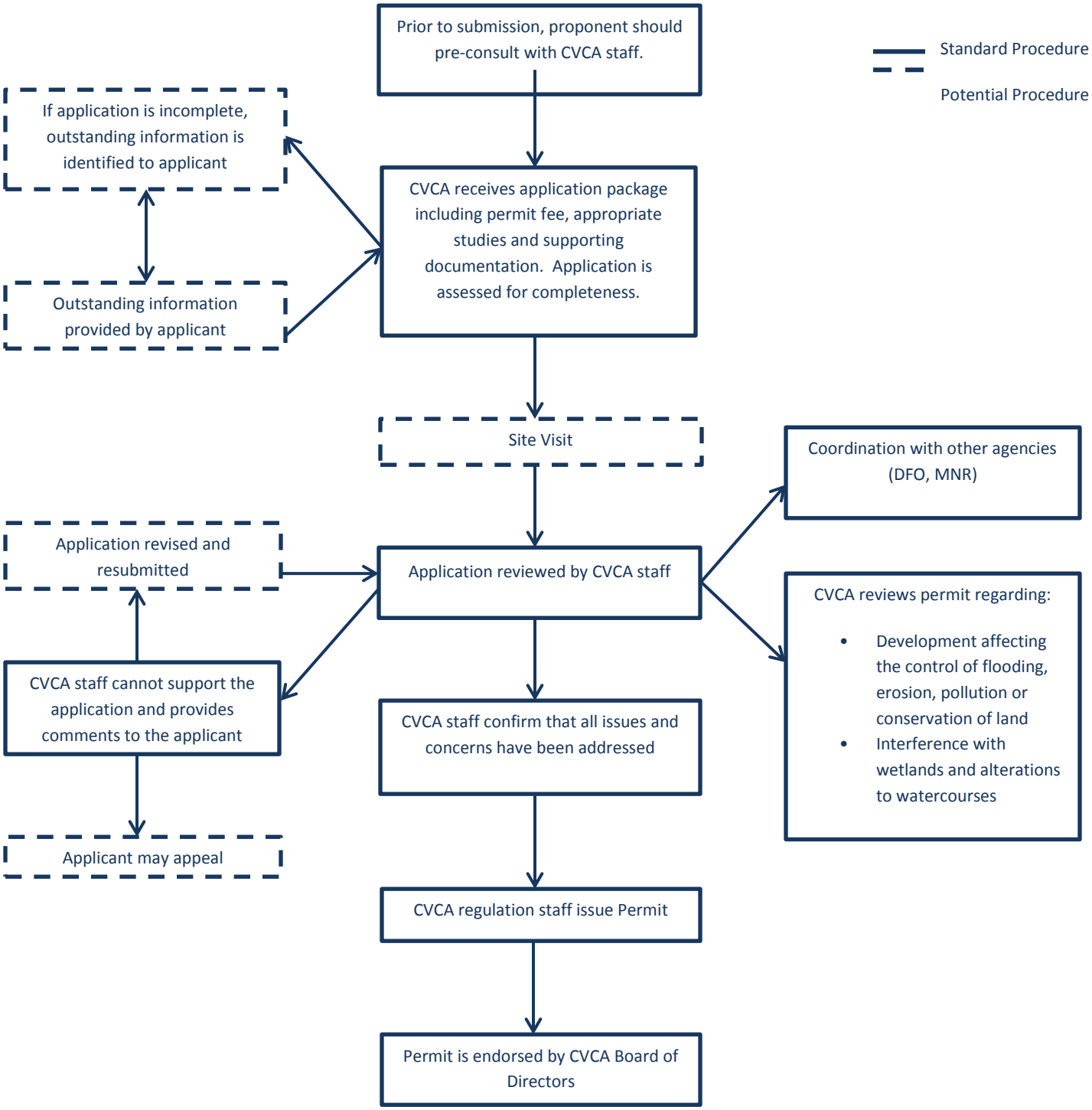


Diagram sourced from ORCA/KRCA Policy and Procedures Manual.

3.5 Activities Typically Regulated

The following identifies examples of development activities that CAs typically regulate. In many cases, the proposed development and proposed ancillary uses of the development could detrimentally affect the control of flooding, erosion, pollution, dynamic beaches, or the conservation of land. These development activities may include, but are not limited to:

- Construction of all buildings and additions including modification or reconstruction of foundations which support existing buildings;
- Breakwalls, revetments, rubble groynes, jetties, etc.;
- Headland beach system and artificial nourishment (beach, berm or dune);
- Other similar marine works on or near shorelines or lakeshores;
- Docks;
- Stairs, decks, gazebos;
- Boat ramps, boat storage structures;
- Dredging;
- In-ground and above-ground pools;
- Temporary or permanent placement of fill, grading, removal of fill, or site alteration;
- Retaining walls;
- Trailers and mobile homes;
- Bridges, crossings, roads and pipelines; and
- Municipal drains.
-

Development associated with existing uses in river/stream valleys or shorelines such as non-habitable structures is often differentiated from new development to allow landowners to maintain, and to a limited extent, improve their properties.

3.6 Activities That Do Not Require a Permit

The following uses and activities will not require written permission.

- Floating, removable or cantilever docks unless there is a shoreline alteration proposed to anchor the dock to land;
- Repairs and renovations to an existing structure within the existing roofline and exterior walls and above the existing foundation (window repair, siding, etc.);
- Non-structural activities associated with existing agricultural use (cropping, pasturing, tilling, fence row clearing, stone pile removal, etc.);
- Landscaping that does not result in alterations to existing grade (e.g. gardens, nurseries, timber harvesting with stump removal, etc.);
- Patching or resurfacing of existing access routes (public roads, driveways, private access roads, and entrance ways) that do not result in alterations to existing grade;
- Well installation;
- Fence installation, not including stone or concrete walls.

So long as these activities do not result in the straightening, changing, diversion or interference in any way with a watercourse, or interference in any way with a wetland, they are not subject to Ontario Regulation 159/06 and do not require written permission from CVCA.

3.7 General Regulation Policies

The Regulation gives CVCA the mandate to prohibit development throughout its watershed in those areas described in Section 3.4. Under the Conservation Authorities Act, development means:

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

The Regulation also gives CVCA authority to regulate activities which would result in:

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

These general policies apply to all activities (regulated activities) and all areas defined by the Regulation (regulated lands).

It is the policy of CVCA

3.7.1 That development, interference or alteration will not be permitted within a regulated area, except in accordance with the policies contained within this document. In the event of a conflict between the policies applicable to the development, interference or alteration, the most restrictive policy shall apply.

3.7.2 Notwithstanding Policy 3.7.1, the CVCA's Board of Directors may grant permission for development, interference and/or alteration where the application provided evidence acceptable to the Board of Directors that documents the development and/or activity will have no adverse effect on the control of flooding, erosion, pollution or the conservation of land with respect to river or stream valleys, hazardous land, wetland and areas of interference, or result in unacceptable interference with a watercourse or wetland.

3.7.3 That development, interference or alteration within a regulated area may be permitted where it can be demonstrated to the satisfaction of CVCA, through appropriate technical reports, assessments, site plans and/ or other documents as required by CVCA, that:

- the risk to public safety is not increased;
- susceptibility to natural hazards is not increased and no new hazards are created;
- there are no adverse hydraulic or fluvial impacts on rivers, creeks, streams, or watercourses;
- negative or adverse hydrological or ecological impacts on natural features and functions, including wetlands, are avoided and mitigated;

- intrusions on natural features, areas and systems contributing to the conservation of land, including areas providing ecological functions and hydrologic functions, are avoided or mitigated;
- access for emergency works and maintenance of flood or erosion control works is available;
- pollution, sedimentation and erosion during construction and post-construction is minimized using best management practices including site, landscape, infrastructure and/or facility design (whichever is applicable based on the scale and scope of the project), construction controls, and appropriate remedial measures;
- the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected during and post development, interference or alteration.

3.7.4 That notwithstanding Sections 3.7.1 and 3.7.2, where there is an existing vacant lot of record, (including an infill lot), no new development will be permitted where the lot has no safe access, or is entirely within one or more of the following:

a) the flood hazard (One Zone Policy Area) or erosion hazard of valley and stream corridors;

b) a provincially significant wetland or other wetlands greater than 2 ha; or

c) any natural features, areas and systems contributing to the conservation of land, including areas providing hydrologic functions or ecological functions.

Prohibited Development, Interference and Alterations

3.7.5 That notwithstanding Sections 3.7.1 and 3.7.2, development will not be permitted within the flood or erosion hazard of valley and stream corridors, erosion or dynamic beach hazard, a wetland, or hazardous lands, where the use is:

a) an institutional use including but not limited to those associated with a hospital, pre-school, 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;

b) an essential emergency service such as that provided by fi re, police, and ambulance stations, and electrical substations; or

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

Emergency Works

3.7.6 Permission will be granted to municipalities and other agencies for emergency works to repair existing infrastructure within a regulated area that is at immediate risk of failure or other public safety concerns provided that CVCA is notified prior to conducting remediation works, and where appropriate or possible given the opportunity to review, provide technical guidance related to the control of flooding, pollution and/or the conservation of land, and supervise. Municipalities shall provide a description of the emergency works or 'as built' information upon the completion of emergency works.

Development Setbacks

3.7.7 That notwithstanding supplementary policies or stand-alone policies as specified in Sections 4.0 through to and including 8.0, development within a regulated area shall be set back from the greater of the following:

a) Valley and Stream Corridors: 15 metres from the long term stable top of slope, stable toe of slope, Regulatory flood plain, meander belt and any contiguous natural features and areas that contribute to the conservation of land;

b) Wetlands: 30 metres from provincially significant wetlands and wetlands greater than 2 ha and 15 metres for all other wetlands; and

d) setbacks based upon the results of a comprehensive environmental study or technical report completed to the satisfaction of the CVCA.

If the property is not located within or adjacent to a regulated area, permission from CVCA is not required. Approvals from other agencies may be required and CVCA staff can provide additional information in this regard. The applicant should also contact the municipality to determine if Planning Act approvals or a building permit is needed.

This page has been left intentionally blank.

4.0 RIVER OR STREAM VALLEYS

River and stream systems also provide physical, biological and chemical support functions for sustaining ecosystems. These functions are directly associated with the physical processes of discharge, erosion, deposition and transport which are inherent in any river and stream system. The interplay between surface and ground water and the linkages, interactions and inter-dependence of aquatic environments with terrestrial environments supply hydrologic and ecological functions critical to sustaining watershed ecosystems. Given that ecological sustainability is based on the dynamic nature of these systems, it is essential that they be allowed to function in as natural a state as possible.

River or stream valleys are shaped and re-shaped by the natural processes of erosion, slope stability and flooding. Erosion and slope stability are two natural processes that are quite different in nature yet often linked together. Erosion is essentially the continual loss of earth material (i.e. soil or sediment) over time as a result of the influence of water or wind. Slope stability, usually described in terms of the potential for slope failure, refers to a mass movement of earth material, or soil, sliding down a bank or slope face as a result of a single event in time.

The degree and frequency with which the physical change will occur in these systems depends on the interaction of a number of interrelated factors including hydraulic flow, channel configuration, sediment load in the system, storage and recharge functions, and the stability of banks, bed and adjacent slopes. The constant shaping and re-shaping of the river and stream systems by the physical processes results in hazardous conditions which pose a risk to life and cause property damages.

River and stream systems can exhibit erosion potential of the actual river and stream bank, as well as potential slope instability issues related to valley walls. Slopes steeper than 3:1 (horizontal: vertical) with a height greater than 3 metres are generally considered potentially unstable. Slopes in sandy soil areas may be unstable if the slope is steeper than 5:1 (horizontal: vertical). Erosion hazards and slope instability pose a threat to life and property through the loss of land due to human or natural processes.

The erosion hazard limit is determined using the 100 year erosion rate (the average annual rate of recession extended over a hundred year time span), and includes allowances for toe erosion, meander belt, and slope stability. The erosion hazard component of river and stream systems

is intended to address both erosion potential of the actual river and stream bank, as well as erosion or potential slope stability issues related to valley walls.

Flooding of river or stream systems typically occurs following the spring freshet and may occur again as a result of extreme rainfall events. Rivers naturally accommodate flooding within their valleys. Historically, development occurred in floodplain areas because of the availability of water for power, transportation, energy, waste assimilation, and domestic and industrial consumption. However, floodplain development is susceptible to flooding which can result in property damage and/or loss of life.

Furthermore, river and stream systems are part of larger overall drainage watersheds, and the river and stream mechanics are linked to the watershed processes. The natural importance of river and stream systems in providing physical, biological and chemical support functions for sustaining ecosystems (including that of humans) is well established. These support functions are strongly associated with the physical processes of discharge (flow), erosion, deposition and transport that are inherent in any fluvial system. Given that ecological sustainability is based on the dynamic nature of these systems, it is essential that their physical processes (i.e., flow dynamics) be allowed to function in a natural state.

In Ontario, either storm centred events, observed events, or a flood frequency based event may be used to determine the extent of the Regulatory floodplain, as prescribed by each individual CA Regulation.

River or stream systems may contain lands that are not subject to flooding or erosion. Examples of these non-hazardous lands include isolated flat plateau areas or areas of gentle slopes (see Figure 3). In these situations, the CA shall determine the applicability of the Regulation.

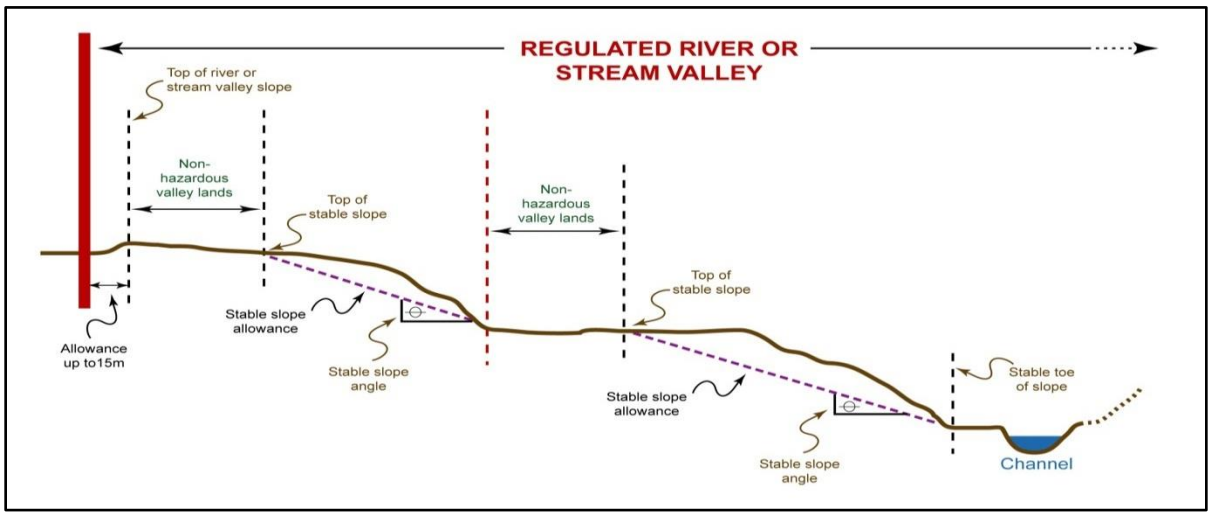


Figure 3 Regulated river or stream valley containing non-hazardous valley lands.

4.1 Defining the River or Stream Valley

To define the Regulation Limits for river and stream valleys, it is important to understand the landforms through which they flow. River or stream valleys are described in the Regulation as "depressional features associated with a river or stream, whether or not they contain a watercourse". While there are many different types of systems, the application of the Regulation Limit for rivers and stream systems is based on two simplified landforms, as explained in the Technical Guides for River and Stream Systems (MNR, 2002a; and MNR, 2002b):

"Apparent[3] (confined) river and stream valleys: are ones in which the physical presence of a valley corridor containing a river or stream channel, which may or may not contain flowing water, is visibly discernible (i.e. valley walls are clearly definable) from the surrounding landscape by either field investigations, aerial photography and/or map interpretation. The location of the river or stream channel may be located at the base of the valley slope, in close proximity to the toe of the valley slope (i.e. within 15 metres), or removed from the toe of the valley slope (i.e. greater than 15 metres)."

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

4.1.1 Apparent/Confined Valleys

Where the physical presence of a valley corridor containing a river or stream channel, which may or may not contain flowing water, is visibly discernible (i.e., valley walls are clearly definable) from the surrounding landscape, the regulated area (or Regulation limit) for apparent/confined valley systems takes into account the following three considerations:

- toe erosion;
- a stable slope limit; and
- a 15 metre allowance.

The limit of the regulated area associated within an apparent/confined valley is based on whether or not the valley slopes are stable.

[3] The individual CA Regulations describe river or stream valleys as "apparent" and "not apparent". Provincial Technical Guides utilize the terminology "confined" and "unconfined", respectively.

Valley slopes are considered stable when the valley is not subject to toe erosion, the valley walls are no more than 3 metres in height, and the existing slope angle is no steeper than 3:1 (horizontal: vertical units). The valley slopes in these circumstances typically resist slumping and rotational slippage but may become unstable as a consequence of the increased loading forces of development, depending on the soil structure and underlying geology. The regulated area includes the river or stream and the valley walls extending landward to the stable top of bank plus an allowance of 15 metres. Valley slopes are considered unstable when the valley slope may be impacted by toe erosion and/or slope instabilities (i.e., existing slope angle steeper than 3:1 (horizontal: vertical units) and/or greater than 3 metres in height). The regulated area includes the river or stream and the valley walls extending landward to the predicted long term stable top of slope projected at a 3:1 (horizontal: vertical) (or 5:1 (horizontal: vertical) for sandy soils) slope ratio from the predicted stable toe of slope (taking into consideration a toe erosion allowance of 15 metres, unless otherwise determined through a technical analysis) plus an allowance of 15 metres.

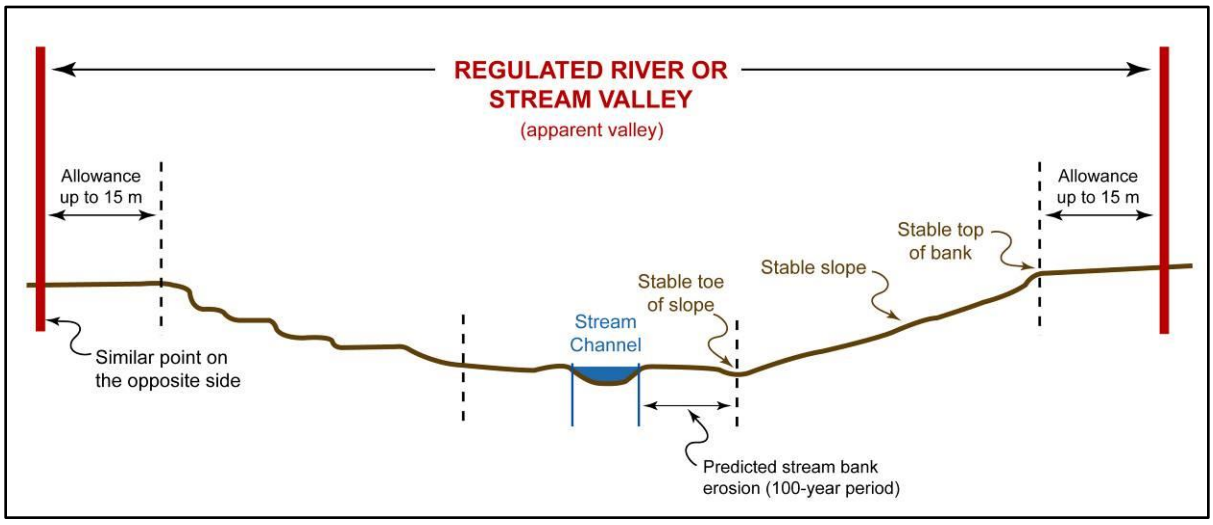


Figure 4 Apparent River or Stream Valley where the valley slopes are stable.

4.1.2 Not Apparent/Unconfined Valleys

Where a watercourse is not contained within a clearly visible valley section (that is, a river or stream is present but there is no discernible valley slope or bank that can be detected from the surrounding landscape), the flow of water is free to shift across the shallower land. Although toe erosion and slope stability are not deemed potential hazards, consideration of the meandering (erosion potential) tendencies of the system must be taken into account. In these valley systems, the regulated area consists of the maximum extent of whatever is greater: the floodplain or the predicted meander belt width (erosion hazard) of the river or stream plus an allowance of 15 metres.

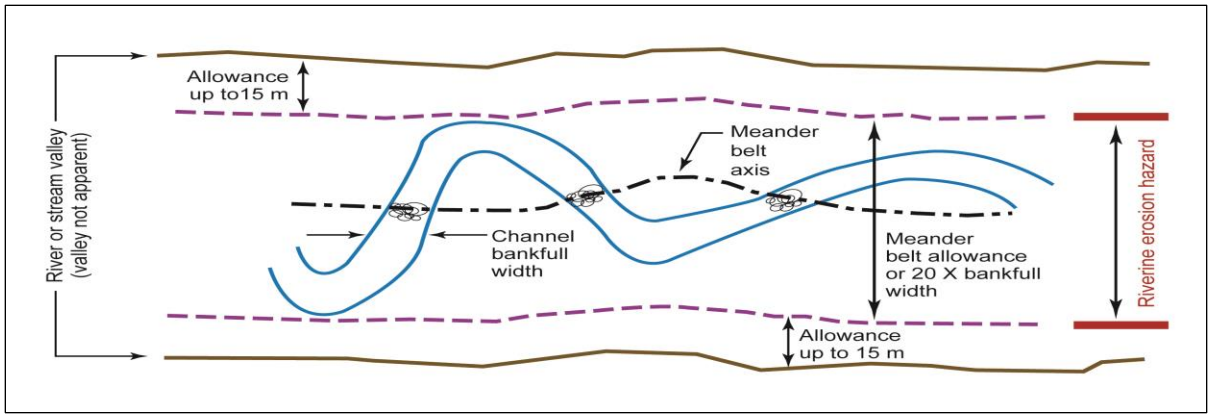


Figure 5 Not Apparent River or Stream Valley (Meander Belt)

4.1.3 Regulation Allowances

River or stream valley allowances allows CVCA to regulate development adjacent to erosion and flooding hazards in a manner that provides protection against unforeseen or predicted external conditions that could have an adverse effect on the natural conditions or processes of the river or stream valley. Allowances give CVCA the opportunity to protect access to and along a valley and/or floodplain. This access may be required for emergency purposes, regular maintenance to existing structures or to repair failed structures.

Development within the allowance must be regulated to ensure that existing erosion and flooding hazards are not aggravated, that new hazards are not created, and to ensure that pollution and the conservation of land will not be affected. The allowance provides CVCA with the opportunity to maintain and enhance the natural features and ecological functions of the river or stream valley. Regulation of development in the allowance is also required to deal with issues related to accuracy of the modeling and analysis tools utilized to establish the limits of the erosion and flooding hazards.

To provide access and protection against unforeseen conditions, provincial guidelines recommend that development should generally be set back a minimum of 6 metres adjacent to erosion and flooding hazards (Sections 3.0 and 3.4, Erosion Access Allowance, Technical Guide – River and Stream Systems: Erosion Hazard Limit (MNR, 2002b)). MNR recommends that this setback not only be applied to the erosion hazards but also adjacent to the flooding hazard because of the potential for erosion throughout the flooding hazard as a result of the flow of water during significant runoff events. For those situations where additional study is warranted to determine the development setback required to provide the required public safety and access, a study should be undertaken using accepted scientific, geotechnical, and engineering principles.

Protection of public safety and access, however, may not be sufficient to provide for all of the above noted requirements or purposes for the allowances. Additional technical studies by qualified professionals may be required to establish the appropriate extent and location of

development within the allowance. CVCA may also determine that a reduced development setback is appropriate where the existing development already encroaches within the recommended 6 metre setback, and where further development will not aggravate the erosion or flooding hazard.

The CVCA will require all new development to be setback 6m from a flooding or erosion hazard.

4.2 Policies for River or Stream Valleys

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As stated in Policy 3.7.1, development will not be permitted within the regulated area associated with a river or stream valley, except in accordance with the policies contained in this section.
It is important to note that if development is proposed within the hazard associated with a river or stream valley (i.e., a flooding hazard and/or erosion hazard), the policies contained within Section 5.0 Hazardous Lands are to be applied in addition to the policies in this section.

Identification of the Flooding and/or Erosion Hazard Limit

4.2.1 When development is proposed within or adjacent to a river or stream valley and the floodplain limits for the watercourse are not available, CVCA may require that the applicant (or agent) provide appropriate technical reports identifying the floodplain limits on the subject lands to the satisfaction of CVCA. The floodplain limit is to be based on the 100-year flood.

4.2.2 In cases where development is proposed within or adjacent to an apparent river or stream valley and the valley is unstable or adjacent to a river or stream where there is no apparent valley, CVCA may require that the applicant (or agent) provide appropriate technical reports identifying the extent of the erosion hazard limit on the subject lands to the satisfaction of CVCA

In order to ensure that valley systems can preserve the functionality of their physical processes it is important to maintain their natural state in order to prevent property damage and/or loss of life resulting from hazards associated with erosion, slope instability and flooding. For this reason, CVCA encourages that development take place outside of the regulated area associated with any river or stream valley.

Development Within or Adjacent to an Apparent River or Stream Valley with Stable Valley Slope

4.2.3 Where the valley slope is stable, development will be permitted within 15 metres of the existing stable top of slope provided that:

- it can be demonstrated through appropriate technical documents (e.g., topographic survey) that all buildings or structures will be located beyond the existing stable top of slope. If the submitted plans do not demonstrate that buildings or structures will be located beyond the existing stable top of slope, buildings or structures will only be permitted where it can be demonstrated through a geotechnical study that there will be no impact on existing and future slope stability;
- safe access (ingress/egress) is present;
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted;
- development does not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and,
- if within 15 metres of the floodplain: the finished floor/lowest opening of proposed habitable structures is to be located at least 0.3 metres above the regulatory flood elevation; and, all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the regulatory flood elevation.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures, where applicable must be submitted.

Development Within or Adjacent to an Apparent River or Stream Valley with Unstable Valley Slope

4.2.4 Where the valley slope is unstable, development will be permitted within 15 metres of the projected stable top of slope provided that:

- it can be demonstrated through appropriate technical reports (e.g. topographic survey, stream bank erosion analysis, geotechnical investigation) that all development will be located a minimum of 6 metres beyond the projected stable top of slope (taking into account toe erosion allowance, where applicable);
- safe access (ingress/egress) is present;
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted;
- development does not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and,
- if within 15 metres of the floodplain: the finished floor/lowest opening of proposed habitable structures is to be located at least 0.3 metres above the regulatory flood

elevation; and, all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the regulatory flood elevation.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures, where applicable must be submitted.

4.2.5 Where the valley slope is unstable, development located within 6 metres of the projected stable top of slope would be considered susceptible to erosion hazards and therefore subject to Section 6.2 – Erosion Hazards (Policies 6.2.1 to 6.2.6 inclusive).

Development Within or Adjacent to a Not Apparent River of Stream Valley

4.2.6 Development will be permitted within 15 metres of the greater of the floodplain or predicted meander belt width (erosion hazard) of the river or stream provided that:

- it can be demonstrated through appropriate technical reports (e.g., topographic survey, geomorphologic assessment, floodplain mapping) that all development will be located a minimum of 6 metres beyond the greater of the floodplain OR the predicted meander belt width (erosion hazard);
- safe access (ingress/egress) is present;
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted;
- development does not change drainage or vegetation patterns that would exacerbate flooding hazards and/or erosion hazards;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;
- the finished floor/lowest opening of proposed habitable structures is to be located at least 0.3 metres above the regulatory flood elevation; and,
- all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the regulatory flood elevation.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures, where applicable must be submitted.

4.2.7 Development within 6 metres of (whatever is greater) the floodplain OR the predicted meander belt width (erosion hazard) would be considered susceptible to erosion hazards and therefore subject to Section 6.2 – Erosion Hazards (Policies 6.2.1 to 6.2.6 inclusive).

Fill Placement, Excavation and/or Grade Modifications within or Adjacent to an Apparent River or Stream Valley

4.2.8 Where the valley slope is stable, fill placement, excavation and/or grade modifications may be permitted within 15 metres of the existing stable top of slope where the works are: associated with existing access roads and driveways; required for the construction of a new access route to serve an existing residential, agricultural, commercial, industrial or institutional use; required for the purpose of flood and/or erosion protection; to facilitate the installation of geothermal, water and/or sewage treatment systems; to facilitate the installation of a new dug-out or isolated pond*; and/or, associated with retrofitting of an existing dug-out or isolated pond* that would result in an enlargement of the pond in area or volume beyond what was previously constructed, provided that:

- the fill placement, excavation and/or grade modifications does not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;
- for dug-out or isolated ponds*, the pond does not extend beyond the existing stable top of slope;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted.

*Ponds for the specific purpose of watering livestock are not subject to Policy 4.2.8 as they are not subject to Ontario Regulation 159/06 in accordance with Section 28(10)(a) of the Conservation Authorities Act.

4.2.9 Where the valley slope is unstable, fill placement, excavation and/or grade modifications may be permitted within 15 metres of the projected stable top of slope where the works are: associated with existing access roads and driveways; required for the construction of a new access route to serve an existing residential, agricultural, commercial, industrial or institutional use; required for the purpose of flood and/or erosion protection; to facilitate the installation of geothermal, water and/or sewage treatment systems; to facilitate the installation of a new dug-out or isolated pond*; and/or, associated with retrofitting of an existing dug-out or isolated pond* that would result in an enlargement of the pond in area or volume beyond what was previously constructed, provided that:

- it can be demonstrated through appropriate technical reports (e.g., topographic survey, stream bank erosion analysis, geotechnical investigation) that the limit of all fill placement, excavation and/or grade modifications will be located a minimum of 6 metres beyond the projected stable top of slope (taking into account toe erosion allowance, where applicable);

- the fill placement, excavation and/or grade modifications will not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted.

*Ponds for the specific purpose of watering livestock are not subject to Policy 4.2.9 as they are not subject to Ontario Regulation 159/06 in accordance with Section 28(9)(a) of the Conservation Authorities Act.

4.2.10 Notwithstanding Policy 4.2.9, where the valley slope is unstable, fill placement, excavation and/or grade modifications located within 6 metres of the projected stable top of slope would be considered susceptible to erosion hazards and, therefore, may be permitted subject to the policies contained in Section 6.2 – Erosion Hazards (Policies 6.2.1 to 6.2.6 inclusive).

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

Fill Placement, Excavation and/or Grade Modifications within or Adjacent to a Not Apparent River or Stream Valley

4.2.11 Fill placement, excavation and/or grade modifications may be permitted within 15 metres of the greater of the floodplain or predicted meander belt width (erosion hazard) of the river or stream where the works are: associated with existing access roads and driveways; required for the construction of a new access route to serve an existing residential, agricultural, commercial, industrial or institutional use; required for the purpose of flood and/or erosion protection; to facilitate the installation of geothermal, water and/or sewage treatment systems; to facilitate the installation of a new dug-out or isolated pond*; and/or, associated with retrofitting of an existing dug-out or isolated pond* that would result in an enlargement of the pond in area or volume beyond what was previously constructed, provided that:

- it can be demonstrated through appropriate technical reports (i.e., topographic survey, geomorphologic assessment, floodplain mapping) that the limit of all fill placement, excavation and/or grade modifications will be located a minimum of 6 metres beyond the greater of the floodplain OR the predicted meander belt width (erosion hazard);

- the fill placement, excavation and/or grade modifications will not change drainage or vegetation patterns that would exacerbate flooding hazards and/or erosion hazards;
- the potential for erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted.

*Ponds for the specific purpose of watering livestock are not subject to Policy 4.2.11 as they are not subject to Ontario Regulation 159/06 in accordance with Section 28(10)(a) of the Conservation Authorities Act.

4.2.12 Notwithstanding Policy 4.2.11, fill placement, excavation and/or grade modifications located within 6 metres of the greater of the floodplain OR the predicted meander belt width (erosion hazard) would be considered susceptible to erosion hazards and, therefore, may be permitted subject to the policies contained in Section 6.2 – Erosion Hazards (Policies 6.2.1 to 6.2.6 inclusive).

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

This page has been left intentionally blank.

5.0 HAZARDOUS LANDS

Hazardous Lands are defined in the Conservation Authorities act as land that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches and/or unstable soil or bedrock.

5.1 Defining the Flooding Hazard and Associated Regulated Area

In Ontario, either storm-centred events, flood frequency based events, or an observed event may be used to determine the extent of the Regulatory floodplain[4]. These events are:

a. A **storm-centred event**, either Hurricane Hazel storm (1954) or Timmins storm (1961). A storm-centred event refers to a major storm of record which is used for land use planning purposes. The rainfall actually experienced during a major storm event can be transposed over another watershed and when combined with the local conditions, Regulatory floodplains can be determined. This centering concept is considered acceptable where the evidence suggests that the storm event could have potentially occurred over other watershed in the general area;

b. **100 year flood event** is a frequency based flood event that is determined through analysis of precipitation, snow melt, or a combination thereof, having a return period (or a probability of occurrence) of once every 100 years on average (or having a 1% chance of occurring or being exceeded in any given year). The 100 year flood event is the minimum acceptable standard for defining the Regulatory floodplain; and

c. An **observed event**, which is a flood that is greater that the storm-centred events or greater that the 100 year flood and which was actually experienced in a particular watershed, or portion thereof, for example as a result of ice jams[5], and which has been approved as the standard for that specific area by the Minister of Natural Resources.

[4] High points of land not subject to flooding but surrounded by floodplain or "flooded land" are considered to be within the flood hazard and part of the regulated floodplain.

[5] However, localized chronic conditions (e.g. ice or debris jams) related to flood prone areas may be used to extend the regulated area beyond the Regulatory Flood limit without the approval of the Minister of Natural Resources. It

The Province has adopted standards for addressing floodplain management. Unless otherwise approved by the Minister of Natural Resources, the regulatory flood standard is the Hurricane Hazel (1954) standard for the south and central part of the province, the Timmins Storm (1961) for the central and northern part of the province and the 100 year flood for the eastern part of the province. An observed event may take place in any part of the province, exceeding either the storm-centred events or the 100 year frequency based flood. These standards may be increased by the Minister of Natural Resources if a known flood (maximum observed) exceeds these criteria (Natural Hazards Technical Guidelines, 2002 (MNR) – Section 7.0, River and Stream Systems of Understanding Natural Hazards and River and Stream Systems Flooding Hazard Limit Technical Guide).

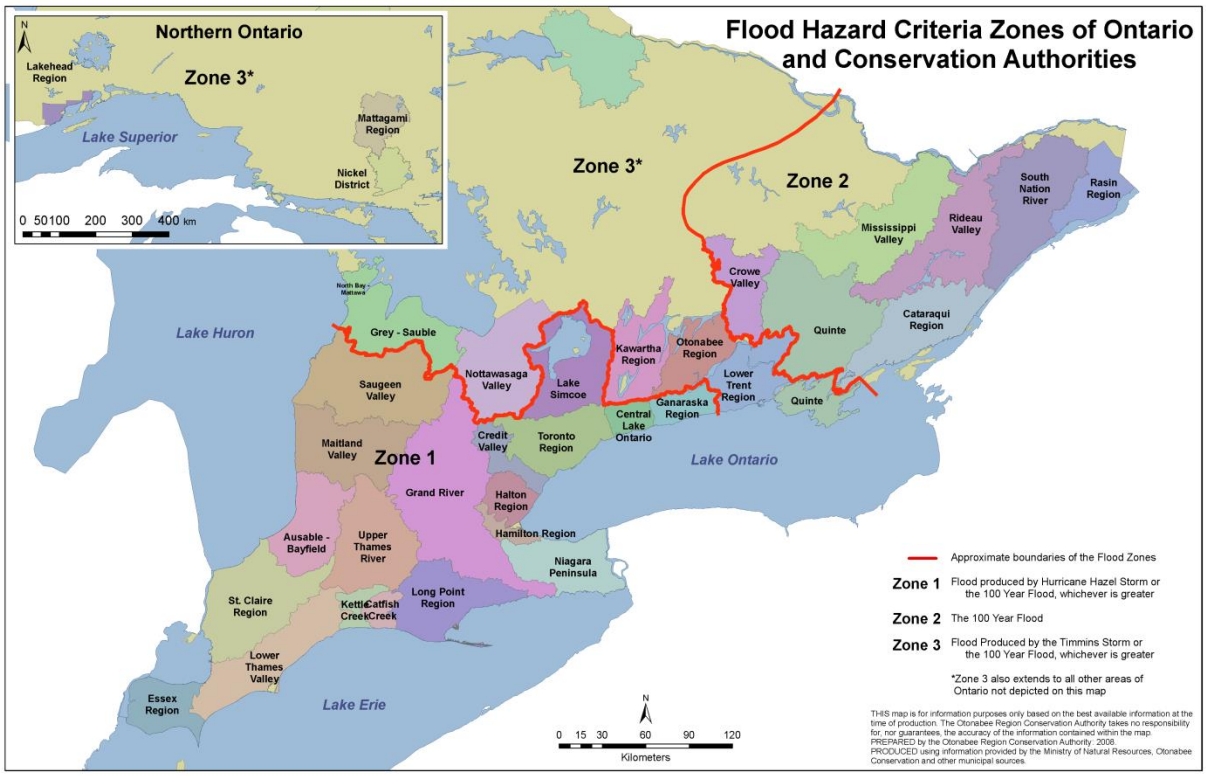


Figure 6 Flood Hazard Criteria Zones of Ontario

Thus, the Regulatory floodplain for river or stream valley systems is defined as the area adjacent to the watercourse which would be inundated by a flood event resulting from either Hurricane Hazel, the Timmins Storm, an observed event, or by the 100 year frequency based event. The regulated area includes the floodplain and for not apparent valley systems, an allowance. The allowance is not to exceed 15 metres from the hazard (Figure 7).

will be necessary to inform the property owner(s) as well as ensuring that the revised limits are reflected in the appropriate municipal documents at the first opportunity.

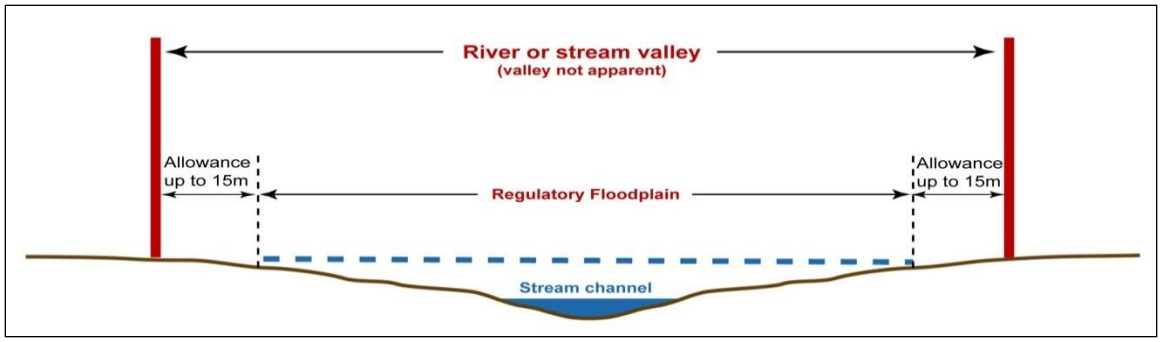


Figure 7 Regulated area of floodplain

The Crowe Valley watershed uses the 1:100 year storm to delineate its regulated area. With the exception of the lakes in Table 1 that have a known 1:00 year elevation, the CVCA regulates 30m from all shorelines.

Table 2 Flood Elevations for Lakes in CVCA Watershed

Lake	1:100 Elevation	Summer Elevation	Winter Elevation
Belmont	188.8	187.03	186.66
Cordova	217.58	216.5	216.2
Crowe	183.88	182.31	182.09
Kasshabog	262.7	262.16	261.64
Paudash	342.8	342.31	342.02
Round	200.3	200.1	199.34
St. Ola	313.93	313.57	313.06
Wollaston	311.55	310.3	309.88

According to MNR and CO Guidelines for Developing Scheduled Area (2005), the flooding hazard applied to all watercourses and lake systems in the CVCA watershed.

Any development within a flooding hazard requires permission from CVCA.

5.2 Defining the Erosion Hazard and Associated Regulated Area

The erosion hazard is that area of a watercourse bank and lands adjacent to a watercourse (i.e., a watercourse valley) where erosion is actively occurring and/or where development could create slope stability issues. The erosion hazard addresses both the erosion potential of the actual watercourse bank and the potential slope instability related to valley walls. Development adjacent to valley slopes can cause increased loading forces on the top of slope, compromise slope stability or increase erosion of the slope face, and result in the loss of stabilizing vegetation. Where there is no apparent valley the regulated area associated with an erosion hazard is comprised of the meander belt (i.e., the meander belt width). Where the

valley is apparent the regulated area associated with an erosion hazard is comprised of the stream bank and slope erosion (i.e., the toe erosion allowance and the stable slope allowance).

CVCA relies on the Ministry of Natural Resources Technical Guide – River & Stream Systems: Erosion Hazard Limit (2002) to determine the erosion hazard. Due to this, CVCA considers an erosion access allowance of 6 metres adjacent to the stable top of slope and/or meander belt width when evaluating development proposals in relation to erosion hazards. An erosion access allowance is meant to provide access for emergencies, maintenance and construction activities. As such, development within the erosion access allowance is considered to be encroaching on the associated hazardous lands and would be subject to the policies contained in this section. According to the MNR and CO Guidelines for Developing Scheduled Areas (2005), the erosion hazard applies to all watercourses and lake systems in the CVCA watershed.

Any development within an erosion hazard requires permission from CVCA.

5.3 Defining the Regulated Area Associated with Unstable Soils or Bedrock

Due to the specific nature of areas of unstable soil or unstable bedrock, it is difficult to identify these hazards. The potential for catastrophic failures in some areas of unstable soil and unstable bedrock warrant site specific studies to determine the extent of these hazardous lands, and therefore the appropriate limits of the hazard and Regulation Limits. The regulated area is based on the conclusions and recommendations of such studies.

Development within areas deemed as hazardous is considered through the “development” provision of the Regulation. Activities proposed within unstable soil and unstable bedrock hazardous lands must therefore meet the definition of “development” (see Section 1.4.1) in the Conservation Authorities Act to be regulated.

5.3.1 Unstable Soil

Unstable soil includes but is not necessarily limited to areas identified as containing sensitive marine clays (e.g. leda clays) or organic soils (MNR & CO, 2005).

5.3.1.1 Sensitive Marine Clays (Leda Clay)

Sensitive marine clays, also known as leda clays, are clays that were deposited as sediment during the last glacial period in the Champlain Sea. Undisturbed, the clays can appear as solid and stable. But when disturbed by excessive vibration, shock or when they become saturated with water, the clays can turn to liquid (MNR, 2001). The resulting failures or earthflows can be sudden and catastrophic.

Sensitive marine clays are restricted to specific locations in the province, however, are not restricted to just along rivers and streams In addition to the mapping that individual CAs may have developed or obtained, information is also available from Geological Survey of Canada and the MNR.

To determine Regulation Limits, it is recommended that site specific studies be undertaken to determine the full extent of the sensitive marine clays and their full potential for retrogressive failures. While useful standards for defining the limits of the hazardous lands are provided within the "Understanding Natural Hazards" (MNR, 2001) document and Hazardous Sites Technical Guide (MNR, 1996a), it is crucial to recognize that these standards only address a first occurrence of slope failure. As such, the Guidelines for Developing Schedules of Regulated Areas recommend the use of a site/area specific study in defining the appropriate hazard (and therefore the Regulation Limit) to account for the potential of subsequent failures.

Section 3.0 of the Hazardous Sites Technical Guide (MNR, 1996a) provides important guidance with respect to assessing marine sensitive clays and the potential for development within this type of hazardous lands.

5.3.1.2 Organic Soils

Organic soils are normally formed by the decomposition of vegetative and organic materials into humus, a process known as humification. A soil is organic when the percentage weight loss of the soil, when heated, is five to eighty per cent (MNR, 2001).

As a result, organic soils can cover a wide variety of soil types. Peat soils, however, are the most common type of organic soil in Ontario. Therefore, a CA's wetland inventory may provide guidance in the location of organic soils. In addition, maps by the Geological Survey of Canada, MNR, Ministry of Northern Development & Mines, and the Ministry of Agriculture, Food and Rural Affairs may provide additional information on the location of organic soils.

Due to the high variability of organic soils the potential risks and hazards associated with development in this type of hazardous land are also highly variable. As such, assessment of development potential in areas of organic soils is site specific. Section 4.0 of the Hazardous Sites Technical Guide (MNR, 1996a) provides important guidance in this regard.

5.3.2 Unstable Bedrock

Unstable bedrock includes but is not necessarily limited to areas identified as karst formations. Karst formations may be present in limestone or dolomite bedrock, and are extremely variable in nature. Local, site-specific studies are required for identifying karst formations. Air photo interpretation of surface features such as sink holes may provide an indication of karst formations (MNR and CO, 2005).

As with unstable soils, the potential for development to be undertaken safely in an area of unstable bedrock is site specific. Section 5.0 of the Hazardous Sites Technical Guide (MNR, 1996a) provides important guidance in this regard.

The regulated area associated with unstable soil or bedrock includes the maximum extent of the unstable soil or bedrock.

Any development on unstable soil or unstable bedrock required permission from CVCA.

6.0 POLICIES FOR FLOODING HAZARDS

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As per Policy 3.7.1, development will not be permitted within the regulated area associated with a flooding hazard, except in accordance with the policies contained in this section.

It is the policy of CVCA

6.0.1 In general, development within the Regulatory floodplain shall not be permitted

6.0.2 In general, flood hazard protection and bank stabilization works to allow for future/proposed development or an increase in development envelope or area within the Regulatory floodplain shall not be permitted

6.0.3 In general, development associated with new and/or the expansion of existing trailer parks/campgrounds in the Regulatory floodplain shall not be permitted

6.0.4 In general, stormwater management facilities within the 100 year floodplain shall not be permitted

6.0.5 In general, development within the Regulatory floodplain on vacant lots of record shall not be permitted

6.0.6 In general, basements within the Regulatory floodplain shall not be permitted

6.0.7 In general, underground parking within the Regulatory floodplain shall not be permitted

6.0.8 Notwithstanding Section 3.7.1, public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) may be permitted within the Regulatory floodplain subject to the activity being approved through a satisfactory Environmental Assessment process and/or 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

6.0.9 Notwithstanding Section 3.7.1, development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail systems) may be permitted within the Regulatory floodplain 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

6.0.10 Notwithstanding Section 3.7.1, stream, bank, slope, and valley stabilization to protect existing development and conservation or restoration projects may be permitted within the Regulatory floodplain subject to the activity being approved through a satisfactory Environmental Assessment process and/or 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

6.1 Specific Policies for Flooding Hazards

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As per Policy 3.7.1, development will not be permitted within the regulated area associated with a flooding hazard, except in accordance with the policies contained in Section 4.2 and this section.

6.1.1 Residential Development

New Residential Development

6.1.1.1 New multiple residential development will not be permitted within a flooding hazard, regardless of previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act).

6.1.1.2 New single residential development on an existing lot will not be permitted within a flooding hazard regardless of previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act).

Minor Residential Additions

6.1.1.3 Minor ground floor additions (including an attached garage) to existing residential dwellings located within a flooding hazard will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- the ground floor addition is 50% or less of the original habitable floor space* to a maximum footprint of 46.5 square metres (~500 square feet), whichever is less, or in the case of multiple additions, all additions combined are equal to or less than 50% of the original habitable floor space to a maximum footprint of 46.5 square metres (~500 square feet), whichever is less;
- the number of dwelling units is the same or fewer;
- the addition will not be subject to flows that could cause structural damage;
- where feasible, an improvement in the existing dwelling will occur with respect to floodproofing of the structure;
- safe access (ingress/egress) can be achieved;
- the addition will be floodproofed to an elevation of 0.3 metre above the regulatory flood elevation as per floodproofing standards outlined in Appendix C – Floodproofing Guidelines;
- the structure is properly anchored to prevent flotation, is not subject to damage by flooding or other hazards and flood flows and flood water storage are not impeded; and,

- no basement is proposed and any crawl space is designed to facilitate service only.

A ground floor addition will not be permitted in addition to policy 6.1.1.5 at any time.

A site plan prepared by qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted. In addition, detailed technical analysis completed by a qualified professional engineer may be required to be submitted to demonstrate the acceptability of the proposal.

6.1.1.4 Ground floor additions to existing residential dwellings greater than the size provision identified in 6.1.1.3 above would be considered Single Residential Development and therefore subject to Policy 6.1.1.2.

6.1.1.5 An additional storey (or extension) on existing residential dwellings located within a flooding hazard will be permitted provided it can be demonstrated that:

- it does not exceed the original habitable ground floor space* of the existing dwelling;
- The number of dwelling units is be the same or less, and;
- Safe access (ingress/egress) is present.

An additional storey (or extension) will not be permitted if there has been or will be a proposed ground floor addition as per Policy 6.1.1.3.

*Original habitable floor space means the floor space that was part of the original structure when it was first constructed. Subsequent requests for additions which will result in the cumulative exceedance of 50% of the original floor space or 46.5 square metres (~500 square feet) will not be considered.

Residential Replacement

6.1.1.6 Replacement of residential dwellings located within a flooding hazard that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- the dwelling to be replaced is relocated outside the flooding hazard where feasible;
- there is no increase in the number of dwelling units;
- the new dwelling is the same size or smaller than the previous dwelling;
- the use of the new dwelling is the same as the previous dwelling;
- the dwelling will be floodproofed to an elevation of 0.3 metre above the regulatory flood elevation, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- safe access (ingress/egress) is present;
- no basement is proposed and any crawl space is designed to facilitate service only; and,
- there is no risk of structural failure due to potential hydrostatic/dynamic pressures.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.1.7 Replacement of residential dwellings within a flooding hazard that would result in an increase in dwelling size will be permitted provided it can be demonstrated that the conditions for Minor Residential Additions (Policies 6.1.1.3, 6.1.1.4, 6.1.1.5) can be satisfied, and safe access is present.

Internal Residential Renovation

6.1.1.8 Internal renovations to existing residential buildings or structures located within a flooding hazard which change the use or potential use of the building or structure but provide for no additional dwelling units will be permitted provided it can be demonstrated that:

- the internal renovation does not result in a new use prohibited by the General Policies – 3.7.5 and,
- floodproofing is undertaken to the extent practical, in accordance with floodproofing standards identified in the Appendix C - Floodproofing Guidelines.

Residential Relocation

6.1.1.9 Relocation of existing residential dwellings located within a flooding hazard will be permitted provided it can be demonstrated that the dwelling is relocated outside of the flooding hazard, or where this is not feasible, the dwelling is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent possible, and that the dwelling is floodproofed to an elevation of 0.3 metre above the regulatory flood, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.2 Agricultural Development

New Agricultural Development

6.1.2.1 New structural agricultural development associated with existing agricultural uses will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- the site is not subject to frequent flooding OR where a subwatershed study or other comprehensive plan demonstrates that flooding has been artificially created as a result of undersized infrastructure such as culverts and bridges;
- a balanced cut and fill operation can be implemented on the lot in accordance with Policy 6.1.13 to provide a suitable building envelope outside of the flooding hazard to the extent possible;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in the Appendix C – Floodproofing Guidelines;
- the building or structure is securely anchored to either a concrete pad or footings; and,
- no basement is proposed and any crawl space is designed to facilitate service only.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

Minor Agricultural Additions

6.1.2.2 Minor additions to existing agricultural buildings or structures located within a flooding hazard will be permitted provided it can be demonstrated that:

- the addition will not facilitate a use prohibited by the General Policies – Prohibited Uses (Policy 3.7.5);
- the addition is 50% or less of the original ground floor area of the building or structure to a maximum footprint of 100 square metres, or in the case of multiple additions, all additions combined are equal to or less than 50% of the original ground floor area of the building or structure to a maximum footprint of 100 square metres;
- no basement is proposed and any crawl space is designed to facilitate service only;
- where dry floodproofing cannot be achieved, wet floodproofing of the addition is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- where feasible, an improvement in the existing building or structure will occur with respect to floodproofing of the building or structure; and,
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g. release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event.)

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.2.3 Additions to existing agricultural buildings or structures greater than the size provided in Policy 6.1.2.2 would be considered New Agricultural Development and therefore subject to the policies of 6.1.2.1.

Agricultural Replacement

6.1.2.4 Replacement of agricultural buildings or structures located within a flooding hazard that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- design modifications and lot modifications (e.g., balanced cut and fill operation in accordance with Policy 6.1.1.3 will reduce the risk of flooding and property damage to the greatest extent, wherever possible;
- the new building or structure is the same size or smaller than the previous building or structure;
- the new building or structure is securely anchored to either a concrete pad or footings;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- no basement is proposed and any crawl space is designed to facilitate service only; and,
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.2.5 Replacement of agricultural buildings or structures located within a flooding hazard that would result in an increase in building or structure size will be permitted provided it can be demonstrated that the conditions for Minor Agricultural Additions (Policies 6.1.2.2 and 6.1.2.3) can be satisfied.

Agricultural Relocation

6.1.2.6 Relocation of existing agricultural buildings and structures located within a flooding hazard will be permitted provided it can be demonstrated that the building or structure is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible, and where dry floodproofing cannot be

achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.3 Commercial, Industrial and Institutional Development

New Commercial, Industrial or Institutional Development

6.1.3.1 New institutional development will not be permitted within a flooding hazard regardless of previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act).

6.1.3.2 New commercial or industrial development may be permitted within a flooding hazard provided it can be demonstrated that:

- the addition will not facilitate a use prohibited by the General Policies – Prohibited Uses (3.7.5);
- there is no feasible alternative site outside of the flooding hazard;
- the site is not subject to frequent flooding OR a subwatershed study or other comprehensive plan has confirmed that flooding has been artificially created as a result of undersized infrastructure such as culverts and bridges;
- safe access (ingress/egress) is present;
- the building or structure (including any crawlspace) will be floodproofed to an elevation of 0.3 metre above the regulatory flood elevation in accordance with floodproofing standards outlined in Appendix C – Floodproofing Guidelines;
- the building or structure is securely anchored to either a concrete pad or footings;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g., release of biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- no basement is proposed;
- A balanced cut and fill operation can be implemented on the lot in accordance with Policy 6.1.13.1 to provide a suitable building envelope outside of the flooding hazard to the extent possible; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted.

Minor Commercial or Industrial Additions

6.1.2.3 Minor additions to existing commercial/industrial buildings or structures located within a flooding hazard will be permitted provided it can be demonstrated that:

- the addition will not facilitate a use prohibited by the General Policies - Prohibited Uses (Policy 3.7.5);
- the addition is 50% or less of the original ground floor area of the building or structure to a maximum footprint of 100 square metres, or in the case of multiple additions, all additions combined are equal to or less than 50% of the original ground floor area of the building or structure to a maximum footprint of 100 square metres;
- no basement is proposed and any crawl space is designed to facilitate service only;
- the addition is floodproofed to an elevation of 0.3 metre above the regulatory flood elevation, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines; and
- where feasible, an improvement in the existing building or structure will occur with respect to floodproofing of the building or structure.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.3.4 Additions to existing commercial/industrial buildings or structures greater than the size provision identified in Policy 6.1.2.3 above would be considered New Commercial/Industrial Development and therefore subject to Policy 6.1.3.1 and 6.1.3.2.

Commercial, Industrial or Institutional Replacements and Renovations

6.1.3.5 Replacement of commercial, industrial, institutional buildings or structures located within a flooding hazard that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- design modifications and lot modifications (e.g. balanced cut and fill operation in accordance with Policy 6.1.1.3 will reduce the risk of flooding and property damage to the greatest extent, wherever possible;
- the number of dwelling units is the same or less;
- the new building or structure is the same size or smaller than the previous dwelling;
- the building or structure is floodproofed to an elevation of 0.3 metres above the regulatory flood elevation, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- Safe access (ingress/egress) is present; and
- no basement is proposed and any crawl space is designed to facilitate service only.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.3.6 Replacement of commercial and industrial buildings located within a flooding hazard ~~that would result in an increase in building or structure size will only be permitted where~~ it can be demonstrated that the conditions for Minor Commercial, Industrial or Institutional Additions can be satisfied and that safe access (ingress/egress) is present.

Commercial, Industrial or Institutional Relocation

6.1.3.7 Relocation of existing commercial/industrial/institutional buildings or structures located within a flooding hazard will be permitted provided it can be demonstrated that the building or structure is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible, and that the building or structure is floodproofed to an elevation of 0.3 metre above the regulatory flood, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.4 Accessory Buildings and Structures

Accessory Buildings or Structures

6.1.4.1 Accessory buildings or structures associated with an existing residential, agricultural, commercial, industrial or institutional use such as detached garages, sheds, silos, gazebos and other similar structures (but not including on-shore boathouses: see Policy 6.1.5), will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- there is no habitable floor space associated with the building or structure and no opportunity for conversion into habitable floor space in the future;
- the site is not subject to frequent flooding;
- the building or structure does not exceed 46.5 square metres for settlement areas or shoreline development and for rural areas, the building or structure does not exceed 100 square metres;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- the building or structure is securely anchored to either a concrete pad or footings;
- no basement is proposed and any crawl space is designed to facilitate service only; and,
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of proposed buildings/structures must be submitted.

Additions to Accessory Buildings or Structures

6.1.4.2 Additions to existing accessory buildings or structures located within a flooding hazard will be permitted provided it can be demonstrated that:

- the total size of the building or structure that would result from the addition does not exceed the maximum size identified in Policy 6.1.4.1;
- there is no habitable floor space associated with the addition and no opportunity for conversion into habitable floor space in the future;
- no basement is proposed and any crawl space is designed to facilitate service only;
- an improvement in the existing building or structure will occur with respect to floodproofing;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g. release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event); and
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

Replacement of Accessory Buildings or Structures

6.1.4.3 Replacement of existing accessory buildings or structures that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside the flooding hazard;
- the building or structure to be replaced is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent, wherever possible;
- the new building or structure is the same size or smaller than the previous building or structure (Note: replacements to accessory buildings or structures located within a flooding hazard that would result in an increase in building or structure size are subject to the provisions of Policy 6.1.4.2;
- there is no habitable floor space associated with the building or structure and no opportunity for conversion to habitable floor space in the future;

- no basement is proposed and any crawl space is designed to facilitate service only; and,
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

Relocation of Existing Accessory Buildings or Structures

6.1.4.5 Relocation of an existing accessory building or structure located within a flooding hazard will be permitted provided it can be demonstrated that the building or structure is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible, and where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.5 Boathouses

On-Shore Boathouses

6.1.5.1 On-shore boathouses will be permitted within a flooding hazard where it can be demonstrated that:

- there is no habitable floor space associated with the boathouse and there is no opportunity for conversion into habitable floor space in the future. The boathouse shall contain no services other than electricity);
- the structure will be located within existing impacted or open areas, wherever possible;
- the structure does not exceed 80 square metres;
- the structure will not restrict safe access;
- the structure will be constructed in a manner to minimize impacts to the natural grade of the shoreline and riparian vegetation;
- the structure is securely anchored to either a concrete pad or footings; and,

- where dry floodproofing cannot be achieved, wet floodproofing will be undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

*NB. For In-Water Boathouses please refer to Policies 7.4.1.8 and 7.4.1.9

6.1.6 Swimming Pools

Swimming Pools

6.1.6.1 Below ground swimming pools will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- floodproofing is undertaken to the extent practical, in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines; and,
- all excavated fill is removed from the flooding hazard.

6.1.7 Infrastructure

Infrastructure

6.1.7.1 Public infrastructure (e.g., roads, sewers, flood and/or erosion control works, water supply, municipal stormwater management facilities required to alleviate a flood problem associated with existing development) and private infrastructure (e.g., roads, gas and electrical transmission pipelines/corridors, etc.) will be permitted to be constructed, realigned and/or upgraded within a flooding hazard when the location is supported through an approved Environmental Assessment and/or in the case of private infrastructure, it has been demonstrated through a comprehensive plan that there is no feasible alternative site outside the flooding hazard, provided it can be demonstrated that:

- risk of flood damage to upstream or downstream properties is not increased or is minimized through site design;
- the risk of pollution is minimized through site design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- where applicable, floodproofing measures are incorporated into the design in accordance with floodproofing standards identified in Appendix C – Floodproofing guidelines;
- where applicable, safe access (ingress/egress) is present; site, facility, and/or landscape design and appropriate best management practices will be employed to:
  - maintain stage-storage relationships to the floodplain;
  - control sediment and erosion; and,

- minimize impervious surfaces and loss of natural vegetation.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

6.1.7.2 Parking lots and access routes (e.g., driveways, private access roads and entrance ways) associated with existing residential, agricultural, commercial, industrial or institutional uses will be permitted within a flooding hazard provided it can be demonstrated that:

- the risk of flooding and property damage is minimized through site design;
- drainage of parking lots will take place within 1 hour following the cessation of the rainfall event, and does not result in depth of flooding that would exceed 30 centimetres; and,
- Safe access (ingress/egress) is present.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

6.1.8 Stormwater Management Facilities

New Stormwater Management Facilities

6.1.8.1 New stormwater management facilities will not be permitted within a flooding hazard with the exception of municipal stormwater management facilities required to alleviate a non-regulatory flood problem associated with existing development:

- there is no feasible alternative outside of the hazard;
- natural erosion and sedimentation processes within the receiving watercourse are not impacted;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site and facility design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- facilities are excavated with minimal berming, and all excavated material is removed from the flooding hazard and/or erosion hazard; and,
- design and maintenance performance requirements as determined by CVCA for the receiving watercourse are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

Retrofitting Stormwater Management Facilities

6.1.8.2 Retrofitting of stormwater management facilities will be permitted within a flooding hazard where there is no feasible alternative site to locate the facility outside the flooding hazard provided it can be demonstrated that:

- natural erosion and sedimentation processes within the receiving watercourse are not impacted;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site and facility design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- facilities are excavated with minimal berming, and all excavated material is removed from the flooding hazard and/or erosion hazard; and,
- design and maintenance performance requirements as determined by CVCA for the receiving watercourse are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

6.1.9 Ponds

Dug-out/Isolated Ponds

6.1.9.1 New dug-out or isolated ponds will be permitted in a flooding hazard where there is no feasible alternative site to locate the pond outside the flooding hazard provided it can be demonstrated that:

- all dredged material is removed from the flooding hazard;
- finished side slopes are stable;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site and pond design and appropriate remedial measures will mitigate disturbance to hydrologic functions; and,
- the risk of pollution and sedimentation during construction is minimized.

6.1.9.2 Enlargement of an existing dug-out or isolated pond located within a flooding hazard will be permitted provided it can be demonstrated that the enlargement can satisfy Policy 6.1.9.1 and will not further encroach on the flooding hazard.

6.1.10 Low Intensity Recreational Uses

Low Intensity Recreational Uses

6.1.10.1 Low intensity recreational uses, such as parks, trail systems and watercourse access points will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside the flooding hazard;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site, facility, and/or landscape design and appropriate remedial measures will mitigate disturbance to hydrologic functions; and,
- the risk of property damage is minimized through site, facility, and/or landscape design and flood emergency plans.

6.1.11 Marinas

Marinas

6.1.11.1 Marina facilities will be permitted within a flooding hazard provided it can be demonstrated that:

- all associated permanent, closed structures (e.g., clubhouses, washrooms with septic systems and maintenance buildings) are located outside of the flooding hazard;
- all boat storage facilities will be constructed on shore and all proposed permanent docks can satisfy policies outlined in section 7.4.1.1 – Structures;
- facilities will be located within existing impacted or open areas, wherever possible;
- facilities will be constructed in a manner to minimize impacts to the natural grade of the shoreline;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site, facility, and/or landscape design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- where dry floodproofing cannot be achieved, wet floodproofing will be undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines; and,
- the risk of property damage is minimized through site, facility and/or landscape design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

6.1.12 Golf Courses

Golf Courses

6.1.12.1 Golf courses or golf course expansions will be permitted within a flooding hazard provided it can be demonstrated that:

- all associated permanent, closed structures (e.g., clubhouses, washrooms with septic systems and maintenance buildings) will be located outside of the flooding hazard;
- watercourse crossings are minimized and designed in accordance with the policies that pertain to structures; and,
- where unavoidable, intrusions on hydrologic functions are minimized.

6.1.13 Fill Placement, Excavation and/or Grade Modifications

Fill Placement, Excavation and/or Grade Modifications

6.1.13.1 Fill placement, excavation, and/or grade modifications: associated with existing access roads and driveways; required for the purpose of floodproofing existing and/or proposed structures; required for erosion control; and/or, to facilitate the installation of geothermal, and water and/or sewage treatment systems will be permitted within a flooding hazard provided it can be demonstrated that:

- stage-storage and stage-discharge characteristics of the floodplain will be maintained by means of an incrementally balanced cut and fill operation to ensure that there will be no adverse hydraulic or fluvial impacts on rivers, creeks, streams or watercourses. This cut and fill operation must be designed in 0.3 metre vertical increments. Engineered hydraulic analyses may be required, at the discretion of CVCA, to demonstrate that the latter condition has been met and the proposed placement of fill will not have a detrimental effect on upstream water levels or local stream flow velocities;
- flood flows will not be impeded; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted;

OR where stage-storage and stage-discharge characteristics of the floodplain cannot be maintained by a balanced cut and fill operation:

- fill placement, excavation, and/or grade modifications required for water and/or septic treatment systems will be limited to the required area and depths as specified by the approval agency;
- fill placement, excavation, and/or grade modifications required for floodproofing purposes will not exceed the minimum amount required to floodproof the structure in accordance with floodproofing guidelines in Appendix C – Floodproofing Guidelines;

- fill placement, excavation, and/or grade modifications required for sediment and/or erosion control or shoreline stabilization be in accordance with Erosion Protection, Shoreline/Bank Stabilization and Sediment Control policies (Policy 7.4.4.5);
- no impacts on the hydraulic or fluvial functions of the river, creek, stream or watercourse will occur and upstream and downstream flow velocities related to ~~increased flood risk or damage are unaffected. An engineered hydraulic analysis may~~ be required, at the discretion of CVCA, to ensure that these matters have been addressed;
- flood flows are not impeded; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted.

A site plan prepared by a qualified professional illustrating the elevations of existing grades and the proposed grades after development must be submitted.

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

6.2 Specific Policies for Erosion Hazards

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As per Policy 3.7.1, development will not be permitted within the regulated area associated with an erosion hazard, except in accordance with the policies contained in this section.

6.2.1 Residential, Agricultural, Commercial, Industrial or Institutional Development

New Residential, Agricultural, Commercial, Industrial or Institutional

6.2.1.1 New residential, agricultural, commercial, industrial or institutional development will not be permitted within an erosion hazard, regardless of any approvals previously obtained under the Planning Act or other regulatory process (e.g., Building Code Act).

Additions

6.2.1.2 Additions to existing residential, agricultural, commercial or industrial buildings or structures located within an erosion hazard will be permitted subject to the following:

- a geotechnical study prepared by a qualified professional demonstrates that: there is no feasible alternative to locate the addition outside of the erosion hazard and that the addition will be located in an area of least (and acceptable) risk; there is no impact on

existing and future slope stability; and, the potential for erosion is addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and,

- the addition will not prevent access into and through the valley in order to undertake erosion prevention works and/or maintenance of existing buildings or structures or during an emergency.

Replacement/Relocation

6.2.1.3 The replacement or relocation of an existing building or structure within an erosion hazard will be permitted subject to the following:

- a geotechnical study prepared by a qualified professional demonstrates that: there is no opportunity to relocate the building or structure outside of the erosion hazard and that the building or structure will be located in an area of least (and acceptable) risk; there is no impact on existing and future slope stability; and, the potential for erosion is addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;
- the replacement/relocation will not prevent access into and through the valley in order to undertake erosion prevention works and/or maintenance of existing buildings or structures or during an emergency; and,
- the building or structure will be protected from the erosion hazard through incorporation of appropriate building design parameters.

6.2.1.4 Replacement of an existing building or structure located within an erosion hazard that would result in an increase in building or structure size will be permitted provided it can be demonstrated that Policy 6.1(2) can be satisfied

6.2.2 Accessory Buildings or Structures

Accessory Buildings or Structures

6.2.2.1 Accessory buildings or structures associated with an existing residential, agricultural, commercial, industrial or institutional use such as detached garages, tool sheds, gazebos and other similar structures or additions to existing accessory buildings or structures will be permitted within an erosion hazard where it can be demonstrated that:

- there is no feasible alternative to locate the building or structure outside of the erosion hazard and that the building or structure will be located in an area of least (and acceptable) risk as determined through appropriate technical reports (e.g., topographic survey, geotechnical study);
- there is no impact on existing and future slope stability;
- the building or structure will not prevent access into and through the valley in order to undertake preventative actions or maintenance or during an emergency;

- the building or structure will be protected from the erosion hazard through incorporation of appropriate building design parameters; and,
- the potential for erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans.

6.2.3 Passive Low-Intensity Recreational Uses and Conservation Activities

Passive Low-Intensity Recreational Uses and Conservation Activities

6.2.3.1 Passive low-intensity recreational uses associated with public parks, outdoor recreation and education, trail systems, watercourse access points or conservation activities will be permitted within an erosion hazard provided it can be demonstrated that:

- there is no feasible alternative to locate the development outside of the erosion hazard and that the development will be located in an area of least (and acceptable) risk as determined through appropriate technical reports (e.g., topographic survey, geotechnical study);
- there is no negative impact on existing and future slope stability;
- the use will not prevent access into and through the valley in order to undertake preventative actions or maintenance or during an emergency; and,
- the potential for erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans.

6.2.4 Ponds

New Ponds

6.2.4.1 New dug-out or isolated ponds* will not be permitted within an erosion hazard.

*Ponds for the purpose of watering livestock are not subject to Policy 8.4.2.9 or Policy 8.4.2.10 as they are not subject to Ontario Regulation 167/06 in accordance with Section 28(10) of the Conservation Authorities Act.

6.2.5 Infrastructure

Infrastructure

6.2.5.1 Public infrastructure (e.g., roads, sewers, flood and/or erosion control works, water supply,) and various utilities (pipelines) will be permitted within an erosion hazard subject to the following:

- an approved Environmental Assessment, or other comprehensive plan that is supported by CVCA, demonstrates that all alternatives to avoid the erosion hazard have been considered or it has been demonstrated that the proposed alignment minimizes encroachment into the erosion hazard to the greatest extent possible;
- a more detailed site-specific study (i.e., a geotechnical study) is conducted to determine a more precise erosion hazard limit(s) in accordance with the Ministry of Natural Resources "Technical Guide – River & Stream Systems: Erosion Hazard Limit" (2002) and demonstrates how impacts to the erosion hazard will be mitigated to ensure that there is no impact on existing and future slope stability and that the infrastructure or utility will not prevent access into and through the valley in order to undertake preventative actions or maintenance or during an emergency.

6.2.6 Fill Placement, Excavation and/or Grade Modifications

Fill Placement, Excavation, and/or Grade Modifications

6.2.5.1 Fill placement, excavation, and/or grade modifications: associated with existing access roads and driveways; required for the purpose of erosion protection; and/or, to facilitate the installation of geothermal, and water and/or sewage treatment systems within an erosion hazard will be permitted provided it can be demonstrated through appropriate technical reports (e.g., topographic survey, geotechnical study) that:

- slope stability will not be compromised;
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted;
- the erosion susceptibility of existing structures or adjacent properties will not be impacted; and,
- a more detailed site-specific study (i.e., a geotechnical study) demonstrates how the risks to public safety and impacts to the hazard will be mitigated, if not included in the above-noted plan(s).

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

6.3 Specific Policies for Unstable Bedrock

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As per Policy 3.7.1, development will not be permitted within the regulated area associated with unstable soil or bedrock, except in accordance with the policies contained in this section.

Identification of the Hazard Limit – Unstable Soil or Bedrock

6.3.a In cases where development is proposed within or adjacent to hazardous lands associated with unstable soil or unstable bedrock, CVCA will require that the applicant (or agent) provide appropriate technical reports identifying a precise boundary associated with the limit of the unstable soil or bedrock to the satisfaction of CVCA.

6.3.1 New Development

New Development

6.3.1.1 New residential, commercial, industrial, institutional or agricultural development will not be permitted within hazardous lands associated with unstable soil or unstable bedrock, regardless of previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act).

6.3.2 Replacement and Relocation

Replacement and Relocation

6.3.2.1 The replacement or relocation of existing buildings or structures within hazardous lands associated with unstable soil or unstable bedrock will be permitted subject to the following:

- no feasible alternative exists to locate the building or structure outside of the hazardous lands; and,
- a technical site-specific study demonstrates that all hazards/risks associated with unstable soils or unstable bedrock have been adequately addressed.

6.3.3 Accessory Buildings or Structures

Accessory Buildings or Structures

6.3.3.1 Accessory buildings or structures associated with an existing residential, commercial, industrial, institutional or agricultural use such as detached garages, tool sheds, gazebos and other similar structures or additions to existing accessory buildings or structures will be permitted subject to the following:

- there is no feasible alternative to locate the building or structure outside of the hazardous lands; and,
- a technical site-specific study demonstrates that all hazards/risks associated with unstable soils or unstable bedrock have been adequately addressed.

6.3.4 Infrastructure

Infrastructure

6.3.4.1 Public infrastructure (roads, sewers, flood and/or erosion control works, water supply,) and various utilities (pipelines) will be permitted within hazardous lands associated with unstable soil or bedrock subject to the following:

- an approved Environmental Assessment, or other comprehensive plan that is supported by CVCA, demonstrates that all alternatives to avoid the hazard have been considered and that the proposed alignment minimizes encroachment into the hazard to the greatest extent possible; and,
- a more detailed site-specific study (i.e., a geotechnical study) demonstrates how the risks to public safety and impacts to the hazard will be mitigated, if not included in the above-noted plan(s).

6.3.5 Fill Placement, Excavation and/or Grade Modifications

Fill Placement, Excavation, and/or Grade Modifications

6.3.4.1 Fill placement, excavation, and/or grade modifications: associated with existing access roads and driveways; required for the construction of a new access route to serve an existing residential, agricultural, commercial, industrial or institutional use; required for the purpose of flood and/or erosion protection; and/or, to facilitate the installation of sewage disposal systems and the like within hazardous lands associated with unstable soil or bedrock will be permitted provided it can be demonstrated through appropriate technical reports (e.g., geotechnical study) that:

- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted;
- the stability of existing structures or adjacent properties will not be impacted; and,
- a more detailed site-specific study (i.e., a geotechnical study) demonstrates how the risks to public safety and impacts to the hazard will be mitigated, if not included in the above-noted plan(s).

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

This page has been left intentionally blank.

7.0 WATERCOURSES

7.1 Discussion of Watercourses

As identified earlier in this document, watercourse means an identifiable depression in the ground in which a flow of water regularly or continuously occurs. These policies must be read in conjunction with the River or Stream Valleys section.

To provide guidance in the Regulation of watercourses, it is necessary to highlight the functions of watercourses.

7.2 Function of Watercourses

Watercourses transport both water and sediment from areas of high elevation to areas of low elevation. Watercourses also transfer energy (e.g. heating and cooling of stream waters) and organisms (e.g. movement of mammals, fish schooling and insect swarming) and provide habitat for fish and other species either in-stream or at the air-water interface. Moreover, watercourses provide a source of water supply for wildlife and livestock.

From a human perspective, watercourses provide social and economic values such as water supply, food resources, recreational opportunities (canoeing and fishing), hydro generation, land drainage, education experiences, and aesthetics.

Watercourses are dynamic, living systems with complex processes that are constantly undergoing change. The structure and function of watercourses are influenced by channel morphology, sediment characteristics (soil type, bedrock, and substrate characteristics) and the nature of the riparian vegetation both on the overbank and rooted in the bed of the watercourse. Any changes to one of these influences can have significant impacts upon other parts of the system. One of the key influences on the structure and function of a watercourse is

related to the hydrology of the stream and its normal hydrograph. Changes in the volume, peaks and timing of flows can significantly impact the stream morphology, sediment transport and even riparian vegetation.
Changes to channel morphology reduce the ability of the watercourse to process sediment causing erosion and changing the amount or size of bed load being moved. Loss of riparian vegetation results in more pollutants and run-off being transferred from the land to the water, impacting water quality and flooding downstream reaches. These changes, in turn, degrade near shore and aquatic habitat and impair the watercourse for human use.

Applicants and their agents should be advised that where any in water or near water works are being proposed, there may be restrictions relating to the timing of activities (e.g. Seasonal restrictions) that may be required by MNR and/or Fisheries and Oceans Canada.

Permits and/or authorization may also be required from the MNR and DFO.

7.3 General Policies for Watercourses

The term "interference" below includes all alterations mentioned within the individual CA Regulations (straighten, change, divert or interfere in any way).

7.3.1 In general, interference with a watercourse shall not be permitted.

7.4 Specific Policies for Watercourses

The policies in this section are to be applied in conjunction with the General Policies in Section 3.7. As per Policy 3.7.1, development will not be permitted within the regulated area associated with a watercourse, except in accordance with the policies contained in Section 4.2 and this section.

7.4.1 Structures

Crossings

7.4.1.1 Crossings include but are not limited to: bridges, culverts, and causeways, and will be permitted to be constructed, replaced or upgraded as follows:

- in the case of public infrastructure, all feasible alternative sites and alignments have been considered through an approved Environmental Assessment, or other comprehensive plan, where applicable, or in the case of replacements and/or upgrades, the crossing design is engineered through site-specific studies;
- in the case of private infrastructure, all feasible alternative sites and alignments have been considered and, crossing design engineered through site-specific studies with the

possible exception of temporary crossings based on the structural scale and scope, and the purpose of the temporary crossing;

and, where it can be demonstrated that:

- crossings avoid any bends in the watercourse to the extent practical;
- crossings are located to take advantage of existing impacted or open areas on the channel bank or valley slope, wherever possible;
- crossing structures avoid the erosion hazard in order to accommodate natural watercourse movement;
- the risk of flood damage to upstream or downstream properties is reduced through site and crossing design;
- the design encourages fish passage where possible;
- interference with hydrologic function (e.g., water quality and quantity control) is minimized and it can be demonstrated that best management practices including site and crossing design and appropriate remedial measures will mitigate disturbance to features and functions;
- physical realignments or alterations to the river, creek, stream or watercourse channel associated with a new crossing are avoided or are in accordance with the CVCA channelization policies that follow; and,
- maintenance requirements are minimized.

7.4.1.2 Bed-level crossings will be permitted to be constructed, replaced or upgraded where it can be demonstrated that:

- stable, non-erodible, rounded inorganic material is used;
- crossings avoid any bends in the watercourse to the extent practical;
- crossings are located to take advantage of existing impacted or open areas on the channel bank or valley slope, wherever possible;
- the risk of flood damage to upstream or downstream properties is reduced through site and structure design;
- design encourages fish passage where possible;
- physical realignments or alterations to the river, creek, stream or watercourse channel associated with a new crossing are avoided or are in accordance with the CVCA channelization policies that follow; and,
- maintenance requirements are minimized.

Water Control Structures

7.4.1.3 Water control structures to: protect existing development from a flooding hazard; OR, facilitate approved renewable energy generation projects (for water control structures associated with conservation activities refer to Policy 7.4.2) will be permitted to be constructed, maintained or repaired subject to the following:

- the water management benefits of the water control structure are demonstrated and all feasible alternatives considered through an approved Environmental Assessment, or other comprehensive plan that is supported by CVCA, whichever is applicable based on the scale and scope of the project;
- there will be no adverse hydraulic or fluvial impacts; and;
- impacts on hydrologic function (e.g., water quality and quantity control) are avoided or it can be demonstrated that best management practices including site and structure design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions.

7.4.1.4 Water control structures for any purpose other than that identified in Policy 7.4.1.3 will not be permitted within the channel of a river, creek, stream or watercourse.

MNR is responsible for the approval of dams under the Lakes & Rivers Improvement Act (LRIA). Furthermore, dams are subject to various other pieces of legislation and regulations (e.g., GEA and REA Regulation).

Alterations and/or Maintenance of Existing Water Control Structures

7.4.1.5 Alterations and/or maintenance of existing water control structures will be permitted where it can be demonstrated that:

- impacts on hydrologic functions (e.g., water quality and quantity control) are avoided or that site and structure design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions;
- there will be no adverse hydraulic or fluvial impacts;
- there are no adverse impacts on the capacity of the structure to pass flows; and,
- the integrity of the original structure is maintained or improved.

7.4.1.6 Notwithstanding the above, where the alteration/maintenance will not affect the footprint or height of the existing water control structure and in the opinion of CVCA, would not affect the control of flooding, erosion, pollution or the conservation of land and would not result in changes to the capacity to pass river flows or impact on the integrity of the structure or in-water works, a permit will not be required.

7.4.1.7 Decommissioning of dams which are structurally unsound or no longer serve their intended purpose, located within a river, stream, creek or watercourse will be permitted provided a decommissioning plan demonstrates, at a minimum, that:

- impacts on hydrologic functions (e.g., water quality and quantity control) within or adjacent to the river, creek, stream or watercourse will be avoided or that site and structure design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions;
- there will be no adverse hydraulic or fluvial impacts; and,

- the risk of pollution and sedimentation during and after retirement or removal is addressed through a draw down plan.

New In Water Boathouses and Permanent Docks

7.4.1.8 New in-water boathouses (for upland boathouses see Policy 6.1.5) and permanent docks that are within the channel of a watercourse will be not be permitted.

Existing In Water Boathouses and Permanent Docks

7.4.1.9 Repairs to existing in water boathouses and permanent docks may be permitted provided that the repairs:

- do not impede the flow of water;
- do not provide an opportunity for conversion into habitable space in the future (to ensure no habitable component, the boathouse shall contain no services other than electricity);
- do not alter the natural contour of the shoreline; and,
- do not extend beyond existing structures or create a navigational hazard.

Public Infrastructure

7.4.1.10 Public Infrastructure sewers, flood and/or erosion control works) and various utilities (pipelines) will be permitted within a watercourse provided that:

- all feasible alignments have been considered through an approved Environmental Assessment, other comprehensive plan or site specific technical studies supported by CVCA, whichever is applicable based on the scale and scope of the project;
- interference with natural features and hydrologic and ecological functions (e.g., fish and fish habitat, water quality and quantity control) is minimized and it can be demonstrated that best management practices including site and infrastructure design and appropriate remedial measures will mitigate disturbance to features and functions; and,
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material and conduct other studies and/or monitoring as may be required to ensure the control of pollution and the conservation of land is not impacted.

7.4.2 Conservation Activities

Conservation Activities

7.4.2.1 Conservation activities (e.g., stream rehabilitation) will be permitted within a watercourse provided that the hydrologic function of the watercourse (e.g., water quality and quantity control) will be maintained, restored, or enhanced. The submitted plans will be required to demonstrate that:

- based on documentation of existing watercourse characteristics (e.g., thermal regime, substrate type, fish communities), there will be direct conservation benefits of the project (e.g., enhancement in watercourse feature and/or function);
- there will be no negative impact on watercourse functionality;
- best management practices including site and project design and appropriate remedial measures will be employed to minimize disturbance;
- natural channel design practices will be followed; and,
- maintenance requirements will be minimized.

If the above noted requirements cannot be met an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

7.4.3 Ponds

Ponds exist for many reasons, such as recreation, irrigation, watering, landscaping and aquaculture. This section applies to these types of ponds but not to stormwater management ponds, reservoirs constructed for the purpose of generating hydroelectricity or ponds associated with conservation activities.

New Ponds

7.4.3.1 CVCA will not support the construction of ponds that are directly connected to a watercourse (e.g., in-stream ponds, bypass ponds, etc.)

Existing Ponds

7.4.3.2 Bank alterations and/or dredging of existing connected ponds will be considered provided that:

- impacts on hydrologic function (e.g., water quality and quantity control) of the pond are avoided or it can be demonstrated that best management practices including project design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions;
- there is no negative impact on the hydrologic function (e.g., water quality and quantity control) of the receiving river, creek, stream or watercourse;
- there is no negative impact on the downstream thermal regime;
- maximum berm heights above existing grades do not exceed 0.3 metre within the flooding or erosion hazard;
- any excavated material is removed from the hazard area; and,

- the works are designed to limit the need for future maintenance.

7.4.4 Channel or Shoreline Alterations

Realignment, Channelization or Straightening

7.4.4.1 Realignment, channelization or straightening of a river, creek, stream or watercourse is generally discouraged, but will be permitted to improve hydraulic characteristics and fluvial processes, facilitate public infrastructure projects (e.g., highway construction or reconstruction), facilitate works approved pursuant to the Drainage Act and/or on-going operations associated with existing agricultural use, or to improve aquatic habitat or water quality where a site plan and/or other site-specific study demonstrates that:

- all feasible alternative alignments have been considered through an approved Environmental Assessment, other comprehensive plan or though site-specific studies supported by CVCA, whichever is applicable based on the scale and scope of the project;
- impacts on hydrologic functions (e.g., water quality and quantity control) are minimized and it can be demonstrated that best management practices including project design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions; and
- natural channel design practices are followed to the maximum extent possible.

Enclosures

7.4.4.2 Enclosures of rivers, creeks, streams or watercourses are discouraged, but will be permitted where there is a risk to public safety and/or potential property damage and where a site specific study demonstrates that:

- all feasible options and methods have been explored to address the hazard(s);
- impacts on hydrologic functions (e.g., water quality and quantity control) are minimized and it can be demonstrated that best management practices including project design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions;
- there is no negative impact on the downstream thermal regime; and,
- design encourages fish passage to the extent possible.

Dredging

7.4.4.3 Dredging of an existing channel of a river, creek, stream or watercourse will be permitted to maintain boating or shipping channels (e.g. harbours, marinas, canals),

enhance water flow in the case of drains, improve hydraulic characteristics and fluvial processes or to improve aquatic habitat or water quality where a dredging plan demonstrates that:

- stream bank stability is not impacted or is improved;
- the size and depth of the area proposed for dredging while meeting the need is minimized;
- impacts on hydrologic functions (e.g., water quality and quantity control) are minimized and it can be demonstrated that best management practices including project design and appropriate remedial measures will mitigate and/or compensate for disturbance to features and functions;
- all dredged material is removed from flooding and erosion hazards and safely disposed of in accordance with the policies in provincial guidelines; and,
- are designed to limit future maintenance requirements.

Shoreline Excavation

7.4.4.4 Excavating the shoreline for any purpose will not be permitted, with the exception of excavation works required for erosion protection and shoreline/bank stabilization in accordance with the following Erosion Protection and Shoreline/Bank Stabilization policies.

Erosion Protection, Shoreline/Bank Stabilization and Sediment Control

7.4.4.5 New and/or replacement of erosion protection and shoreline/bank stabilization measures may be permitted where there is a demonstrated erosion or bank instability problem resulting in property loss and/or risk to public safety subject to the following:

- shoreline/bank stabilization will employ best management practices that utilize natural materials that integrate with the existing natural features and processes (e.g. bio-engineering);
- impacts on hydrologic functions (e.g., water quality and quantity control) are minimized; and,
- the works will result in a naturally stable slope; and,
- erosion risk on adjacent, upstream and/or downstream properties is reduced or erosion and sedimentation processes are controlled to reduce existing or potential impacts from adjacent land uses, whichever is appropriate

OR

- where it has been demonstrated that bioengineering solutions have been considered and where a qualified engineer demonstrates that an engineered solution to the erosion problem is required, hardened surfaces (e.g., retaining walls) may be considered.

7.4.4.6 Repair/maintenance of existing erosion protection and shoreline/bank stabilization structures will be permitted where the repair/maintenance will not result in an increase ~~in footprint or height of the existing structure. When considering repair/maintenance,~~ proponents are encouraged to replace existing hardened shoreline surfaces with bio-engineered solutions.

- erosion risk on adjacent, upstream and/or downstream properties is reduced or erosion and sedimentation processes are controlled to reduce existing or potential impacts from adjacent land uses, whichever is appropriate;
- intrusions on hydrologic functions (e.g., water quality and quantity control) are minimized, and it can be demonstrated that best management practices including site and structure; and,
- design and appropriate remedial measures mitigate and/or compensate for disturbance features and functions.

This page has been left intentionally blank.

8.0 WETLANDS AND OTHER AREAS

8.1 Functions of Wetlands

Wetlands provide functions that have both ecosystem and human values. From an ecosystem perspective these include primary production, sustaining biodiversity, 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 values such as flood attenuation, recreation opportunities, production of valuable products, improvement of water quality and educational benefits.

Wetlands retain waters during periods of high water levels or peak flows (i.e. spring freshet and storm events) allowing the water to be slowly released into the watercourse, infiltrate into the ground, and evaporate. As well, wetlands within the floodplain of a watercourse provide an area for the storage of flood waters and reduce the energy associated with the flood waters. Wetlands retain and modify nutrients, chemicals and silt in surface and groundwater thereby improving water quality. This occurs temporarily in the plants of the wetland but long term in the organic soils.

In addition, wetlands provide a variety of hydrologic functions. Over 60 potential hydrological functions have been identified for wetlands when developing the Southern Ontario Wetland Evaluation System (OWES). However, confirmation of many of these functions requires hydrological experts and field studies by qualified hydrologists. Therefore, the OWES utilizes easily identifiable features and measures as surrogate values for these hydrological features.

8.2 Development and Interference

There are three ways through which the Conservation Authorities Act and individual CA Regulations address wetlands and other areas (areas of interference or adjacent lands within which development may interfere with the hydrologic function of the wetland) (Figure 8):

- **Development within the wetland boundary**
  To be regulated, the activity must meet the definition of Development. Applications for development must be assessed with respect to the five "tests" outlined in the Conservation Authorities Act (control of flooding, erosion, pollution, dynamic beaches and the conservation of land);

- **Development within the "other areas"**
  To be regulated, the activity must meet the definition of Development. Applications for development must be assessed only with respect to the hydrologic function of the adjacent wetland; and

- **Interference with Wetlands**
  To be regulated, the activity must occur within the wetland boundary and must constitute an interference in any way with the wetland. Applications for interference must be assessed with respect to the natural features and hydrologic and ecological functions of the wetland.

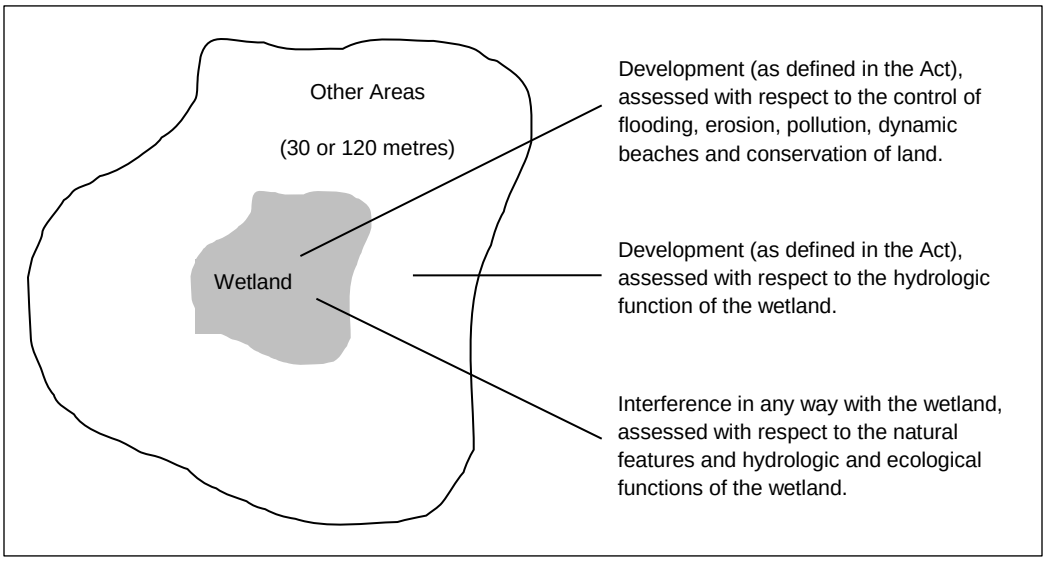


Figure 8 Three ways the CA Act and individual CA regulations address wetlands and other areas.

Portions of wetlands may also be regulated due to presence of hazardous lands such as regulated floodplains or unstable soils. The applicable sections of this guideline document should be referenced with respect to these hazards.

Removal, filling, dredging, or changing the hydrologic regime of wetlands (e.g. ponds or drains) can result in reducing the capacity of wetlands to retain water. This can result in higher flows in watercourses with resulting increases in flooding and erosion. As well, with no ability to retain water, the ability to recharge the aquifer is reduced, and the hydrologic cycle is modified. Development in wetlands has the potential to interfere with many of the natural features or ecological functions of wetlands. Development may remove or impact wildlife species and their habitat, degrade or remove natural vegetation communities and impair water quality and quantity in both surface and groundwater. As a result, development within wetlands can impact conservation of land.

Many wetlands develop on organic soils and, as a result, when reviewing development within a wetland, the soil composition should be reviewed. Where the soils are organic then Section 5.0 (Hazardous Lands) should also be reviewed.

Pollution from development in the form of improperly installed or maintained septic systems or urban runoff has the potential to interfere with the wetland. Proposals to drain stormwater management facilities into wetlands do not benefit the wetland through constant flows for dilution and moving particulate matter. Nutrients, chemicals, and sediments could enter the wetland impeding the function of the wetland.

Many individual and cumulative hydrologic impacts to a wetland commonly occur within the catchment area of the wetland. It is important to consider the linkages between small wetlands and headwater areas, impacts of stormwater, and upstream constrictions to flow. Impacts to the hydrologic function of a wetland due to development within the “other areas” may also result from changes in imperviousness/infiltration due to a removal or change in vegetation, soil compaction during construction, disruption or alteration of groundwater flow paths due to underground construction, etc.

8.2.1 Environmental Impact Study

As part of the review of an application, the CVCA may request an Environmental Impact Study (EIS) to address Interference with a wetland. An EIS is a mechanism for assessing impacts to determine the suitability of a proposal. The submission of an EIS does not guarantee approval of the works. An EIS must be carried out by a qualified professional, with recognized expertise in the appropriate area of concern and shall be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA. Appendix E provides additional details on what an EIS may contain.

8.3 General Policies for Wetlands

For evaluated wetlands and wetlands greater than 2 hectares in size, CVCA regulates a 120 metre buffer (other lands) from the wetland boundary. For unevaluated wetlands and

wetlands less than 2 hectares in size, CVCA regulated a 30 metre buffer (other lands) from the wetland boundary.

8.3.1 In general, development and interference shall not be permitted within wetlands

For Evaluated Wetland and Wetlands greater than 2 hectares the following shall apply:

8.3.1a There shall be no development within 30 metres of the wetland boundary

8.3.1b A 15 metre vegetative buffer from the edge of the wetland boundary shall be encouraged to protect the wetland from nutrient loading and surface runoff which could impact area and/or function

8.3.1c Proposed development within the 120m buffer may require an EIS

For Unevaluated Wetlands and Wetlands less than 2 hectares in size the following shall apply:

8.3.1.d There shall be no development within 15 metres of the wetland boundary

8.3.2 In general, ponds and drains shall not be permitted within wetlands

8.3.3 In general, stormwater management facilities shall not be permitted within wetlands

8.4 Specific Policies for Wetlands

8.4.1 Wetland Boundary Identification

For development proposals where a wetland is present on or adjacent to lands subject to the development proposal, CVCA may require on-site wetland boundary delineation/staking completed by an Ontario Wetland Evaluation System (OWES) qualified professional. The boundary delineation shall be illustrated on a Reference Plan or Site Plan. Where a wetland boundary identified on-site differs from the approved Ontario Ministry of Natural Resources Provincially Significant Wetland boundary, the proponent will be responsible for obtaining acceptance of the new wetland boundary from the Ontario Ministry of Natural Resources.

8.4.2 Development and Interference within Wetlands

The policies in this section are to be applied in conjunction with the General Policies (Section 3.7). As per Policy 3.7.1, development or interference will not be permitted within the

regulated area associated with a wetland, except in accordance with the policies contained in this section.

New Development

8.4.2.1 New development will not be permitted within a wetland, regardless of previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act), except as outlined below.

8.4.2.2 New development on an existing lot(s) within a small portion of a wetland to facilitate the development of the lot OR where a wetland is less than 0.5 hectares may be permitted provided that:

- the wetland is not a bog or fen, or part of a Provincially Significant Wetland;
- is not part of a groundwater recharge area or a groundwater discharge area; and,
- it can be demonstrated through an Environmental Impact Study that offsetting will be accommodated on the subject lands resulting in a net gain in wetland function and, where applicable, the maintenance of existing hydrologic and ecological linkages.

Land Conversion for Agricultural Activities

Note: Previously cultivated buffer areas around wetlands and small isolated wetlands that are not connected to a surface watercourse do not meet the definition of a wetland under the Conservation Authorities Act. A permit is not required.

8.4.2.3 Conversion of land for agricultural purposes may be permitted where the wetland limits existing agriculture activity provided that:

- the wetland is not a bog or fen, or part of a Provincially Significant Wetland;
- there would be a benefit for conversion for agriculture purposes; and,
- will be subject to an offsetting plan acceptable to CVCA. This plan will demonstrate at a minimum “no net loss” and will strive to achieve the principle of “net gain”.

Note: It is normal practice for tile drainage to utilize the natural drainage grade as it is the most practical and economically feasible way of installing tile drainage. However, where agricultural field tile drainage would convey water in a manner inconsistent with the natural drainage grade surrounding a wetland, it would have the potential to interfere with the wetland and therefore, be subject to Policy 8.4.2.4.

Agricultural Tile Drainage

8.4.2.4 The installation of agricultural field tile drainage in a manner inconsistent with the natural drainage grade surrounding a wetland may be permitted provided that:

- it is not feasible to follow the natural drainage grade; and,
- a scoped Environmental Impact Study demonstrates that the hydrologic function of the wetland will be maintained and appropriate best management practices will be employed to control sediment and erosion.

Conservation Activities

8.4.2.5 Conservation activities will be permitted within a wetland where it can be demonstrated that the hydrologic and ecological functions of the wetland will be maintained, restored, or enhanced OR where Policy 8.4.2.2 can be satisfied. Submitted plans will be required to demonstrate the following:

- based on documentation of existing wetland characteristics (e.g., wetland type, connectivity, size and dominant vegetation communities), there will be direct conservation benefits of the project (e.g., enhancement in wetland feature and/or function);
- there will be no impact on the functionality of any watercourse;
- best management practices including site and project design and appropriate remedial measures will be employed to mitigate disturbance; and,
- maintenance requirements will be minimized.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

Passive Low-Intensity Recreational Uses

8.2.4.6 Passive low-intensity recreational uses associated with public parks, outdoor recreation and education, trail systems or watercourse access points will be permitted within a wetland where an Environmental Impact Study demonstrates that there will be no negative impact on the hydrologic and ecological functions of the wetland OR where Policy 8.4.2.2 can be satisfied.

Infrastructure

8.4.2.7 Public infrastructure (e.g., roads, sewers, flood and/or erosion control works, water supply,) and various utilities (pipelines) will be permitted to be constructed, realigned and/or upgraded within a wetland subject to the following:

- an approved Environmental Assessment, or other comprehensive plan that is supported by CVCA, demonstrates that all alternatives to avoid intrusions on wetland

features, hydrologic and ecological functions have been considered and that the proposed alignment minimizes wetland loss or interference with hydrologic and ecological functions to the greatest extent possible; and,

- a more detailed site-specific study (i.e., a scoped Environmental Impact Study) consistent with the Environmental Assessment or comprehensive plan is prepared. This study shall determine a more precise area wetland boundary in accordance with the current Provincial Ontario Wetland Evaluation System (OWES), and demonstrate that appropriate remedial measures will mitigate and/or offset for wetland loss or interference with hydrologic and ecological functions;

OR,

- it can be demonstrated that Policy 8.4.2.2 can be satisfied.

8.4.2.8 Access routes (e.g., driveways, private access roads, and entrance ways) associated with an existing residential, agricultural, commercial, industrial or institutional use will be permitted within a wetland where it can be demonstrated that:

- there is no feasible alternative to locate the access route outside of the wetland;
- an Environmental Impact Study provides for remedial measures that will mitigate and/or compensate for wetland loss or interference with the natural features and hydrologic and ecological functions;

OR,

- Policy 8.4.2.2 can be satisfied.

Ponds and Drains

8.4.2.9 New dug-out or isolated ponds*, and drainage works approved pursuant to the Drainage Act, will be permitted within a wetland provided that it has or can be demonstrated to the satisfaction of CVCA through an Environmental Impact Study that there will be no negative impact on the natural features and hydrologic and ecological functions of the wetland.

8.4.2.10 Maintenance of the functionality (e.g., bank stabilization, removal of accumulated sediment, etc.) of existing ponds and drains within a wetland will be permitted provided that:

- all dredged material is placed at a suitable distance from the wetland or other natural hazard features;
- best management practices including site and project design and appropriate remedial measures will be employed to mitigate disturbance and minimize impacts to the natural features and hydrologic and ecological functions of the wetland; and,

- there will be no increase in surface area or volume beyond that resulting from the volume of accumulated sediment removed.

*Ponds for the purpose of watering livestock are not subject to Policy 8.4.2.9 or Policy 8.4.2.10 as they are not subject to Ontario Regulation 167/06 in accordance with Section 28(10) of the Conservation Authorities Act.

Organic Soil (Peat) Extraction

8.4.2.11 No new organic soil (peat) extraction operations or expansion of existing organic soil (peat) extraction operations will be permitted within wetlands except where Policy 8.4.2.2 can be satisfied.

8.4.3 Development within Adjacent Land of a Wetland

The applicability, width and vegetation composition of buffers around wetlands varies depending on the potential impact (i.e., sediment and erosion, habitat protection) and the sensitivity of the wetland type (e.g., fen, bog).

Scientific study suggests that appropriate buffer widths range from 3 metres to 300 metres. A buffer width of 30 metres provides better protection from runoff (sediment and other contaminants), some aquatic habitat protection, good corridor width for some fur-bearers, habitat for edge bird species and some amphibians and reptiles. (How Much Habitat is Enough, 2nd Edition, Environment Canada, 2004 and Best Management Practices 15 – Buffer Strips, 2004

Previous Planning Approvals

8.4.3.1 New development associated with existing residential, agricultural, commercial, industrial or institutional use with previous approvals provided under the Planning Act or other regulatory process (e.g., Building Code Act) proposed within an area of interference will be subject to policy requirements identified within this section and the General Policies that may not have been considered in previous approvals.

New Development

8.4.3.2 New residential or structural agricultural (for agricultural land reclamation see Policy 8.4.3.17) commercial, or industrial development within 120 metres of a designated Provincially Significant Wetland on an existing vacant lot(s) where the principle of development has already been established will be permitted provided that:

- development will be setback from the wetland boundary by at least 30 metres, where feasible; and,

- it can be demonstrated through site review and/or an Environmental Impact Study that the hydrologic function of the wetland will not be negatively impacted.

8.4.3.3 Development associated with existing commercial or industrial uses, and/or development into the water table will be permitted within 120 metres of a designated Provincially Significant Wetland provided that:

- development will be setback from the wetland boundary by at least 30 metres; and,
- it can be demonstrated through an Environmental Impact Study that there will be no negative impact on the hydrologic function of the wetland.

8.4.3.4 New commercial, industrial or institutional uses will be permitted within 120 metres of a designated Provincially Significant Wetland provided that:

- development will be setback from the wetland boundary by at least 30 metres; and
- it can be demonstrated through an Environmental Impact Study that there will be no negative impact on the hydrologic function of the wetland.

8.4.3.5 New residential or structural agricultural development OR development associated with an existing commercial or industrial use will be permitted within 30 metres of a non-provincially significant wetland on an existing lot(s) provided that:

- it is not feasible to locate the development at least 30 metres away from the wetland boundary;
- it can be demonstrated through a site review and/or an Environmental Impact Study that there will be no negative impact on the hydrologic function of the wetland.

Expansion/Reconstruction/Relocation

8.4.3.6 Expansion, reconstruction or relocation of an existing building or structure within an area of interference will be permitted provided that there will be no negative impact on the hydrologic function of the wetland. Submitted plans will be required to demonstrate the following:

- disturbance to natural vegetation communities will be minimized;
- disturbed area and soil compaction will be minimized;
- impervious areas will be minimized;
- development will be located above the high water table;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - maintain water balance;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

Accessory Buildings or Structures

8.4.3.7 Accessory buildings or structures associated with an existing residential agricultural, commercial or industrial use will be permitted within an area of interference provided that there will be no negative impact on the hydrologic function of the wetland. Submitted plans will be required to demonstrate the following:

- the size of the accessory building or structure does not exceed 46.5 square metres for settlement areas or shoreline development and for rural areas, the building or structure does not exceed 100 square metres;
- disturbance to natural vegetation communities will be minimized;
- disturbed area and soil compaction will be minimized;
- impervious areas will be minimized;
- development will be located above the high water table;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - maintain water balance;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

Infrastructure

8.4.3.8 Public infrastructure (roads, sewers, flood and/or erosion control works, water supply, municipal stormwater management facilities required to alleviate a flood problem associated with existing development) and various utilities (pipelines) will be permitted within an area of interference subject to the following:

- an approved Environmental Assessment, or other comprehensive plan that is supported by CVCA, demonstrates that all alternatives to avoid intrusions on hydrologic wetland functions have been considered and that the proposed alignment minimizes wetland interference to the greatest extent possible; and,
- a more detailed site-specific study (i.e., an Environmental Impact Study) consistent with the Environmental Assessment or comprehensive plan is prepared. This study shall determine a more precise area wetland boundary in accordance with the current Provincial Ontario Wetland Evaluation System (OWES), and demonstrate that appropriate remedial measures will mitigate the impact on and/or compensate for the loss of the hydrologic function of the wetland.

Conservation Activities

8.4.3.9 Conservation activities will be permitted within an area of interference where it can be demonstrated that the hydrologic function of the wetland will be maintained, restored, or enhanced. Submitted plans will be required to demonstrate the following

- disturbance to natural vegetation communities will be minimized;
- disturbed area and soil compaction will be minimized;
- impervious areas will be minimized; and,
- best management practices will be used to:
  - ensure hydrologic connectivity;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

Passive Low-Intensity Recreational Uses

8.4.3.10 Passive low-intensity recreational uses associated with public parks, outdoor recreation and education, trail systems or watercourse access points will be permitted within an area of interference provided that there will be no negative impact on the hydrologic function of the wetland. Submitted plans will be required to demonstrate the following:

- disturbance to natural vegetation communities will be minimized;
- disturbed area and soil compaction will be minimized;
- impervious areas will be minimized;
- natural materials that integrate with the existing natural features and processes (bio-engineering) will be utilized;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - ensure hydrologic connectivity;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

Organic Soil (Peat) Extraction

8.4.3.11 Organic soil (peat) extraction operations will be permitted within an area of interference where it can be demonstrated through an Environmental Impact Study that appropriate remedial measures will mitigate the impact on and/or compensate for the loss of the hydrologic function of the wetland.

Ponds and Dams

8.4.3.12 New dug-out or isolated ponds* and new drainage works approved pursuant to the Drainage Act will be permitted within an area of interference provided that there will be no negative impact on the hydrologic function of the wetland. Submitted plans will be required to demonstrate the following:

- disturbance to natural vegetation communities will be minimized;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - maintain water balance;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

8.4.3.13 Enlargement of an existing dug-out or isolated pond* located within an area of interference will be permitted where it can be demonstrated that the enlargement can satisfy Policy 8.4.3.12.

*Ponds for the purpose of watering livestock are not subject to Policy 8.4.3.12 or Policy 8.4.3.13 as they are not subject to Ontario Regulation 167/06 in accordance with Section 28(10) of the Conservation Authorities Act.

Stormwater Management Facilities

8.4.3.14 Stormwater management facilities for water quantity control and/or water quality purposes will be permitted within an area of interference, provided that:

- development will be setback from the wetland boundary by at least 30 metres, where feasible;
- all structural components and actively managed components of the stormwater management facility are located outside of the wetland;
- a detailed study (e.g., scoped Environmental Impact Study) demonstrates that appropriate remedial measures will mitigate the impact on and/or compensate for the loss of the hydrologic function of the wetland;

- pollution and sedimentation during construction and post construction are minimized using best management practices including site and facility design, construction controls, and appropriate remedial measures; and,
- design and maintenance requirements as determined by CVCA are met.

Golf Courses

8.4.3.15 Golf courses or golf course expansions will be permitted within an area of interference provided that:

- It can be demonstrated through an Environmental Impact Study that there will be no negative impact on the hydrologic function of the wetland;
- natural erosion and sedimentation processes within the wetland are not impacted;
- the risk of pollution from the application of fertilizers, herbicides, pesticides or insecticides or other chemical or organic compounds is mitigated and addressed in a turf management plan;
- pollution and sedimentation during construction and post construction are minimized using best management practices including site and facility design, construction controls, and appropriate remedial measures.

Fill Placement, Excavation and/or Grade Modifications

8.4.3.16 Fill placement, excavation and/or grade modifications: associated with existing access roads and driveways; required for the construction of a new access route to serve an existing residential, agricultural, commercial, industrial or institutional use; required for the purpose of flood and/or erosion protection; and/or, to facilitate the installation of geothermal, water and/or sewage treatment systems will be permitted within an area of interference provided that there will be no negative impact on the hydrologic function of the wetland and inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted. Submitted plans will be required to demonstrate the following:

- fill placement, excavation and/or grade modifications will be setback from the wetland boundary by at least 30 metres, where feasible;
- disturbance to natural vegetation communities will be minimized;
- disturbed area and soil compaction will be minimized;
- all excavation will be located above the high water table, with the exception of excavation required to install a geothermal system;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - maintain water balance;
  - control sediment and erosion; and,
  - maintain or enhance as much of a wetland buffer as is feasibly possible.

If the above noted requirements cannot be met, an Environmental Impact Study will be required that demonstrates no negative impact on the hydrologic function of the wetland.

8.4.3.17 Fill placement, excavation and/or grade modifications for agricultural land reclamation will be permitted within an area of interference where there is a demonstrated history of agricultural use provided there will be no negative impact on the hydrologic function of the wetland and inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted. Submitted plans will be required to demonstrate the following:

- there will be no tile drainage system that would drain water away from the wetland;
- disturbed area and soil compaction will be minimized;
- all excavation will be located above the high water table;
- overall existing drainage patterns will be maintained; and,
- best management practices will be used to:
  - maintain water balance;
  - control sediment and erosion; and,
  - maintain wetland buffers.

If the above noted requirements cannot be met, an Environmental Impact Study will be required
that demonstrates no negative impact on the hydrologic function of the wetland.

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

Quick Reference Guide

Feature	Hazard	Regulation Zone (including and offset from Feature)	No Development Zone (Distance from Feature)
River or Stream Valley[6]	Stable Top of Slope	15m	6m
River or Stream Valley[7]	Predicted Stable Top or Toe of Slope	15m	6m
River or Stream Valley[8]	The greater of: 1:100 year flood plain Or The predicted meander belt	15m	6m
Hazard Land[9]	1:100 year flood line	15m	6m
Watercourses[10]	Identifiable Depression	30m	15m
PSW and Wetlands greater than 2ha	Wetland Boundary	120m	30m
Unevaluated Wetlands and Wetlands less than 2ha	Wetland Boundary	30m	15m

Table 3 Quick Reference Guide

[6] Stream Valley Apparent with Stable Slopes
[7] Stream Valley Apparent with Unstable Slopes
[8] Stream Valley Not Apparent
[9] Shoreline with known 1:100 year flood line
[10] Includes all shorelines with no known flood line

This page has been left intentionally blank.

APPENDIX A - Definitions

100 Year Flood: A flood event that has a 1% probability of occurring or being exceeded in any given year. This flood is likely to occur or be exceeded an average of once every one hundred years.

Alteration to a waterway: The act whereby the channel of a watercourse is altered in some manner. Examples of an alteration include, but are not limited to the following: channelization, full or partial diversions, retaining walls, revetments, bridges, culverts, pipeline crossings, erosion protection measures and construction of storm outlets.

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

Balanced Cut and Fill: The removal and replacement of suitable fill material at equal elevations. Material must be removed and replaced either adjacent to or at opposite location of one another so as to achieve equality of stage-discharge within an approved watercourse reach.

Boat House: A one-story accessory structure that has an opening to the water of an appropriate size to accommodate a boat.

Building: A structure 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, plumbing not located in a structure, or a sewage system.

Channel: The area of a watercourse carrying normal flows within the banks.

Channelization: The straightening, widening and/or deepening of a watercourse channel.

Conservation of Land: Management of a natural resource or of a particular ecosystem, including all aspects of the physical environment, be it terrestrial, aquatic, biological, botanic or air, to prevent exploitation, pollution, destruction or neglect and to ensure the future usability of the resource.

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.

Diversion: The process whereby stream flow is directed from the original channel of the watercourse and returned to the original channel at another point on the watercourse. Diversions may be full or partial re-direction of flow from the channel of one watercourse to the channel of another watercourse.

Dynamic Beach: Sediments that accumulate along sea or lake shores, the configuration and contours of which depend upon the action of coastal processes including but not limited to wind, waves, currents, ice jamming/piling, the kinds of sediment involved, and the rate of delivery of this sediment.

Dwelling unit: 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.

Environmental Impact Statement: A study performed by a qualified professional who has been educated in, and has current knowledge of, biology, ecology, landscape ecology and any other relevant fields of study, as required. An environmental impact study should:

- Be consistent with the intent of the Provincial Policy Statement;
- For areas on and adjacent to the site, include descriptions and clearly legible scaled maps of the existing land uses, and the proposed development and site alteration, including all proposed buildings, structures, driveways and parking areas, and sources of human intrusion;
- Provide a through inventory of flora and fauna and related habitat features, as well as relevant information on soils and geology, slope, hydrology and hydrogeology;
- Review the ecological functions of the natural features identified above, including the habitat needs of species that utilize adjacent lands;
- Predict the impacts of the proposed development and site alteration on the various attributes of the environment on and adjacent to the site, such as habitat, vegetation, soil, surface and ground water, air and any other relevant attributes;
- Evaluate the significance of all predicted positive and negative impacts on the environment;
- Recommend extents of land where: disturbance must be avoided, or where disturbance must be limited in order to maintain the natural features and ecological functions of the area, supported by a detailed rationale;
- Review alternative development options and recommend measures that could be implemented to avoid or mitigate the predicted negative impacts;
- Identify any measures needed to monitor the mitigation measures and to assess the long-term impacts associated with the proposal;
- Conclude with an independent professional opinion as to whether or not the development and site alteration is appropriate, and consistent with the intent of the Provincial Policy Statement.

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

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

Fill: Earth, sand, gravel , building materials, storage, rubble, rubbish, garbage or any other material whether similar to or different from any of the aforementioned materials, whether originating on the site or elsewhere, used or capable of being used to raise, lower or in any way affect or alter the contours of the ground.

Flooding Hazard: in Ontario, either storm-centred events, flood frequency based events, or an observed event may be used to determine the extent of the flooding hazard[11]. These events are:

a) A storm-centred event, either Hurricane Hazel storm (1954) or Timmins storm (1961). A storm-centred event refers to a major storm of record which is used for land use planning purposes. The rainfall actually experienced during a major storm event can be transposed over another watershed and when combined with the local conditions, Regulatory floodplains can be determined. This centering concept is considered acceptable where the evidence suggests that the storm event could have potentially occurred over other watershed in the general area;

b) 100 year flood event is a frequency based flood event that is determined through analysis of precipitation, snow melt, or a combination thereof, having a return period (or a probability of occurrence) of once every 100 years on average (or having a 1% chance of occurring or being exceeded in any given year). The 100 year flood event is the minimum acceptable standard for defining the Regulatory floodplain; and

c) An observed event, which is a flood that is greater that the storm-centred events or greater that the 100 year flood and which was actually experienced in a particular watershed, or portion thereof, for example as a result of ice jams[12] , and which has been approved as the standard for that specific area by the Minister of Natural Resources.

Flood: A temporary inundation of lands adjacent to the normal low flow channel of a watercourse.

Flood Line: An engineered line delineating the potential extent of flooding, by elevation, as a result of a specific flood event.

Flood Plain: An area of land adjacent to a watercourse that has been or may be covered by water.

Floodproofing: A combination of structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structures or properties subject to flooding so as to reduce or eliminate flood damages.

Floodway: The channel of a watercourse and the 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 the safe passage of flood flow and/or that velocities are considered to be such that they pose a potential threat to life and/or property damage.

Habitable: suitable to live in or on (American Heritage Dictionary) OR means, that can be inhabited. Inhabit means to dwell in, occupy.

[11] High points of land not subject to flooding but surrounded by floodplain or "flooded land" are considered to be within the flood hazard and part of the regulated floodplain.

[12] However, localized chronic conditions (e.g. ice or debris jams) related to flood prone areas may be used to extend the regulated area beyond the Regulatory Flood limit without the approval of the Minister of Natural Resources. It will be necessary to inform the property owner(s) as well as ensuring that the revised limits are reflected in the appropriate municipal documents at the first opportunity.

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

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.

Inert Fill: Earth or rock fill or material of a similar nature that contains no putrescible materials or soluble or decomposable chemical substances.

Infrastructure: as defined in the Provincial Policy Statement mane physical structures (facilities and corridors) that from the foundation for development. Infrastructure includes: sewage and water systems, septic treatment systems, waste management systems, electric power generation and transmission, communication/telecommunications, transit and transportation corridors and facilities, oil and gas pipelines and associated facilities.

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.

One Zone Concept: An approach whereby the entire flood plain, as defined by the regulatory flood, is treated as one unit, and all development is prohibited or restricted.

Pollution: The addition of any substance or form of energy (e.g. heat, sound, radioactivity) to the environment at a rate faster than the environment can accommodate it by dispersion, breakdown, recycling or storage in some harmless form.

Regulated Lands: The area within which filling and construction activities are regulated by the Authority.

Regulatory Flood: The standard used in a particular watershed to define the limit of the flood plain for regulatory purposes. For the purposes of this Policy document, the regulatory flood shall mean the Regional Storm as defined in the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses regulation.

Safe Access (Ingress/Egress): The standards and procedures currently applied in engineering practice associated with providing safe passage for vehicles and people to and from a property during an emergency situation as a result of flooding, or other water related hazards (e.g., erosion), the failure of floodproofing and/or erosion protection works, that have been reviewed and approved by the Conservation Authority and/or the Ministry of Natural Resources. The CVCA uses the criteria set out in the Ontario MNR's Technical Guide – River & Stream Systems: Flooding Hazard Limit (2002) and Technical Guide – River and Stream Systems: Erosion Hazard Limit (2002) to determine safe access.

Shoreline Alteration: A physical alteration to the lands within, adjacent or close to the shoreline of any lake, river, or watercourse.

Structure: Any material, object or works 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.

Top-of-Bank: The point at which a valley wall or other slope feature meets higher table land.

Unstable Slopes: A slope that can be characterized as being unstable or hazardous due to factors such as toe or run-off erosion, lack of vegetative cover, soil type, and/or geological considerations.

Watercourse: A watercourse is specifically defined within section 28(25) of the Conservation Authorities Act as follows: "watercourse means an identifiable depression in the ground in which a flow of water regularly or continuously occurs." This definition included but is not limited to lakes, rivers, creeks and streams.

Wave Uprush: An engineered allowance for wave surge beyond the extent of the flood plain which would occur during a regulatory flood event.

Wetland: Wetlands are specifically defined within section 28(25) of the Conservation Authorities Act as follows: "wetland means land that,

1. is seasonally or permanently covered by shallow water or has a water table close to or at its surface;
2. directed contributes to the hydrological function of a watercourse through connection with a surface watercourse;
3. has hydric soils, the formation of which has been caused by the presence of abundant water; and,
4. 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 purposed and no longer exhibits a wetland characteristic referred to in clause (3) or (4)."

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.

This page has been left intentionally blank.

APPENDIX B – Ontario Regulation 159/06

ONTARIO REGULATION 159/06
made under the
CONSERVATION AUTHORITIES ACT

Made: April 28, 2006 Approved: May 2, 2006 Filed: May 4, 2006 Published on e-Laws: May 8, 2006 Printed in *The Ontario Gazette*: May 20, 2006

CROWE VALLEY CONSERVATION AUTHORITY: REGULATION OF DEVELOPMENT, INTERFERENCE WITH WETLANDS AND ALTERATIONS TO SHORELINES AND WATERCOURSES

Definition

1. In this Regulation,
"Authority" means the Crowe Valley Conservation Authority.

Development prohibited

2. (1) Subject to section 3, no person shall undertake development, or permit another person to undertake development in or on the areas within the jurisdiction of the Authority that are,

(a) river or stream valleys that have depressional features associated with a river or stream, whether or not they contain a watercourse, the limits of which are determined in accordance with the following rules:

(i) where the river or stream valley is apparent and has stable slopes, the valley extends from the stable top of bank, plus 15 metres, to a similar point on the opposite side,

(ii) where the river or stream valley is apparent and has unstable slopes, the valley extends from the predicted long term stable slope projected from the existing stable slope or, if the toe of the slope is unstable, from the predicted location of the toe of the slope as a result of stream erosion over a projected 100-year period, plus 15 metres, to a similar point on the opposite side,

(iii) where the river or stream valley is not apparent, the valley extends the greater of,

(A) the distance from a point outside the edge of the maximum extent of the flood plain under the applicable flood event standard, plus 15 metres, to a similar point on the opposite side, and

(B) the distance from the predicted meander belt of a watercourse, expanded as required to convey the flood flows under the applicable flood event standard, plus 15 metres, to a similar point on the opposite side;

(c) hazardous lands;

(d) wetlands; or

(e) other areas where development could interfere with the hydrologic function of a wetland, including areas within 120 metres of all provincially significant wetlands and wetlands greater than 2 hectares in size, and areas within 30 metres of wetlands less than 2 hectares in size, but not including those where development has been approved pursuant to an application made under the *Planning Act* or other public planning or regulatory process.

(2) The areas described in subsection (1) are the areas referred to in section 12 except that, in case of a conflict, the description of the areas provided in subsection (1) prevails over the descriptions referred to in that section.

Permission to develop

3. (1) The Authority may grant permission for development in or on the areas described in subsection 2 (1) if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development.
(2) The permission of the Authority shall be given in writing, with or without conditions.

Application for permission

4. A signed application for permission to undertake development shall be filed with the Authority and shall contain the following information:

1. Four copies of a plan of the area showing the type and location of the development.

2. The proposed use of the buildings and structures following completion of the development.

3. The start and completion dates of the development.

4. The elevations of existing buildings, if any, and grades and the proposed elevations of buildings and grades after development.

5. Drainage details before and after development.

6. A complete description of the type of fill proposed to be placed or dumped.

Alterations prohibited

5. Subject to section 6, no person shall straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or change or interfere in any way with a wetland.

Permission to alter

6. (1) The Authority may grant a person permission to straighten, change, divert or interfere with the existing channel of a river, creek, stream or watercourse or to change or interfere with a wetland.

(2) The permission of the Authority shall be given in writing, with or without conditions.

Application for permission

7. A signed application for permission to straighten, change, divert or interfere with the existing channel of a river, creek, stream or watercourse or change or interfere with a wetland shall be filed with the Authority and shall contain the following information:

1. Four copies of a plan of the area showing plan view and cross-section details of the proposed alteration.

2. A description of the methods to be used in carrying out the alteration.

3. The start and completion dates of the alteration.

4. A statement of the purpose of the alteration.

Cancellation of permission

8. (1) The Authority may cancel a permission if it is of the opinion that the conditions of the permission have not been met.

(2) Before cancelling a permission, the Authority shall give a notice of intent to cancel to the holder of the permission indicating that the permission will be cancelled unless the holder shows cause at a hearing why the permission should not be cancelled.

(3) Following the giving of the notice, the Authority shall give the holder at least five days notice of the date of the hearing.

Validity of permissions and extensions

9. (1) A permission of the Authority is valid for a maximum period of 24 months after it is issued, unless it is specified to expire at an earlier date.

(2) A permission shall not be extended.

Appointment of officers

10. The Authority may appoint officers to enforce this Regulation.

Flood event standards

11. The applicable flood event standards used to determine the maximum susceptibility to flooding of lands or areas within the watersheds in the area of jurisdiction of the Authority are the Hurricane Hazel Flood Event Standard, the 100 year flood level and the Timmins Flood Event Standard described in Schedule 1.

Areas included in the Regulation Limit

12. Hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances, within the watersheds in the area of jurisdiction of the Authority are delineated by the Regulation Limit shown on maps 1 to 129 dated December 2005 and filed at the head office of the Authority at 70 Hughes Lane, Marmora, Ontario, K0K 2M0 under the map title "Ontario Regulation 97/04: Regulation for Development, Interference with Wetlands and Alterations to Shorelines and Watercourses".

SCHEDULE 1

1. The Hurricane Hazel Flood Event Standard means a storm that produces over a 48-hour period,

(a) in a drainage area of 25 square kilometres or less, rainfall that has the distribution set out in Table 1; or

(b) in a drainage area of more than 25 square kilometres, rainfall such that the number of millimetres of rain referred to in each case in Table 1 shall be modified by the percentage amount shown in Column 2 of Table 2 opposite the size of the drainage area set out opposite thereto in Column 1 of Table 2.

TABLE 1

73 millimetres of rain in the first 36 hours
6 millimetres of rain in the 37th hour
4 millimetres of rain in the 38th hour
6 millimetres of rain in the 39th hour
13 millimetres of rain in the 40th hour
17 millimetres of rain in the 41st hour
13 millimetres of rain in the 42nd hour
23 millimetres of rain in the 43rd hour
13 millimetres of rain in the 44th hour
13 millimetres of rain in the 45th hour
53 millimetres of rain in the 46th hour
38 millimetres of rain in the 47th hour
13 millimetres of rain in the 48th hour

TABLE 2

Column 1 Drainage Area (square kilometres)	Column 2 Percentage
26 to 45 both inclusive	99.2
46 to 65 both inclusive	98.2
66 to 90 both inclusive	97.1
91 to 115 both inclusive	96.3
116 to 140 both inclusive	95.4
141 to 165 both inclusive	94.8
166 to 195 both inclusive	94.2
196 to 220 both inclusive	93.5
221 to 245 both inclusive	92.7
246 to 270 both inclusive	92.0
271 to 450 both inclusive	89.4
451 to 575 both inclusive	86.7
576 to 700 both inclusive	84.0
701 to 850 both inclusive	82.4
851 to 1000 both inclusive	80.8
1001 to 1200 both inclusive	79.3
1201 to 1500 both inclusive	76.6
1501 to 1700 both inclusive	74.4
1701 to 2000 both inclusive	73.3
2001 to 2200 both inclusive	71.7
2201 to 2500 both inclusive	70.2
2501 to 2700 both inclusive	69.0
2701 to 4500 both inclusive	64.4
4501 to 6000 both inclusive	61.4
6001 to 7000 both inclusive	58.9
7001 to 8000 both inclusive	57.4

2. The 100 year flood level means the peak instantaneous still water level plus an allowance for wave uprush and other water-related hazards for Lake Ontario that has a probability of occurrence of one per cent during any given year.
3. The Timmins Flood Event Standard means a storm that produces over a 12-hour period,

(a) in a drainage area of 25 square kilometres or less, rainfall that has the distribution set out in Table 3; or

(b) in a drainage area of more than 25 square kilometres, rainfall such that the number of millimetres of rain referred to in each case in Table 3 shall be modified by the percentage amount shown in Column 2 of Table 4 opposite the size of the drainage area set out opposite thereto in Column 1 of Table 4.

TABLE 3

15 millimetres of rain in the first hour
20 millimetres of rain in the second hour
10 millimetres of rain in the third hour
3 millimetres of rain in the fourth hour
5 millimetres of rain in the fifth hour
20 millimetres of rain in the sixth hour
43 millimetres of rain in the seventh hour
20 millimetres of rain in the eighth hour
23 millimetres of rain in the ninth hour
13 millimetres of rain in the tenth hour
13 millimetres of rain in the eleventh hour
8 millimetres of rain in the twelfth hour

TABLE 4

Column 1 Drainage Area (Square Kilometres)	Column 2 Percentage
26 to 50 both inclusive	97
51 to 75 both inclusive	94
76 to 100 both inclusive	90
101 to 150 both inclusive	87
151 to 200 both inclusive	84
201 to 250 both inclusive	82
251 to 375 both inclusive	79
376 to 500 both inclusive	76
501 to 750 both inclusive	74
751 to 1000 both inclusive	70
1001 to 1250 both inclusive	68
1251 to 1500 both inclusive	66
1501 to 1800 both inclusive	65
1801 to 2100 both inclusive	64
2101 to 2300 both inclusive	63
2301 to 2600 both inclusive	62
2601 to 3900 both inclusive	58
3901 to 5200 both inclusive	56
5201 to 6500 both inclusive	53
6501 to 8000 both inclusive	50

Made by:

Crowe Valley Conservation Authority:

Wayne Longmuir
Chair

Kenneth Phillips

General Manager

Date made: April 28, 2006.

I certify that I have approved this Regulation.

David James Ramsay

Minister of Natural Resources

Date approved: May 2, 2006.

This page has been left intentionally blank.

APPENDIX C – Floodproofing Guidelines

The minimum standards for floodproofing are based on the Regulatory Flood elevation. The following table depicts the minimum elevations for various features and structures.

Opening into structures	Regulatory flood elevation +0.3m or wave uprush elevation (whichever is greater)
Basement Floor	Regulatory flood elevation -1.0m
Fill places around buildings and structures	Regulatory flood elevation
Electrical and Heating circuits	Regulatory flood elevation +0.3m or wave uprush elevation (whichever is greater)
1st floor (main) on raised buildings and structures	Regulatory flood elevation +0.3m or wave uprush elevation (whichever is greater)
Access roads, parking areas	Regulatory flood elevation -0.3m
Pedestrian Access	Regulatory flood elevation -0.8m

Introduction

Floodproofing is defined as a combination of structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structures or properties subject to flooding so as to reduce or eliminate flood damages. It is acknowledged that this term is somewhat misleading, since total protection from flood damage cannot always be assured. However, if applied effectively, floodproofing can play a significant role in comprehensive flood plain management.

Floodproofing is generally most appropriate in situations where moderate flooding with low velocity and short duration is experienced and where traditional structural flood protection, such as dams and channels are not considered to be feasible. Although measures can be applied to both existing and new developments, it is usually impractical, expensive and extremely difficult to floodproof existing buildings.

Since floodproofing is best incorporated into the initial planning and design stages, new development has the greatest potential for permanent structural adjustment. In general, floodproofing can be applied most economically and effectively in the design of new buildings in developing areas. It can also be applied to infilling situations and proposed additions in developed areas. However, as well as providing adequate flood protection, new development within developed areas will have to take into account special considerations such as the aesthetic blend with neighbouring properties.

Floodproofing, whether wet or dry should be no lower than the 1:100 year flood level. The only exceptions are in cases where an addition is proposed to an existing structure or there is one

remaining infilling lot in a neighbourhood. In these instances, the floodproofing level should be no lower than the first floor levels of the existing structure or the adjacent structures.

Types of Floodproofing

All floodproofing measures can be described as active or passive and providing wet or dry protection.

Active vs Passive

Active floodproofing requires some action, i.e. closing watertight doors or sandbagging for the measure to be effective. Advance flood warning is almost always required in order to make the flood protection operational.
Passive floodproofing measures are defined as those that are in place and do not require flood warning or any other action to put the flood protection into effect. These include construction of development at or above the flood standard, or the use of continuous berms or floodwalls.

Dry vs Wet Protection

The object of dry floodproofing is to keep a development and its contents completely dry. Such can be carried out by elevating the development above the level of the flood standard or by designing walls to be watertight and installing watertight doors and seals to withstand the forces of flood waters. The benefit of elevated floodproofing is that it is passive and advance warning of an impending flood is not required. Temporary watertight closures, on the other hand, are considered to be active floodproofing usually requiring advance warning for operation.

Wet floodproofing is undertaken in expectation of possible flooding. 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 flood standard 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 of 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.

For new development, dry floodproofing above the level of the flood standard can generally be economically and easily achieved in the design and early construction phase. However, dry floodproofing of structures which will have portions below the level of the flood standard will

require additional special design attention so that the structure will resist all loads including hydrostatic pressures.

Technical Considerations

Once flood waters enter a development, the risk of loss of life and flood damage will be determined by the location of the habitable portion of the buildings. The habitable portion of a structure is defined as living space intended for use by the occupant with the key concern being overnight occupancy. This includes buildings used for residential, commercial, recreational, and institutional purposes. In considering appropriate floodproofing measures, the habitable portion of the building should be designed to eliminate or minimize the risk of flood damage and loss of life.

As a rule, damages increase rapidly with the depth of flooding. Major structural damage occurs when a structure is weakened, totally collapses or is displaced. Damage to contents, such as finishes, trimwork, furniture, appliances, equipment and storage materials, also represents a substantial portion of the total loss. In addition, it is difficult to assign a dollar value to compensate for human suffering caused by a flood.

Thus, protection to at least the level of the flood standard is significant in reducing human suffering and property damage. In selecting between wet or dry flood protection, consideration must be given to the type of development, need for floodproofing and cost effectiveness.

Further, selection of active or passive measures will depend on location of the habitable portion of the development below or above the level of the flood standard, local flood warning, and access ways.

As well, all mechanical and electrical systems should be designed and installed so that the heating, lighting, ventilation, air conditioning and other systems are not vulnerable to flood damage during the flood standard. Where flooding could interrupt key power supplies, it may be necessary to provide stand-by or backup systems, with power and controls located above the level of the flood standard.

In order to determine the most appropriate floodproofing measure, the full extent of the flood hazard must be evaluated. This section outlines technical considerations which can assist in determining the most suitable floodproofing measure.

(1) Flooding as a Threat to Life

Hazard to life is linked to the frequency of flooding, and to depth of flood waters and the velocity of flow in the floodplain. Depth increases buoyancy and velocity increases instability, so that each of depth and velocity should be studied independently or as a combined function.

a) Depth

Any person in the midst of a flooded area will be acted upon by a buoyant force equal to the weight of water displaced by that person. The volume of displaced water and this force increases with depth until neutral equilibrium is reached and the person begins to float.

Average adults and teenage children remain stable when standing in flood depths up to about 1.37 m (4.5 ft). The average school child 6 – 10 years old would float at about 1.1 m (3.5 ft), although smaller, younger children in this range would float at a depth of about 0.98 m (3.2 ft).

Hence, in terms of depth and individuals who could be present in the floodplain during a flood:

· depths in excess of about 0.98 m (3.2 ft) would be sufficient to float young school children;

· a depth of about 1.37 m (4.5 ft) is the threshold of stability for teenage children and most adults.

b) Velocity

Moving water in the floodplain exerts a lateral force resulting from momentum thrust of the flood flow. This force acts to displace objects in a downstream direction. The shear force of friction of a person on the wet surface of the floodplain resists this force. However, even relatively low velocities of flow in the floodplain can pose possible flood hazards.

The force exerted by various flow velocities can be developed for different age and size groups, but because its effect is tied to depth, a better appreciation of velocity effects can be gained by looking at both depth and velocity in combination.

c) Combination of Depth and Velocity

As a guide for personnel involved in stream flow/depth monitoring, the simple “3 x 3 rule” was developed in the U.S. based on 3 ft depth and 3 ft/s velocity values. The rule suggests that people would be at risk if the product (multiple) of the velocity and the depth exceeded 0.8 m2/s (9 ft2/s).

The Water Survey of Canada has the same rule of thumb and its Hydrometric Field Manual (1981) states, “a general rule of thumb which has been used in the past is arrived at through the product of the depth and velocity. Generally speaking, if the bed is firm and provides good footing, the product of these two factors should be slightly less than 1 m2/s, or roughly 9 ft2/s”.

It should be noted that this rule of thumb applies to trained professionals whose regular work accustoms them to the dynamic forces of river flows, buoyant forces from partial submergence and recognition of potential hazards, e.g. rocks, depressions, etc. They also enter the stream with equipment which will assist them in maintaining stability, e.g. tag line, wading rod, strap-on cleats for greater stability.

It is considered highly unlikely that such equipment would be available to most occupants of floodproofed buildings in the flood plain. It seems equally unlikely that these occupants would have the same level of experience as water survey staff in dealing with high depths, current speeds, unsteady footing, or cold weather/water conditions.

As a result, it is likely that the simple rule of 3 x 3 product (1 m2/s or 9 ft. 2/s) represents an upper limit for adult male occupants in the flood plain and that it would be reasonable to consider something lower as being more representative of a safe upper limit for most flood plain occupants.

As noted earlier, any person on foot during a flood may be subject to a number of forces in the floodplain. Excluding impact by ice and/or other debris, these forces include:
· an upward buoyant force, equal to the weight of the fluid displaced;
· a lateral force exerted by the moving water (linear momentum); and,
· unbalanced hydrostatic forces.
Resisting these forces are:
· the shear force of friction acting through the weight of the person standing on a wet surface in the floodplain.

Adults of average size would fall into the range between 976 -1952 kg/m2 (200 - 400 lb/ft2) but young children would more appropriately fall into a range of 732 - 1464 kg/m2 (150 - 300 lb/ft2). Only 7% of Ontario's population is within the 6 - 10 year age range, i.e. young children (Statistics Canada, 1981).

The coefficient of friction between foot apparel and wet grass, gravel, bare soils, pavements or other wet surfaces under flood conditions is not well known. A standard table of friction coefficients suggests that friction factors in the order of 0.3 to 0.6 could be characteristics of the ratio of the force to body weight required to initiate movement over unlubricated, dry surfaces. It is assumed that a lower friction factor range would be representative of the same state for a person standing on wet grass or pavement under flood conditions.

Any flood plain situation giving velocity and depth conditions lower than the appropriate curve for that individual is one where that person would be in a stable condition in the flood plain. Conditions of velocity or depth exceeding the appropriate stability curve would be unstable conditions for the same individual.

It is also appropriate to note that this analysis is based on a person standing still in the flood plain. Once a person begins to move to install floodproofing measures or leave the flood-prone area, stability is reduced further.

At low velocity but depths greater than 0.9 - 1.2 m (3 - 4 ft), most individuals would become buoyant. Similarly, in areas where flood plain depths may be less than 0.3 m (1 ft) but where velocities exceed 1.5 - 1.8 m/s (5 - 6 ft/s) encountered on roadways or bridge crossings, for example, stability conditions would be exceeded and some individuals would be swept off their feet.

Although no product rule exactly defines this region, a reasonable approximation of the low risk area can be made with a product rule that includes some constraints on the domain of depth and velocity. For example, a product depth and velocity less than or equal to 0.4 m2/s (4 ft2/s) defines the low risk area providing that depth does not exceed 0.8 m (2.6 ft) and that the velocity does not exceed 1.7 m/s (5.5 ft/s). By contrast, in a situation where the depth and velocity are 1.1 m (3.5 ft) and 0.3 m/s (1 ft/s) respectively, the product is less than 0.4 m2/s (4 ft2/s) but the depth limit is exceeded. Hence, these conditions define a high risk area for some individuals.

It is evident that this approximate classification is somewhat conservative; but until further research is undertaken, it provides a reasonable factor of safety for all individuals - young and old - who may be present in the floodplain.

(2) Duration of Flood

The duration of a flood or the length of time a river overflows its banks, reaches its crest and recedes to within its banks depends on the efficiency of the river to transport the flood waters. Since the size of the watershed, time of concentration and duration of a flood affects the type of impact and pressure on the development, floodproofing measures must be designed to withstand these forces for the required period of time.

(3) Rate of Rise and Fall

The rate of rise and fall of a flood to and from its crest can affect the type and extent of floodproofing. For example, where the rise and fall are very sudden, there may not be time to implement active floodproofing measures, such as watertight seals and doors and thus these approaches would be deemed unacceptable. The rate should also be considered in investigations of slope stability for certain types of soils where a quick drawdown of flood waters may pose problems.

(4) Flood Warning System

The availability of advance warning can play an important role in determining the most appropriate measure. Where active floodproofing procedures are contemplated, lead time for implementation of appropriate protective measures and devices must be related to the amount of advance warning.

(5) Structural Integrity

When buildings and structures are surrounded by flood waters, they cause unbalanced pressures and loadings on all wetted surfaces, which increase rapidly with depth. Unbalanced pressures can cause structural and sub-structural damages which can completely collapse or displace the development. In order to design the most appropriate floodproofing measures, it is important to determine the effect of stresses on the proposed building.

The stresses imposed on a building are due to hydrostatic, hydrodynamic and impact loadings, depending on its location. Hydrostatic loads are developed by water that is either still or moving at a low velocity. These loads may be defined as acting vertically downward (i.e., on floors), or vertically upward (i.e., uplift), or laterally when acting horizontally on walls. Hydrodynamic loads results from the flow of water against or around a structure at moderate or higher velocities. These loads are directly dependent on the velocity of flow, and can also adversely affect the floodproofing measures by causing erosion and scour. Impact loads are caused by water-borne objectives, debris and ice. Their effects become greater and more crucial as the velocity and weight of objects increase. Impact loads are difficult to predict and define accurately. However, a reasonable allowance can be made with the knowledge of the conditions of the site.

a) Superstructures (Above Ground)

Hydrostatic Loading Effects

Until the mid-1970s, it was assumed that standard design and construction practices - without modification - would be adequate to ensure that floodproofing by closures and seals could be conducted to moderate depth/ hydrostatic loading without threatening the structural integrity of the above ground/superstructure of most buildings. However, various research by the U.S. Corps of Engineers over the years, has suggested otherwise.

Studies on structures of conventional design have determined that:

- brick veneer, frame structures (such as a typical home) would resist hydrostatic loading up to about 0.8 m (2.5 ft) without damage;
- concrete block structures with limited or no reinforcement (such as the small warehouse building) displayed similar resistance characteristics and would not be damaged by hydrostatic loading up to 0.8 m (2.5 ft). Above this at 0.9 and 1.2 (3 and 4 ft) depths deflection and cracking became significant;
- solid brick structures responded in a similar manner. Tests with these also included end and side walls and walls with and without door openings. Walls with ceiling joists (with and without door openings) were found adequate to resist loadings to about 0.8 m (2.5 ft). Walls with ceiling joists provide much stronger, but failed explosively when 2 x 4 supports were snapped; and,
- poured concrete walls were not tested, but from experience with other structural designs it was presumed that conventional design techniques would prove adequate against hydrostatic loads to at least 0.9 (3 ft).

Therefore, 0.8 m (2.5 ft) would appear to be the upper limit of effective flood depth (static plus equivalent hydrodynamic head) which can be resisted by conventionally designed structures without affecting structural integrity.
Studies on structural integrity during flow conditions have also given an appreciation of the permeability of conventional structures, in that:

- brick structures of conventional design begin to leak almost immediately and badly, when in contact with flood waters; and,
- concrete block structures of conventional design also leak badly at a rate that exceeds that of brick structures.

Tests also conducted to determine if materials or surface coatings would enhance water tightness found:

- no clear sealants (e.g. epoxy) were completely effective;
- no asphaltic material was completely effective;
- embedded roofing felts with polyethylene sheeting laid between a second brick course were found effective - but exceptionally stringent quality control of workmanship was required (particularly at joints);
- flood shields/bulkheads also presented difficulties and were for the most part ineffective unless designed especially with gaskets, smooth surfaces and locking bolts; and,
- certain thick, non-tear materials can be used as external “wrappings” to effectively seal buildings against infiltration. These are very special materials and fall into the category of “active” measures vs “passive”, permanent measures.

In summary then:

- conventional designs are not water resistant/waterproof for even low depths of flooding;
- new structures should be designed from scratch for complete water tightness (or if not completely watertight must incorporate an internal system to collect and remove water seepage); and,
- new structures using conventional designs can be made watertight (without re-design) but the only proven approach so far uses external “wrapping”.

<u>Erosion</u>
Flow velocities which will cause erosion of grass covered slopes or erosion around foundations are difficult to determine. Factors such as type of cover, slope and soil conditions must be taken into account. For most common situations, the range lies between 0.8 m/s and 1.2 m/s (2.5 ft/s and 4 ft/s) for easily eroded soils and 1.1 m/s to 1.5 m/s (3.5 ft/s to 5 ft/s) for more erosion resistant soils.

<u>Impact Loading and Debris Accumulation</u>

This aspect of structural integrity has not been studied in the field because it is practically impossible to establish velocity/depth limits associated with loadings caused by debris accumulation and the impact of floating objects on the flood plain. The nature of debris accumulations and size and shape of floatables simply varies too significantly.

Ice, debris and other floating materials can result in significant impact loading on buildings within the flood plain or increase the loads on buildings as a result of blockage. Although these loads are difficult to estimate a reasonable allowance must be made in design. Sites where the potential for such loading is high should simply be avoided or buildings should be designed/ landscaped to intercept/deflect materials before the building is affected.

In cases where floodproofing is achieved by elevation on columns or piles, the clearing space between the columns or piles should measure perpendicular to the general direction of flood flow and should be adequately designed to minimize possible debris blockage. The open space created below the level of the flood standard should remain essentially free of more buoyant or hazardous materials.

b) Substructures/Basements (Below Ground)

Based on normal (conventional) construction methods, any hydrostatic head in excess of 0.2 m (0.7 ft) may result in damage to basement floors (i.e. the upward force of groundwater on the basement floor).

Even where the basement of a single storey brick or masonry structure has been structurally reinforced and/or made watertight, structural integrity or buoyancy may pose problems when groundwater (saturated soil) levels are 1.2 - 1.5 m (4 - 5 ft) above the level of the basement floor. Much depends on the duration of the flooding, type of soil and the presence/effectiveness of the drainage system.

(6) Vehicular Access

Little or no information exists in the literature regarding ingress/egress criteria for vehicles.

The question of safety for the passage of vehicles can be subdivided into:

- flood depth and velocity considerations affecting egress of private vehicles from floodproofed areas; and,
- flood depth and velocity affecting access of private and emergency vehicles to floodproofed areas.

a) Private Vehicles

In general, water contact is one critical issue in terms of its effect on the ignition/electrical system and the exhaust system. In the former, the distributor and/or spark plugs are the main items of concerns and those which are typical problem areas for most motorists.

Private vehicles come in all shapes and sizes and it is practically impossible to identify “typical” vehicles for assessing the elevation of key electrical components from the road surface. It appears likely that a depth of about 0.4 m - 0.6 m (1.5 - 2 ft)

would be sufficient to reach the distributor or plugs of most private vehicles. They would fail to start at this depth and hence vehicular egress will be halted. Cars may start at lower depths but then "splash" from driving on wet pavement or from the radiator fan would become a concern.

The issue of the exhaust system and the effect that flooding can play on engine back pressures/expulsion of exhaust gases appears to be the controlling factor. Difficulty would probably be experienced in starting most vehicles if the vehicle is standing in water at a depth that covers the muffler. The vehicle may start and continue to run if it is quickly removed from the water but if remains at that depth, there is a strong possibility that it will fail soon after.
Again, it is practically impossible to generalize this depth but for most family automobiles something in the range of about 0.3 m - 0.4 m (1 - 1.5 ft) would be the maximum depth of flooding before potential egress problems would result.

A "typical" North American car would not be significantly affected by velocities up to about 4.5 m/s (15 ft/s) or more at flood depths at less than 0.3 m (1 ft). At running board depth or slightly above 0.3 m (1 ft) the maximum velocity for stability drops to about 3 m/s (10 ft/s) and at about 0.4 m (1.5 ft) depth an average vehicle may be displaced by velocities as low as 0.3 - 0.6 m/s (1 - 2 ft/s), with smaller vehicles becoming buoyant.

b) Emergency Vehicles

Emergency vehicles operate under the same constraints relating to the electrical/exhaust system. Most police vehicles and ambulances would be limited by exhaust considerations, although emergency vans are better equipped to avoid splash problems since the key electrical components are higher above the road surface.

Diesel fire vehicles with top exhausts appear best suited for flood conditions. Their road clearance is high and it is suggested that 0.9 m -1.2 m (3 - 4 ft) of flood depth would not present a problem. These vehicles are about 10 times heavier than most automobiles and hence are resistant to displacement by higher velocity flood flows. Operations at velocities in excess of 4.5 m (15 ft/s) would probably not pose a problem when these vehicles are moving over a good/non-eroding base.

(7) Portable or Mobile Buildings and Structures

A portable or mobile building is one that is not permanently tied or anchored to a foundation and can be transported by means of a hauler. Portable or mobile buildings can be located on individual sites or in a park or subdivision. They can be used for temporary purposes, such as for construction crews or as full-time residences/seasonal homes with overnight occupancy.

When located in flood plains, portable or mobile buildings are highly susceptible to flood damage. Since they are not affixed to a permanent foundation, flood waters may easily sweep such buildings off their sites. Without advance warning, residents can be entrapped in the building. In addition, portable or mobile buildings can increase the flood hazard as they collide with other structures or block bridge openings or culverts. Despite this, portable or mobile buildings often are located in flood plains because:

- flood plain land acquisition costs may be lower;
- swamp conditions and higher water table which prevail in flood plain areas may preclude construction of permanent homes with basements; and/or,
- potential recreational access by locating close to the water's edge.

Ideally, portable or mobile buildings should not be located in the flood plain. However, when located in the flood fringe, they should be properly floodproofed to the flood standard, in order to prevent flotation, collapse and lateral movement. Due to the inherent hazard of remaining in a mobile building during a flood, contingency plans indicating escape routes and alternative vehicular access ways should be prepared. Where the portable or mobile building is on site temporarily, it may not be feasible to meet all the requirements for floodproofing. In such cases, temporary location of portable and mobile buildings in the flood fringe may be considered where the time frame is very short and sufficient flood warning would allow the structure to be hauled away in advance of the flood.

(8) Floodproofing Complexity

The complexity of floodproofing techniques (and to a degree the cost) is best related to depth and type of floodproofing considered.

a) Closures and Seals

It appears that external walls can be floodproofed by closures and seals to a flood depth of about 0.8 m (2.5 ft). Beyond this depth, structural integrity is threatened and special reinforcing or revised designs (with poured concrete walls for example) are required.

Dry floodproofing to this depth can be completed with the use of impervious external "wrappings". These contingency wrappings are anchored beneath the ground surface along the foundation and rolled upward and hung into place along the walls of building prior to flooding. Equivalent dry floodproofing using internal sealants, doubled walls, etc. with flood shields at openings is more complex, expensive and uncertain as to effectiveness.

Basements can be closed and sealed to levels of about 1.2 - 1.5 m (4 - 5 ft) above the floor slab with poured concrete designs employing additional reinforcement and special attention to monolithic construction. Beyond this level, the procedure becomes complicated as buoyancy/uplift must be addressed through anchors and/or added wall and slab thickness.

Overall, closures and seals is fraught with possible problems and is considerably more complicated than other floodproofing approaches.

(b) Elevated structures

Structures on Fill Floodproofing on fill is generally considered for slab on grade construction. It is not a complex procedure and conventional building techniques are employed once the pad is down. The principal concern is fill compaction which must usually be done in 0.2 - 0.3 m (0.5 - 1 ft) lifts. Beyond 0.6 - 0.9 m (2 - 3 ft). however, pad sizes increase, compaction requirements become more important and an engineer or soils consultant should be employed for design review and inspection. Increased elevation may also lead to requirements for pad sizes in excess of lot size and, hence, additional requirements for erosion protection, etc.

Houses with conventional basements can also be placed in fill to elevate the first floor to a level about 2.1 - 2.4 m (7 - 8 ft) above grade (i.e. the basement is founded on grade and the basement walls are surrounded by fill). At 1.2 - 1.5 m (4 - 5 ft) above grade, the procedure is complicated by the need for wall and slab reinforcement, and anchors to prevent buoyancy.

Elevation on Columns, Piles, Piers and Extended Foundation Walls

Elevated structures using these techniques must be designed with consideration for debris loading, orientation of supports, effective submergence on foundation soil conditions and anchorage, bracing and connection details, availability of mechanical equipment, etc. In most instances, an engineer should be consulted to ensure that the possible effects of flooding are considered in the design. There are more factors to consider than conventional house construction on fill and, hence, these approaches could be considered more complex.

The majority of elevated buildings use posts for support (steel or timber). Installation becomes more complex at lengths in the range of 3.6 - 4.8 m (12 - 16 ft) since machinery is needed for installation. A range of 3 - 3.6 m (10 - 12 ft) seems typical for most homes which use extended posts.

Mechanically-driven piles are reported to be the best solution if severe erosion is anticipated. Pile driving equipment and skilled operators are at a premium and, because of the initial expense, this technique may be too complex/unnecessary for flood depths less than 1.5 - 1.8 m (5 - 6 ft).

Piers/columns are generally constructed with brick, concrete block or poured concrete. The common elevation range for each of these approaches is as follows, beyond which increasing complexity is assumed:

- 0.4 - 1.8 m (1.5 - 6 ft) for brick piers;
- 0.4 - 2.4 m 91.5 - 8 ft) for reinforced concrete masonry piers; and,

- 0.4 - 3.6 m (1.5 - 12 ft) (or more) for poured in place, reinforced concrete piers.

Extended foundation walls make a relatively simple and effective foundation for elevated structures but again must be designed with consideration for loads and pressures anticipated in the flood plain.

Berms and Floodwalls

Berms (or levees) and floodwalls used for floodproofing are low structures built around single homes or individual industrial complexes. Property design is more complex since material and construction practices must be closely monitored, they must be regularly maintained (in the case of berms), and they usually require adequate pumping facilities to handle interior drainage and seepage. Both berms and floodwalls usually have some opening for access and consideration must be given to closure.

In many instances, berms and floodwalls should be designed by qualified professional engineers.

Intentionally Flooding a Building (Wet Floodproofing)

Intentionally flooding a building for the purpose of balancing internal and external pressures so as to maintain structural integrity is in itself not complex. To ensure minimal damage and quick clean up, a number of conditions have been placed on the use of wet floodproofing by agencies such as Canada Mortgage and Housing Corporation. Requirements include:

- at least two open able windows located on opposite sides of the building;
- tops of window sills to be not less than 150 mm below grade (to allow flood water into the basement);
- basements to remain unfurnished and contain nonhabitable space only;
- mechanical and electrical equipment, heating units and duct work to be located above the flood standard; and,
- sump pump required.

While wet floodproofing may be designed and provided for in a building, there is no guarantee over time that the requirements will be maintained. In particular, it is difficult to control the “finishing off” of basements which would then result in damages when wet floodproofing measures were put into effect. Therefore, while wet floodproofing may appear desirable initially, the ability to ensure the principles and requirements of wet floodproofing are maintained in the future must also be considered.

Above taken from Appendix 6: Floodproofing of *Technical Guide – River & Stream Systems: Flooding Hazard Limit* (MNR, 2002).

This page has been left intentionally blank.

APPENDIX D – Hearing Guidelines

SECTION 28 (3)

CONSERVATION AUTHORITIES ACT

HEARING GUIDELINES

October 2005

Conservation ONTARIO
Natural Champions

ONTARIO

Ministry of Natural Resources
Ministère des Richesses naturelles

SECTION 28 (3)

CONSERVATION AUTHORITIES ACT

HEARING GUIDELINES

October 2005

_____	_____
Peter Krause, Chairman	Gail L. Beggs, Deputy Minister
Conservation Ontario	Ministry of Natural Resources

Section 28 (12), Conservation Authorities Act - Hearing Guidelines

Table of Contents

Appendices

1.0 PURPOSE OF HEARING GUIDELINES:

The purpose of the Hearing Guidelines is to reflect the changes to the 1998 Conservation Authorities Act. The Act requires that the applicant be party to a hearing by the local Conservation Authority Board, or Executive Committee (sitting as a Hearing Board) as the case may be, for an application to be refused or approved with contentious conditions. Further, a permit may be refused if in the opinion of the Authority the proposal adversely affects the control of flooding, pollution or conservation of land, and additional erosion and dynamic beaches. The Hearing Board is empowered by law to make a decision, governed by the Statutory Powers Procedures Act. It is the purpose of the Hearing Board to evaluate the information presented at the hearing by both the Conservation Authority staff and the applicant and to decide whether the application will be approved with or without conditions or refused.

These guidelines have been prepared as an update to the October 1992 hearing guidelines and are intended to provide a step-by-step process to conducting hearings required under Section 28 (12), (13), (14) of the Conservation Authorities Act. Similar to the 1992 guidelines, it is hoped that the guidelines will promote the necessary consistency across the Province and ensure that hearings meet the legal requirements of the Statutory Powers Procedures Act without being unduly legalistic or intimidating to the participants.

2.0 PREHEARING PROCEDURES

2.1 Apprehension of Bias

In considering the application, the Hearing Board is acting as a decision-making tribunal. The tribunal is to act fairly. Under general principles of administrative law relating to the duty of fairness, the tribunal is obliged not only to avoid any bias but also to avoid the appearance or apprehension of bias. The following are three examples of steps to be taken to avoid apprehension of bias where it is likely to arise.

(a) No member of the Authority taking part in the hearing should be involved, either through participation in committee or intervention on behalf of the applicant or other interested parties with the matter, prior to the hearing. Otherwise, there is a danger of an apprehension of bias which could jeopardize the hearing.

(b) If material relating to the merits of an application that is the subject of a hearing is distributed to Board members before the hearing, the material shall be distributed to the applicant at the same time. The applicant may be afforded an opportunity to distribute similar pre-hearing material.

(c) In instances where the Authority (or Executive Committee) requires a hearing to help it reach a determination as to whether to give permission with or without conditions or refuse a permit application, a final decision shall not be made until such time as a hearing is held. The applicant will be given an opportunity to attend the hearing before a decision is made; however, the applicant does not have to be present for a decision to be made.

Individual Conservation Authorities shall develop a document outlining their own practices and procedures relating to the review and reporting of Section 28 applications, including the role of staff, the applicant and the Authority or Executive Committee as well as, the procedures for the hearing itself. Such policy and procedures manual shall be available to the members of the public upon request. These procedures shall have regard for the above information and should be approved by the Conservation Authority Board of Directors.

2.2 Application

The right to a hearing is required where staff is recommending refusal of an application or where there is some indication that the Authority or Executive Committee may not follow staff's recommendation to approve a permit or the applicant objects to the conditions of approval. The applicant is entitled to reasonable notice of the hearing pursuant to the Statutory Powers Procedures Act.

2.3 Notice of Hearing

The Notice of Hearing shall be sent to the applicant within sufficient time to allow the applicant to prepare for the hearing. To ensure that reasonable notice is given, it is recommended that prior to sending the Notice of Hearing, the applicant be consulted to determine an agreeable date and time based on the local Conservation Authority's regular meeting schedule.

The Notice of Hearing must contain the following:

(a) Reference to the applicable legislation under which the hearing is to be held (i.e., the Conservation Authorities Act).

(b) The time, place and the purpose of the hearing.

(c) Particulars to identify the applicant, property and the nature of the application which are the subject of the hearing.

Note: If the applicant is not the landowner but the prospective owner, the applicant must have written authorization from the registered landowner.

(d) The reasons for the proposed refusal or conditions of approval shall be specifically stated. This should contain sufficient detail to enable the applicant to understand the issues so he or she can be adequately prepared for the hearing.

It is sufficient to reference in the Notice of Hearing that the recommendation for refusal or conditions of approval is based on the reasons outlined in previous correspondence or a hearing report that will follow.

(e) A statement notifying the applicant that the hearing may proceed in the applicant's absence and that the applicant will not be entitled to any further notice of the proceedings.

Except in extreme circumstances, it is recommended that the hearing not proceed in the absence of the applicant.

(f) Reminder that the applicant is entitled to be represented at the hearing by counsel, if desired.

It is recommended that the Notice of Hearing be directed to the applicant and/or landowner by registered mail. Please refer to Appendix A for an example Notice of Hearing.

2.4 Presubmission of Reports

If it is the practice of the local Conservation Authority to submit reports to the Board members in advance of the hearing (i.e., inclusion on an Authority/Executive Committee agenda), the applicant shall be provided with the same opportunity. The applicant shall be given two weeks to prepare a report once the reasons for the staff recommendations have been received. Subsequently, this may affect the timing and scheduling of the staff hearing reports.

2.5 Hearing Information

Prior to the hearing, the applicant shall be advised of the local Conservation Authority's hearing procedures upon request.

3.0 HEARING

3.1 Public Hearing

Pursuant to the Statutory Powers Procedure Act, hearings are required to be held in public. The exception is in very rare cases where public interest in public hearings is outweighed by the fact that intimate financial, personal or other matters would be disclosed at hearings.

3.2 Hearing Participants

The Conservation Authorities Act does not provide for third party status at the local hearing. While others may be advised of the local hearing, any information that they provide should be incorporated within the presentation of information by, or on behalf of, the applicant or Authority staff.

3.3 Attendance of Hearing Board Members

In accordance with case law relating to the conduct of hearings, those members of the Authority who will decide whether to grant or refuse the application must be present during the full course of the hearing. If it is necessary for a member to leave, the hearing must be adjourned and resumed when either the member returns or if the hearing proceeds, even in the event of an adjournment, only those members who were present after the member left can sit to the conclusion of the hearing.

3.4 Adjournments

The Board may adjourn a hearing on its own motion or that of the applicant or Authority staff where it is satisfied that an adjournment is necessary for an adequate hearing to be held.

Any adjournments form part of the hearing record.

3.5 Orders and Directions

The Authority is entitled to make orders or directions to maintain order and prevent the abuse of its hearing processes. A hearing procedures example has been included as Appendix B.

3.6 Information Presented at Hearings

(a) The Statutory Powers Procedure Act, requires that a witness be informed of his right to object pursuant to the Canada Evidence Act. The Canada Evidence Act indicates that a witness shall be excused from answering questions on the basis that the answer may be incriminating. Further, answers provided during the hearing are not admissible against the witness in any criminal trial or proceeding. This information should be provided to the applicant as part of the Notice of Hearing.

(b) It is the decision of the hearing members as to whether information is presented under oath or affirmation. It is not a legal requirement. The applicant must be informed of the above, prior to or at the start of the hearing.

(c) The Board may authorize receiving a copy rather than the original document. However, the Board can request certified copies of the document if required.

(d) Privileged information, such as solicitor/client correspondence, cannot be heard. Information that is not directly within the knowledge of the speaker (hearsay), if relevant to the issues of the hearing, can be heard.

(e) The Board may take into account matters of common knowledge such as geographic or historic facts, times measures, weights, etc or generally recognized scientific or technical facts, information or opinions within its specialized knowledge without hearing specific information to establish their truth.

3.7 Conduct of Hearing

3.7.1 Record of Attending Hearing Board Members

A record shall be made of the members of the Hearing Board.

3.7.2 Opening Remarks

The Chairman shall convene the hearing with opening remarks which generally; identify the applicant, the nature of the application, and the property location; outline the hearing procedures; and advise on requirements of the Canada Evidence Act. Please reference Appendix C for the Opening Remarks model.

3.7.3 Presentation of Authority Staff Information

Staff of the Authority presents the reasons supporting the recommendation for the refusal or conditions of approval of the application. Any reports, documents or plans that form part of the presentation shall be properly indexed and received.

Staff of the Authority should not submit new information at the hearing as the applicant will not have had time to review and provide a professional opinion to the Hearing Board.

Consideration should be given to the designation of one staff member or legal counsel who coordinates the presentation of information on behalf of Authority staff and who asks questions on behalf of Authority staff.

3.7.4 Presentation of Applicant Information

The applicant has the opportunity to present information at the conclusion of the Authority staff presentation. Any reports, documents or plans which form part of the submission should be properly indexed and received.

The applicant shall present information as it applies to the permit application in question. For instance, does the requested activity affect the control of flooding, erosion, dynamic beach or conservation of land or pollution. The hearing does not address the merits of the activity or appropriateness of such a use in terms of planning.

- The applicant may be represented by legal counsel or agent, if desired
- The applicant may present information to the Board and/or have invited advisors to present information to the Board
- The applicant(s) presentation may include technical witnesses, such as an engineer, ecologist, hydrogeologist etc.

The applicant should not submit new information at the hearing as the Staff of the Authority will not have had time to review and provide a professional opinion to the Hearing Board.

3.7.5 Questions

Members of the Hearing Board may direct questions to each speaker as the information is being heard. The applicant and /or agent can make any comments or questions on the staff report.

Pursuant to the Statutory Powers Procedure Act, the Board can limit questioning where it is satisfied that there has been full and fair disclosure of the facts presented. Please note that the

courts have been particularly sensitive to the issue of limiting questions and there is a tendency to allow limiting of questions only where it has clearly gone beyond reasonable or proper bounds.

3.7.6 Deliberation

After all the information is presented, the Board may adjourn the hearing and retire in private to confer. The Board may reconvene on the same date or at some later date to advise of the Board's decision. The Board members shall not discuss the hearing with others prior to the decision of the Board being finalized.

4.0. DECISION

The applicant must receive written notice of the decision. The applicant shall be informed of the right to appeal the decision within 30 days upon receipt of the written decision to the Minister of Natural Resources.

It is important that the hearing participants have a clear understanding of why the application was refused or approved. The Board shall itemize and record information of particular significance which led to their decision.

4.1 Notice of Decision

The decision notice should include the following information:

(a) The identification of the applicant, property and the nature of the application that was the subject of the hearing.

(b) The decision to refuse or approve the application. A copy of the Hearing Board resolution should be attached.

It is recommended that the written Notice of Decision be forwarded to the applicant by registered mail. A sample Notice of Decision and cover letter has been included as Appendix D.

4.2 Adoption

A resolution advising of the Board's decision and particulars of the decision should be adopted.

5.0 RECORD

The Authority shall compile a record of the hearing. In the event of an appeal, a copy of the record should be forwarded to the Minister of Natural Resources/Mining and Lands Commissioner. The record must include the following:

(a) The application for the permit.

(b) The Notice of Hearing.

(c) Any orders made by the Board (e.g., for adjournments).

(d) All information received by the Board.

(e) The minutes of the meeting made at the hearing.

(f) The decision and reasons for decision of the Board.

(g) The Notice of Decision sent to the applicant

Appendix A

NOTICE OF HEARING

IN THE MATTER OF
The Conservation Authorities Act,
R.S.O. 1990, Chapter 27

AND IN THE MATTER OF an application by

FOR THE PERMISSION OF THE
CONSERVATION AUTHORITY
Pursuant to Regulations made under
Section 28, Subsection 12 of the said Act

TAKE NOTICE THAT a Hearing before the Executive Committee of the Conservation Authority will be held under Section 28, Subsection 12 of the Conservation Authorities Act at the offices of the said Authority (**ADDRESS**), at the **hour of , on the day of , 2001**, with respect to the application by (**NAME**) to permit development within an area regulated by the Authority in order to ensure no adverse effect on (***the control of flooding, erosion, dynamic beaches or pollution or conservation of land./alter or interfere with a watercourse, shoreline or wetland***) on **Lot , Plan/Lot , Concession , (Street) in the City of , Regional Municipality of ,** River Watershed.

TAKE NOTICE THAT you are invited to make a delegation and submit supporting written material to the Executive Committee for the meeting of (**meeting number**). If you intend to appear, please contact (**name**) . Written material will be required by (**date**), to enable the Committee members to review the material prior to the meeting.

TAKE NOTICE THAT this hearing is governed by the provisions of the Statutory Powers Procedure Act. Under the Act, a witness is automatically afforded a protection that is similar to the protection of the Ontario Evidence Act. This means that the evidence that a witness gives may not be used in subsequent civil proceedings or in prosecutions against the witness under a Provincial Statute. It does not relieve the witness of the obligation of this oath since matters of perjury are not affected by the automatic affording of the protection. The significance is that the legislation is Provincial and cannot affect Federal matters. If a witness requires the protection of the Canada Evidence Act that protection must be obtained in the usual manner. The Ontario Statute requires the tribunal to draw this matter to the attention of the witness, as this tribunal has no knowledge of the effect of any evidence that a witness may give.

AND FURTHER TAKE NOTICE that if you do not attend at this Hearing, the Executive Committee of the Conservation Authority may proceed in your absence, and you will not be entitled to any further notice in the proceedings.

DATED the ___ day of , _____200X

The Executive Committee of the
Conservation Authority Per: Chief Administrative Officer/Secretary-Treasurer

Appendix B

HEARING PROCEDURES

1. Motion to sit as Hearing Board.

2. Roll Call followed by the Chair's opening remarks.

3. Staff will introduce to the Hearing Board the applicant/owner, his/her agent and others wishing to speak.

4. Staff will indicate the nature and location of the subject application and the conclusions.

5. Staff will present the staff report included in the Authority/Executive Committee agenda.

6. The applicant and/or his/her agent will speak and also make any comments on the staff report, if he/she so desires.

7. The Hearing Board is open to the public and therefore, the Hearing Board will allow others to speak, and, if necessary, the applicant in rebuttal.

8. The Hearing Board will question, if necessary, both the staff and the applicant/agent.

9. The Hearing Board will move into camera.

10. Members of the Hearing Board will move and second a motion.

11. A motion will be carried which will culminate in the decision.

12. The Hearing Board will move out of camera.

13. The Chairman or Acting Chairman will advise the owner/applicant of the Hearing Board decision.

14. If decision is "to refuse", the Chairman or Acting Chairman shall notify the owner/applicant of his/her right to appeal the decision to the Minister of Natural Resources within 30 days of receipt of the reasons for the decision.

15. Motion to move out of Hearing Board and sit as Executive Committee.

Appendix C

CHAIR'S REMARKS WHEN DEALING WITH HEARINGS WITH RESPECT TO ONTARIO REGULATION 169/06

We are now going to conduct a hearing under section 28 of the Conservation Authorities Act in respect of an application by _____: , for permission to:_____

The Authority has adopted regulations under section 28 of the Conservation Authorities Act which requires the permission of the Authority for development within an area regulated by the Authority in order to ensure no adverse effect on (the control of flooding, erosion, dynamic beaches or pollution or conservation of land) or to permit alteration to a shoreline or watercourse or interference with a wetland.

The Staff has reviewed this proposed work and a copy of the staff report has been given to the applicant.

The Conservation Authorities Act (Section 28 [12]) provides that:

"Permission required under a regulation made under clause (1) (b) or 8) shall not be refused or granted subject to conditions unless the person requesting permission has been given the opportunity to require a hearing before the authority or, if the authority so directs, before the authority's executive committee."

In holding this hearing, the Authority Board/Executive Committee is to determine whether or not a permit is to be issued. In doing so, we can only consider the application in the form that is before us, the staff report, such evidence as may be given and the submissions to be made on behalf of the applicant.

The proceedings will be conducted according to the Statutory Powers Procedure Act. Under Section 5 of the Canada Evidence Act, a witness may refuse to answer any question on the ground that the answer may tend to criminate the person, or may tend to establish his/her liability to a civil proceeding at the instance of the Crown or of any person.

The procedure in general shall be informal without the evidence before it being given under oath or affirmation unless decided by the hearing members.

If the applicant has any questions to ask of the Hearing Board or of the Authority representative, they must be directed to the Chair of the board.

Appendix D

(Date)
BY REGISTERED MAIL
(name)
(address)

Dear:

RE: NOTICE OF DECISION
Hearing Pursuant to Section 28(12) of the Conservation Authorities Act
Proposed Residential Development
Lot , Plan ; ?? Drive City of
(Application #)

In accordance with the requirements of the Conservation Authorities Act, the (**name**) Conservation Authority provides the following Notice of Decision:

On (**meeting date and number**), the Hearing Board/Authority/Executive Committee refused/approved your application/approved your application with conditions. A copy the Boards/Committee's resolution # has been attached for your records. Please note that this decision is based on the following reasons: *(the proposed development/alteration to a watercourse or shoreline adversely affects the control of flooding, erosion, dynamic beaches or pollution or interference with a wetland or conservation of land).*

In accordance with Section 28 (15) of the Conservation Authorities Act, An applicant who has been refused permission or who objects to conditions imposed on a permission may, within 30 days of receiving the reasons under subsection (14), appeal to the Minister who may refuse the permission; or grant permission, with or without conditions. For your information, should you wish to exercise your right to appeal the decision, a letter by you or your agent/counsel setting out your appeal must be sent within 30 days of receiving this decision addressed to:

The Honourable ***David Ramsay***
Minister of Natural Resources
Queen's Park, Whitney Block
99 Wellesley Street West, 6th Floor, Room 6630
Toronto, Ontario M7A 1W3
TEL: (416) 314-2301 FAX: (416) 314-2216

Should you require any further information, please do not hesitate to contact (staff contact) or the undersigned.

Yours truly,
Chief Administrative Officer/Secretary Treasurer

Enclosure

APPENDIX E – Environmental Impact Study Terms of Reference

Crowe Valley Conservation

Environmental Impact Study
Terms of Reference
&
Submissions Standards

This document supports Crowe Valley Conservation Authority's role in the municipal plan review process under the Planning Act, R.S.O. 1990, as well as the review of permit applications under the Conservation Authorities Act Ontario Regulation 159/06, Development, Interference with Wetlands & Alterations to Shorelines & Watercourses.

January 2016

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Environmental Study – When is it Required?

Under the *Planning Act*, R.S.O. 1990, and in accordance with the Provincial Policy Statement (PPS) (2014) the Crowe Valley Conservation Authority (CVCA) can request an Environmental Impact Study (EIS) to help guide recommendations for applications for development within or adjacent to natural heritage features or areas. These recommendations are provided to the affected municipalities for their consideration. In addition, under the *Conservation Authorities Act Ontario Regulation 159/06, Development, Interference with Wetlands & Alterations to Shorelines & Watercourses*, CVCA can request an EIS to aid informed decision-making by CVCA on permit applications within or adjacent to a wetland or watercourse. An EIS may need to be updated if the development proposal changes or new natural heritage information becomes available.

This document outlines the EIS Terms of Reference and Submission Standards for proponents, and their consultants, for both municipal planning and permit applications. The intent of these guidelines is to:

1. Provide standardized study guidelines;
2. Improve the quality of submitted reports; and
3. Expedite the review process.

The EIS requirements for the municipal planning process and for the Conservation Authority regulations process are outlined in Figures 1a and 1b.

Note: This document supports Crowe Valley Conservation's role in the municipal plan review process under the *Planning Act*, R.S.O. 1990, as well as the review of permit applications under the *Conservation Authorities Act Ontario Regulation 159/06, Development, Interference with Wetlands & Alterations to Shorelines & Watercourses.*

Figure 1a. Overview of Environmental Impact Study process for municipal planning development applications under the *Planning Act*.

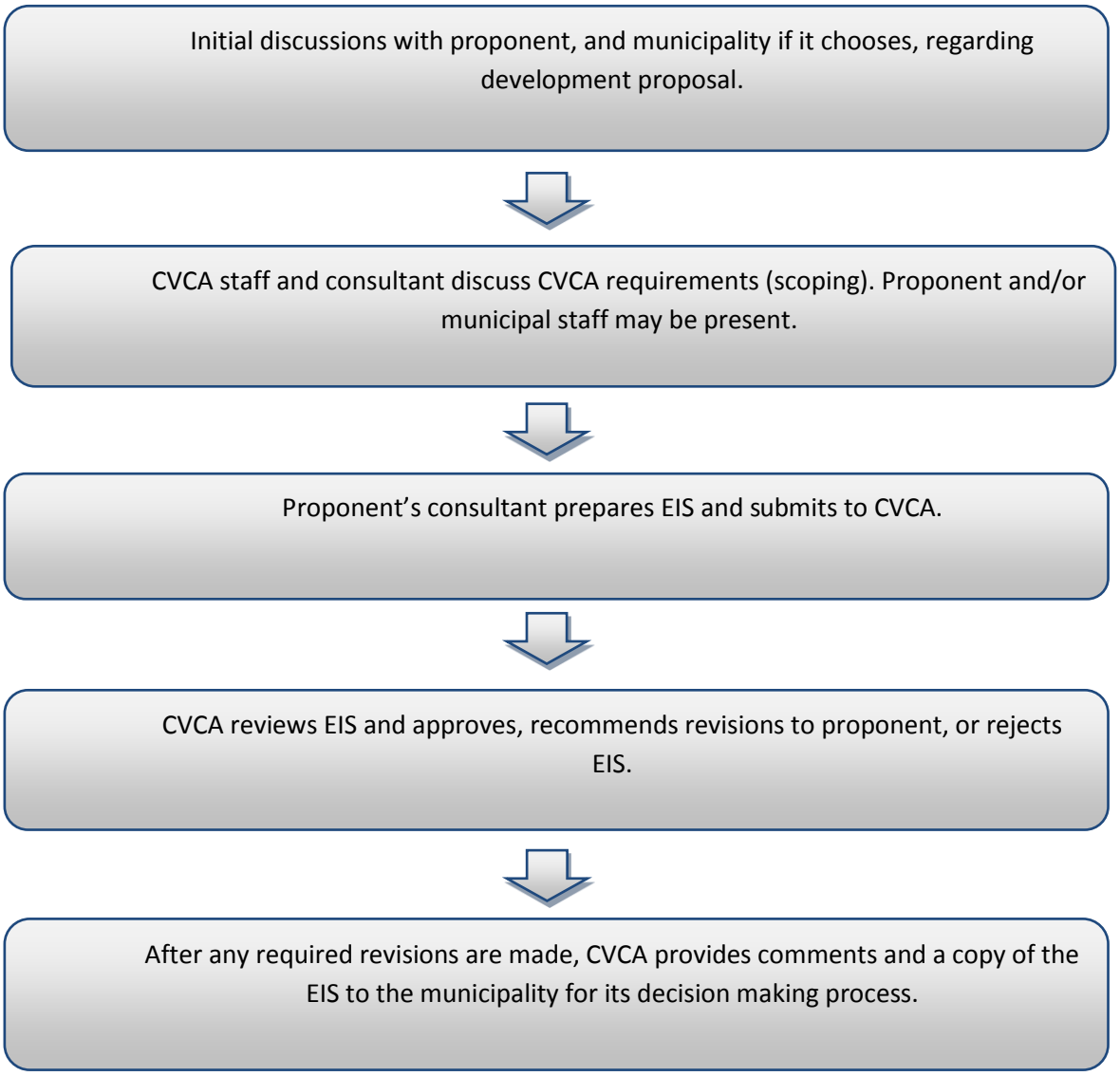
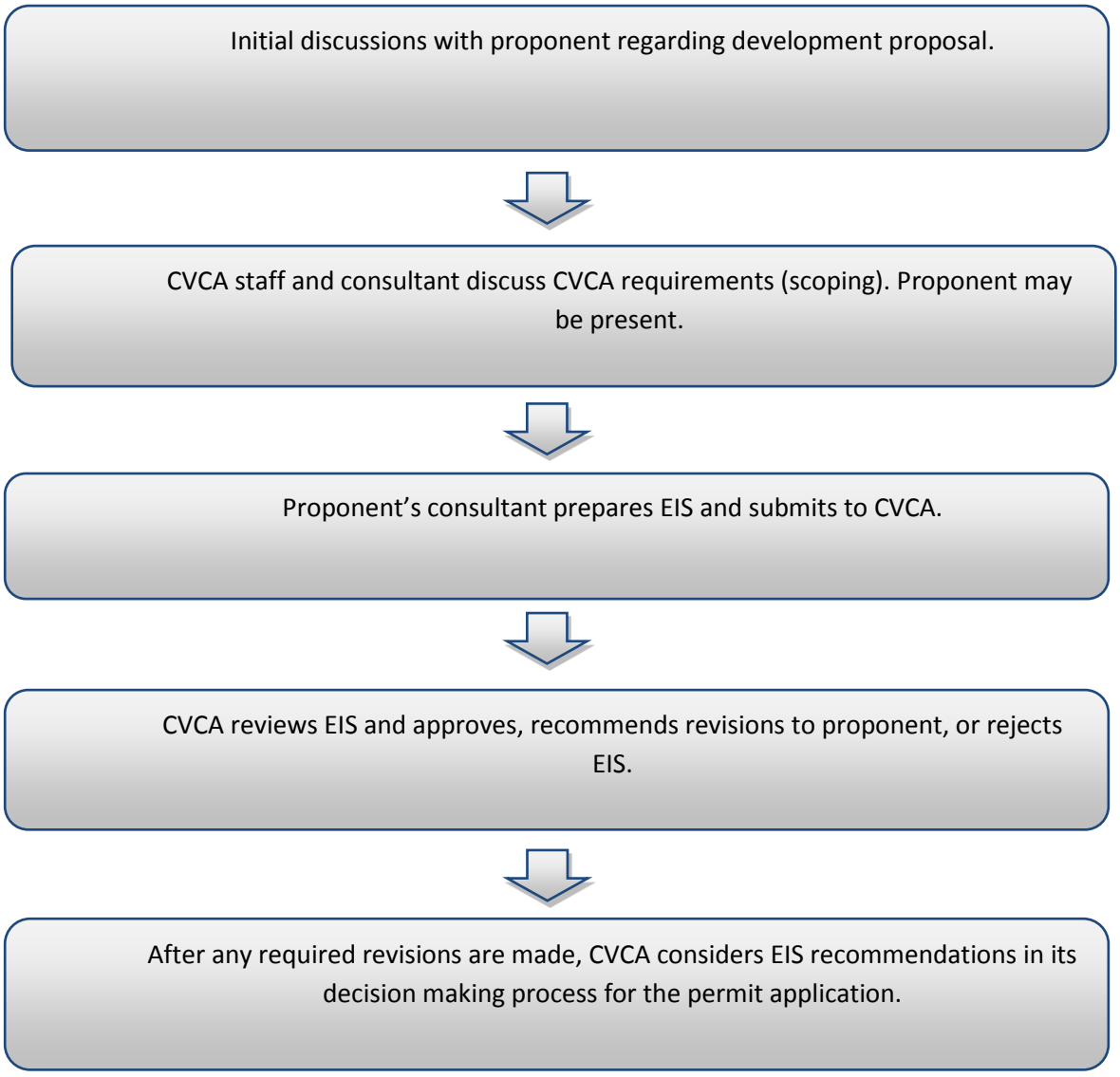


Figure 1b. Overview of Environmental Impact Study process for permit applications under the *Conservation Authorities Act Ontario Regulation 163/06, Development, Interference with Wetlands & Alterations to Shorelines & Watercourses.*



1.2 Environmental Impact Study – What Is It?

An EIS assesses potential impacts of a development proposal within or adjacent to a natural heritage feature or area. This EIS Terms of Reference and Submission Standards document sets out the process for undertaking an EIS when required as part of planning and permit applications. The purpose of the EIS is to ensure the protection of significant[13] natural heritage features and areas, and their functions, including, but not limited to the list below.

- Wetlands, including coastal wetlands
- Habitat of Threatened and Endangered Species
- Areas of Natural and Scientific Interest
- Woodlands
- Valleylands
- Fish Habitat
- Wildlife Habitat

An EIS may also be requested for proposed development in or adjacent to watercourses and/or wetlands that are not designated as provincially significant, since regard for CVCA Regulations needs to be considered at the planning stage.

Note: In some cases (subdivision or site plan application), a Comprehensive EIS may need to be conducted on a watershed or subwatershed scale to identify natural heritage features for protection, potential development areas, and development setbacks that are ecologically sustainable. The natural heritage or environmental management strategies developed through watershed, subwatershed or secondary plans may fulfill these requirements. Should a Comprehensive EIS be required, CVCA will work with the municipality and/or proponent to develop a Terms of Reference.

[13] Significant, as defined by the 2014 Provincial Policy Statement means:
a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time;
b) in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria established by the Ontario Ministry of Natural Resources; and
c) in regard to other features and areas in policy 2.1, ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system.

An EIS identifies and assesses potential impacts of a proposed development on environmentally sensitive features, adjacent lands and ecological functions, specifying appropriate mitigation measures. It should be based on: a detailed literature review, field investigations, as well as modeling (where appropriate). An EIS may be coordinated with other technical studies (e.g. hydrological, hydrogeological, stormwater management). Lastly, an EIS should provide recommendations for natural heritage protection and ecological enhancement.

1.3 Pre-Consultation – Before Submitting an Application

Pre-consultation is an opportunity for the proponent, municipality and CVCA to discuss the development proposal and identify the issues and concerns surrounding the protection of natural heritage on the subject site. Pre-consultation should occur prior to circulation of the development application to ensure a complete application is submitted under the Planning Act, or under the *Conservation Authorities Act Ontario Regulation 159/06, Development, Interference with Wetlands & Alterations to Shorelines & Watercourses.*

The intent of pre-consultation is to:

- Review current policy, discuss existing information, data and recommendations provided in other studies, including subwatershed studies that are relevant to the subject lands and the development proposal;
- Determine the scope of EIS that is required based on the significance and sensitivity of the natural heritage features and areas, and their associated functions of the subject site and adjacent lands, and the scale of the proposal;
- Identify future site visit dates to be conducted by the proponent/consultants and agencies to field review and/or stake the natural feature boundaries (e.g., top of bank, wetlands, woodland drip line), potential locations for watercourse crossings, geotechnical hazards, etc.

Both the proponent and CVCA should provide information at the pre-consultation meeting.

- The proponent may provide:
    - Development proposal
    - Preliminary site plan, if available
    - Existing background information
- CVCA may provide:
    - Natural heritage feature and hazardous area mapping
    - Policy documents relevant to subject property
    - Relevant studies and recommendations
    - Information on regulations affecting the subject property
    - Suggestions for modifying development area, to reduce EIS requirements or avoid the need for an EIS altogether

1.4 Why is an EIS Required?

An EIS is generally required when development or site alteration is proposed within or adjacent to an area identified as a natural heritage feature or area either by the province, the municipality, or CVCA. The PPS does not permit development and site alteration on adjacent lands to a significant natural heritage feature and area, unless the ecological functions of those adjacent lands have been evaluated demonstrating no negative development impacts on the features or their ecological functions. For example, development or site alteration proposed within 120 m of a provincially significant wetland (PSW) will trigger an EIS under the PPS.

CVCA generally prohibits development in all wetlands and adjacent lands under its Regulations, not only those considered significant under the PPS. Since regard for our Regulations needs to be considered at the planning stage, CVCA may request an EIS for development in or adjacent to a wetland that is not significant under the PPS.

It is important to note that the submission of an EIS does not guarantee approval of a development or permit application. In some circumstances, CVCA may require a peer review of the EIS, and, like the EIS, the costs incurred to conduct the peer review will be the responsibility of the proponent.

1.5 Qualifications

The qualifications of the individual(s) tasked to complete an EIS must meet minimum standards as set by CVCA. Fieldwork must be completed by qualified professionals with appropriate training, such as the Ministry of Natural Resources Ontario Wetlands Evaluation System and the Ecological Land Classification system, as well as education and experience in biology, ecology, botany or related fields. Specific expertise may be required for specific surveys.

1.6 EIS Terms of Reference

The specific information requirements needed to complete an EIS are scoped for each application following the pre-consultation meeting. Generally, this will address the following:

- Description of proposed development;
- Study area boundaries;
- Key ecological features, functions, linkages and other natural processes that may be affected, directly or indirectly, by development;
- Information needs and availability of information;
- Potential impacts (direct and indirect) associated with the proposed development;
- Means of avoiding or mitigating anticipated impacts; and
- The nature and extent of additional information or studies that may be required.

An EIS checklist has been prepared (Appendix B) to assist with this EIS Terms of Reference customization process. The purpose of the checklist is to identify EIS parameters that must be addressed in order to support a proposed planning or permit application.

2.0 EIS REPORT REQUIREMENTS

This chapter outlines CVCA's requirements for an EIS report to support municipal planning applications and permit applications. Table 1 summarizes the preferred EIS report Table of Contents. The content requirements of each section are elaborated on in the following pages. The EIS report formatting submission standards are listed in Appendix C.

TABLE 1. Outline of the Environmental Impact Study report preferred Table of Contents.

EIS Report Section	Contents
Introduction	☐ Results of pre-consultation
Background	☐ Identity of proponent and professional(s) ☐ Site plan of existing conditions ☐ Location map ☐ Land use history ☐ Relevant policies and regulations
Biophysical description of site	☐ Background studies and reports ☐ Field work dates, methodology and results ☐ Existing natural heritage elements ☐ Map of existing natural heritage features and areas and the associated development constraints
Description of proposed development	☐ Description of proposed development ☐ Site plan of proposed site ☐ Proposed site alterations
Potential impacts assessment	☐ Map of development constraints and site plan ☐ Impacts to physical features

	☐ Impacts to ecosystems ☐ Impacts to society ☐ General impacts
Analysis of mitigation measures and compensation options	☐ Mitigation measures ☐ Compensation options
Monitoring	☐ Study design to evaluate mitigation and compensation measures, where appropriate
Conclusions and recommendations	☐ Summary of impacts ☐ Summary of mitigation measures and/or compensation options ☐ Preferred development alternative
References	☐ List of reference materials cited
Appendices	☐ Maps ☐ Species lists ☐ Copies of completed field sheets (ELC, OWES, MMP, etc.) ☐ Photographs ☐ CV(s) of professional(s) conducting EIS

2.1 Introduction

This section of the EIS report should summarize the results of the pre-consultation meeting with CVCA and outline the agreed upon EIS Terms of Reference.

2.2 Background

This section should provide details about existing conditions on the subject property. The identity of the proponent, as well as the identity and professional expertise of the proponent's representative(s) (consultant) should be outlined and their curriculum vitae provided as an appendix. This section should also briefly describe the historical and present land uses on the subject property, as well as the current land use policy and regulations on and adjacent to the subject property. A general location map and site map is required.

2.3 Biophysical Description of the Site

This section of the EIS should provide a description of the existing natural environment. It should summarize the relevant background studies and report the results of field work conducted during the current study. The study area, survey dates, and field methodology should be discussed in detail. A discussion of the broader Natural Heritage System within which the site is located should be included where applicable. When available, CVCA will provide information on wetland mapping, natural heritage features, flood plain mapping, etc. The Ministry of Natural Resources and Forestry (MNRF) district office in Peterborough or Bancroft may also be a source of information on biophysical features of the site.

The biophysical description section can be divided according to six elements including: geology, hydrogeology, hydrology, vegetation, wildlife and fish habitat. The inventory, described below, can be done using primary and secondary information methods, as appropriate.

The required GIS format of maps and coordinates provided to CVCA are UTM Zone 18 NAD 83 in ESRI shape file format. The use of historical aerial photographs for the subject and surrounding lands is encouraged. Photos dating back to 1952 are available at CVCA. Photos of the current land conditions are also required.

The following is a general list of elements to be considered in the biophysical description of the site. All of these elements must be mapped on an existing conditions site plan showing existing structures as well as existing natural heritage features and areas. Constraints to development must be clearly identified. This should be done prior to mapping of the proposed development on the site plan.

1. Geology
    - Landforms
    - Soils

- Topography
- Erosion-prone locations

2. Hydrogeology
   - Recharge/discharge zones, including seeps
   - Groundwater quality and quantity
   - Groundwater elevations and flow directions
   - Seasonal groundwater elevation variations
   - Connection between groundwater and surface water at site, and the adjacent natural feature(s)
3. Hydrology
   - Surface water quality and quantity
   - Surface drainage features, including swales
   - Wetlands
   - Floodplain and regulation limits
4. Vegetation (see Appendix D)
   - Onsite vegetation:
     I. Determine and map all vegetation communities, including dominant species in accordance with the Ecological Land Classification System (ELC), Southern Ontario manual protocol as appropriate. In tabular format, list all species observed by ecosite or vegetation type unit. Provide copies of completed ELC field sheets in an appendix.
     II. Examine and report on soil samples for communities that may be wetlands.
     III. Describe the location and distribution of all rare or uncommon species based on field surveys and those obtained from the local MNRF district office.
     IV. Map and evaluate wetlands using the latest Ontario Wetland Evaluation System (OWES) Manual. Provide copies of completed OWES field sheets in an appendix.
   - Offsite vegetation, adjacent to the subject property:
     I. Describe the location and distribution of any rare, uncommon or species of conservation concern based on relevant field work and records obtained from the local MNRF district office.
5. Wildlife (see Appendix D)
   - Inventory all wildlife species for each ELC ecosite or vegetation type observed during field site visits and in background reviews. Conduct species specific inventories using acceptable methodologies when required.
   - Report on observed habitat units as per the ELC protocol (e.g., snags, den trees, hibernacula, nests, etc.).
   - Conduct a breeding bird survey (include minimum of two dedicated field site visits) for each habitat type using the Point Count method and provide breeding evidence for each species observed as described in Ontario Breeding Bird Atlas Guide for Participants (2001). Complete field surveys in accordance with the appropriate timing and habitat survey requirements. Please contact the MNRF district office to determine what species specific field surveys are required for

Species At Risk (e.g., bobolink, eastern meadowlark, whip-poor-will) for the property. Include owl call play back surveys where appropriate.

- Complete a spring frog and marsh bird survey in accordance with the Marsh Monitoring Program methodology (Bird Studies Canada), as appropriate.
- Identify, map and confirm all candidate significant wildlife habitat both onsite and on adjacent lands using the Significant Wildlife Habitat Technical Guide, 2000 (OMNR).
- Describe the location and distribution of any rare, uncommon species as well as Species At Risk. Please contact the local MNRF district office to obtain additional records. Please refer to the *Ontario Endangered Species Act* and the federal *Species At Risk Act* to ensure compliance.
- Identify, map and confirm all candidate Significant Habitat of Endangered and Threatened Species both onsite and on adjacent lands, if not already done so by the MNRF. Contact the MNRF district office for information and guidance. Precise configuration of the significant habitat area should be done by an individual with expert knowledge of species requirements.

6. Fish Habitat (see Appendix D)
    - Determine and map the location and distribution of fish habitat and species, particularly spawning and other critical habitats (e.g., refuge pools and nursery habitat).
    - Define watercourse flow characteristics with particular emphasis on seasonal fish habitat.
    - Determine site specific water temperatures.
    - If there is no fish habitat onsite, identify contributing functions (e.g., flow and sediment regime, water quality, vegetation as food source).
    - Identify channel characteristics using the current Ontario Stream Assessment Protocol (OSAP) (Stanfield, 2013) (e.g., width, depth, substrate, meander patterns).

2.4 Description of Proposed Development

This section of the report should focus on the proposed development and/or site alteration in order to fully assess potential impacts associated with various development alternatives and methods. The level of detail required will be determined during the pre-consultation meeting. The EIS sets out conditions that must be met prior to approving development plans. Details such as stormwater management, erosion and sediment control, and/or landscaping plans may be submitted as part of the detailed site design prior to grading. The final site plan should provide sufficient detail, which may include, but is not limited to, the following:

- a detailed map illustrating proposed building envelope(s), the location of any new building(s) or structure(s), new lot lines, stormwater management areas, drainage features (e.g., swales, culverts, tile beds), septic system areas, driveways and parking lots, utility corridors, maintenance routes, public trails, etc), existing infrastructure (including renewable energy)

- a map of natural heritage features and areas, and applicable development constraints
- erosion and sedimentation control measures
- grading limits and post grading contours
- extent of proposed vegetation removal/retention
- development or land use alternatives
- timing of construction, including phasing of development
- all proposed activities associated with the development that may have environmental impacts, and
- other features as requested through the EIS pre-consultation process

Many of these elements can be discussed or described in a general or conceptual manner within the EIS, with the understanding that further detail will be provided when detailed grading information and building envelope information is available. Impacts can be clearly stated in the EIS with final impacts clarified during detailed design stages.

2.5 Potential Impacts Assessment

This section of the report must address impacts that might reasonably be expected to occur as a result of development. Impacts may be direct or indirect and not immediately apparent at the time of initial development. The EIS should consider impacts both onsite and relative to the adjacent lands. The assessment should consider short and long-term cumulative impacts resulting from the development proposal. It is important to note that small-scale development can contribute to cumulative impacts on the landscape. The EIS should predict cumulative impacts of the proposal including existing and future developments within the surrounding area.

Features and functions of concern may include, but are not limited to:

- Impacts to physical features
    - topography – alteration to grade, filling, retaining walls
    - pre-development flood plain encroachments/alterations
    - watercourse or surface drainage feature alterations
    - sediment and erosion sensitive areas – e.g., grading on steep slopes, adjacent to drainage features, etc.
- Impacts to ecosystems
    - vegetation – loss of, encroachment, modification, etc.
    - wildlife and habitat – loss of, fragmentation, lighting, noise, predation by pets, etc.
    - fish habitat – any permanent alteration to, or destruction of fish habitat
    - habitat linkages – loss, encroachment, modification, etc.
    - other natural features including swales, hedgerows, thickets, meadows, etc.
- Impacts to society

- activities that occur within or adjacent to the natural features, (walking, swimming, boating, fishing, trapping, hunting, harvesting, use of all terrain vehicles, etc.)
- recreational amenities – both existing and future trails, access points, etc.

Section 13 of the Natural Heritage Reference Manual (OMNR 2010) provides a comprehensive list of potential impacts on significant (as defined by the Provincial Policy Statement) natural features and natural heritage systems. A condensed list of potential development impacts can also be found in Appendix E of this Terms of Reference.

2.6 Analysis of Mitigation Measures and Compensation Options

All development has the potential for negative impacts on ecosystems. This section of the EIS report must describe potential mitigation measures and possible compensation, and their effectiveness to eliminate or reduce potential impacts of the proposed development on natural features and areas and their functions.

2.6.1 Mitigation

Mitigation, as defined by the Natural Heritage Reference Manual (OMNR 2010), involves the prevention, modification or alleviation of impacts on the natural environment and the prevention of any negative impacts. Mitigation can also include any action intended to enhance beneficial effects.

Types of mitigation include, but are not limited to:

- Modifying the proposal
- Salvaging plant material
- Vegetated buffers and setbacks
- Retaining riparian and shoreline vegetation
- Additional plantings
- Removal of non-native and/or invasive species
- Control of invasive species (gardening or landscaping with native species)
- Timing restrictions, including temporary construction setbacks
- Creating wildlife passages to reduce road kill and the barrier effect of roads
- Wildlife appropriate lighting
- Infiltration measures such as Low Impact Development technologies
- Stormwater management
- Sediment control
- Fencing to control human and pet access to natural areas
- Dedication of land, and

- Public and landowner education (e.g., adverse effects of pets, dumping of lawn clippings and yard waste in natural areas, gardening with native instead of non-native and potentially invasive plants)

2.6.2 Compensation

Compensation for loss of natural vegetation cover and wildlife habitat can include restoring, enhancing or creating habitat. Generally, compensation is not considered an acceptable approach. However, for some very small, low diversity natural features, compensation may be considered, at the sole discretion of CVCA, and when all other mitigation options have been determined to be not feasible. It is a last resort and in many cases will not be considered an acceptable solution.

If compensation is being contemplated, potential opportunities on the property at a suitable location should be identified through the EIS. If compensation for loss of habitat is not possible on the subject property, it may be directed off site to suitable restoration and rehabilitation sites within the CVCA watershed region.

Compensation must be designed and undertaken by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of CVCA.

Compensation can be varied and may involve, but is not limited to restoring wetlands, planting of trees, restoring vegetation communities, creating riparian buffers, creating nesting sites, creating hibernacula, etc. It should be noted that generally, through consultation with CVCA, compensation should favour “like for like.”

2.7 Monitoring

As determined during pre-consultation, monitoring may be required in the pre-construction, construction/operation and post construction periods depending on the scale of development. Details of the monitoring program will be specific to the proposal and will be determined through the completion of the EIS and supporting studies submitted for the site plan and detailed design. Monitoring must be able to detect environmental change that can be attributed to work, or an activity related to the development, and for which some anticipated level of mitigation may be employed.

2.8 Conclusions and Recommendations

This section of the EIS report must:

- Identify and provide the rationale for the preferred development alternative
- Summarize any potential impacts to the natural heritage feature(s) on and off the site
- Summarize any mitigation and compensation measures to be implemented

- Indicate if additional plans are expected to be completed after the EIS report is submitted, or if a new, amended EIS is required due to substantial changes to the original proposal

2.9 References

A list of cited materials comprising the literature review is to be provided in this section of the report.

2.10 Appendices

The appendices should include all information gathered while conducting site visits, including species lists of flora and fauna and site photographs. Curriculum vitae of the acting consultant(s) must also be included. Additional information that must be provided if applicable includes:

- Copies of completed field survey sheets (e.g., Ecological Land Classification (ELC), Ontario Wetland Evaluation System (OWES), Marsh Monitoring Program (MMP), etc.)
- Natural heritage feature boundaries and appropriate buffers and/or development setbacks
- Preliminary stormwater management plans
- Preliminary erosion and sediment control plans, and
- Preliminary vegetation planting and management plans for proposed restoration or buffer areas, including species lists

3.0 REFERENCES

Lee, H, T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification System for Southern Ontario: First Approximation and its application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement under the Planning Act.

Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch Wildlife Section. Science Development and Transfer Branch.

Ontario Ministry of Natural Resources. March 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. 2005. Second edition. Toronto: Queen's Printer for Ontario.

Ontario Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System for Southern Ontario 3rd edition.

Stanfield, L. (editor). 2013. Ontario Stream Assessment Protocol. Version 9.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 505 pages.

4.0 APPENDICES

Appendix A: EIS Scoping Checklist

Date: _____ Completed by: _____

Proponent: _____

Location: _____

Type of Application: _____

Check first box if sufficient information is available; check second box if to be addressed by current EIS

□ □ **Natural Heritage Designation and Zoning:**

- □ □ Provincially Significant Wetland
- □ □ Non-Provincially Significant Wetland
- □ □ Unevaluated Wetland
- □ □ Threatened or Endangered Species Habitat
- □ □ Significant Woodland
- □ □ Significant Valleyland
- □ □ Significant Wildlife Habitat
- □ □ Area of Natural and Scientific Interest
- □ □ Fish Habitat
- □ □ Other Designations (e.g., SNA, ESA, ORM, Greenlands, etc.)

□ □ **Geology, Hydrogeology, Hydrology:**

- □ □ Subwatershed or Wetland Catchment boundary
- □ □ Surface Drainage Patterns (incl. all permanent and intermittent watercourses)
- □ □ Geomorphologic and Topographic features
- □ □ Soils (surface and subsurface)
- □ □ Groundwater Recharge/Discharge Areas
- □ □ Hyrdogeologic Conditions

Specify timing of any field studies to be done:

□ winter □ spring □ summer □ fall

□ □ **Natural Hazard Lands:**

- □ □ Survey Flood Plain
- □ □ Valleylands
- □ □ Erosion Hazards
- □ □ Poorly Drained Soils

□ □ **Biological Inventory:**

- □ □ Wetland Evaluation
- □ □ Wetland Boundary Deliniation
- □ □ Ecological Land Classification
- □ □ Wildlife Inventory
  - □ Amphibians □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Reptiles □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Birds □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Mammals □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Fish □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Insects □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Plants □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ SAR □ Jan □ Feb □ Mar □ Apr □ May □ Jun □ Jul □ Aug □ Oct □ Nov □ Dec
  - □ Other:

See next page for Significant Wildlife Habitat identification.

- □ Significant Wildlife Habitat
  - □ Seasonal Concentration Areas of Animals
    - □ Waterfowl Stopover and Staging Areas -Terrestrial and Aquatic
    - □ Shorebird Migratory Stopover Area
    - □ Raptor Wintering Area
    - □ Bat Hibernacula
    - □ Bat Maternity Colonies
    - □ Bat Migratory Stopover Area
    - □ Turtle Wintering Area
    - □ Snake Hibernacula
    - □ Colonially Nesting Bird Breeding Habitat (Bank and Cliff/Tree/Shrub, Ground)
    - □ Migratory Butterfly Stopover Area
    - □ Landbird Migratory Stopover Areas
    - □ Deer Yarding Areas
    - □ Deer Winter Congregation Area
  - □ Rare Vegetation Communities or Specialized Habitat for Wildlife
    - □ Cliff and talus slopes
    - □ Sand Barren
    - □ Alvar
    - □ Old Growth Forest
    - □ Savannah
    - □ Tallgrass Prairie
    - □ Other
  - □ Specialized Habitat for Wildlife
    - □ Waterfowl Nesting Area
    - □ Bald Eagle and Osprey Nesting, Foraging, Perching Habitat
    - □ Woodland Raptor Nesting habitat
    - □ Turtle Nesting Areas
    - □ Seeps and Springs
    - □ Amphibian Breeding Habitat - Woodland and Wetland
  - □ Habitat for Species of Conservation Concern (not including End or Thr Species)
    - □ Marsh/Woodland Area-Sensitive/Open Country/Shrub/Early Successional Bird Breeding Habitat
    - □ Terrestrial Crayfish
    - □ Special Concern and Rare Wildlife Species
  - □ Animal Movement Corridors
    - □ Amphibian Movement Corridors
    - □ Deer Movement Corridors
  - □ Other
    - □ Mast producing Areas
    - □ Lek

Appendix B: EIS Reporting Standards

Please ensure that the following standards are met:

- 2 paper copies of the report and a digital copy, signed by the principal author(s), are submitted to CVCA;
- 8 ½" X 11" paper, doubled sided;
- a title page listing the name of the proponent, address of the subject property, name of consulting firm and consultant, and the date the report was completed;
- maps 11"X17" shall be bound into the report – larger maps shall be inserted in a pocket inside the back cover of the report;
- minimum map size is 8"X11", maximum 36"X60" (folded to 8.5"x11" to fit inside report) and must be in colour where applicable;
- all maps to include a metric scale, north arrow, full legend corresponding to all mapped features
- surveyed site plan and maps showing vegetation community boundaries identified using the Ecological Land Classification System for Southern Ontario (Lee et all. 1998), surveyed wetland boundary and verified by CVCA staff, flood plain lines and regulation limits, existing and proposed land use and property boundaries;
- appendices to include:
    - annotated species checklists with current S ranks and *Endangered Species Act* and *Species At Risk Act* designations
    - CV(s) of consultant(s) carrying out the EIS
    - list of contributors
    - a copy of the approved Terms of Reference

Submitted documents shall remain the property of CVCA.

Appendix C: Data Collection Standards

The requirement for multi-season biological inventory will be determined during the pre-consultation meeting with CVCA. A multi-season inventory may be waived or reduced in scale when relatively current data is available for the site. Such studies may include subwatershed studies, biological inventories, wetland evaluations, or site specific biological studies completed for a municipality or in support of other development applications. In most cases, a minimum of three (3) site visits at the appropriate time of year will be required. When older (5 years and older) inventory data is available, it must be updated through the current study. The need to supplement existing data through a single or multi-season inventory will be evaluated on a case by case basis depending on the nature of the development. The appropriate standard inventory protocols must be followed by a trained field biologist. The suggested biological inventory schedule is shown below.

Survey Timing	Target Organisms
Early Spring (Late March / early April)	• early frogs (wood, spring peeper and chorus frogs) • salamanders • ducks and geese • raptors • owls
Spring (May)	• frogs • migratory birds • reptiles including turtles and snakes • benthics • ephemeral flora
Early Summer (June)	• breeding birds • reptiles including turtles and snakes • benthics • fish and fish habitat • vegetation communities including wetlands

Summer (mid-July / early August)	• breeding birds • wildlife habitat • wetland species • vegetation communities including wetlands • summer flora • prairie species • insects including butterflies and dragonflies
Fall (September)	• migratory birds • late summer plant species • prairie species • butterflies

The following list provides standard surveying protocols for natural heritage identification and fieldwork in Ontario. *Please provide copies of completed field sheets for each field methodology used.*

1. OWES - Ontario Wetland Evaluation System for Southern Ontario (OMNR, 2013, or most current version)
2. ELC - Ecological Land Classification System for Southern Ontario (Lee et al. 1998, or most current version)
3. Ontario Breeding Bird Atlas guide for participants (2001 or most current version). (http://www.birdsontario.org/download/atlas_feb03.pdf)
4. MMP - Great Lakes Marsh Monitoring Program (http://www.bsc-eoc.org/mmpmain.html)
5. Significant Wildlife Habitat Technical Guide (OMNR 2000, or most current version)

Appendix D: Potential Impacts

Development activities likely to impact natural heritage features and areas, their functions, and natural heritage systems include: vegetation removal, grading, aggregate extraction, installation of services and utilities, building construction, water crossings, paving, groundwater taking, use of septic systems, human occupation, and recreation (walking, swimming, boating, fishing, hunting, use of all terrain vehicles, etc.).

Vegetation removal and/or site grading can:

- reduce wildlife habitat;
- fragment natural areas stressing forest interior species;
- introduce non-native species;
- cause loss of linkages for animal movement resulting in isolation of populations and ultimately loss of biodiversity;
- disturb sensitive wildlife species;
- result in loss of rare plant species and communities;
- change the soil moisture regime and vegetation communities;
- reduce stability or cause physical alterations to sensitive landforms; and
- affect groundwater recharge.

In riparian areas, vegetation removal and site grading can also:

- increase runoff and stream water temperature negatively affecting aquatic habitats;
- increase inputs of nutrients and contaminants to waterbodies;
- reduce quantity of food supply for aquatic life in the form of leaves, twigs and insects in waterbodies;
- reduce bank stability and increase erosion and sedimentation with resultant impacts on aquatic habitats;
- disrupt riparian corridors; and
- disturb sensitive wildlife species.

In addition, wildlife may be negatively impacted by the following features associated with residential and commercial development:

- lights;
- noise;
- pets; and
- lawns.

Construction of buildings and roads, and installation of services can:

- increase water contamination by oils, gasoline, grease and other materials from parking lots, driveways, and roads;
- increase imperviousness affecting groundwater recharge;
- result in direct loss of wildlife from collisions with buildings or vehicles;
- attract nesting turtles and other wildlife to roadsides increasing roadkills;
- increase nutrient inputs from septic systems;
- result in increased use of pesticides and fertilizers on lawns;
- increase predation of wildlife species by pets and invasion of non-native species;
- increase lighting and noise which may affect sensitive wildlife species; and
- result in loss of linkages between habitats.

Interference with waterways (realignment, stream crossings) can:

- affect fish movement;
- affect water temperature and aquatic habitat; and
- affect channel geomorphology, wetland communities and fish habitat.

Recreational activities and seasonal development can:

- increase harvest of fish and reduce populations;
- improve access to sensitive sites which can result in vandalism and loss of ecosystem integrity;
- increase shoreline alteration which affects fish habitat;
- cause trampling of vegetation and soil compaction which affects vegetation communities and increases runoff to watercourses (impacting aquatic life);
- result in removal of vegetation causing loss of wildlife habitat and reduced biodiversity; and
- disturb sensitive wildlife species.