

**Infrastructure Services Report to
Infrastructure and Planning Committee
2025 February 12**

**ISC: UNRESTRICTED
IP2025-0150**

Water System Planning

PURPOSE

At the meeting of Council on December 17, 2024 (IP2024-1237) The City committed to provide information to Council and Calgarians on water system planning (Attachment 2) and share information as it becomes available on the City's next steps to improve reliability of the Bearspaw South Feedermain.

This report will:

- 1) Share how we plan for water system capacity and redundancy to ensure delivery of safe drinking water to customers now and in the future.
- 2) Identify the infrastructure projects that are underway to serve growth in Calgary and the region, to provide system redundancy and the City's next steps to improve the reliability of the Bearspaw South Feeder main.
- 3) This report is not part of the independent review. Learnings from the independent review will be used to improve water system planning and investments.

PREVIOUS COUNCIL DIRECTION

Council has received verbal updates regarding the Bearspaw South Feeder Main since the original break on 2024 June 5 (Attachment 1).

RECOMMENDATION:

That the Infrastructure and Planning Committee recommend that Council:

1. Receive this report for the Corporate Record.

CHIEF ADMINISTRATIVE OFFICER/GENERAL MANAGER COMMENTS

General Manager Michael Thompson (Infrastructure Services) supports the contents of this report.

HIGHLIGHTS

Key highlights are as follows:

- The City of Calgary's water system planning considers the need for system capacity to serve growth and infrastructure redundancy requirements to ensure the delivery of safe water to customers.
- Calgary has made great progress on water efficiency over the years, however challenges such as source water availability and rapid population growth in Calgary and the region require continued focus on water efficiency, including an accelerated focus on reducing water loss.
- Increasing demand is triggering the need for major infrastructure investment to provide increased system redundancy and serve growth, sooner than originally planned.
- Infrastructure projects are underway including planning for a new Water Treatment Plant, expansion of the Glenmore Water Treatment Plant, and three major feeder main projects. The City will also improve the reliability of the Bearspaw South Feeder Main as it will continue to play an important role in the function of Calgary's water system.

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- The City will continue to share information with the independent review and apply any learnings to improve water system planning and investments.

DISCUSSION

Service reliability is a top priority for our customers. We understand the provision of water is both an essential need and a critical service. Calgarians expect drinking water to be reliable and available, now and for generations to come.

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The City of Calgary's water system is designed to provide maximum day demand in normal working conditions and average day demand for Calgary and the region in a planned or emergency infrastructure outage. This planning criteria applies to all infrastructure from the raw water intakes to our customers tap and aligns to the Province of Alberta Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems Guidelines.

The City of Calgary planning criteria is reviewed regularly with fulsome evaluation, peer reviews, and updates made in 1996, 2011 and 2021. A comparison of the City of Calgary's criteria and was undertaken as part of the 2021 Water Long Range Plan. This comparison showed Calgary's planning criteria provides a level of system redundancy that is better than or on par with other jurisdictions.

Maximum Day Demand is the highest total volume of water produced in a single day in a given year. In Calgary our maximum day demand is often on days of +30 °C weather in June, July or August. Average Day Demand is calculated by taking the total volume of water produced at both treatment plants over a year divided by 365 days. In Calgary an average day of water demand is similar to demand on a shoulder season day in April or October.

Over the past two decades, Calgarians have reduced their per capita water use by 30 per cent, enabling an overall demand that has been the same since 2003, even as the population grew by half a million. The City has implemented a range of tactics, and worked in partnership with Calgarians, since the 1980s to reduce Calgary's water consumption. While we've made great progress over the years, challenges such as source water availability and rapid population growth in Calgary and the region necessitate continued focus on water efficiency.

Calgary's historical water demand is shown in Attachment 3. The historical demand trend shows that Calgary's average day demand and maximum day demand began to increase in 2020. As Calgary and the region continues to grow at a high pace, water demand will continue to increase, the capacity of the existing system will be fully utilized and the need and timeframe for major infrastructure will be accelerated.

Plans for capacity, redundancy and reliability

The City's updated Water Efficiency Plan and Accelerated Water Loss Program are both key initiatives to reduce both maximum and average day water demand. The update to the Water Efficiency Plan will be brought to Council in early 2026, while the actions identified in the Accelerated Water Loss Program are underway. These key initiatives are expected to result in

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gradual demand reductions over a longer timeframe but are necessary components in optimizing the water system and reducing loss.

The feeder main projects, shown below and on Attachment 4, will increase Calgary's water transmission capacity, ensuring there is capacity in the water system to serve growth, provide redundancy and reduce reliance on existing feeder mains.

- North Calgary Water Servicing Project. This project will provide partial system redundancy to the Bearspaw South feeder main. It will also provide redundancy to six other feeder mains. This project will be complete by the end of 2028.
- South Calgary Water Servicing. This project is in early development and will provide the remaining system redundancy to the Bearspaw South feeder main and two other feeder mains. This project is a new feeder main to move water to south Calgary from the Bearspaw Water Treatment Plant (likely in an alignment along Stoney Trail terminating at Anderson Road and 14th Street) that is planned to be complete by 2031.
- Crosstie Feeder main. This project will improve the redundancy of the feeder main network in NE Calgary and improve system pressures in Saddle Ridge, Taradale, Martindale and Falconridge. This feeder main extends along Country Hills Blvd from Coventry Hills Blvd to 60th Street NE and will be constructed by 2029.

The water treatment plant projects, shown below and on Attachment 4, will increase Calgary's water treatment and raw water capacity, ensuring sufficient drinking water supply to serve growth. Additionally, the Glenmore Expansion investment will eliminate single points of failure improving the reliability of the treatment plant.

- Glenmore Water Treatment Plant Expansion. This expansion includes a new treated water storage reservoir (called a "clearwell"), high lift pump station and electrical building. These projects will be complete by 2031.
- Water Treatment Expansion program. This program includes a new water treatment plant, and a new and/or upgraded raw water intake. The new infrastructure will be located along the Bow River and will be complete in 2035.

Building on the learnings from 2024 about how to operate the system in new ways, there are small scale pump station projects that will improve our flexibility to move water. This work will help us do critical maintenance work with less interruptions to customers.

The infrastructure projects listed above are complex and challenging to design and build, usually resulting in a project timeframe that is >10 years from planning to infrastructure being in service. As Calgary and the region continues to grow at a high pace and water demand in Calgary increases, the timing of this infrastructure and ensuring the reliability of our existing infrastructure becomes critical.

As shared with Council in December 2024, the condition of Bearspaw South Feeder Main has been improved through the repairs that were undertaken in 2024. These repairs have enabled stable operation of the infrastructure under current conditions; however analysis has determined that over the next 5 to 30 years a growing number of pipe segments are likely to require repair or replacement as it continues to deteriorate.

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North Calgary and South Calgary Water Servicing projects will reduce the reliance on the Bearspaw South Feeder main to supply water during average day demand conditions, but this feeder main will continue to be relied upon in the future to provide maximum day demand. It is also a key piece of infrastructure that will enable the Glenmore WTP to be taken out of service for planned maintenance and upgrades. This feeder main is and will continue to be an important part of Calgary's water infrastructure and as such will continue to be monitored and operated in a manner that reduces the risk of failure.

To improve the reliability of the 1950 mm prestressed concrete cylinder pipe (PCCP) portion of the Bearspaw South Feeder main (from 87th Street to Shaganappi Trail) several rehabilitation and replacement options have been identified and explored. At this time, the preferred option is to employ a combination of microtunnelling a new feeder main, in concert with other construction and repair techniques. Microtunnelling is preferred as it best minimizes impact to adjacent citizens and businesses and service impacts to Calgarians. Design of the Bearspaw South Feeder Main Reliability project will begin in Q1 2025. The City will share additional information with the public as it becomes available.

Plans informed by reviews and new information

This report is not part of the independent review. The City has shared and will continue to share information with the independent review as we go forward. We understand the provision of water is both an essential need and a critical service, therefore any learnings from ongoing reviews will be used to improve water system planning practices.

EXTERNAL ENGAGEMENT AND COMMUNICATION

- | | |
|--|---|
| <input type="checkbox"/> Public engagement was undertaken | <input type="checkbox"/> Dialogue with interested parties was undertaken |
| <input type="checkbox"/> Public/interested parties were informed | <input checked="" type="checkbox"/> Public communication or engagement was not required |

IMPLICATIONS

Social

Administration recognizes the importance of having a water system planning consider the need for system capacity to serve growth and infrastructure redundancy requirements to ensure the delivery of clean and reliable drinking water to customers.

Environmental

Administration recognizes the broader environmental impacts on the water system for citizens.

Economic

Administration recognizes the economic benefit of these investments is to provide service reliability and certainty for residents and businesses in Calgary and the region.

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Service and Financial Implications

Other:

There are no operating or capital costs associated with the recommendation in this report. Consistent with current processes within these lines of service, construction budget may be requested separately from when design budget is needed. As projects move through stages of development, and when better cost estimates are available, a budget request for construction may come forward, which will also highlight any impact online of service rates.

RISK

As part of the next Water Long Range Plan Administration will assess its risk appetite and tolerance regarding the reliability of water service, the inherent risks of aging infrastructure and management of water feeder main assets.

ATTACHMENTS

1. Previous Council Direction
2. Conversations with Council
3. Historical Water Demand
4. Map of Projects
5. Water System Planning Presentation

Department Circulation

| General Manager/Director | Department | Approve/Consult/Inform |
|--------------------------|-----------------------------------|------------------------|
| Michael Thompson | Infrastructure Services | Approve |
| Stuart Dalgleish | Chief Operating Officer | Consult |
| Doug Morgan | Operational Services | Consult |
| Deb Hamilton | Planning and Development Services | Consult |

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