



## **East Burlington Creeks Flood Hazard Mapping Study**

### **Public Engagement Session #1**

Conservation Halton hosted the first public engagement session for the East Burlington Creeks Flood Hazard Mapping Study on October 14, 2021. The virtual Zoom session was attended by approximately 80 residents and stakeholders and approximately 85 questions were submitted before and during the session. We recognize and appreciate the high level of public interest in this study and have grouped questions with similar themes together to provide complete responses.

If you do not see an answer to your specific question, please contact us at [floodplainmapping@hrca.on.ca](mailto:floodplainmapping@hrca.on.ca) or at the contact information below and we would be happy to discuss further:

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*The second public engagement session to update on study progress, present draft, updated flood hazard mapping and engage with residents and stakeholders will occur in Winter 2022.*

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## **Question & Answer Summary**

### **How does this flood hazard mapping study apply to active Planning Act applications in the study area?**

The purpose of Conservation Halton's (CH) East Burlington Creeks Flood Hazard Mapping Study is to comprehensively update riverine flood hazard mapping for Tuck, Shoreacres, Appleby and Sheldon Creek watersheds. It is also to help us better understand the magnitude and extent of riverine hazards and to assess potential risk to life and property.

This study is not evaluating site specific planning applications or development proposals. However, Conservation Halton Planning and Regulations staff is involved in the review of Planning Act applications in the study area through the municipal plan review process. This includes Millcroft Greens Corporation (Country Club Drive and Dundas Street) and Branthaven Development Corporation (Oval Court and Fairview Street).

CH reviews planning applications or development proposals that are located near or within hazardous lands (e.g., flooding and erosion hazards). Developers are required to demonstrate that any proposed development will not increase flood risk or impact upstream or downstream lands by using sophisticated studies done by independent engineering firms specializing in water resources engineering. CH's goal in the review of planning and development proposals is to protect people and property from risks related to natural hazards and to make sure that existing hazards are not worsened and/or new hazards are not created by new development.

Through our public engagement efforts and reviews of planning and development proposals, developers are notified of CH's East Burlington Creeks Flood Hazard Mapping Study to ensure that they are aware of the study and have access to the best available flood hazard information coming out of the study, once available.

CH will continue to review any planning applications or developments submitted within the East Burlington Creeks Flood Hazard Mapping Study area using the best available flood hazard information. We will advise the municipalities and developers of any necessary revisions and/or Conservation Halton permit requirements as new information becomes available through completion of the study, which is targeted for March 2022.

### **How does this flood hazard mapping study apply to new development proposals in the study area?**

Developers of residential, commercial, industrial, and/or infrastructure projects are required by Conservation Halton to demonstrate that any proposed development in hazard lands will not increase flood risk or impact upstream or downstream lands. CH's primary goal is to protect people and property from risks related to natural hazards and to make sure that existing hazards are not worsened and/or new hazards are not created by new development.

The East Burlington Creeks Flood Hazard Mapping Study completion is anticipated for March 2022. However, once the study is further advanced, Conservation Halton will assess study results to determine when the information is considered the best available information for understanding the magnitude and extent of the flood hazard, assessing potential risk to life and property, identifying areas requiring further analysis, and/or decision making when development is contemplated in hazardous areas.

### **How does this flood hazard study relate to home insurance policies for flooding?**

The East Burlington Creeks Flood Hazard Mapping Study is not being undertaken for insurance policy purposes. We recommend that property owners contact their insurance provider to learn more about coverage for different types of flooding and how the insurance provider assesses risk.

The updated flood hazard mapping will be made publicly available in draft form, as part of the second public engagement session of the study. Once finalized, the mapping will be brought forward to Conservation Halton's Board of Directors for approval and then it will be incorporated into Conservation Halton's approximate regulation limit (ARL) mapping.

Conservation Halton's ARL mapping is shared with municipalities and made publicly available through the Conservation Halton website at [conservationhalton.ca/planning-permits](https://conservationhalton.ca/planning-permits). This mapping provides property owners and potential purchasers with the best available information about potential riverine flood risks on a property.

If your property falls within the existing or updated riverine flood hazard limit, it may be at risk of riverine flooding under an extreme weather event. It also means your property is regulated by Conservation Halton and permission from Conservation Halton will be required prior to any construction or development. Application forms are available on the Conservation Halton website and proposals for development will be assessed according to policies as approved by the Conservation Halton Board of Directors (also available on the Conservation Halton website) Conservation Halton regulates properties within or close to hazardous lands to ensure risk to any future development from flooding are mitigated or avoided and that there are no impacts to neighbouring properties.

CH's mapping may differ from the information insurance companies apply when establishing rates for flood coverage. Insurance companies may consider flooding potential based on alternate standards or may consider other types of flooding including pluvial or urban flooding that is not associated with a watercourse or sewer backup. We recommend that property owners contact their insurance provider to learn more about coverage for different types of flooding.

### **What actions can property owners take to minimize flood damage?**

The Region of Halton, City of Burlington and Conservation Halton have all advanced initiatives and programs to help property owners minimize flood damage during a flood event.

The Region of Halton has information available on its website to help homeowners prepare for emergencies and protect their homes, including programs related to basement flooding prevention:

- [Enhanced Basement Flooding Prevention Subsidy Program](#)
- [Guide to Flooding Prevention And Recovery](#)

The City of Burlington has information available on its website regarding their flood mitigation initiatives, including completion of the *Flood Vulnerability, Prioritization and Mitigation Study*:

- [Flood Prevention Homeowner Resources](#)
- [Flood Recovery](#)

The Town of Oakville has information available on its website regarding their flood mitigation initiatives, including completion of the *Flood Prioritization Study*:

- [Flooding](#)

Conservation Halton has information available on its website regarding its modernized watershed monitoring systems and renewed Floodplain Mapping Program which identifies whether you are in a flood risk area.

- [Flood Forecasting](#)
- [Burlington Flood](#)
- [Floodplain Mapping](#)

CH provides flood forecasting and monitoring and issues public watches/warnings when flooding is anticipated or is imminent. CH's municipal partners have emergency management plans and are responsible for the "on the ground" actions during and after an emergency. These plans outline the role of police, fire, and other municipal staff and includes evacuation plans, emergency shelters and communication protocols.

**Will this flood hazard mapping study address matters such as the protection of the natural environment in Burlington (e.g., wildlife, vegetation)? How can I find out more information on the health of the watershed?**

The purpose of the East Burlington Creeks Flood Hazard Mapping Study is to give us a better understanding the magnitude and extent of riverine hazards, to assess potential risk to life and property, and to update riverine flood hazard mapping for Tuck, Shoreacres, Appleby, and Sheldon Creek watersheds.

CH is dedicated to protecting, restoring, and enhancing natural spaces across our watershed through our conservation areas, restoration, planning and regulatory, and stewardship programs and services.

CH's long-term environmental monitoring team provides a comprehensive understanding of our local ecosystems, which is necessary for assessing the long-term health of the watershed. Every 5 years, Conservation Halton releases a Watershed Report Card which highlights key environment conditions and trends. Additional information can be found on CH's website: [conservationhalton.ca/long-term-environmental-monitoring](https://conservationhalton.ca/long-term-environmental-monitoring)

## **How does this flood hazard mapping study relate to flood mitigation studies led by the City of Burlington and Town of Oakville?**

Local municipalities such as the City of Burlington and Town of Oakville often lead flood and erosion mitigation projects within their jurisdiction (more information can be found at [burlington.ca/en/services-for-you/environmental-assessments-projects.asp](https://www.burlington.ca/en/services-for-you/environmental-assessments-projects.asp) and <https://www.oakville.ca/environment/flooding.html>). Conservation Halton works with our municipal partners in the review of these mitigation projects to provide technical advice and ensure these studies meet Conservation Halton regulatory requirements.

This flood hazard mapping study will assist Conservation Halton and its municipal partners to identify flood hazard areas, minimize risk to people and property, support emergency management preparations and plan for long-term flood mitigation measures. This includes informing active and future flood mitigation studies by municipal partners.

## **How are watercourses and hazards managed and owned across Burlington? Do some privately owned properties contain watercourses and can I enter these lands?**

In recent years, Conservation Halton has worked with municipal partners through the planning process to have regulated areas including watercourses and natural hazard areas dedicated to municipalities and included within appropriate Official Plan and zoning by-law designations (i.e., natural creek blocks in subdivisions). This ensures that new development is not located in hazard lands.

Older communities within the study area such as those in Burlington south of the QEW/403 pre-date this planning practice and in these areas, some sections of watercourse may traverse private properties.

Trespassing on private property is not supported by Conservation Halton and may violate the Trespass to Property Act. We recommend contacting your local municipality to find out if a specific section of watercourse or creek block in your community is privately owned and whether it is included in any active or future flooding or erosion mitigation studies.

CH regulates all watercourses, valleylands, wetlands, Lake Ontario and Hamilton Harbour shoreline and hazardous lands, as well as lands adjacent to these features on both public and private property.

## **How will information from this flood hazard mapping study be used?**

This study results will be used by both Conservation Halton and its municipal partners to ensure that flood hazard areas are identified and understood, to minimize the risk to people and property, to support emergency management preparations and to plan for long-term flood mitigation measures.

The current approach to flood plain management in Ontario is to reduce or avoid hazard risk to life and property by limiting development within floodplains and ensuring that any permitted development does not impact downstream landowners. There are various ways to help avoid or mitigate risk associated with flooding hazards. Flood management activities of CAs include:

- undertaking floodplain mapping, modelling, and monitoring streamflow/rainfall
- limiting existing development in flood prone areas and preventing new floodplain development as required by the Province in legislation
- providing planning support and advice to municipalities to identify flood prone areas, minimize flood impacts, and issue flood warnings
- owning/acquiring important floodplain lands
- operating dams, dykes, channels and erosion control structures
- undertaking watershed management activities that support flood management which include watershed-scale monitoring, data collection management and modelling, watershed-scale studies, plans, assessments and strategies, and watershed-wide actions including stewardship, communications, and outreach and education activities.
- Municipalities create OP and zoning by-laws, upgrade infrastructure, risk preparedness, etc.

The updated flood hazard mapping will be made publicly available in draft form, as part of the second public engagement session of the study. Once finalized, the mapping will be brought forward to CHs Board of Directors for approval and then it will be incorporated into CH's approximate regulation limit (ARL) mapping.

CHs ARL mapping is shared with municipalities and made publicly available through the Conservation Halton website at [conservationhalton.ca/planning-permits](https://conservationhalton.ca/planning-permits). This mapping provides property owners and potential purchasers with the best available information about potential riverine flood risks on a property.

### **How do residents and stakeholders share their concerns and observations regarding flooding in their communities?**

Please feel free to share any photos, video, or other documentation you may have that shows the extent of past flood riverine flooding. Sharing this information early in the study process will help us refine our models so we can have greater confidence in the final study results. Please send information to [floodplainmapping@hrca.on.ca](mailto:floodplainmapping@hrca.on.ca)

Current flood hazard information for the study area can be obtained through the Conservation Halton website at [conservationhalton.ca/planning-permits](https://conservationhalton.ca/planning-permits). The current flood hazards shown for the study area may be updated and are subject to change.

### **How does this study relate to the class action lawsuit that Conservation Halton and the Town of Oakville are currently involved in?**

On June 24, 2021, an Amended Amended Statement of Claim was served which alleges that the Province, the municipalities and Conservation Halton caused an increase in the floodplain in south Oakville by allowing upstream development. Conservation Halton is and will continue to vigorously oppose this claim, which Conservation Halton firmly believes is without merit.

Conservation Halton manages water resources using integrated, ecologically sound environmental practices to maintain secure supplies of clean water, to protect communities from flooding and erosion to ensure that environmental planning is an integral part of community development. Conservation Halton has invested in reducing flood risk to watershed residents throughout our area of jurisdiction through preventative measures such as reforestation, restoration, land acquisition, regulations, mapping, monitoring, flood warning and forecasting, and as a last resort, structural flood control measures such as dams, reservoirs, and channels.

Conservation Halton has faithfully fulfilled and will continue to fulfill its mandate under the Conservation Authorities Act to:

- protect the public from the risks to life and property from flooding
- provide planning services and advice to municipalities, including the Town of Oakville, and other agencies as required in keeping with provincial policies

Permission is required from Conservation Halton for undertaking activities in the floodplain and other hazard areas under Regulation 162/06. Conservation Halton's policies provide landowners with the opportunity for reasonable home improvements (e.g., minor additions) and replacement of existing structures, where it can be demonstrated that neighbouring properties will not be impacted and flood proofing measures can be undertaken. Conservation Halton's core policy is to ensure there is no net cumulative impact and this policy was implemented over the years in question. Conservation Halton will fully explain the situation in due course in its court filings.

### **What is the timeline for the flood hazard mapping study and how will residents and stakeholders be kept informed?**

In 2018, Conservation Halton initiated a multi-year program to update floodplain mapping across our jurisdiction through our Floodplain Mapping Program (FPM). More information can be found on CHs website at:

[conservationhalton.ca/floodplainmapping](https://conservationhalton.ca/floodplainmapping). This flood hazard mapping study is part of a pre-planned update. As part of our FPM, we intend to update the floodplain mapping associated with Bronte Creek and all other watersheds within the next five years.

The approximate cost to complete the East Burlington Creeks Hazard Mapping Study is \$500,000. This study is financially supported by the Province of Ontario and Government of Canada through the National Disaster Mitigation Program and by the Region of Halton.

Notification of Public Engagement Sessions for flood hazard mapping studies are published in local newspapers (e.g., Burlington Post and Oakville Beaver) and posted on CH's social media (e.g., Facebook and Twitter). Direct email notifications are also sent to stakeholders and those who have requested to be added to our email list. Study information is posted on CH's website with contact information for key staff involved in each study.

Draft floodplain mapping will be shared with the public during the second public engagement session. The study team will consider public comments before finalizing the study. Once the study is finalized, the study will be brought to Conservation Halton's Board of Directors for approval before the final study results are incorporated into CH's ARL mapping.

### **What areas does Conservation Halton regulate? How will this flood hazard mapping study affect areas that Conservation Halton regulates?**

Under Section 28 (1) of the *Conservation Authorities Act*, an authority may make regulations applicable in the area under its jurisdiction to prohibit, regulate or require 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
- prohibiting, 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 the development;

Under Ontario Regulation 162/06, Conservation Halton regulates all watercourses, valleylands, wetlands, Lake Ontario and Hamilton Harbour shoreline and hazardous lands, as well as lands adjacent to these features. Not all regulated areas are mapped, but natural hazards, whether mapped or not, are considered regulated. Section 2(2) of the regulation explicitly states:

- (2) All areas within the jurisdiction of the Authority that are described in subsection (1) 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". O. Reg. 59/13, s. 1 (2).
- (3) If there is a conflict between the description of areas in subsection (1) and the areas as shown on the series of maps referred to in subsection (2), the description of areas in subsection (1) prevails. O. Reg. 59/13, s. 1 (2).

When a flood hazard is identified and/or mapped through technical studies, Conservation Halton assesses risk and advises landowners of CH's regulatory requirements when development is contemplated in hazardous areas.

*Ontario Regulation 162/06* requires that a permit be obtained from Conservation Halton prior to development, interference with wetlands or alterations to shorelines and watercourses. Development within CH's regulated area can be restricted and, in some cases, not permitted. Development as defined in the *Conservation Authorities Act* has a broad meaning and includes:

- 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 of potential use of the building or structure;
- increasing the size of the building or structure; or increasing the number of dwelling units in the building or structure, site grading, or
- the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

A copy of the *Conservation Authorities Act* can be found at [elaws.gov.on.ca](http://elaws.gov.on.ca). Please visit [conservationhalton.ca](http://conservationhalton.ca) for a copy of *Ontario Regulation 162/06* and the related policy document.

If your property falls into the existing or updated riverine flood hazard limit, it may be at risk of riverine flooding under an extreme weather event. It also means your property is regulated by Conservation Halton and permission is required from Conservation Halton to develop in these areas.

As the East Burlington Creeks Flood Hazard Mapping Study progresses, staff anticipates that refinements to CH's ARL mapping will likely be necessary. Additional flood hazard or regulated areas may be identified but, some areas may also be removed.

### **Why are the 1:100 year and Regional floodplains applied to establish the flood hazard? Is this an appropriate standard?**

In CH's jurisdiction, the Province stipulates the regulatory flood event standard for riverine systems as the greater of the 1:100 year flood event or the Hurricane Hazel (Regional storm) flood event. The regulatory flood events within CH's (and other Southern/Central Conservation Authorities') jurisdiction are the most stringent applied in Ontario, with the Regional Storm reflecting a significant rainfall event that occurred in 1954 in the Toronto area.

The rainfall patterns that define these flood event standards have different characteristics. Peak rainfall intensity is higher for the 1:100 year storm, while total rainfall is much greater for the Regional Storm. In the uppermost reaches of a watershed, where the drainage area contributing runoff is small, peak flows are more sensitive to rainfall intensities than rainfall volume. In these reaches, the regulatory flood hazard is typically defined by the 1:100 year flood hazard. For most of a watershed however the rainfall volume is typically the critical factor, and the Regional Storm determines the regulatory flood hazard.

## **How will climate change impacts be incorporated into this study?**

Climate change impacts will be incorporated into our analysis of the 1:100-year flood hazard. In 2020, the City of Burlington updated their Stormwater Management Guidelines to define how climate adjusted rainfall is to be calculated for return events (such as the 1:100-year storm). As part of this study, we will be applying the climate adjusted rainfall to estimate future 1:100 year flows and flood hazard limits. Climate change adjustments will not be applied to the Regional Storm, as its rainfall distribution is defined by the Province's regulation.

We anticipate climate change will result in only localized impacts to the regulatory flood hazard, as:

- the Regional Storm typically defines the regulatory flood hazard in most areas, and
- floodplain characteristics, such as slope, valley shape, and road/rail crossings have a greater influence on floodplain limits

## **How are peak flows calculated?**

Peak flows are calculated by evaluating runoff, rainfall intensity and size of the catchment area. Hydrologic modelling evaluates what proportion of the rainfall will infiltrate, evaporate or runoff. Hydrologic modelling considers multiple factors including soil type, land cover, vegetation, and rainfall intensity to determine what portion of the rainfall will generate runoff, and what the corresponding flow will be at various points within the watershed.

## **How are regulated allowances determined?**

The Province prescribes regulated allowances of up to 15 metres adjacent to the greater of the stable top of bank of valley features and floodplain limits. Conservation Halton applies a 7.5 m regulated allowance to all minor valley systems, including Tuck, Appleby, Sheldon, and Shoreacres Creeks.

The regulated allowance:

- ensures safe access and egress for people and vehicles during a flooding (or erosion) emergency and regular maintenance or repair to structures within or adjacent to the hazard;
- provides a buffer from the impacts of unknown events and addresses limitations in accurately predicting extreme events within a naturally variable system, considering
  - erosion/channel migration
  - debris/ice jams impeding flows
  - flood waves (should a culvert or embankment wash out)
  - potential for a larger storm event to occur

- data limitations
- software capabilities to model complex processes; and,
- allows for consideration of activities directly adjacent to the flood (and erosion) hazard which could aggravate or increase the hazard risk.

**Did the flood hazard model that existed prior to the August 4, 2014 flooding event in Burlington match the extent of actual flooding?**

CH documented the August 2014 flooding event in a report titled “August 4, 2014 Storm Event” available from our website at [conservationhalton.ca/burlingtonflood](http://conservationhalton.ca/burlingtonflood). Conservation Halton staff documented high flow observations within public lands and our models generally provided a good approximation of the flooding extent (see report pages 27 and 28 for comparison), however, older models did not define flow paths associated with spills or recognize flow interactions between watersheds.

**How do stormwater management, land use, and changes in hydrologic and hydraulic modelling affect CH’s approach to undertaking flood hazard mapping studies?**

Flood hazard mapping and stormwater management design are coordinated through various planning processes, such as subwatershed, servicing and mapping studies, as well as through guidelines and common industry practices.

CH makes decisions associated with flood hazards and development based on the best information available at that time. The goal of our study is to define the current and future flood hazard based on the best available information, using current tools and technology. While we will consider the findings of past studies, flood hazard limits are defined using future conditions based on planned future growth and land uses designated in municipal official plans and climate adjusted rainfall data.

Despite considering potential future conditions, flood hazard limits determined through this study may need to be updated in the future to incorporate new technical standards and resources such as new topographic or calibration data and updates to modelling software and to recognize new information describing future conditions.

The updated flood hazard mapping will be made publicly available in draft form, as part of the second public engagement session of the study. Once finalized, the mapping will be brought forward to CH’s Board of Directors for approval and then it will be incorporated into CH’s approximate regulation limit (ARL) mapping.

Flood hazard mapping and stormwater management design are coordinated through various planning processes, such as subwatershed, servicing and mapping studies. Parameter assumptions, such as run-off co-efficients, may differ between studies as guidelines and common industry practices evolve over time.

**How does development impact sewer capacity?**

Assessing impacts to storm sewers or impacts associated with changes in development density is outside the scope of this study. We recommend contacting the Region of Halton for more information on the wastewater management ([halton.ca/For-Residents/Water-and-Environment/Wastewater](http://halton.ca/For-Residents/Water-and-Environment/Wastewater)).

**Is there any larger storm infrastructure in Burlington designed to above 1/100 event?**

Current industry practices require creek blocks and stormwater management facilities to safely convey both the 1:100 year and Regional Storm. Please contact City of Burlington staff for more information.

**How are factors like debris jams and beaver dams considered in flood hazard mapping?**

Riverine systems are naturally dynamic, making it impossible to predict exact flood conditions. Debris jams and beaver dams are not included in flood hazard mapping; however, provincial guidelines include approaches to manage natural variability and potential risks. For instance, flood hazard mapping assumes that storage occurring upstream of a road or rail embankment does not reduce downstream flows and a regulated allowance is applied to recognize uncertainty in the analysis. With this balanced approach it is expected that the flood hazard limits defined will be reasonably representative of the potential flood conditions associated with a 1:100 year or Hurricane Hazel flood.

- END -