

# Bow River Reservoir Options

## Phase 2: Feasibility Study

### October 2023 Update

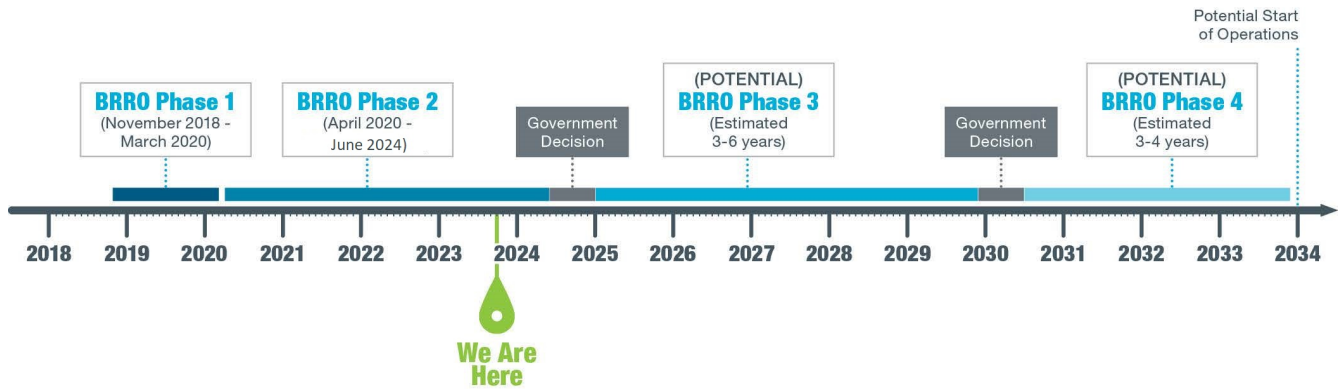
Thank you for your continued interest in the Bow River Reservoir Options (BRRO) initiative. As part of our commitment to provide regular updates on the initiative, we would like to share information on the feasibility study with you. This newsletter includes information about Indigenous engagement as well as potential dam site assessment.

Please note that the BRRO project timeline has been extended, as reflected in the graphic below.

You can find more information on the BRRO initiative, including feasibility study updates and engagement opportunities at: <https://www.alberta.ca/bow-river-reservoir-options.aspx>.

We look forward to continuing our discussions with you.

- The Bow River Reservoir Options Study Team



### Indigenous Engagement

The study team has received some inquiries about how the government connects with Indigenous communities and organizations about environmental issues. As such, we would like to introduce the concept of traditional knowledge studies.

Traditional knowledge studies are comprised of two components: Traditional Ecological Knowledge (TEK) and traditional land use (TLU). The TLU assesses the project area for historic, cultural and current use of the land, such as harvesting locations, settlement sites, ceremonial sites and areas of cultural significance.

The TEK utilizes generations of community knowledge and understanding of the local environment. In addition to traditional activities like ceremonies, hunting, trapping and fishing, this study can also include medicinal plants and Nation specific customs and observances. With a rich oral history, the stories of the land are connected to physical locations and landmarks.

The Indigenous technicians, Elders, and Knowledge Keepers that conduct TEK/TLU studies generate reports on their field observations, which are used to inform Alberta government policy or decisions. When culturally sensitive data is shared with the Government of Alberta, steps are taken to avoid appropriation and misuse of the information shared.

Indigenous Traditional Knowledge enriches our ability to understand local ecosystems, respects the historical and ongoing value of the land and provides insight into sustainability. By acknowledging and embracing this wisdom, we not only honour Indigenous cultures, but can learn innovative solutions to ecological issues and better understand the ecosystem services the land provides.

Indigenous communities and organizations have a deep understanding of the land within the study area, which will inform the current feasibility study or any potential future phases of the BRRO initiative.

The feasibility study team's engagement with Indigenous communities and organizations started with reaching out to share information about the BRRO initiative and discussing a path forward. The input and traditional knowledge shared with our team during the feasibility study will inform our assessment of the various factors and potential impacts of the reservoirs. If there is a decision to proceed to the next phase of the project, there will be opportunities for further engagement, provision of input, and knowledge sharing.

## Spotlight on: Assessing the area of a potential dam site

Understanding the subsurface conditions of a potential dam site helps ensure proper performance of a dam. The subsurface conditions impact the engineering design, selection of type of dam and construction of a dam. Depending on the conditions, a variety of techniques can be implemented during design and construction to ensure a dam's structural stability and to control water seepage through the foundation that could otherwise cause erosion and failure of a dam.

In the Bow River Reservoir Options Initiative, the Morley and Relocated Ghost Dam options are estimated to be located on stronger bedrock than the Glenbow East option. The stronger bedrock means the Morley and Relocated Ghost dams would likely be designed as concrete gravity dams while the Glenbow East Option would likely be designed as a zoned earth fill embankment dam and built with a large base for stability.

In the construction of a dam, substrate that contains bedrock is treated by grouting to seal potential water passages. Grouting is used in the construction of most concrete gravity dams where the substrate is anticipated to be relatively strong bedrock. Grouting is not usually done in soil as it is costly and ineffective.

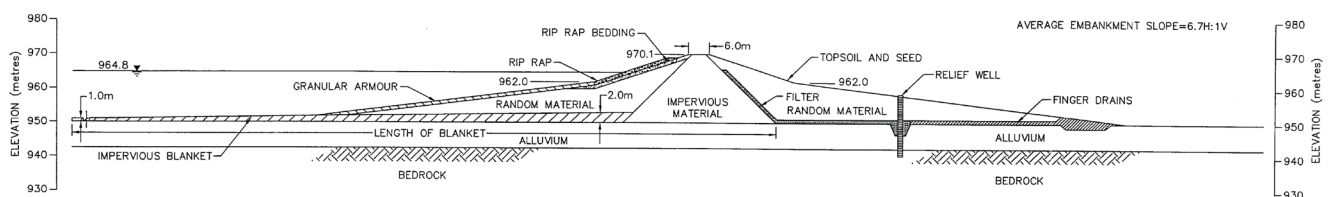
In site conditions where the substrate is made of permeable materials such as gravel, clay, silt, and sand, drainage features such as seepage blankets, filters, and cut-offs are used to direct the flow of seepage and reduce the movement of soil particles. In conditions with relatively impermeable material, such as clay till, features such as a key trench and stripping are used to prevent the movement of water through the foundation. In earthen dams, a low permeability blanket of soil on the upstream surface of the dam is commonly used to reduce seepage. Horizontal filter drains may be installed below ground in the downstream slope of the dam to control the erosion of foundation materials and reduce the pore pressures in the soil.

Assessing the subsurface conditions at each of the three potential dam sites will help the study team understand what type of dam could be built.

**Figure 1.0** Twin Valley Reservoir Earthen Dam



**Figure 2.0** Cross Section of an Earthen Dam



Learn more at: <https://www.alberta.ca/bow-river-reservoir-options.aspx>  
 Contact us today at [epa.bowbasin@gov.ab.ca](mailto:epa.bowbasin@gov.ab.ca) or call 310-3773, toll-free.  
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