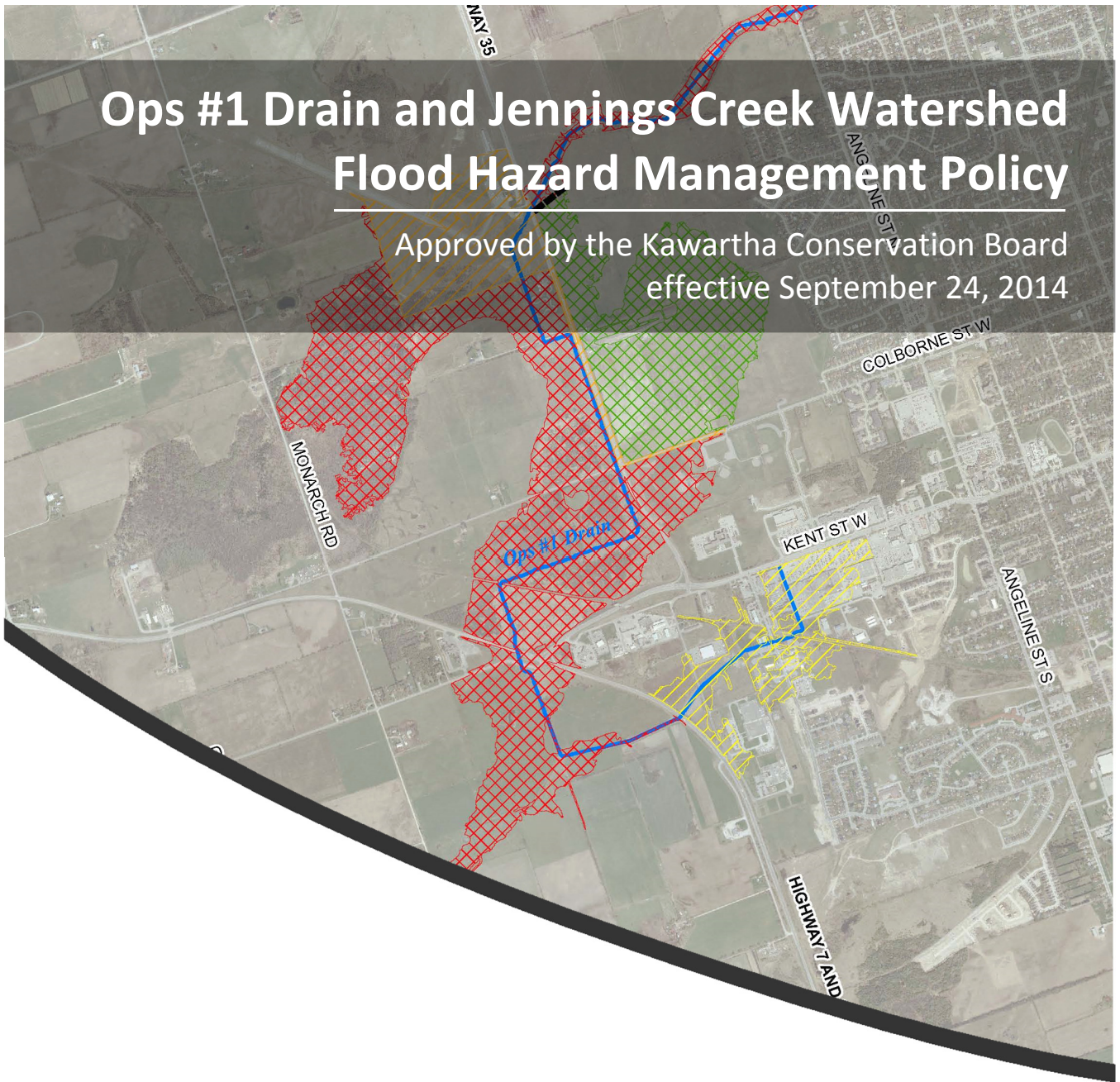


Ops #1 Drain and Jennings Creek Watershed Flood Hazard Management Policy

Approved by the Kawartha Conservation Board
effective September 24, 2014



**KAWARTHA
CONSERVATION**

Discover • Protect • Restore

About Kawartha Conservation

Who we are

We are a watershed-based organization that uses planning, stewardship, science, and conservation lands management to protect and sustain outstanding water quality and quantity supported by healthy landscapes.

Why is watershed management important?

Abundant, clean water is the lifeblood of the Kawarthas. It is essential for our quality of life, health, and continued prosperity. It supplies our drinking water, maintains property values, sustains an agricultural industry, and contributes to a tourism-based economy that relies on recreational boating, fishing, and swimming. Our programs and services promote an integrated watershed approach that balance human, environmental, and economic needs.

The community we support

We focus our programs and services within the natural boundaries of the Kawartha watershed, which extend from Lake Scugog in the southwest and Pigeon Lake in the east, to Balsam Lake in the northwest and Crystal Lake in the northeast – a total of 2,563 square kilometers.

Our history and governance

In 1979, we were established by our municipal partners under the *Ontario Conservation Authorities Act*.

The natural boundaries of our watershed overlap the six municipalities that govern Kawartha Conservation through representation on our Board of Directors. Our municipal partners include the City of Kawartha Lakes, Region of Durham, Township of Scugog, Township of Brock, Municipality of Clarington, Municipality of Trent Lakes, and Township of Cavan Monaghan.

Kawartha Conservation

T: 705.328.2271

F: 705.328.2286

277 Kenrei Road, Lindsay ON K9V 4R1

GenInfo@KawarthaConservation.com

KawarthaConservation.com

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Ops #1 Drain and Jennings Creek Watershed Flood Hazard Management Policy

Kawartha Region Conservation Authority (further referred to as Kawartha Conservation)

The Ops #1 Drain and Jennings Creek Flood Hazard Management Policy defines area specific flood plain management policies for the Ops#1 Drain and Jennings Creek watershed area.

Preamble

During a flood, river water levels rise resulting in the inundation of areas not ordinarily covered by water. Such areas are known as flood plains. How extensive flooding will be in any area is determined generally, by the drainage basin or watershed, as well as the land use. In an attempt to prevent loss of life and minimize property damage, *development* in flood plains is managed to minimize risks.

In most cases, the flood plain is identified and regulated as one unit; this includes all areas of inundation and is called the One-Zone concept. The Two-Zone concept is another way to regulate the flooding hazard and involves establishing areas within the flood plain that may be permitted to develop with suitable guidelines and policies to manage the risk, and areas where *development* cannot occur due to the risks and/or effects of the *development* on the flood hazard. These two areas are called the floodway and the flood fringe. The floodway is defined as the portion of the flood plain representing the area required for the safe passage of flood flow and/or where flood depths and/or velocities are considered to be such that they pose a potential threat to life and/or property damage. Development and site alteration within the floodway would cause a danger to public health and safety or property damage. The flood fringe is the portion of the flood plain where flood depths and velocities are less severe and where *development* may be permitted subject to certain standards and procedures. Under certain circumstances the floodway and the flood fringe can be managed differently while still adequately managing the risk associated with the flood plain. Kawartha Conservation has utilized both the One-Zone concept and the Two-Zone concept within the Ops #1 Drain and Jennings Creek flood plain.

This policy document also addresses an existing developed area where flooding potential exists as a result of backwater flooding from structures at the Highway #7/35 crossing and in the built up area. This area has been identified as an Urban Drainage Flooding Hazard Area and Kawartha Conservation's Plan Review and Regulations Policies will be applied based on the dynamic hydraulic modeling developed in the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014, as amended).

This policy has been approved by the Kawartha Conservation Board, effective September 24, 2014.

1.0 General

- 1.1 The policies contained herein are based on the flood plain analysis and recommendations of the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014, as amended), and are consistent with the Provincial Policy Statement issued under Section 3 of the Planning Act (Public Health & Safety) R.S.O. 2014.
- 1.2 Consistent with the PPS (2014), development shall be directed away from the flood plain where there is an unacceptable risk to public safety or property damage, and shall not create new or aggravate existing hazards.
- 1.3 The following new uses shall not be permitted in the flood plain:
 - 1.4 institutional uses including hospitals, long-term care homes, retirement homes, pre-schools, school nurseries, day cares and schools;
 - 1.5 essential emergency services such as that provided by fire, police and ambulance stations and electrical substations; or
 - 1.6 uses associated with the disposal, manufacture, treatment or storage of hazardous substances.
- 1.7 The policies contained herein shall come into effect when approved by Kawartha Conservation's Board of Directors.
- 1.8 For the purposes of this policy, the Regulatory flood is either the Regional Storm (Timmins Flood Event) or the 100-year Flood Event, whichever results in the highest flood elevation as described in Ontario Regulation 182/06.
- 1.9 For the purposes of this policy, development will be defined using the Conservation Authorities Act definition which includes site grading and modification. Please refer to the definitions section for a full definition.
- 1.10 Where the One-Zone concept for the flood plain continues to be applied, development proposals shall be evaluated in accordance with Kawartha Conservation's current Plan Review and Regulations Policies.
- 1.11 Where the *Two-Zone concept* for the *flood plain* has been applied, *development* may be permitted, subject to policies in Section 3.0.
- 1.12 Watershed areas downstream of the Highway 7/35 and Ops #1 Drain crossing and upstream of the Scugog River will be regulated using the Regulatory flood results of the static hydraulic model developed in the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014, as amended).
- 1.13 *Watershed* areas upstream of the Highway 7/35 and Ops #1 Drain crossing (Urban Drainage Flooding Hazard Area) will be regulated using the *Regulatory flood* results of the dynamic hydraulic model developed in the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014, as amended).
- 1.14 *All proposed development should attempt to mitigate the flood risk wherever possible through informed development siting.*

- 1.15 *Where capital improvements are implemented and/or land development has the potential to alter the extent or elevation of the flooding hazard Kawartha Conservation will determine the need for flood line mapping updates.*
- 1.16 *The policies contained herein shall be implemented by Kawartha Conservation when considering applications submitted pursuant to Ontario Regulation 182/06 within the Policy Areas as identified in Section 2.0.*
- 1.17 *Kawartha Conservation shall apply the policies contained herein when providing comments on applications submitted under the Planning Act for lands affected by the Policy Areas as identified in Section 2.0.*
- 1.18 *The policies contained herein are intended to guide planning policy established by the City of Kawartha Lakes.*
- 1.19 *Development applications submitted for lands affected by this policy will also be subject to the normal course of approvals and applicable fees, including but not limited to: policies and procedures for obtaining fill permits, site plan applications, plan of subdivision, building permit applications and/or provincial permitting requirements.*

2.0 Definition of Policy Areas

The policies contained herein identify policy areas based on the characteristics of the *watershed* and the recommendations from Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014).

2.1 One-Zone Policy Area

Where the *One-Zone concept* continues to be applied Kawartha Conservation's Plan Review and Regulation Policies shall apply.

The spatial extents of the One-Zone Policy Areas are defined as all of the lands affected by the *Regulatory flood* within the *watershed* of Ops #1 Drain and Jennings Creek saving and excepting those lands where the *Two-Zone concept* has been applied, and lands that have been identified as an Urban Drainage Flooding Hazard Policy Area under Section 2.0, and as illustrated in Schedule A.

2.2 Two-Zone Policy Areas

The *Two-Zone concept* will be applied within the Two-Zone Policy Areas identified in Section 2.2.1 and 2.2.2 subject to the policies in Section 3.0.

2.2.1 Planned Development Area

Within this policy area there are lands which have been identified in the Lindsay Secondary Plan for development. The spatial extents of the Planned Development Area is defined as all the lands located within Lots 22 & 23, Concession 4 in the former Township of Ops that are affected by the Regulatory flood of the Ops #1 Drain and Jennings Creek, and illustrated in Schedule A, Two Zone Area – Flood Fringe which covers all or portions of the lots described above.

Based on the results of the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014) these lands have been identified as flood plain under a Regulatory Storm where previous reports had indicated otherwise. This study also recommended that the Two-Zone concept could be applied to these lands based on:

- Flooding results from water overtopping Highway #35 and collecting on the subject lands which has very low water velocities and does not pose a risk;
- A preliminary analysis to remove this Planned Development Area from the flood plain indicated no significant effects on the flood hazard; and
- Intent for *development* has been established through:
 - o Long term planning for the Community of Lindsay indicate *development* for the subject lands;
 - o Investments have been made by the Municipality and developers to service the lands; and
 - o Both the Municipality and Kawartha Conservation support the *development* of these lands while maintaining the need to adequately manage the flood hazard.

Based on the results of the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014) and consultation with stakeholders Kawartha Conservation has identified these lands as flood fringe. Kawartha Conservation will permit *development* provided that the requirements of Policy 3.2 are satisfied and the comprehensive study demonstrates that flood risks can be managed adequately in the interim at various phases of development through to the complete development of those lands in the Planned Development Area.

2.2.2 Airport Lands

This policy area contains a portion of the Airport Lands as identified in the Lindsay Secondary Plan for future development. The Municipality and Airport Board would like to develop these lands in the future while adequately managing the flood hazard. The Two-Zone concept will also be applied to these lands for the following reasons:

- Long term plans for expansion and *development* are in place in the form of an Airport Development Plan;
- Development of the lands are also subject to Federal jurisdiction;
- Flood water velocities do not pose a risk on a majority of the lands; and
- The Lindsay Airport Board has indicated its intent to implement *development* recommendations made by Kawartha Conservation.

The spatial extents of the Airport Lands are defined as all of the lands identified in the Lindsay Secondary Plan as Airport Lands that are affected by the Regulatory flood of the Ops #1 Drain and Jennings Creek, and as illustrated in Schedule A.

2.3 Urban Drainage Flooding Hazard Policy Area

Regulatory *flood plain* mapping is generally not applied to areas which drain less than 125 hectares. The majority of the Urban Drainage Flooding Hazard Area is less than 125 hectares. However, within the urbanized headwaters of the Ops #1 Drain a *flooding hazard* has been identified (Kawartha Conservation, June 2014) as a result of *backwater flooding* from a number of structures upstream of and including the Highway 7/35 structure. In order to appropriately manage risk to life and property, while recognizing the presence of *existing uses*, this area has been identified as an Urban Drainage Flooding Hazard Area. The *flooding hazard* within this area will be regulated using the dynamic hydraulic modeling results developed in the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014, as amended).

The spatial extent of the Urban Drainage Flooding Hazard Policy Area is defined as all of the lands within the *watershed* of Ops #1 Drain upstream of the crossing of the Ops #1 Drain and Highway 7/35 affected by flooding based on the dynamic hydraulic modeling developed in the Ops #1 Drain and Jennings Creek *Flood Plain Mapping Study* (Kawartha Conservation, June 2014, as amended), and as illustrated in Schedule A.

3.0 Two-Zone Area Policies

3.1 Refer to the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014) for the *flood elevation* of the *flooding hazard* for the Two-Zone Area.

3.2 Comprehensive Studies

A comprehensive study will be required by Kawartha Conservation to inform flood plain management decisions and facilitate future *development* plans in those areas where a Two – Zone concept will be applied. A comprehensive study is intended to develop the technical information and assess the cumulative impact of *development* plans on the flooding hazard and should be based on the most current planning information available at the time. A study may be scoped based on storm outlets and the hydrological connection of adjacent lands.

It is intended that comprehensive studies be conducted prior to or in concert with detailed site planning and may satisfy other two-zone policy requirements as set out in Section 3.4. If future planning information (e.g. detailed site plans) changes the findings of a comprehensive study, Kawartha Conservation will determine if revisions to *development* plans and/or the comprehensive study are required.

A comprehensive study will demonstrate the required conditions established in a terms of reference developed through consultation with Kawartha Conservation and City of Kawartha Lakes to the satisfaction of Kawartha Conservation and the City of Kawartha Lakes. At a minimum this terms of reference should include the following analyses completed by a *qualified professional*:

- i. delineation of the existing and future *floodway* and *flood fringe*, where the *flood fringe* has not been defined by this policy;
- ii. a hydrologic/hydraulic analysis of the *development* demonstrating:
 - a. no significant adverse impact on flood elevations and/or velocities upstream or downstream; and
 - b. new flooding hazards are not created and existing flooding hazards are not aggravated.
- iii. a report to demonstrate a conceptual storm water management scheme that does not affect the flood hazard;
- iv. a report demonstrating how the *development* will convey the Regulatory flow (i.e. flow path, ultimate outlet, overland flow route capacity, etc.);
- v. grading and drainage plans which strive to eliminate the *flooding hazard* within *flood fringe* areas; and/or
- vi. where it is not feasible to eliminate the *flooding hazard* through grading , the placement of fill and/or cut of land, and drainage plans a report shall demonstrate that the *development* provides:
 - a. safe ingress/egress to a maximum of 0.3m below the *flood elevation*; and
 - b. any flood proofing standards required (current MNR technical guidelines to be used as a minimum).

3.3 Policies Applicable to Floodway

3.3.1 *Development* shall not be permitted in the *floodway*, except for uses which by their nature must locate within the *floodway*, including flood and/or erosion control works or minor additions or passive non-structural uses which do not affect flood flows.

3.4 Policies applicable to the Flood Fringe

3.4.1 A change in existing use may be permitted, if it is demonstrated that the proposed change in use will not result in an increased flood risk or threat to public safety and property damage.

3.4.2 New buildings may be permitted within the *flood fringe* provided:

- i. finished floor elevations are at least 0.3 metres above the *flood elevation*;
- ii. lowest openings are at least 0.3 metres above the *flood elevation*;
- iii. safe ingress/egress can be provided to no more than 0.3 metres below the *flood elevation*; and
- iv. all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the *flood elevation*.

3.4.3 Expansions and/or additions to existing buildings may be permitted within the *flood fringe* provided:

- i. dry, passive floodproofing measures are used for all residential, commercial and industrial buildings;
- ii. options are explored to mitigate flood risks to the existing building;
- iii. safe ingress/egress can be provided to no more than 0.3 metres below the *flood elevation*; and
- iv. all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the *flood elevation*.

3.4.4 Notwithstanding Policy 3.4.2 and 3.4.3, new airplane hangars and non-habitable accessory buildings or expansions and/or additions to existing hangars and non-habitable buildings may be permitted provided they are:

- i. constructed at or above existing grade;
- ii. sited in a way that minimizes the flood risks;
- iii. structurally anchored; and
- iv. all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the *flood elevation*.

3.4.5 Further to 3.4.2, 3.4.3, and 3.4.4, and for all other types of *development*, additional studies or analysis completed by a *qualified professional* may be required depending on the nature and scale of the *development* and could include:

- i. a hydrologic/hydraulic analysis of the *development*;
- ii. an assessment of the impacts of any additional *fill* on the *flooding hazard* and upstream/downstream lands;

- iii. an assessment of the structural integrity of the building to withstand flood and hydro-static pressures;
 - iv. an assessment of storm servicing feasibility; and/or
 - v. floodproofing plans to support any proposed *development*.
- 3.4.6 New roads and parking lots shall be constructed such that they are above the *flood elevation*, wherever possible. Where this is not possible they must be no more than 0.3m below the *flood elevation*.
- 3.4.7 Notwithstanding Policy 3.4.6, road reconstruction and new roadway connections to existing roads that are more than 0.3m below the *flood elevation* may be constructed with a suitable transition.
- 3.4.8 Storm water management controls shall be located outside of the flooding hazard wherever possible. Where this is not possible they must adequately address the flood hazard.

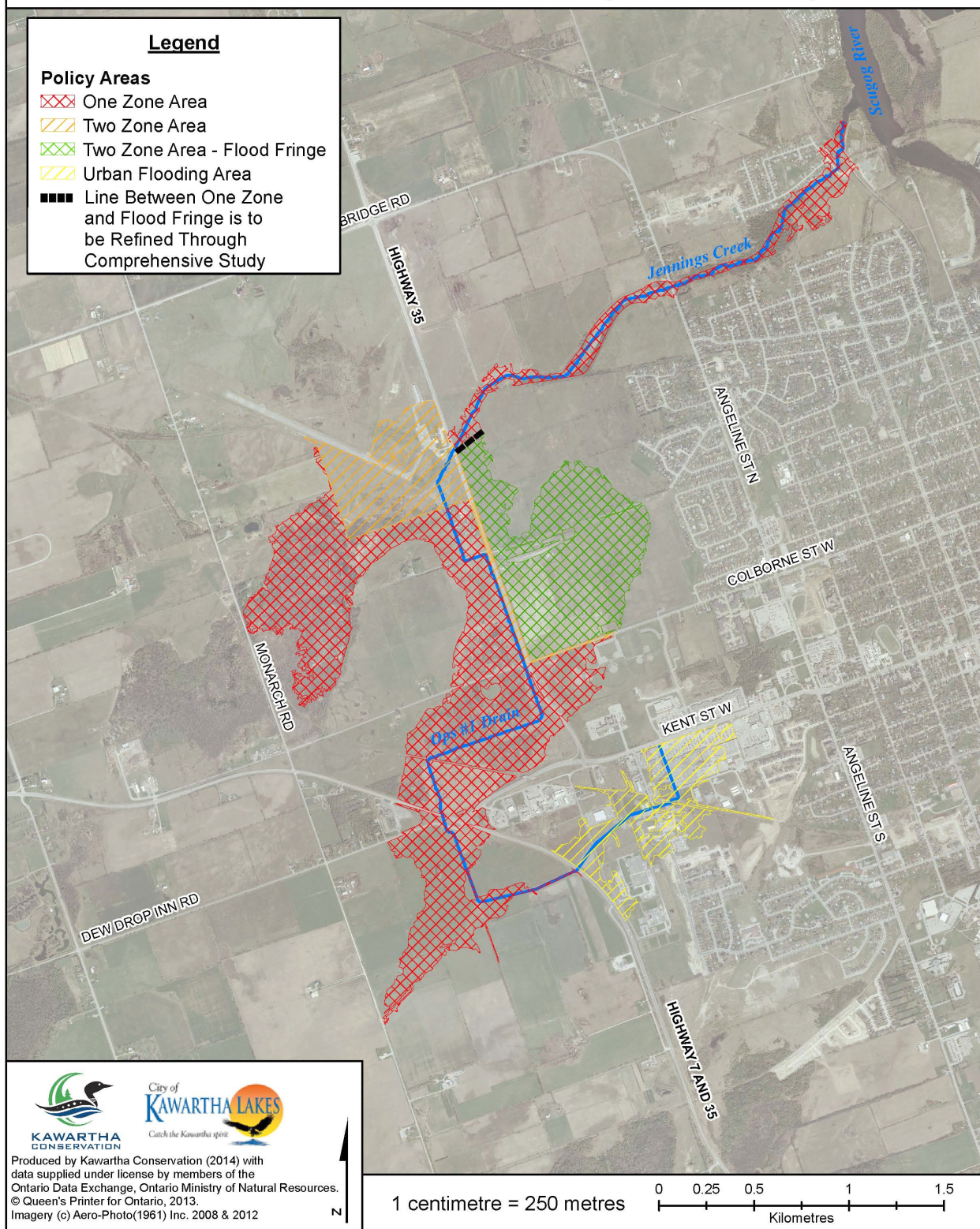
4.0 Urban Drainage Flooding Hazard Area Policies

- 4.1 Refer to the Ops #1 Drain and Jennings Creek Flood Plain Mapping Study (Kawartha Conservation, June 2014) for the *flood elevation* of the *flooding hazard* for the Urban Drainage Flooding Hazard Area.
- 4.2 New lots shall require a building envelope outside of the flooding hazard.

Storm water management controls shall be located outside of the flooding hazard. For quality control where this is not possible, the design must adequately address the flood hazard.
- 4.3 A change in existing use may be permitted, if it is demonstrated that the proposed change in use will not result in an increased flood risk or threat to public safety and property damage.
- 4.4 Development may be permitted provided:
 - i. dry, passive floodproofing measures are used for all residential, commercial and industrial buildings;
 - ii. notwithstanding 4.4 (i.) Wet floodproofing may be permissible for non-habitable accessory structures provided it is structurally anchored;
 - iii. *safe ingress/egress* can be provided to no more than 0.3 metres below the *flood elevation*;
 - iv. only the minimum amount of *fill* required to dry floodproof and/or achieve the required safe ingress/egress shall be permitted, and a *balanced cut/fill* shall be required where practical and feasible;
 - v. all electrical circuits, outlets and permanently installed electrical equipment are to be located at least 0.3 metres above the *flood elevation*; and
 - vi. additional studies or analysis completed by a *qualified professional* may be required depending on the nature and scale of the *development* and could include:
 - a. a hydrologic/hydraulic analysis of the *development*;
 - b. an assessment of the impacts of any additional *fill* on the *flooding hazard* and upstream/downstream lands;
 - c. an assessment of the structural integrity of the building to withstand flood and hydrostatic pressures; and/or a
 - d. an assessment of storm servicing feasibility.
- 4.5 Parking lots should be constructed such that they are above the flood elevation, wherever possible. Where this is not possible, they must be no more than 0.3 m below the flood elevation.
- 4.6 No basements are proposed.

Schedule A

Schedule A: Ops #1 Drain and Jennings Creek Policy Areas



Definitions

Backwater Flooding – Flooding as a result of downstream human-made structure(s) such as a bridge opening or culvert that restricts water flow.

Balanced Cut and Fill - All fill placed at or below the flood elevation balanced with an equal amount of soil material removal within a defined reach of a watercourse.

Development - As defined by the Conservation Authorities Act:

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

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

Fill - Includes earth, sand, gravel, rubble, rubbish, garbage, or any other matter 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 effect the existing grade (does not include herbaceous or woody plant material).

Flood Elevation - The elevation of inundation or the water surface elevation of flood waters for a specific area as determined through a Flood Plain Study accepted and approved for use by Kawartha Conservation.

Flooding hazard - The limits of an area of inundation under a flood resulting from the rainfall experienced during the Timmins storm (1961) or the 100-year flood, whichever is greater.

Flood fringe - for river, stream and small inland lake systems, means the remaining portion of the flood plain between the floodway and the flooding hazard limit. Depths and velocities of flooding are generally less severe in the flood fringe than those experienced in the floodway.

Flood plain - The area, usually low lands, adjoining a river, stream or small inland lake system, which has been or may be subject to flooding hazards.

Floodway - for river, stream and small inland lake systems, means the portion of the flood plain where development and site alteration would cause a danger to public health and safety or property damage.

Where the one zone concept is applied, the floodway is the entire contiguous flood plain.

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

Material - Includes earth, sand, gravel, stone or woody debris (e.g., root wads, fascines).

One Hundred Year Flood Event (100-year flood) - Rainfall or snowmelt, or a combination of rainfall and snowmelt, producing at any location in a river, creek, stream or watercourse a peak flow that has a probability of occurrence of one per cent during any given year.

One-Zone Concept - means an approach to flood plain management where the floodway is the entire contiguous flood plain.

Qualified Professional - A person with specific qualifications, training, and experience authorized to undertake work in accordance with the policies in accepted engineering or scientific principles, provincial standards, criteria and guidelines, and/or to the satisfaction of Kawartha Conservation.

Regulated Area - Those areas within the jurisdiction of Kawartha Conservation defined in Ontario Regulation 182/06.

Regulatory Flood - The inundation under a flood resulting from the rainfall experienced during the Timmins Storm (1961) or the 100-year flood, wherever it is greater, the limits of which define the flooding hazard.

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

Safe Ingress/Egress - The standards and procedures currently applied in engineering practice associated with providing safe passage for vehicles and people during an emergency situation as a result of flooding, 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. Kawartha Conservation looks to the most conservative criteria set out in the Ministry of Natural Resources' Technical Guide – River & Stream Systems: Flooding hazard Limit (2002), and Technical Guide – River & Stream Systems: Erosion Hazard Limit (2002), to determine safe access.

Structure - Is that which is constructed to contain, convey, hold-back and/or support, comprised of a combination of multiple related parts, elements or constituents.

Two-Zone concept - means an approach to flood plain management where the flood plain is differentiated in two parts: the floodway and the flood fringe.

Watershed - An area that is drained by a river and its tributaries

Kawartha Conservation

T: 705.328.2271

F: 705.328.2286

277 Kenrei Road, Lindsay ON K9V 4R1

GenInfo@KawarthaConservation.com

KawarthaConservation.com