



Calgary

Naheed K. Nenshi, Mayor

June 12, 2018

Shelly Boss
Project Manager
Springbank Off-Stream Reservoir Project
Canadian Environmental Assessment Agency (CEAA)
Canada Place, 9700 Jasper Avenue, Suite 1145
Edmonton, Alberta T5J 4C3

Dear Ms. Boss:

Re: The City of Calgary's support for an expedited review of the Springbank Off-Stream Reservoir Project

The City of Calgary ("The City") strongly supports the Government of Alberta's Springbank Off-Stream Reservoir Project ("Springbank Project") and that this project be constructed as soon as possible.

The Springbank Project is critical to public safety in Calgary as it will reduce our city's flood risk on the Elbow River by as much as 80 per cent. The Springbank Project will protect infrastructure and private property and help prevent flood damages to Calgary's economic engine – the downtown core. Based on The City's latest flood damage model, it is estimated that this project will reduce annual average flood damage risk by \$30 million. Previous provincial timeline estimates were extended by 10 months and it is The City's perspective that 1.25 million Calgarians are relying on the Springbank Project to be built without further delay.

Regarding the invitation for public comment on the environmental impacts of the Springbank Project, I am pleased with the rigorous effort that was put into Alberta Transportation's Environmental Impact Statement submission. The City is satisfied that this project is not likely to result in significant environmental impacts and has the least impact compared with the alternative flood mitigation options. In fact, the Springbank Project will alleviate environmental impacts caused by flooding by protecting Calgary's wastewater treatment facilities and aquatic and riparian habitat. The Springbank Project will also reduce water contamination due to floodwater contact with industrial sites, utility facilities, vehicles, storage tanks and other substances.


The City appreciates the opportunity to directly contribute to the process by participating on CEAA's Technical Working Group. Additionally, City staff continue to work closely with Alberta Transportation to

share expertise and data to help address environmental and dam safety issues. As a water supplier to almost 1 in 3 Albertans, The City recognizes that sustainable development of the Springbank Project is critical to ensure the least amount of impact for the greatest benefit.

The City continues to build our own flood mitigation projects in an environmentally responsible manner, while supporting the essential work that the Government of Alberta is undertaking to improve flood resiliency across Alberta. However, The City's flood mitigation projects alone will not protect Calgary from a flood similar to what we experienced in 2013. We must all proceed quickly with this upstream mitigation project to properly manage Calgary's annual flooding risk.

To prevent further delays in moving this critical project forward, The City requests that CEAA expedite the regulatory review process and draft the Environmental Assessment Report as soon as possible. We are confident that Minister McKenna will determine that the Springbank Project is not likely to cause significant adverse environmental impacts. Our position is supported by The City's detailed comments on the Environmental Impact Statement for the Springbank Project, which are attached. Thank you for your consideration.

Sincerely,
<original signed by>

 Naheed K. Nenshi
MAYOR

Thank you for your work on this. It is a vital piece of infrastructure for our future.

CC: **Honourable Catherine McKenna, Minister of Environment and Climate Change, Government of Canada**
Honourable Brian Mason, Minister of Transportation, Government of Alberta
Honourable Shannon Philips, Minister of Environment & Parks, Government of Alberta
David Duckworth, General Manager, Utilities & Environmental Protection, The City of Calgary
Rob Spackman, Director, Water Resources, The City of Calgary

Introduction

The City of Calgary (“The City”) has made significant investments to increase Calgary’s flood resilience since the 2013 floods. With municipal projects complete and underway, The City has reduced Calgary’s exposure to flood risk by approximately one third with provincial funding support. The Government of Alberta’s agreement with TransAlta has further decreased flood risk on the Bow River in Calgary. However, the remaining risk in Calgary is still high at \$70 million/year in average annual damages. The Springbank Off-Stream Reservoir Project (“SR1” or “the Springbank Project”) will reduce this risk by approximately \$30 million/year in average annual damages. The reduction in risk is mainly on the Elbow River, however, benefits extend to the eastern part of Calgary’s downtown and downstream of the confluence with the Bow River, providing a significant reduction of risk on both rivers.

The Springbank Project plays a crucial role in Calgary’s Flood Mitigation and Resilience Strategy, which relies on a combination of watershed and community level mitigation efforts. The Project will reduce flood damage on the Elbow River by 80 per cent. In combination with improvements The City is making to the gates on the crest of the Glenmore Dam, the Springbank Project will manage a flood event similar to what was experienced in 2013 on the Elbow River without overland flooding through communities along the Elbow River downstream of Glenmore Dam. This project is critical to increase public safety, protect infrastructure and private property, and help protect the region’s economic engine, social and cultural centre and historical origin – Calgary’s downtown core – from flood damage.

Floods larger than 2013 are not unprecedented - had the rainfall pattern in 2013 shifted slightly, flooding would have been much worse in Calgary. Climate change is expected to increase the frequency and magnitude of flooding in the region. The Springbank Project will help Calgary become more resilient to flooding in the face of climate uncertainty.

The City of Calgary values a healthy, resilient watershed that will continue to provide reliable, clean water for current and future generations and ecosystem services for all Albertans. The City recognizes the importance of sustainable development of this project, and is satisfied that rigorous effort has been put into the environmental assessment by Alberta Transportation. The City urges the Canadian Environmental Assessment Agency (CEAA) to expedite the regulatory review process, as The City is satisfied that the Project is not likely to cause significant adverse environmental impacts.

How Calgary benefits from the Springbank Project

The devastation from the 2013 flood event was well documented, and included major economic losses, business disruption, LRT road and pathway transportation disruption, damage to critical utility infrastructure, negative environmental and safety impacts due to sewage backup into homes and release of partially treated sewage due to flooding and overloading of The City’s Bonnybrook Waste Water Treatment Plant. The flooding also put many citizens’ safety at risk and resulted in one causality in The City of Calgary.

The Project provides significant benefits for public safety, the environment, public health, and the regional economy. It will work in tandem with The City’s Glenmore Reservoir to provide full mitigation for a 2013 sized flood event, so that no overland flooding occurs in communities downstream of the Glenmore Reservoir. Damages, economic disruption and safety risks will be all but precluded for all smaller flood events and minimized for larger

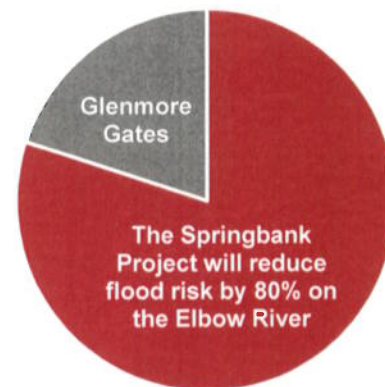


Figure 1: Damages from a 2013-sized flood will be reduced on the Elbow River by the Springbank Project and Glenmore Dam

ones. The risk reduction will facilitate future land development decisions and sustain cultural resources including the Calgary Stampede, Fort Calgary, historic Deane House, and The Calgary Zoo.

Furthermore, by setting aside this land for The Springbank Project, land in the upstream watershed is retained in an undeveloped state. Calgary provides drinking water to several municipalities and a First Nation in the region and this will also have a positive benefit of source water quality protection for the region’s drinking water.

Flow reduction and emergency response

During the 2013 flood, City operation of the Glenmore Dam successfully reduced the 1200 m³/s peak inflow to the reservoir to 700 m³/s downstream of the dam. With the Springbank Project in place, the flow could have been reduced to 150 m³/s, the threshold where flooding begins on the Elbow River. The Springbank Project would have diverted and stored approximately 85% of the volume required to mitigate flooding downstream of the Glenmore Reservoir in 2013, and the Glenmore Reservoir would have contained the remaining 15% required to fully mitigate the flood (Figure 2, Alberta Transportation, 2016). The maps below show the difference in flood extents between what occurred in 2013, and what would have occurred if the Springbank Project had been in place (i.e., no overland flooding downstream of Glenmore Reservoir) (Figure 3).

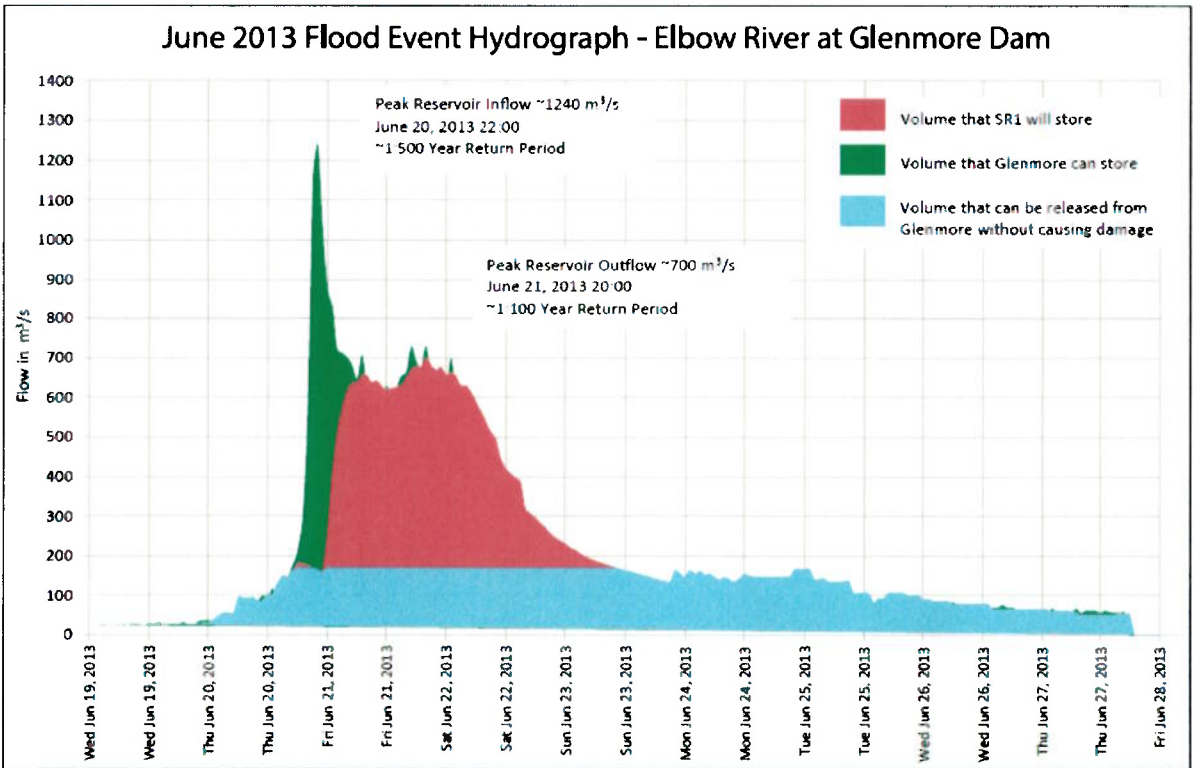


Figure 2 – Proportion of the 2013 flood water on the Elbow River that would have been retained in the Glenmore Reservoir (green), the Springbank Project (red), and safely passed through The City (blue).



Figure 3 – The 2013 Elbow River flood extents (left), and what the flooding would have looked like if the Springbank Project had been in place (right).

In the event of a flood on the Elbow larger than 2013, SR1 would still provide significant mitigation by reducing and delaying peak flows downstream of Glenmore Reservoir by as much as 24 hours based on The City’s analysis. This increased lead time will allow streamlined emergency response to ensure safety of life and reduced damages to critical infrastructure and property. With SR1 in operation, The City will be able to focus more of its resources for emergency response on the Bow River, where around 85% of The City’s flood risk will remain after SR1 is built. The storage capacity at SR1 will also facilitate more dynamic and adaptive management of the Glenmore reservoir, which is a key City asset to sustain water supply, fire protection and drought resilience for the City, neighboring municipalities and First Nations.

Flood damage reduction

The City of Calgary estimates that SR1 will reduce potential flood damages in Calgary by \$30 million per year, calculated as average annual damages from floods. The 2013 flood caused approximately \$445 million in damages to public infrastructure alone. The protection provided by SR1 will reduce the damages caused to critical and public infrastructure, vital community services, public and private property (both buildings and contents). On the Elbow River downstream of Glenmore Reservoir, there are nearly 2000 properties with buildings that would be flooded in an unmitigated 1:100 flood. Reducing flood impacts to these properties also reduces the significant mental health and well-being impacts that often afflict those affected by flooding.

Groundwater backup near the river and through sewer systems into basements can account for 15% to more than 50% of flood damages. Lowering the flows in the Elbow River during a flood by detaining water in the Glenmore and Springbank Reservoirs would significantly reduce these damages, as the likelihood of groundwater and sewer backup is much lower when river levels are managed.

Environmental benefits of the Springbank Project

The Project will reduce flooding downstream, thereby avoiding many potential environmental threats to the aquatic and riparian ecosystem, as well as human health. Environmental benefits that SRI will provide include:

- **Protection of Calgary’s Bonnybrook Wastewater Treatment Plant.** During the 2013 flood, Bonnybrook, The City’s largest wastewater treatment plant, was completely inundated with floodwaters and discharged untreated wastewater to the Bow River. The health of the Bow River’s ecosystem depends on

the plant functioning. Releases of untreated or undertreated sewage can threaten aquatic and human health.

- **Source water protection for the region's drinking water supply.** Calgary provides drinking water to several municipalities and communities in the region. By setting aside this land for SR1, land in the upstream watershed that would otherwise be subject to agricultural practices and potential future development is retained in an undeveloped state, which has a positive benefit for source water quality protection for the region's drinking water.
- **Bank erosion protection.** Erosion of river banks during flooding can threaten infrastructure and cause increased sediment contamination of the river. In 2013, significant erosion threatened roads, railways, utilities and properties. Critical erosion sites were reinforced and repaired during and after the flood. The loss of aquatic habitat resulting from these repairs required significant work to recreate high quality habitat elsewhere in the years following the flood.
- **Reduce risk of derailment.** In 2013, a railway bridge was compromised by debris mobilized in the flood, and a train on the bridge was in danger of falling into the river. Such derailments may cause significant releases of deleterious substances, posing a threat to environmental and human health.
- **Reduce risk of erosion and/or inundation of construction sites, industrial areas or fuel storage areas.** Flooding of these sites can result in floodwater contamination from materials, equipment or deleterious substances that are washed into the river. Utility trailers, shipping containers and other large movable equipment were swept into the river in the 2013 flood, creating hazards and blockages at bridges downstream. Such blockages can create raised flood levels upstream, as well as endanger bridge piers and other infrastructure.
- **Protection of utility crossings.** Reduced river flows will decrease the risk of scour (removal of surface materials) at pipeline crossings and utility crossings, which may cause pipe breakages and subsequent contamination.

Why the the Springbank Project is the best option

The City of Calgary supports the Springbank Project over other alternatives for flood mitigation in Calgary, based on third party, Provincial and The City of Calgary's own studies.

Maclean Creek Reservoir

The City supports the recommendations from technical experts at Deltares (Deltares, 2015) that:

- *“Environmental reviews undertaken have consistently described the McLean Creek reservoir (MC1) proposal as fundamentally more ecologically sensitive to disturbance than the Springbank Project (SR1)*
- *Construction of MC1 would permanently alter fish habitat and interfere with fish spawning.*
- *The Elbow Valley is home to a number of species at risk or concern, including grizzly bears, harlequin ducks, bull trout, westslope cutthroat trout, and wolverine.*
- *MC1 would require the removal of trees and vegetation from the reservoir area, and would irreparably alter the habitat for wildlife and fish population.*
- *From an environmental point of view, SR1 leaves the river as a more natural system.*
- *SR1 is more effective than MC1 because it is further downstream and has a larger catchment area. It can respond to rainstorms occurring over a significantly larger area than MC1 by also managing water entering the Elbow River downstream of MC1.*
- *MC1 is on-stream, closer to the mountains, and is more likely to trap rocks and trees, putting the structure and its operations at risk.”*

Elbow River Diversion Tunnel

The City's feasibility study for a diversion tunnel on the Elbow River from Glenmore Reservoir to the Bow River (Hatch Mott MacDonald, 2014), combined with the Government of Alberta's cost benefit analysis (IBI Group, 2015) indicate:

- The diversion tunnel design is ranked last in a comparison with the cost benefit analysis of SR1 and MC1, with SR1 being having the best cost benefit ratio.
- The cost benefit of the SR1 design is over 50% greater than that of the tunnel design.
- The diversion tunnel does not mitigate flooding downstream of the tunnel outlet.
- The uncertainty relating to the cost estimate is highest for the diversion tunnel design.

Diversion from Glenmore Reservoir to Fish Creek

The City hired a consultant to assess the concept of diverting flood flows from the Glenmore Reservoir to Fish Creek in south Calgary. It was found that while preliminary calculations indicated that a channel or tunnel could divert flows to Fish Creek, the financial cost, and social, environmental and geomorphologic impacts render the concept infeasible. Further pursuit of this option was not recommended (Stantec, 2015).

Flood barriers within Calgary

The City conducted a study to assess several mitigation options for flooding in Calgary (IBI Group, 2017). The study considered protecting communities along the Elbow and Bow Rivers with flood barriers instead of upstream reservoirs. Using flood barriers alone was found to be infeasible from a social and economic standpoint. To achieve a similar level of protection (2013-sized flood), many of the barriers would have to be several metres tall. Due to the extent of private property along the riverfront, acquiring land to construct the barriers would be extremely expensive and disruptive to the fabric of some of Calgary's oldest communities. The cost of building barriers to an equivalent protection level as that provided by SR1 was nearly twice as much. In addition, the social and environmental impacts, including reduced ability to evacuate with barriers, as bridges would have to be closed and gaps in the barriers blocked, were significant.

Temporary barriers

Temporary emergency response measures for Calgary are continually being improved and refined, however, constructing kilometres of temporary barriers along the length of the Elbow River, through many private properties, is not feasible. Flood response times in Calgary are in the order of 12 hours on the Elbow River.

Dredging the Glenmore Reservoir and/or the Elbow River

River channels naturally change over time as the rivers deposit and move gravel during different flow conditions. During the 2013 flood the rivers channels changed – gravel was scoured out of some locations, and deposited creating islands in other locations. The effect of dredging is not durable – gravels will move again during normal high flows, filling in again the areas that were dredged. Dredging the river channels would also cause significant damage to aquatic habitat.

The Bow and Elbow Rivers are fish-bearing rivers, protected from disturbance under the federal Fisheries Act. Areas where gravel accumulated during the flood will be monitored by The City to ensure vegetation growth does not cause new flood debris hazards or reduce floodwater conveyance. The City of Calgary evaluated the feasibility of dredging at the Glenmore Reservoir in 2014 and it provided little benefit in reducing flood risk. It was also identified that dredging the reservoir could adversely impact drinking water quality (The City of Calgary, 2014).

Property buy-outs

Buying out properties at risk of flooding, while effective at reducing future flood risk, is infeasible as a primary flood risk reduction solution in Calgary due to the scale of buyouts required, high property values, and disruption to inner-city communities that have been established for over 100 years in some cases. Properties within the 1:100 flood risk area (2013 was a 1:200 event peak flow event upstream of the Glenmore Reservoir) have a combined assessed value over \$30 Billion on the Elbow River alone. Buy-outs could result in abandoning existing core utilities and infrastructure, loss of social and historical resources and increase in cost and environmental footprint to replace existing communities with new land development or redevelopment.

Land use regulation and other non-structural measures

Historic development patterns have led to a complex relationship between cities and floodplains, and the social and economic value of development in floodplains is significant. Currently in Calgary, no new development is allowed in the floodway, and development in the flood fringe must be flood-proofed to the regulated 1:100 flood level. Over time, potential flood damages could be reduced by further regulating development in flood prone areas, however, reducing flood risk through policy changes takes decades to become effective in existing communities. While The City of Calgary can implement some mitigation measures within its jurisdiction, and is doing so, it is essential that upstream mitigation is built to provide the level of protection needed for Calgary.

The City has implemented several lessons-learned from the 2013 flood, and continues to improve forecasting, emergency response, citizen education and communication, and preparedness for citizens, businesses and City departments. In addition, other non-structural solutions, such as policy, regulations, education and incentives are being explored to complement structural measures and provide further flood resiliency for Calgary.

Conclusion

By reducing flood damage by up to 80 % on the Elbow River, the Springbank Project will secure Calgarians' safety and ensure a flood-resilient downtown. This Project is critical to public safety, and will protect infrastructure, private property, and help prevent flood damages to Calgary's economic engine – the downtown core. The City of Calgary requests that CEAA expedite the regulatory review process and that the Minister determine that the Project is not likely to cause significant adverse environmental impacts.

Reference List

Deltares, 2015. *Review of two flood mitigation projects: Bragg Creek-Springbank off-stream flood storage and McLean Creek flood storage*. Prepared for Alberta Environment and Parks. October 2015.

IBI Group, 2015. *Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: Springbank Off-Stream Flood Storage*. Prepared for Alberta Environment and Parks. February 2015.

IBI Group and Golder Associates Ltd., 2017. *Flooding Mitigation Options Assessment*. Prepared for The City of Calgary. August 2017.

Hatch Mott MacDonald Ltd., 2014. *The City of Calgary Glenmore Reservoir Diversion Feasibility Study*. Prepared for The City of Calgary. July 2014.

Stantec Consulting Ltd., 2015. *Glenmore Reservoir Fish Creek Flood Diversion – Feasibility Assessment*. Prepared for The City of Calgary. October 2015

The City of Calgary, 2014. *Report from the Expert Management Panel on River Flood Mitigation*. June 2014.