



AGENDA

SPC ON UTILITIES AND CORPORATE SERVICES

May 9, 2018, 9:30 AM

IN THE COUNCIL CHAMBER

Members

Councillor W. Sutherland, Chair
Councillor P. Demong, Vice-Chair
Councillor D. Colley-Urquhart
Councillor D. Farrell
Councillor J. Gondek
Councillor S. Keating
Councillor J. Magliocca
Mayor N. Nenshi, Ex-Officio

1. CALL TO ORDER
2. OPENING REMARKS
3. CONFIRMATION OF AGENDA
4. CONFIRMATION OF MINUTES
 - 4.1 Minutes of the Regular Meeting of the SPC on Utilities and Corporate Services, 2018 April 18
5. CONSENT AGENDA

None
6. POSTPONED REPORTS

(including related/supplemental reports)

None
7. ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES
 - 7.1 Update on Upstream Bow River Flood Mitigation, UCS2018-0600
8. ITEMS DIRECTLY TO COMMITTEE
 - 8.1 REFERRED REPORTS

None

8.2 NOTICE(S) OF MOTION
None

9. URGENT BUSINESS

10. CONFIDENTIAL ITEMS

10.1 ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

10.1.1 Proposed Approval of Expropriation – Ward 09 (1020 9 ST SE, UCS2018-0570
Held confidential subject to Sections 23, 24 and 25 of *FOIP*

10.1.2 Proposed Approval of Expropriation – Ward 09 (1024 9 ST SE), UCS2018-0571
Held confidential subject to Sections 23, 24 and 25 of *FOIP*

10.1.3 Proposed Approval of Expropriation – Ward 09 (1002 8 ST SE), UCS2018-0572
Held confidential subject to Sections 23, 24 and 25 of *FOIP*

10.1.4 Summary of Green Line Real Property Transactions Q3 2015 to Q1 2018,
UCS2018-0573
Held confidential subject to Sections 23, 24 and 25 of *FOIP*

10.2 URGENT BUSINESS

11. ADJOURNMENT



MINUTES

SPC ON UTILITIES AND CORPORATE SERVICES

**April 18, 2018, 9:30 AM
IN THE COUNCIL CHAMBER**

PRESENT: Councillor W. Sutherland, Chair
Councillor P. Demong, Vice-Chair
Councillor D. Colley-Urquhart
Councillor D. Farrell
Councillor J. Gondek
Councillor S. Keating
Councillor J. Magliocca

ALSO PRESENT: General Manager D. Duckworth
Acting City Clerk M. A. Cario
Legislative Assistant J. Lord Charest

1. **CALL TO ORDER**

Councillor Sutherland called today's Meeting to order at 9:33 a.m.

2. **OPENING REMARKS**

Councillor Sutherland provided opening remarks at today's Meeting.

3. **CONFIRMATION OF AGENDA**

Moved by Councillor Demong

That the Agenda for today's Meeting be amended as follows:

- Bring forward Item 7.3, Report UCS2018-0116 to be dealt prior to Item 7.1, Report UCS2018-0282, and
- Add an item of Confidential Urgent Business entitled "Verbal Update - Proposed Lease (Downtown West End) 701 11 ST SW - UCS2018-0513".

MOTION CARRIED

Moved by Councillor Magliocca

That the Agenda for the 2018 April 18 Regular Meeting of the SPC on Utilities and Corporate Services be confirmed, **as amended**.

MOTION CARRIED

4. **CONFIRMATION OF MINUTES**

- 4.1 Minutes of the Regular Meeting of the SPC on Utilities and Corporate Services, 2018 March 14

Moved by Councillor Demong

That the Minutes of the Regular Meeting of the SPC on Utilities and Corporate Services held on 2018 March 14, be confirmed.

MOTION CARRIED

5. CONSENT AGENDA

None

6. POSTPONED REPORTS

None

7. ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

- 7.1 Corporate Environment, Health and Safety (EHS) Performance Report, UCS2018-0282

The following documents were distributed with respect to Report UCS2018-0282:

- A PowerPoint presentation entitled "Corporate EHS Performance Report", dated 2018 April 18; and
- A booklet entitled "Did you see a safety concern? Tell us about it".

Speaker: Larry Heather

Moved by Councillor Demong

That with respect to Report UCS2018-0282, the following be approved:

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

MOTION CARRIED

- 7.2 Waste & Recycling Services Outlook for 2018 to 2025, UCS2018-0153

Speaker: Larry Heather

Moved by Councillor Colley-Urquhart

Amendment:

That Councillor Farrell's proposed amendment to Report UCS2018-0153 Recommendations be amended as follows:

- by deleting the words "to investigate" and substituting with the words "to undertake a scoping report that investigates" following the words "direct Administration to"; and

- by deleting the words "by Q2 2020" and substituting with the words "no later than Q2 2019" following the words "SPC on Utilities and Corporate Services with a scoping report".

MOTION CARRIED

Moved by Councillor Farrell

That with respect to Report UCS2018-0153, the following be approved, **after amendment and as amended:**

That the SPC on UCS **recommends that Council:**

1. Receive this report for information; **and**
2. **Direct Administration to undertake a scoping report that investigates options and unintended consequences for significantly reducing waste, "avoidable" plastic waste, and single-use items, engage citizens and waste generators, and the costs of doing this work, and report back to the SPC on Utilities and Corporate Services with a scoping report no later than Q2 2019.**

MOTION CARRIED

Moved by Councillor Demong

That subject to Section 6(1) of Procedure Bylaw 35M2017, Section 78(2)(a) be suspended in order that Committee may complete the remainder of the agenda prior to the scheduled recess.

MOTION CARRIED

7.3 The City of Calgary 2017 Infrastructure Status Report, UCS2018-0116

A PowerPoint Presentation entitled "2017 Infrastructure Status Report", dated 2018 April 18, with respect to Report UCS2018-0116 was distributed.

Moved by Councillor Colley-Urquhart

That with respect to Report UCS2018-0116, the following be approved, **after amendment:**

That the SPC on Utilities and Corporate Services recommends:

1. That Council receive Report UCS2018-0116 and **Revised** Attachment 1 for information; **and**
2. **On behalf of the Chair of the SPC on Utilities and Corporate Services, the Committee formally requests that a Strategic Session of Council be held in May or June 2018 on the Capital Infrastructure Management to include:**
 - **addressing City-Owned assets**
 - **short and long term infrastructure risks**
 - **addressing the infrastructure gap**

And further that this Report be forwarded to the 2018 April 23 Regular Meeting of Council as an item of Urgent Business.

MOTION CARRIED

8. ITEMS DIRECTLY TO COMMITTEE

8.1 REFERRED REPORTS

None

8.2 NOTICE(S) OF MOTION

None

9. URGENT BUSINESS

None

10. CONFIDENTIAL ITEMS

Moved by Councillor Keating

That the SPC on Utilities and Corporate Services move into Closed Meeting at 12:20 p.m., in the Council Boardroom, to consider confidential matters with respect to the following items subject to Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*:

- 10.1.1 Proposed Lease (Spruce Cliff) – Ward 08 File No. 3415 8 AV SW, UCS2018-0434;
- 10.1.2 Summary of Real Estate Transactions for the Fourth Quarter 2017 (JH), UCS2018-0435;
- 10.1.3 Proposed Approval of Expropriation (Alyth-Bonnybrook) – (Ward 09) File No. 1009 26 AV SE (DG), UCS2018-0468;
- 10.1.4 Proposed Approval of Expropriation (Alyth-Bonnybrook) – Ward 09 File No. 1027 26 AV SE (DG), UCS2018-0469; and
- 10.2.1 Verbal Update - Proposed Lease (Downtown West End) 701 11 ST SW - UCS2018-0513.

MOTION CARRIED

Committee moved into Public Meeting at 12:47 p.m. with Councillor Sutherland in the Chair.

Moved by Councillor Demong

That Committee rise and report.

MOTION CARRIED

10.1 ITEMS FROM OFFICERS, ADMINISTRATION AND COMMITTEES

- 10.1.1 Proposed Lease (Spruce Cliff) – Ward 08 File No. 3415 8 AV SW, UCS2018-0434

A PowerPoint Presentation entitled "UCS2018-0434, Proposed Lease", dated 2018 April 18, was distributed which is to remain confidential subject to Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*.

Administration in attendance during the Closed Meeting discussions with respect to Report UCS2018-0434:

Clerk: M. A. Cario, D. Williams. Advice: J. Halfyard, R. Dupuis, S. McClung, S. Quayle, J. Cullen, D. Cassidy, B. Espinoza, K. Stewart, S. Wheeler, L. Kerr, D. Bell, E. Kortje, M. Gray, E. Lee.

Moved by Councillor Demong

That with respect to Report UCS2018-0434, the following be approved:

That the SPC on Utilities and Corporate Services recommend that Council:

1. Approve Administration Recommendation 1 contained in Report UCS2018-0434;
2. Request the Recommendations, Report and Attachments remain confidential under Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*, until the lease is executed.

ROLL CALL VOTE

For: (3): Councillor Sutherland, Councillor Colley-Orquhart, and Councillor Farrell

Against: (3): Councillor Demong, Councillor Keating, and Councillor Magliocca

MOTION DEFEATED

Councillor Demong requested that the defeated motion be forwarded to Council for information subject to Section 134(b) of the Procedure Bylaw 35M2017.

10.1.2 Summary of Real Estate Transactions for the Fourth Quarter 2017 (JH), UCS2018-0435

Administration in attendance during the Closed Meeting discussions with respect to Report UCS2018-0435:

Clerk: M. A. Cario, D. Williams. Advice: J. Halfyard, R. Dupuis, S. McClung, S. Quayle, J. Cullen, D. Cassidy, B. Espinoza, K. Stewart, S. Wheeler, L. Kerr, D. Bell, E. Kortje, M. Gray, E. Lee.

Moved by Councillor Demong

That with respect to Report UCS2018-0435, the following be approved:

That the SPC on Utilities and Corporate Services recommend that Council:

1. Approve Administration Recommendation 1 contained in Report UCS2018-0435; and
2. Request the Recommendations, Report and Attachments remain confidential under Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*, until published in the Council Agenda.

MOTION CARRIED

10.1.3 Proposed Approval of Expropriation (Alyth-Bonnybrook) – (Ward 09) File No. 1009 26 AV SE (DG), UCS2018-0468

Administration in attendance during the Closed Meeting discussions with respect to Report UCS2018-0468:

Clerk: M. A. Cario, D. Williams. Advice: J. Halfyard, R. Dupuis, S. McClung, S. Quayle, J. Cullen, D. Cassidy, B. Espinoza, K. Stewart, S. Wheeler, L. Kerr, D. Bell, E. Kortje, M. Gray, E. Lee.

Moved by Councillor Keating

That with respect to Report UCS2018-0468, the following be approved, **after amendment**:

That the SPC on Utilities and Corporate Services recommend that Council:

1. Approve Administration Recommendation 1 contained in Report UCS2018-0468; and
2. Request the Recommendations, Report and Attachments remain confidential under Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*, unless The City of Calgary is required to disclose pursuant to the *Expropriation Act* (Alberta)

And further, that this Report be forwarded to the 2018 April 23 Regular Meeting of Council as an item of Confidential Urgent Business.

MOTION CARRIED

10.1.4 Proposed Approval of Expropriation (Alyth-Bonnybrook) – Ward 09 File No. 1027 26 AV SE (DG), UCS2018-0469

Administration in attendance during the Closed Meeting discussions with respect to Report UCS2018-0469:

Clerk: M. A. Cario, D. Williams. Advice: J. Halfyard, R. Dupuis, S. McClung, S. Quayle, J. Cullen, D. Cassidy, B. Espinoza, K. Stewart, S. Wheeler, L. Kerr, D. Bell, E. Kortje, M. Gray, E. Lee.

Moved by Councillor Keating

That with respect to Report UCS2018-0469, the following be approved, **after amendment**:

That the SPC on Utilities and Corporate Services recommend that Council:

1. Approve Administration Recommendation 1 contained in Report UCS2018-0469; and
2. Request the Recommendations, Report and Attachments remain confidential under Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*, unless The City of Calgary is required to disclose pursuant to the *Expropriation Act* (Alberta).

And further, that this Report be forwarded to the 2018 April 23 Regular Meeting of Council as an item of Confidential Urgent Business.

MOTION CARRIED

10.2 URGENT BUSINESS

10.2.1 Verbal Update - Proposed Lease (Downtown West End) 701 11 ST SW - UCS2018-0513

Administration in attendance during the Closed Meeting discussions with respect to Verbal Report UCS2018-0513:

Clerk: M. A. Cario, D. Williams. Advice: J. Halfyard, R. Dupuis, S. McClung, S. Quayle, J. Cullen, D. Cassidy, B. Espinoza, K. Stewart, S. Wheeler, L. Kerr, D. Bell, E. Kortje, M. Gray, E. Lee.

Moved by Councillor Farrell

That with respect to Verbal Report UCS2018-0513, the following be approved:

That the SPC on Utilities and Corporate Services direct that Verbal Report UCS2018-0513 and closed meeting discussions remain confidential subject to Sections 23, 24 and 25 of the *Freedom of Information and Protection of Privacy Act*.

Against: Councillor Demong

MOTION CARRIED

11. ADJOURNMENT

Moved by Councillor Keating

That this meeting adjourn at 12:51 p.m.

MOTION CARRIED

The following item has been forwarded to the 2018 April 23 Regular Meeting of Council as item of Urgent Business:

The City of Calgary 2017 Infrastructure Status Report, UCS2018-0116

The following items have been forwarded to the 2018 April 23 Regular Meeting of Council as Items of Confidential Urgent Business:

Proposed Approval of Expropriation (Alyth-Bonnybrook) – (Ward 09) File No. 1009 26 AV SE (DG), UCS2018-0468

Proposed Approval of Expropriation (Alyth-Bonnybrook) – Ward 09 File No. 1027 26 AV SE (DG), UCS2018-0469

The following items have been forwarded to the 2018 May 28 Regular Meeting of Council:

CONSENT:

Waste & Recycling Services Outlook for 2018 to 2025, UCS2018-0153

CONFIDENTIAL CONSENT:

Proposed Lease (Spruce Cliff) – Ward 08 File No. 3415 8 AV SW, UCS2018-0434

Summary of Real Estate Transactions for the Fourth Quarter 2017 (JH), UCS2018-0435

The next Regular Meeting of the SPC on Utilities and Corporate Services has been scheduled for 2018 May 09.

CONFIRMED BY COMMITTEE ON 2018 MAY 09

CHAIR

ACTING CITY CLERK

Update on Upstream Bow River Flood Mitigation

EXECUTIVE SUMMARY

With provincial commitment to Springbank Reservoir on the Elbow River, Calgary's remaining flood risk is primarily on the Bow River. This report summarizes the status of the recommendations of the Bow River Working Group (BRWG) and identifies opportunities to move forward more urgently on upstream flood mitigation on the Bow River. Flood mitigation remains one of The City's top infrastructure needs. The City's Flood Mitigation and Resilience Strategy relies on upstream mitigation complemented by local community mitigation projects to provide mitigation to at least a 2013 flood event.

The City of Calgary participated in the BRWG with the Province, which explored options for flood mitigation and enhanced water supply on the Bow River. The BRWG's 2017 May report recommends construction of at least one new reservoir, as well as operational and infrastructure enhancements, to address flood and water supply management for the Bow River Watershed. Since the release of the 2017 May report, the Province has initiated some of the recommendations and recently announced funding commitments for feasibility studies for key infrastructure recommendations. Administration advocates for continued collaboration to drive this process forward.

A future reservoir and operational efficiencies upstream are essential components to address Calgary's flood resiliency and regional water supply availability in the face of uncertain climate change impacts. The City of Calgary also provides drinking water to about 1 in 3 Albertans and is dedicated to implementing the Government of Alberta's *Water for Life* strategy through an integrated water management framework to ensure reliable and resilient water servicing for Calgary and regional customers. This report also seeks to initiate discussions with the Province to develop solutions for The City's regional watershed management challenges.

ADMINISTRATION RECOMMENDATION:

That the SPC on Utilities and Corporate Services recommend that Council:

Send a letter to the Province requesting:

- a. The Province reconvene the Bow River Working Group with a renewed governance framework as soon as possible;
- b. All projects in The City's 2017 Alberta Community Resilience Program application be approved and funded as submitted; and
- c. The Province work with Administration to develop a proposed scope of work for a bi-lateral Task Force to address The City's flood mitigation, policy, and watershed management issues.

PREVIOUS COUNCIL DIRECTION / POLICY

On 2014 June 26, Council approved the Expert Management Panel's River Flood Mitigation Panel Final report (PFC2014-0512), which included direction to explore upstream storage improvements to manage potential floods on the Bow River. Update reports from Administration have followed annually (UCS2015-0082, UCS2016-0168, UCS2017-0266).

Council directed Administration to develop an implementation and funding plan for community flood mitigation work in the 2016 annual update report which was accepted by Council on 2017

Update on Upstream Bow River Flood Mitigation

June 26 (PFC2017-0462). Administration was also directed to confirm and communicate to other orders of government that flood mitigation is a top strategic priority for The City of Calgary.

On 2018 February 14, The SPC on Utilities and Corporate Services received the Flood Resiliency and Mitigation 2017 Annual Report (UCS2018-0092), which outlined the Council-approved strategic approach to watershed and community level flood mitigation measures for Calgary. During the meeting, Council requested Administration return with an update on the status of upstream flood mitigation by the Province on the Bow River.

BACKGROUND

The Bow River Working Group (BRWG) was formed in 2015 by the Province with representation from The City of Calgary, regional municipalities, First Nations communities, irrigation districts, TransAlta, and other stakeholders. The group's mandate was to provide advice on a long-term water management plan that considers both flood and drought for the region. In 2017 May, the *Advice to Government on Water Management in The Bow River Basin* report (Attachment) was published with recommendations to improve flood resilience and water management in the Bow River Watershed. The recommendations include construction of at least one reservoir, as well as operational and minor infrastructure enhancements, to provide long-term flood mitigation and improve regional water supply management.

INVESTIGATION: ALTERNATIVES AND ANALYSIS

The BRWG report identified 11 recommendations related to regional drought and flood mitigation for further study. As of 2018 April, the Province has begun work on several of the recommendations which are critical to Calgary's flood resilience. This includes:

- Initiated a conceptual study in partnership with TransAlta to increase the drawdown rate in the Ghost Reservoir and expand the reservoir's water storage capacity.
- Committed to funding a conceptual assessment for the three most promising major infrastructure options for an upstream reservoir for flood mitigation and water supply:
 - A New Glenbow reservoir on the Bow River upstream of Bearspaw
 - A New Morley reservoir on the Bow River upstream of Ghost Reservoir
 - Expansion of the existing Ghost Reservoir.
- Initiated discussions with TransAlta to extend and expand the current operational agreement, including adding Spray Lake and Lake Minnewanka to the agreement and using Barrier Lake for flood mitigation. The current agreement expires in 2021 and provides significant flood mitigation for Calgary.

On 2018 May 1, the Minister of Environment and Parks announced the Province's commitment to completing both the feasibility study for the Ghost Reservoir drawdown and the conceptual assessment for the major infrastructure options.

Areas of opportunity

Bow River Working Group

- More urgency is needed to move the BRWG studies beyond conceptual stages. The City is committed to continued collaboration to advance this work and has been strongly encouraging the Province to reconvene the BRWG process. A renewed governance framework for the BRWG should be developed to support moving from conceptual studies to implementation of upstream initiatives.

Update on Upstream Bow River Flood Mitigation

Complementary Bow River community barriers

- The City finalized its flood mitigation plan in 2017 (PFC2017-0462), which is consistent with the BRWG report's conclusions. As part of the plan, four barriers are required to maximize flood mitigation on the Bow River: downtown, Bowness, Sunnyside, and Pearce Estate-Inglewood. The City has initiated the design process for the barriers and community engagement has started. Community input on design is expected to begin in the fall of 2018.
- The proposed barriers will mitigate against smaller flood events and are intended to be complementary to upstream mitigation. Community barriers alone cannot mitigate an event similar to 2013 without significantly disrupting established communities. Administration has completed comprehensive technical studies and has determined that other mitigation alternatives are not technically feasible.
- The City submitted funding applications to the Alberta Community Resilience Program (ACRP) for the four barriers. On 2018 May 1, the Province awarded ACRP funding for the downtown barrier, which will mitigate against a 1:200 flood. The Province indicated that for future ACRP approvals, two of the remaining three barriers need to be higher and provide mitigation to a 1:100 flood on their own.
- Requiring barriers to meet the Province's mitigation requirements is not technically or socially feasible in Calgary's established communities. This would result in significant cost increases, changes to project scope, and could have additional negative impacts on affected communities.
- Provincial recognition that upstream mitigation is critical to Calgary's flood resilience on the Bow River and cannot be replaced solely by barriers is needed. The City is seeking ACRP approval for the remaining barriers as submitted in 2017 September to complement upstream efforts.

Policy and regulations

- Updated Provincial Flood Hazard Area mapping and floodway regulations have been delayed. Administration continues to advocate for Provincial policy that recognizes the impacts of structural and operational flood mitigation efforts, as there are implications on local mitigation project designs, municipal land use policy and development, and eligibility for disaster relief.

Regional watershed management

- There are a number of watershed management issues facing The City, both short and long term. This includes progress on flood mitigation, water supply security in the Bow River basin in the face of a changing climate, and the role of The City in providing regional water supply through its water licences to other members of the Calgary Metropolitan Region Board.
- The City takes an integrated approach to watershed management and would like to work with the Province in the same way. These watershed management issues cross different departments and ministries within the Province, and need to be addressed holistically.
- Administration proposes to work with the Province to establish a bi-lateral Task Force between senior administrations to initiate a solutions-focused framework to address integrated watershed management issues, including flood mitigation, drought, water supply, and water security.

Update on Upstream Bow River Flood Mitigation

Stakeholder Engagement, Research and Communication

The City collaborates with internal and external stakeholders on building flood mitigation and resilience. Through a proposed bi-lateral Task Force between The City and the Province and renewed BRWG process, The City will continue engaging with stakeholders on building water management solutions for the region.

The City continues to engage with flood affected communities to ensure local flood mitigation projects on the Bow River are supported by the community. A robust engagement plan is being implemented to support this work.

Strategic Alignment

The Flood Mitigation and Resilience Strategy aligns with the Resilient Calgary initiative and The City's Climate Program. Our integrated watershed management approach contributes to a number of Council's Priorities for 2015-2018: N2 - Build resiliency to flooding. H3 - Manage the interrelationships between flood protection, water quality and quantity, and land use. H4 - Work with our regional partners and the Government of Alberta on an integrated approach to the watershed.

Social, Environmental, Economic (External)

The City's flood mitigation program is building community resiliency by protecting critical infrastructure and the social and economic fabric of communities from flood risk. Given the region's water security concerns, a new upstream reservoir on the Bow River must address both flood mitigation and water supply. With an understanding of integrated watershed management issues, Provincial action is required on regional water security so growth and economic prosperity are supported while minimizing environmental and social risks.

Financial Capacity

Current and Future Operating Budget:

Program initiatives to achieve flood resiliency goals are incorporated in the 2015-2018 Utilities budget.

Current and Future Capital Budget:

ACRP projects underway since 2014 are funded within the approved capital budget. The City continues to pursue potential external funding opportunities for new projects as they arise.

Risk Assessment

Failure to move quickly on these recommendations leaves communities along the Bow River and the downtown at risk of severe flood damage when another flood occurs. Administration has determined that there is no way to mitigate floods to 2013 levels or higher solely through barriers, and that at least one new reservoir is required on the Bow River. Regulatory uncertainty remains a risk to The City's flood mitigation work, and The City continues to raise its concerns with the Province.

Climate change is likely to increase the frequency of flooding and drought in the region, placing strain on regional water security. The work identified in this report will contribute to mitigation of

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SPC on Utilities and Corporate Services
2017 May 09**

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Update on Upstream Bow River Flood Mitigation

flooding and help address risks related to water security, anticipated changes to service delivery, and the impacts of climate change.

REASON FOR RECOMMENDATION:

Administration advocates for a continuation of the BRWG process to drive the implementation of recommendations on flood mitigation and water supply improvements on the Bow River that are essential to Calgary's flood and water supply resilience. Support from Council is needed to gain Provincial agreement on: renewed governance of the Bow River Working Group, approval of all of The City's 2017 Alberta Community Resilience Program projects as submitted, and a Provincial-City mechanism to address Calgary's watershed management challenges.

ATTACHMENT(S)

Executive Summary: Advice to Government on Water Management in The Bow River Basin

EXECUTIVE SUMMARY

**Bow River Water
Management Project**

Advice to Government on Water Management in the Bow River Basin

Submitted to:
Hon. Shannon Phillips
Minister
Environment and Parks
Government of Alberta

Submitted on:
May 17th 2017

The Bow River system is fundamental to the daily life of people in the watershed and downstream, providing water for drinking, irrigation, livestock, waste assimilation, electricity generation, wildlife and recreation.

Historical records and estimates for the Bow River show dramatic variation in volume from year to year as well as within years. The need to adapt to an ever-changing environment and often rapidly changing weather conditions is a simple reality of life in the basin. The flow in the Bow River is heavily influenced by water management infrastructure. The water from snowmelt and spring rains, partially captured by upstream and downstream reservoirs, has allowed for sufficient flows, in most years, for environmental protection, municipal purposes, power production and irrigation.

A less predictable water supply and an increasing demand for water as well as changing climate and demand patterns mean that careful water management will be critical to success in our economic, community, recreational, and environmental future. A fundamental principle of this work is that floods and droughts cannot be prevented, but we can be better prepared.

The 2005 and 2013 floods surpassed any observed on the Bow River since 1932 and illustrate the risks to public safety and infrastructure associated with populations and developments in the floodplain.

Droughts pose a risk to providing a reliable supply of clean water for municipal, residential, commercial, and agriculture needs. Droughts also place stress on environmental conditions in the watershed, and present significant economic risks.

Flood or drought mitigation cannot be assessed in isolation—they must be considered as part of a water management system that values watershed health.

Water management cannot be looked at in isolation because it ties directly to many other government priorities, including climate change mitigation and adaptation, regional land-use planning, economic development, and recreation and tourism. Thus, this complex river system requires careful water management leadership and operations to balance environmental, social and economic values in the region.

PROJECT OBJECTIVES AND REPORT OVERVIEW

The Bow River Water Management Project, announced in October 2015 by Alberta Environment and Parks (AEP) and jointly chaired with the City of Calgary, is one of many water management projects and investments initiated in the Bow River Basin since the floods in 2013.

Specifically, the project had objectives to:

- Develop scenarios of potential operational and infrastructure flood mitigation opportunities in the upper Bow River Basin (above Calgary) to reduce peak flow during a defined range of

synthesized flood events to approximately 1,200, 800, and 400 cms measured on the Bow River above the confluence with the Elbow River, and assess how these scenarios affect flow thresholds along other reaches of the Bow River.

- Identify schemes required to offset any increased water management risk in the basin created by the flood mitigation scenarios upstream.
- Develop scenarios of potential operational and infrastructure drought mitigation opportunities to reduce the volume of licence shortages by at least 5% to 10%, while continuing to meet apportionment requirements, and with improvement, or at minimum no reduction, in ecosystem health (all relative to current operations in the same time period).

The Bow River Basin is fortunate to have a strong history of collaborative exploration of water management challenges and opportunities. This project benefited from a similar collaborative effort, involving water users, water managers, and other stakeholders from across the basin. This process did not seek consensus; rather, it was designed to explore practical mitigation strategies and scenarios informed by the best available data and knowledge in the basin. The project was governed through three groups: the Advisory Committee, the Bow River Working Group (BRWG), and community groups.

This project focused on the water quantity impacts (peak flow rate and volume, storage, shortages) of a range of potential flood and drought mitigation schemes and drew on the expertise and knowledge of participants to comment on their perspectives on associated socio-economic, environmental, and design and operational considerations. The work was a screening assessment the contributors recognized as an essential first step, and one that must be followed with further analysis based on a prioritized set of schemes.

The Bow River Operational Model (BROM) provided the analysis required for the BRWG to consider a range of flood and drought events, assess the effect of individual mitigation schemes, and assess the cumulative effect of multiple mitigation schemes combined into mitigation scenarios. The BROM is a comprehensive, mass balance model of the Bow River system developed using 86 years of Government of Alberta water data broken into daily flows, combined with the latest data from TransAlta and the Water Survey of Canada for hourly flows during the 2005 and 2013 flood periods.

This report summarizes the findings of the project and offers it as advice to the Minister of Alberta Environment and Parks in developing a robust, strategic plan for water management in the Bow River Basin, from the headwaters to the confluence with the Oldman River and continuing through Medicine Hat. This advice focuses on screening structural flood and drought mitigation opportunities in the basin, assessing the resulting flow impacts downstream through the entire basin, and considering the associated effects on watershed health.

FLOOD MITIGATION RESULTS

Four synthesized flood events, based on data from the actual 2005 and 2013 floods, were chosen to test and assess potential flood mitigation schemes. These flood events exhibited different characteristics, with 2005 having high volume and two peaks, and 2013 having less volume but a single, higher peak. The peak flow at Calgary was used to establish the baseline, but flow rates at many other locations throughout the Bow River system were also considered in the assessment of mitigation schemes.

Early in the process, discussion focused on whether 400 cms is a realistic flood mitigation target—given many schemes would be required to mitigate to that level and there would be potential for detrimental effects on the natural functions of the river and floodplain. Given these concerns of the BRWG and results of preliminary modelling, the Advisory Committee confirmed in August 2016 that flood mitigation scenarios should be developed for the 1,200 and 800 cms targets only.

Fifteen flood mitigation schemes were assessed by the BRWG. These schemes were located across the Bow River Basin upstream of Calgary. The most promising schemes were grouped into scenarios to achieve the flow target. Four scenarios were developed for the 1,200 cms flow target and three scenarios were developed for the 800 cms target.

Flood mitigation in the Bow River Basin

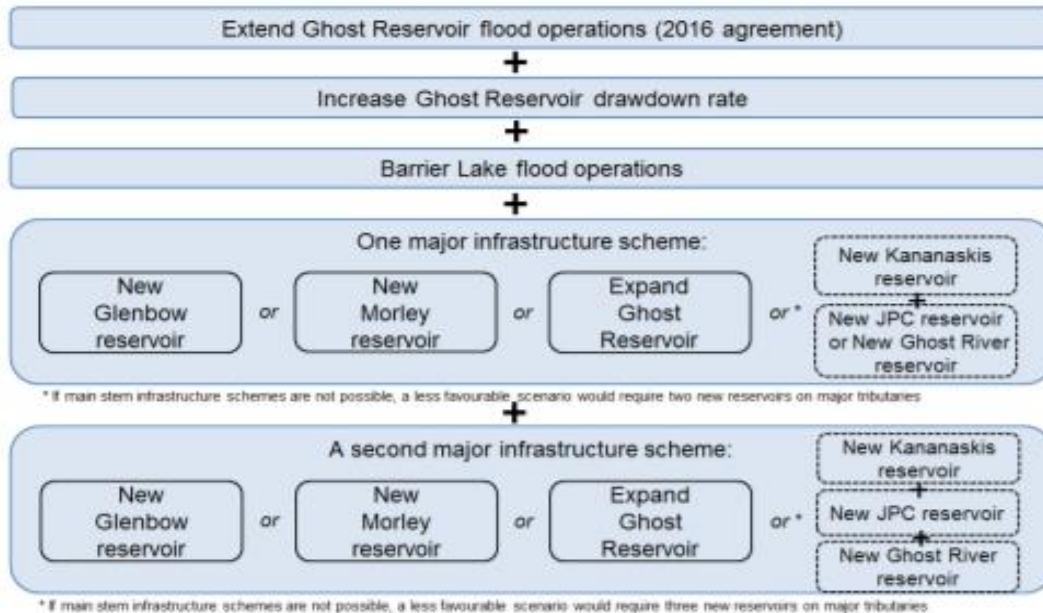
Target: 1200 cms on the Bow River at Calgary



Executive Summary Figure 1: Flood mitigation scenarios for target 1,200 cms on the Bow River at Calgary

Flood mitigation in the Bow River basin

Target: 800 cms on the Bow River at Calgary



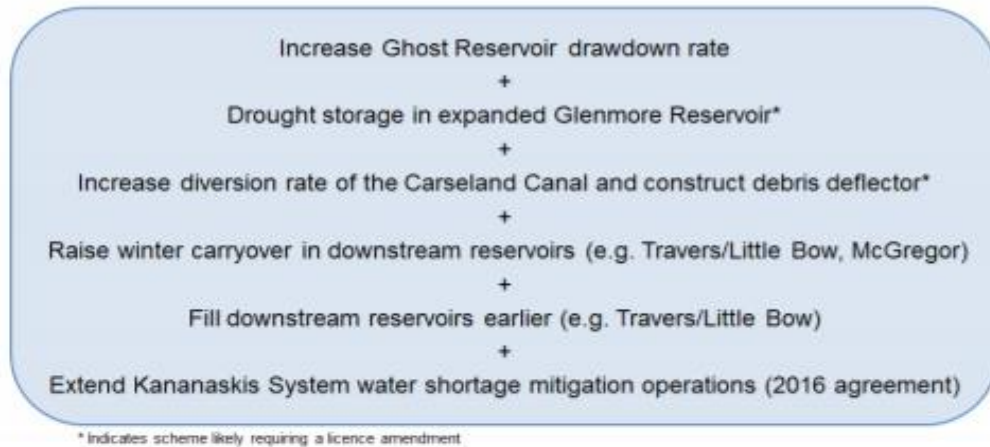
Executive Summary Figure 2: Flood mitigation scenarios for target 800 cms on the Bow River at Calgary

The Bow River Basin is a complex, regulated, interconnected system. Implementing flood mitigation schemes and scenarios upstream of Calgary will change the historically managed flow regime the system has grown and adapted into. Changes to improve flood mitigation have already and could further reduce drought resiliency, which could result in more water shortages to licensed water users and impact watershed health.

Thus, early in this project, project participants emphasized the importance of balancing the system. To address this, six relatively minor schemes were identified as most promising and combined into a scenario to balance the system.

Balancing the System

Target: Offset the increased risk from the flood mitigations schemes



Executive Summary Figure 3: Scenario to balance the system

DROUGHT MITIGATION RESULTS

The historical record and two synthesized drought events (developed to simulate inflow time series that stress the Bow River system beyond what has been observed in the historical record and reflect potential impacts of climate change) were used to assess drought mitigation schemes.

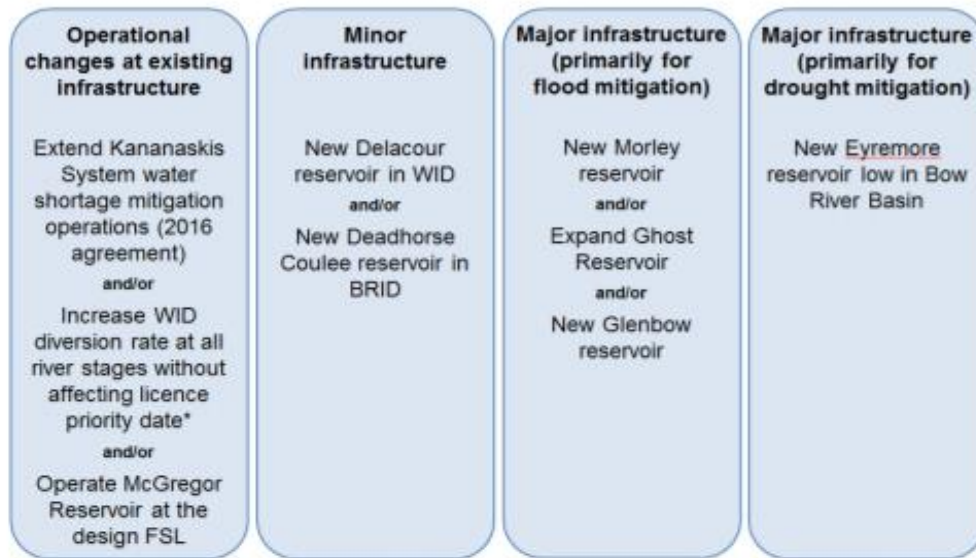
Twelve drought mitigation schemes across the Bow River Basin were assessed by the BRWG. These were over and above the six schemes already covered in the balancing the system scenario.

The BRWG was assigned a drought mitigation objective that early modelling found to be quite conservative. Many of the individual drought mitigation schemes alone could achieve the 5% to 10% reduction in licence shortages without violating apportionment requirements and ecosystem health.

The nature of the BRWG discussion evolved from “How do we achieve the objective?” to “What are the most promising schemes for adding drought mitigation capacity to the Bow River Basin?” The most promising schemes fell into four types: operational changes, minor infrastructure projects, major infrastructure projects primarily for flood mitigation, and major infrastructure projects primarily for drought mitigation.

Drought mitigation in the Bow River Basin

Target: More than 10% reduction in licensed shortages



* Indicates scheme likely requiring a licence amendment

Executive Summary Figure 4: Drought mitigation in the Bow River Basin; in addition to the six schemes already identified to balance the system

WATER MANAGEMENT ADVICE

Participants in the BRWG were adamant that a flexible, resilient, and adaptive water management strategy is needed for the Bow River. During this project, the BRWG identified and assessed multiple potential structural flood and drought mitigation schemes and combined them into scenarios. As presented in this report, in a system as complex as this one, there are a number of promising scenarios that could be pursued following further study.

No single scenario can, at this point, be put forward as the ideal solution. Nor can a single combination of flood and drought mitigation schemes be put forward as the ideal strategy for the Bow River Basin. Instead, this project has reduced the number of potential schemes to a short list of those that appear most promising.

Water management in the Bow River Basin

Target: Balancing flood mitigation and drought mitigation

	Flood mitigation	Balancing the system	Drought mitigation
Operational changes	<ul style="list-style-type: none"> Extend Ghost Reservoir flood operations (2016 agreement)* Barrier Lake flood operations 	<ul style="list-style-type: none"> Drought storage in expanded Glenmore Raise winter carryover in existing reservoirs Fill downstream reservoirs earlier Extend Kan. System water shortage mitigation operations (2016 agreement)* 	<ul style="list-style-type: none"> Increase WID diversion rate at all river stages without affecting licence priority date Operate McGregor Reservoir at the design FSL
Minor infrastructure projects	<ul style="list-style-type: none"> Increase Ghost Reservoir drawdown rate 	<ul style="list-style-type: none"> Increase Carseland diversion and construct debris deflector 	<ul style="list-style-type: none"> New Delacour reservoir in WID New Deadhorse Coulee reservoir in BRID
Major infrastructure projects**	<ul style="list-style-type: none"> New Glenbow reservoir New Morley reservoir Expand Ghost Reservoir 		<ul style="list-style-type: none"> New Eyremore reservoir low in Bow River Basin

*Ghost Reservoir flood operations and Kananaskis System water shortage mitigation operations are currently in place until 2021.

**One major infrastructure project would be required to meet the 1200cms flood mitigation target at Calgary. Two major infrastructure projects would be required to meet the 800cms flood mitigation target at Calgary.

Executive Summary Figure 5: Most promising water management schemes for the Bow River Basin

The varying scale of the potential schemes means many of the operational and minor infrastructure projects could be implemented relatively quickly, while larger infrastructure projects would typically require a longer assessment, design, and construction process.

Recognizing this, the BRWG offers the following next steps for a strategy to improve water management in the Bow River Basin:

1. Build on the 2016 GoA Modified Operations Agreement with TransAlta to put in place the prerequisite needed in the upper Bow system: a long-term flexible watershed agreement between the Province and TransAlta.
2. Implement the relatively quick wins, which can be completed while larger projects are assessed.
 - Extend Ghost Reservoir flood operations (2016 agreement) *
 - Barrier Lake flood operations

- Drought storage in expanded Glenmore Reservoir **
- Increase diversion rate of the Carseland Canal and construct debris deflector **
- Raise winter carryover in downstream reservoirs (e.g., Travers, McGregor)
- Fill downstream reservoirs earlier (e.g., Travers/Little Bow)
- Extend Kananaskis System water shortage mitigation operations (2016 agreement) *
- Increase WID diversion rate at all river stages without affecting licence priority date **
- Operate McGregor Reservoir at the design FSL

* indicates scheme already in place or underway

** indicates scheme likely requiring a licence amendment

3. Complete conceptual assessments and feasibility studies of the minor infrastructure schemes within 1 year.
 - Increase Ghost Reservoir drawdown rate
 - Increase diversion rate of the Carseland Canal and construct debris deflector
 - New Delacour reservoir in WID
 - New Deadhorse Coulee reservoir in BRID
4. Complete conceptual assessments of the 3 major infrastructure flood schemes within 2 years to determine which to advance to feasibility study.
 - New Glenbow reservoir
 - New Morley reservoir
 - Expand Ghost Reservoir
5. Complete conceptual assessment for Eyremore scheme.
6. Ensure full risk management, feasibility, cost–benefit, and triple bottom line assessments are completed in subsequent steps as the schemes and scenarios are advanced.
7. Balance the system to mitigate the increased drought risk from the 2016 GoA Modified Operations Agreement with TransAlta and do not implement further flood mitigation schemes without implementing the accompanying schemes to balance the system and improve its adaptive capacity.
8. Establish a process to set and achieve drought mitigation objectives for the Bow River Basin given that the most promising drought mitigation schemes assessed in this project can achieve far more than the original 5 to 10% objective.
9. Increase resourcing and support for precipitation monitoring and forecasting, flow monitoring, flood forecasting and drought forecasting to enhance the effectiveness and adaptability of water

management operations.

10. Continue to invest in natural watershed functions, floodplain protection and local mitigation.
11. Commit to a continual collaborative process with stakeholders and policy makers for advancing and implementing these schemes as part of the water management strategy in the Bow River Basin.
12. Review and strengthen where possible the current water management operational protocols of both public and private operators.

Most importantly, a coordinated and integrated approach to watershed management throughout the Bow watershed is essential to reduce risks from floods and droughts, minimize costs for mitigation options, and provide for a safe, clean, and healthy river system over the long term.

Much work has already been done, however, given the need for new and costly schemes to achieve flood and drought protection goals, a more formalized collaborative governance process may be needed to select the most effective and affordable options for implementation and to retain public confidence in the expenditures and expected results.

Participants in this project have indicated they are willing and eager to continue to provide their expertise and energy to the next several phases of this long-term, public interest project.