

**Utilities & Environmental Protection Report to
SPC on Utilities and Corporate Services
2019 May 15**

**ISC: UNRESTRICTED
UCS2019-0653**

2018 Flood Resiliency and Mitigation Annual Update

EXECUTIVE SUMMARY

This report summarizes developments related to The City of Calgary's Flood Mitigation program and provincial upstream mitigation in 2018. As of 2019 May, all the Expert Management Panel on Flood Mitigation recommendations (PFC2014-0512) are now either complete or underway. Work underway continues in alignment with other corporate initiatives, such as Resilient Calgary and the Climate Resilience Strategy. The City will also continue to increase its understanding of flood risk and identify opportunities improve resiliency in Calgary. The City is now focused on implementing the Council-approved flood resilience plan (PFC2017-0462), and will continue to report progress annually.

The Province continues to move forward on the Springbank off-stream reservoir (SR1) project, which is currently undergoing a federal Environmental Impact Assessment (EIA). The City participates on the EIA Technical Advisory Committee. On the Bow River, the Province initiated a study of three potential sites for an upstream reservoir in 2018. The Province has also provided \$69.1M of their previously announced \$150M commitment to The City of Calgary through the Alberta Community Resilience Program (ACRP) to date.

The proposed community flood mitigation projects are in early stages and The City is committed to continued dialogue with communities before proceeding to subsequent project phases. The City is working with affected communities to listen, share information, and understand the best mitigation options that are consistent with community values and align with The City's approach to building flood resilience.

In addition to The City's flood resilience plan, which focuses on river flooding, this report also provides an update on The City's Community Drainage Improvements (CDI) program, which focuses on reducing local stormwater flood risk. Program investments remain on track, and strategies are currently underway to examine design innovations, investigate external funding sources, and identify project synergies to enhance service delivery of the CDI program.

ADMINISTRATION RECOMMENDATION:

That the SPC on Utilities and Corporate Services recommend that Council receive this report for information.

PREVIOUS COUNCIL DIRECTION / POLICY

On 2014 March 17 Council received the 2015-2018 Drainage Financial Plan (UCS2014-0022) for information, which included service levels and targets. A progress report on the Drainage Financial Plan (UCS2016-0414) was received by Council for information on 2016 June 20.

On 2014 June 26, Council approved the River Flood Mitigation Panel Final report (PFC2014-0512), which included direction to provide an annual update to City Council on progress related to the recommendations from the Expert Management Panel on River Flood Mitigation.

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On 2015 May 27, The SPC on Utilities and Corporate Services received the Flood Resiliency and Mitigation 2014 Annual Report (UCS2015-0082) for information. Subsequent updates were received on 2016 April 27 (UCS2016-0168), 2017 April 10, (UCS2017-0266), and 2018 February 26 (UCS2018-0092). In addition, The City of Calgary's flood resilience plan was approved by Council on 2017 June 26 (PFC2017-0462).

An update was provided to Council regarding the Province's upstream flood mitigation work on the Bow River on 2018 May 27 (UCS2018-0600).

BACKGROUND

In 2014 June, the Expert Management Panel on River Flood Mitigation delivered 27 recommendations to Council aimed at achieving a safer, more flood resilient Calgary. As part of those recommendations, The City completed a comprehensive Flood Mitigation Measures Assessment in 2016, which examined measures to reduce Calgary's river flood risk. The Assessment recommended that upstream mitigation on the Bow and Elbow Rivers, combined with community mitigation in select locations on the Bow River and property-level mitigation would be needed to prevent flooding in Calgary similar to a 2013-level event. On 2017 June 26, Council approved The City's flood resilience plan (PFC2017-0462).

In 2015 October, the Province announced it would proceed with the SR1 project on the Elbow River, and has been progressing on completing the federal EIA requirement for SR1 since 2016 June. The Province also initiated the Bow River Working Group (BRWG) to study improving flood and drought resiliency in the region, and committed \$150M to The City of Calgary to support community flood mitigation projects through the ACRP program. The *Bow River Water Management Project* final report was completed in 2017 and recommended construction of an upstream reservoir on the Bow River, with three potential locations identified for further study. Subsequently, in 2016 April, the Province announced it had reached a five-year operating agreement with TransAlta to manage water levels for flood and drought on the Bow River at the Ghost Reservoir.

In addition to The City's river flood mitigation work, localized flooding occurs when stormwater drainage infrastructure cannot manage the volume of stormwater either from precipitation, snow or ice melt. Communities built prior to 1990 are at the greatest risk due to aging infrastructure and historic design standards. Though drainage improvement studies have been conducted by The City for over 20 years, The CDI program was established in 2009 to address this risk as a comprehensive infrastructure investment program.

INVESTIGATION: ALTERNATIVES AND ANALYSIS

As of 2019 May, all recommendations of the Expert Management Panel on Flood Mitigation are now either complete or underway. Work underway continues in alignment with other corporate initiatives, such as the Corporate Resilience Strategy and the Climate Resilience Strategy. The City will continue to take an adaptive management approach and continually improve its

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understanding of flood risk in Calgary and identify actions to as part of its flood resilience plan. Appendix A of the Attachment includes a summary and status of the recommendations.

Following Council's approval of the flood resilience plan, Administration is focused on implementation. The plan takes a multi-layered approach to building flood resilience in Calgary based on a combination of upstream, community-level, and property-level mitigation. This layered approach is accepted as best practice internationally and has been confirmed by independent consultants as an effective form of risk management for flooding. The City acknowledges that there is no single solution to mitigating flood risk in communities and that there are many perspectives on how to reduce flood risk in Calgary. The City has established an ongoing dialogue with the Province and communities as studies are completed, information is gathered, and options are assessed. Work in 2018 and throughout 2019 remains focused on engagement with impacted communities regarding The City's flood resilience plan.

Though upstream mitigation is the responsibility of the Province, The City continues to work closely with the Province to advocate for and provide technical support for timely construction of upstream flood mitigation for Calgary. The Province is currently compiling their response to Canadian Environmental Assessment Agency's (CEAA) 2018 August request for more information for the EIA. The EIA will resume after the response is submitted. On 2019 January 30 the Province announced it acquired 465 acres of land, approximately 20 per cent of the land required for SR1. Subsequently, Infrastructure Canada announced \$168M in funding support through its Disaster Mitigation and Adaptation Fund for SR1 on 2019 March 13. While these are significant positive developments, The City continues to advocate that SR1 must be constructed as soon as possible, otherwise Calgary remains at significant risk of flood damages. SR1 when combined with the elevated gates at the Glenmore Dam, which are expected to be operational starting in 2020, will mitigate flooding on the Elbow River to a 2013-level event.

On the Bow River, the Province is currently undertaking a conceptual study for three potential upstream mitigation sites identified in the *Bow River Water Management Project* final report. It is anticipated that this conceptual study will be complete by the end of 2019. The City supports this work and continues to advocate the need for an upstream reservoir on the Bow River with and continuation of the Bow River Working Group. The City has also indicated that continuing the operating agreement with TransAlta beyond 2021 is critical, as no single mitigation component can mitigate flood risk at least a 2013-level event on the Bow River.

Work on the community mitigation projects remains ongoing. Throughout 2018, The City met with affected community members in Bowness and Sunnyside to gather information and understand their concerns. Recognizing these concerns, The City plans to continue discussions with community members as it completes additional studies to inform the projects, and will share information and gather feedback on potential mitigation options before proceeding to subsequent phases.

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Barriers in Calgary's downtown and Pearce Estate Park, the Upper Plateau Separation project in Sunnyside, and replacement of the 9 Avenue SE Bridge were also identified as part of the flood resilience plan. ACRP funding was announced for the Downtown flood barrier, Upper Plateau Separation, and 9 Avenue SE Bridge projects in 2018, and additional funding for Upper Plateau and the Downtown flood barrier was announced in 2019 March. As of 2019, The City has received \$69.1M from ACRP for 13 projects. More information on these projects and the status of ACRP funding can be found in Appendix B of the Attachment to this report.

Development of a property-level mitigation and flood risk awareness program is underway and The City will be undertaking research and engagement to inform development of this program in 2019. The City is initiating a review of its Municipal Development Plan (MDP) and Land-Use Bylaw (LUB) concurrent with the Province's ongoing Flood Hazard Area (FHA) mapping update, which has not been released publicly. The City will continue to monitor provincial developments and integrate changes into MDP, LUB, and relevant flood development policy recommendations as necessary.

The CDI program continues to deliver stormwater infrastructure improvement projects based on comprehensive triple-bottom-line studies of established communities with identified stormwater flooding risks. Projects are prioritized based on flood risk, potential impacts to the community and the cost-effectiveness of the proposed infrastructure upgrades. A prioritized list of current and future identified CDI projects is found in Appendix C of the Attachment to this report. Starting with the community of Renfrew, The City has undertaken an integrated stormwater management study to complement its existing CDI approach, which is expected to be completed in spring 2019. This study will focus on addressing stormwater management issues such as flood control, reducing water quality impacts, future redevelopment and densification considerations, considering climate change impacts, enhancing asset management, and identifying green stormwater infrastructure opportunities.

Stakeholder Engagement, Research and Communication

The City remains in close communication with the Province regarding the need for all flood mitigation components (SR1, Bow River mitigation, the Province's agreement with TransAlta, FHA mapping, floodplain development regulations, and The City's flood resilience plan) in order to mitigate flooding to at least a 2013-level flood throughout Calgary. SR1 and Bow River upstream mitigation were identified as priorities that matter to Calgarians through The City's YYCMatters campaign in advance of the 2019 Provincial election. As part of YYCMatters, a citizen survey showed 83% of Calgarians surveyed want the Province to fund upstream mitigation on the Bow River.

The City acknowledges the potential impacts presented by proposed community flood mitigation. The City is committed to working with community members to understand the need for community mitigation and discuss risks and opportunities associated with different mitigation options. Potential community mitigation projects in the communities of Bowness and Sunnyside are in early phases, and work is underway to address issues previously raised by community members, including studies to look at options for flood mitigation. Findings from these studies

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will be presented to community members throughout Q2 and Q3 2019 and ongoing further engagement is expected to occur in 2019 before moving to subsequent phases.

Strategic Alignment

The City's flood resilience plan aligns with the One Calgary stormwater line of service, which identifies the following service outcomes:

- The City works to reduce flooding from rain and snow melt that impacts homes, businesses and the community
- Calgary is prepared for flooding and recovers quickly
- The City provides quality stormwater management services that are cost efficient.

Social, Environmental, Economic (External)

The flood resilience plan is informed by The City's Triple Bottom Line Policy, Sustainability Direction, and watershed protection goals. Details on the analysis that was conducted can be found in report UCS2017-0266.

Financial Capacity

Current and Future Operating Budget:

There are no operating budget implications from this report.

Current and Future Capital Budget:

All ACRP and federally funded flood mitigation projects include a cost-share obligation for The City of Calgary. This has been accounted for as part of One Calgary and no additional budget impacts are expected. The CDI capital budget was approved as part of One Calgary budget deliberations and no capital impacts are anticipated.

Risk Assessment

Administration is actively working with the Province, stakeholders, and communities to address identified risks, and recognizes both the high level of complexity and uncertainty as it seeks to build flood resilience. Key risks include:

- Reducing flood risk on the Bow River requires multiple components: an upstream reservoir, continuation of the TransAlta agreement, and community mitigation to mitigate to at least a 2013-level flood.
 - A new reservoir on the Bow River may not be built for many years. Three sites are being studied by the Province, with no further commitment at this time.
 - The current TransAlta operating agreement expires in 2021. Continuation of an agreement has not been confirmed at this time.
- Flood risk on the Elbow River remains if SR1 is delayed. The Province remains committed to this project and The City continues to support the project.
- Ensuring proposed flood mitigation options are consistent with community values and sufficient engagement with affected communities occurs is necessary before moving forward with community mitigation.

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- The Province has not publically updated their FHA mapping and associated floodplain development regulations. The City is monitoring developments and will assess implications if these items are released.
- Climate change could result in more severe flooding in the future. The City is accounting for this as part of its flood resilience plan and is aligning with corporate resilience initiatives.

REASON(S) FOR RECOMMENDATION(S):

Flood mitigation remains a top strategic priority for City Council. The 2018 Flood Resiliency and Mitigation update provides an update on activities consistent with The City's stormwater line of service customer commitment to reduce flooding in Calgary.

ATTACHMENT(S)

1. Attachment 1 – Flood Resiliency and Mitigation 2018 Update Report