

Faculty of Science

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RE: Source water protection on Bearspaw Reservoir

Dear Mayor Gondek and Members of City Council,

We are writing to emphasize the critical importance of protecting the Bearspaw Reservoir from both a water quality and ecological perspective. As Calgary's primary drinking water source, the reservoir's integrity directly affects public health, ecosystem stability, and long-term water security for residents of the City of Calgary and downstream communities. The reservoir is a vital component of Calgary's water infrastructure, currently supplying approximately 60% of the city's drinking water to around 1.4 million people in the Calgary region and growing.

There is a strong scientific basis for proactive source water protection, as outlined in the City of Calgary's Source Water Protection Plan. Additionally, source water protection is a central component of the Government of Alberta's *Water for Life Strategy*, introduced in 2003, which is built on three pillars: (1) a safe, secure drinking water supply; (2) healthy aquatic ecosystems; and (3) reliable, quality water supplies to support a sustainable economy.

Achieving effective source water protection requires a proactive, multi-faceted approach that helps mitigate the various environmental stressors that can impact the reservoir's water quality. Below, we briefly outline some of the key issues and actions that warrant consideration.

Restricting Vehicle Access to Prevent Contaminant Entry

Restricting road access is a practical, preventive measure that protects the physical, chemical, and biological integrity of the reservoir, helping ensure cleaner, safer source water over the long term. Preventing contaminant entry is more effective than removal and once pollutants enter the reservoir - treatment becomes more complex and costly. The Bearspaw Reservoir is vulnerable to contamination related to:

- Sediment and nutrient (e.g., phosphorus and nitrogen) input from erosion, road dust, and runoff, which can affect water quality by enhancing the probability of harmful algal blooms and related toxins.
- Pathogens and organic pollutants inputs from human activity, thereby increasing filtration and treatment demands.
- Input of other contaminants, including hydrocarbons and trace chemicals, which may persist in aquatic systems. Vehicles can leak oil, fuel or deposit heavy metals onto roads, which can be subsequently washed into the reservoir by rain or snowmelt.

Enhancing Riparian Protection

Natural vegetation along waterways acts as a biological filter, reducing sediment, absorbing excess nutrients, and stabilizing banks. Degraded riparian zones associated with increasing human activity can lead to higher turbidity and nutrient inputs, subsequently increasing drinking water treatment costs. Moreover, taking appropriate measures ensuring the maintenance and protection of adequate buffer zones around the reservoir is a mitigative action that helps reduce the loss of habitat for beneficial species that contribute to water purification processes at the land-water interface.

Addressing Changing Environmental and Climate Conditions and Water Quality Risks

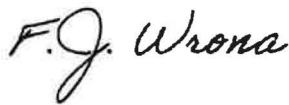
Projected warmer temperatures and shifting precipitation patterns in the Bow River watershed are expected to alter timing of the amount of water in the system and related quality. Water quality will be affected by factors such as increases in sedimentation due to more frequent and intensity of heavy rainfall events, lower water levels during droughts degrading overall water quality, and altered microbial and algal growth, potentially increasing algal toxin risks and taste and odour issues that are challenging and costly to treat. Proactive monitoring and adaptive management are essential to mitigate these impacts before they compromise water supplies.

Early Detection Through Monitoring Prevents Long-Term Damage

Continuous water quality monitoring (e.g., for turbidity, dissolved oxygen, and contaminants) allows for rapid response to emerging threats. Investing in real-time sensor networks and predictive modeling, as the City has done in many locations, can help identify issues early. These efforts can help detect water-quality related events before they reach the reservoir. Robust monitoring can also track long-term trends in water quality degradation. Protecting the Bearspaw Reservoir at the source is a scientifically validated strategy to help ensure safe, sustainable drinking water for Calgary under changing environmental and climate conditions.

In closing, we believe that with shared commitment and thoughtful action, we can collectively protect the Bearspaw Reservoir as a safe and sustainable drinking water source for current and future generations. We respectfully urge all stakeholders to prioritize source water protection as a foundational investment in the health, prosperity, and sustainability of our communities and encourage the city to carefully weigh the importance of source water protection as well as appropriate data collection, when making their decision on the proposed road closure.

Respectfully Yours,



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