UPPER THAMES RIVER
CONSERVATION AUTHORITY

Upper Thames River Conservation Authority

Operational Plan for Flood Control Channels

November 16, 2024

Table of Contents

1. Purpose of Operational Plan

Ontario Regulation 686/21 requires that a Conservation Authority (CA) provide programs and services that support the operation, maintenance, repair, and decommissioning of the following types of infrastructure the CA owns or manages

- Any water control infrastructure, the purpose of which is to mitigate risks to life and damage to property resulting from flooding or to assist in flow augmentation.
- Any erosion control infrastructure.

Programs and services provided shall include the development and implementation of an operational plan on or before December 31, 2024.

Some water control infrastructure in the Upper Thames River Conservation Authority (UTRCA) watershed are not owned by the CA but are managed through an agreement with the owner. These structures also require Operational Plans.

2. Purpose of Structure

2.1. Ingersoll Channel

The first major undertaking of the UTRCA was Ingersoll Channel. The plan was to transform a natural meandering river into a straighter, shorter reach. It involved a new channel from the bridge in Beachville to a point 2 miles downstream of Ingersoll. When constructed the channel was 32,725 feet long compared to the 39,640 feet of the old river. The shorter, relatively straight channel with higher banks allowed larger flood flows to be passed through the channel before overflowing its banks, reducing flood risks.

The channel was built to provide immediate flood protection to the Town of Ingersoll and the industrial plants and quarries located in the river valley upstream of Ingersoll. The channel was designed to carry 8,000 cfs and safely pass 11,750 cfs peak flow, however the Thames Street bridge capacity limited discharge to 8,650 cfs, significantly less than the estimated peak flow of 1937. It was felt, however, that the channel would provide sufficient flood protection for most years and together with the 2 planned reservoirs should provide for the hypothetical flood referred to in the 1952 report (one third more than the 37 flood on the south branch). However, only one of the proposed reservoirs was constructed. While Ingersoll Channel significantly reduces flood risk to more frequent flood events, the current regulatory flood does overtop the banks resulting in a floodplain in which development is regulated.

The Ingersoll Channel was constructed from 1949-1950 at a cost of approximately $1,000,000. The province funded 75% of the project and the UTRCA share of 25% was levied to municipalities to be paid by the companies operating the limestone quarries along the river. The UTRCA share was split between the municipalities in the following

amounts: North Oxford 75.25%, West Oxford 17.25%, Ingersoll 5%. With the formation of the regional government for Oxford County, levy for the local share of operation and maintenance of the channel shifted to the County.

2.2. Mitchell Channel Improvement

The 1952 report assessed the flooding challenges in Mitchell and concluded that a dam with adequate storage was not feasible upstream of the flooding in Mitchell. It considered both channel improvements and diverting Whirl Creek around the town. Channel improvements were recommended.

Channel and Dam construction were undertaken as part of the same project which also included the purchase and removal of 2 buildings subject to regular flooding. The channels along the North Thames River and Whirl Creek in Mitchell significantly reduce the frequency and severity of flooding in Mitchell.

2.3. Stratford Flood Control Channel

As early as 1950, Stratford asked that steps be taken to alleviate flooding along the Avon River.

The Stratford Flood Control Channel was constructed as part of a larger project. The project also included the replacement of the dam upstream (east) of Huron Street with what is now called R Thomas Orr Dam, and the dredging of the reservoir known locally as Lake Victoria. The channel construction required a new bridge at St Vincent Street although the funding for the new bridge was not part of the project costs. The cost of the bridge was shared between the Ontario Department of Highways and City of Stratford. Senior government also declined to support the costs of channel construction downstream of John Street resulting in the downstream extent of the channel ending at John Street. The rest of the project was funded 75% by the province and UTRCA's 25% share was funded by Stratford, as the local beneficiary of the project.

The channel reduces flood risk to the homes along its length.

3. Level of Service

Level of Service (LOS) refers to the ability of an asset or its components to perform the role for which it was designed and to the level or quantity of use for which it was intended. Because of the importance for these flood control channels to continue to reduce the risk of flooding, the required LOS would be high. The amount of attention to, and funding for, operation and maintenance must be reflective of the importance of this asset.

LOS will be further considered through Asset Management Planning and this section will be updated to reflect that ongoing work.

3.1. Service Life

The service life of channels, such as these, is difficult to estimate. Natural rivers are continuously changing. Design and construction of flood control channels such as these is constantly battling against these natural forces. While the straightening and steepening of the channel increases its flood carrying capacity it also has an impact on the velocities and forces acting on the channel substrate and banks, often increasing erosion. Deposition of sediment along the channel may affect the flood carrying capacity of the channel. Vegetation can also have an impact on the capacity of the channel.

While there is no equipment to operate or maintain in channels (other than the John St Weir) it is still important that these channels are inspected regularly and maintained appropriately. Vegetation and erosion protection (gabion baskets, armour stone and riprap) are aspects of the channels that require attention. Continued inspection and maintenance can allow these channels to continue to meet their expected level of service well into the future.

Service Life will be further assessed through Asset Management Planning and this section will be updated to reflect that ongoing work.

4. Stakeholders and Beneficiaries

Each of the channels provides flood risk reduction to those who live or have businesses in the flood plain adjacent to the channels. These channels also have significant parkland and open space around the channels which support recreation. In Stratford and Mitchell the channels were built as part of larger projects which involved reconstruction of dams which support further recreational opportunities upstream of the channels but part of the same park system.

Operating and maintenance costs are levied against the municipalities that the channel is in (beneficiary). The local share of costs associated with Ingersoll Channel is funded by Oxford County. Stratford channel is funded by Stratford. Mitchell Channel is funded by West Perth.

4.1. Communication with Stakeholders

Communication with stakeholders is important to the operation of flood infrastructure. While these structures are not actively operated, flood time communications related to flood forecasts are undertaken directly by flood control staff to municipal flood coordinators consistent with the UTRCA Flood Contingency Plan. It is also important that channel maintenance also be communicated with the municipality.

5. Operations

Flood control channels are not actively operated. These are generally passive flood mitigation measures which work in combination with other water control structures. One exception is John Street Weir, described below.

5.1. John Street Weir

Stratford Channel from downstream of RT Orr Dam to John Street was deepened and straightened with gabion baskets protecting its deep banks. Gabion Baskets were replaced with armour stone when the wire baskets began failing allowing the rocks to escape and the baskets to slump. The Stratford Flood Control Channel includes a weir upstream of John St which is seasonally installed and removed. This stoplog weir provides a 5 foot deep backwater on the upstream side of the weir. The weir impacts the water level upstream (east) to the stilling basin of RT Orr dam (although the additional depth at the dam is much less).

The weir is installed in mid-May after spring flows have reduced to more seasonable levels, but before flows are too low to allow the small backwater to be filled. The small slide gate in the middle of the stoplog weir is opened to draw the level down so all the logs may be removed by crane in late October or early November. The schedule is dependent on flows, weather and site conditions.

6. Routine Maintenance

Routine inspection and maintenance are important to ensure the flood control channels are able to meet their purposes. Annual inspections are generally undertaken by engineering staff. Vegetation assessments are also conducted every few years. In the case of Ingersoll Channel, a vegetation management plan has been developed and is reviewed and refined as appropriate.

7. Emergency Planning

Emergencies associated with flood control channels are largely limited to the impacts of the floods that they help mitigate. Responses to flooding around these channels would be communicated, similar to flooding elsewhere, through Flood Bulletins to municipal flood coordinators who then implement municipal emergency plans.

8. Roles and Responsibilities

Inspection and maintenance of the Flood Control Channels is undertaken by the UTRCA Water and Erosion Control Structure staff and contractors/consultants as necessary.

The UTRCA owns many properties along the Ingersoll channel. Vegetation management of Ingersoll Channel is undertaken by Land Management staff with contractor assistance as necessary.

The lands along the Stratford and Mitchell Channels are municipal parkland which is maintained by the municipalities.

Installation and removal of the John Street Weir is undertaken by the UTRCA.

References

Ontario Department of Planning and Development (1952). Upper Thames Valley Conservation Report.

UTRCA (1973). Twenty-five Years of Conservation on the Upper Thames Watershed, 1947-1973